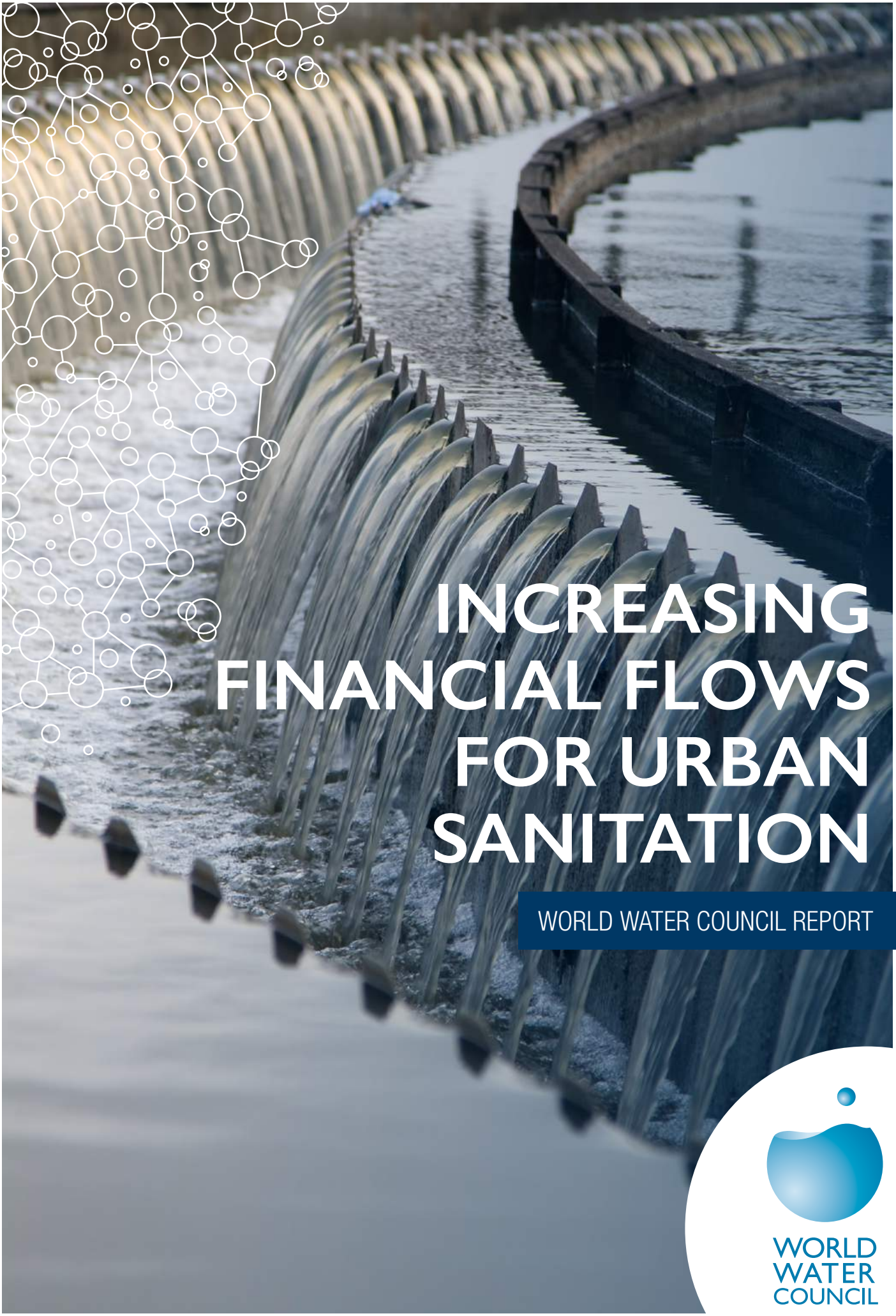
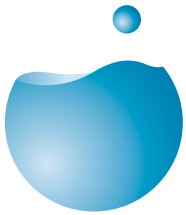


INCREASING FINANCIAL FLOWS FOR URBAN SANITATION

WORLD WATER COUNCIL REPORT

WORLD WATER COUNCIL



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www.worldwatercouncil.org

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FOREWORD

Our founding goal at the World Water Council has been to place water at the heart of our planet's most pressing political priorities. The Council's number one concern is global water security, and the infrastructure which supplies water for drinking and sanitation must be a priority. Without these, societies cannot grow, countries cannot develop. One out of five children under the age of five still die prematurely each year from water-related diseases and nearly a third of the world's population does not have adequate sanitation. A frightening reality considering we are already nearly a quarter of the way through the 21st Century.

These facts are only compounded by the knowledge that the Millennium Development Goal target for sanitation, which aimed to reduce by 50% the world's unserved population, was not even close to being achieved. Now, the Sustainable Development Goals aim for full coverage, which is even more ambitious. As the publication points out, in the next 12 years, sanitation services will need to reach over three billion people in urban environments and 5.5 billion in total. The spending will, therefore, have to follow to cover up to $45 billion in costs per year in urban areas alone, up to five times as much as is now invested.

Business as usual is not going to get us there. Whilst this represents a huge amount for our already overburdened public funds, we must not let it weaken our endeavour. Instead, we must be smarter in our investment, of both money and political will, to ensure sanitation is sufficiently and intelligently financed.

A major re-think of how we do sanitation has to take place if we are to offer a convincing answer to these problems, and the findings in this report provide many promising solutions. Herein, policy recommendations offer pre-emptive responses to trends we know will continue unfolding in the coming years.

I have spoken before about the three I's, three essential pillars on which effective water policy is built – institutions, infrastructure and investment – and this report elaborates on how all three have a role to play. Institutions must come together to promote circular economies of treated wastewater resources and enable financial flows through new and existing financing instruments. Infrastructure can reduce costs by moving away from traditional sewered sanitation to localised solutions. Investment must be increased through improved governance and incentivizing the performance of service providers.

Water management and sanitation in particular needs to be at the heart of global political discussions as integrated approaches are the only guarantee of a sustainable future. Sanitation is at the same time an environmental, social and economic issue and effective sanitation impacts positively the lives and livelihoods of millions throughout the world.
I invite you to read these policy recommendations and join the debate for change.

Benedito BRAGA
President
World Water Council

By initiating its first project on innovative financial mechanisms for urban sanitation, the World Water Council has prepared an analytical study based on eight cities from different continents that agreed to participate in the program. The World Water Council acknowledges the voluntary contribution of these eight cities and would like to express gratitude for their commitment to improving sanitation services.

This project has enabled the evaluation of these cities' potential capacity in delivering on one of the core requirements to achieve Sustainable Development Goal 6, bearing in mind that two other priority areas - namely adequate acquisition of knowledge and adapted technologies, and governance related to urban wastewater management - are also needed to reach SDG6.

The project also contributes to the understanding of basic principles on innovative financial mechanisms to better support the development of the sanitation sector and identifies the messages to be brought to the attention of the main stakeholders, in particular decision makers, professionals, donors and civil society.

For the World Water Council and its partners, the presentation of the project's outcomes at the 8th World Water Forum in Brasilia (Brazil) will provide the opportunity to consider extending the analysis to a larger number of cities. This analysis could start as early as 2019 with the aim to share the outcomes at the 9th World Water Forum in Dakar (Senegal).

The endeavour should be pursued by the World Water Council in perfect coordination with the international institutions and organizations that are involved in the project.

Hachmi KENNOU
Chair of the World Water Council Task Force
"Cities: At the heart of growth"
World Water Council

ACKNOWLEDGEMENTS

This work programme has been designed and directed by the Cities Task Force of the World Water Council under the leadership of Hachmi Kennou; Teresa Liguori is the Project Officer for this work programme and commissioned and managed all the consultants; Tom Soo, then Executive Director of the World Water Council, gave valuable strategic advice.

This report was written by Jon Lane, coordinating consultant to the World Water Council for this work programme. Any errors, omissions, or subjective opinions are his.

The national consultants who carried out the case studies of individual cities were: Abdelaziz Enasri, Diego Fernandez, Vikki Ferrer, John Gathenya, Murty Jonnalagadda, Neil Macleod, Cesar Seara, and Moustapha Sene.

The World Water Council and the author thank the following sector colleagues who reviewed drafts of this report: Guy Hutton (UNICEF), Dennis Mwanza (Gates Foundation), Maimuna Nalubega (African Development Bank), Lesley Pories (Water.org), Sophie Trémolet (World Bank), and Chris Zurbrügg (EAWAG).

The World Water Council and the author thank many sector colleagues who supplied information, published and unpublished material, opinions and advice; they are listed in Annex 2. Of these, Sophie Trémolet of the World Bank has been particularly generous in sharing both published and unpublished work and data on sanitation financing, upon which this report has drawn extensively.

The World Water Council wants this work to be open, collaborative and fully acknowledging the contributions and intellectual properties of others. Indeed the Council, with its unique advantage as the creator and organiser of the World Water Fora, wants to make its advocacy and communications channels available to other colleagues and partners to promulgate their messages on this subject.

EXECUTIVE SUMMARY

The analysis of current trends and innovative ideas generates an optimistic vision for the year 2030. In this vision, urban sanitation will be a tool for progress not a problem to worry about.

INTRODUCTION

Sanitation was one of the worst-performing sectors monitored by the Millennium Development Goals. Now the Sustainable Development Goal target is significantly more onerous than the MDG target was in two respects. First, it aims for sanitation for everybody, rather than only for halving the people without sanitation. Secondly, it aims for safely managed sanitation (the use of improved facilities which are not shared with other households and where excreta are safely disposed in situ or transported and treated off-site) rather than only for basic sanitation (the use of improved facilities which are not shared with other households). Achieving the SDG target will therefore take an enormous operational and financial effort. The World Water Council offers this report, together with eight accompanying case studies of cities, as a contribution to that collective global effort.

While the Council recognises that rural sanitation remains important, it is concentrating its attention on urban sanitation because urban sanitation services need to reach over three billion people in the next 12 years, the technical challenges are more complicated, the costs are higher, and the economic and social benefits of success are much greater. So this report is concerned with urban sanitation.

The report follows a logical sequence: first discussing what urban sanitation could look like by 2030, then examining how that sanitation would be financed, and then identifying what decision-makers can do now in order to increase those financial flows.

WHAT COULD URBAN SANITATION LOOK LIKE IN 2030?

The analysis of current trends and innovative ideas generates an optimistic vision for the year 2030. In this vision, urban sanitation will be a tool for progress not a problem to worry about.

The economic and business case for improved sanitation will be well-understood. Urban sanitation will be a service sector not an infrastructure sector. The safe and economically productive re-use of human excreta as resources will be an integral part of sanitation services. Sewered sanitation, onsite sanitation and container-based sanitation will exist alongside each other. The roles of governments, municipalities, private sector and civil society will reflect the strengths of each. They will follow the concept of city-wide inclusive sanitation, in which all organisations concerned with sanitation in a particular city come together and agree how best to serve all the people.

The roles of governments, municipalities, private sector and civil society (...) will follow the concept of city-wide inclusive sanitation, in which all organisations concerned with sanitation in a particular city come together and agree how best to serve all the people.

HOW WOULD THAT URBAN SANITATION BE FINANCED?

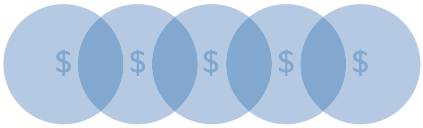
Financing that work using current strategies would require approximately $45 billion per year on urban sanitation, which is five times as much as the current level of spending. This seems a daunting prospect but there are two main ways to achieve it. The first is to reduce the headline figure of $45 billion per year by a strategic change of emphasis from sewered sanitation to on-site and container-based sanitation, which cost only half as much as sewered sanitation does. The second is to make sanitation service providers (whether they are municipal utilities, private sector companies or NGOs, large or small) financially viable and stable by reducing their expenditures and/or increasing their revenues. This report proposes several ideas to do both. By far the most significant idea to reduce expenditure is the change from sewered sanitation to onsite and container-based sanitation mentioned above. The most significant ideas to increase revenues are for regulators to reform tariffs – notably for rich people to cross-subsidise poor people – and for national governments to recognise and quantify the monetary value of the social and economic benefits of sanitation and pay that amount to the service providers.

If the service providers are financially viable and stable, they can attract new finance. The source of that new finance will not be the already-overstretched governments and donors, it will be the unprecedented sums of money saved by people around the world. Those people and their financial advisors and intermediaries are always looking for enterprises in which to invest their money. Once they become confident about the business case for sanitation enterprises, they will invest money into them. Thus, the financing needed to achieve the sanitation SDG will have changed from a headache for grant funders to a market opportunity for investors.

The critical element of this sequence is how the investors' money will reach the sanitation enterprises. This report therefore suggests various innovative ideas to enable that increased financial flow. Some suggestions are specific financial instruments, while others are financial mechanisms. Of the latter, the proposal with the biggest potential impact is for multi-stakeholder finance mechanisms that can enable many different investors to support many different enterprises simultaneously through a single platform with common monitoring and reporting systems. This report gives the working title of "sanitation financing facility" to such a platform. Sanitation financing facilities could take different legal forms and could be created at national, regional, or even global level. Other business sectors have similar platforms, but for urban sanitation they would be unfamiliar concepts requiring resolute pioneers.

These financial innovations will be supported by three main collaborative elements: measuring outcomes of sanitation services; monetising the societal benefits of improved sanitation; building trust among all the stakeholders.

45 Billion
per year in urban sanitation



5 times current level of spending

WHAT CAN DECISION-MAKERS DO NOW TO INCREASE THE FINANCIAL FLOWS?

These financial innovations will only succeed if decision-makers at many levels enable them. This report therefore contains encouragement to all the groups of decision-makers: primarily to national politicians, and secondarily to municipal leaders, regulators, entrepreneurs, bankers, investors, and the international development community. Here are some of the important actions for those various groups:

- Establishing independent statutory bodies to set tariffs and regulations.
- Clearly defining the roles of the various institutions and entities, to give investors confidence to support sanitation service providers.
- Introducing and enforcing national and local standards and regulations for the quality and sale of the products made from treated human excreta, to encourage circular economy concepts and activities to flourish.
- Re-allocating grant funds away from expensive sewered sanitation and treatment plants towards much cheaper decentralised systems, faecal sludge management and the infrastructure for container-based sanitation.
- Encouraging commercial banks and investors to enter the sector by mitigating the risks and costs for them.
- Recognising sanitation's contribution to public health and the environment by contributing financially to service providers' operational expenses.
- Activating and encouraging markets for sanitation products by being customers for fertiliser, energy and other products generated by circular sanitation economy businesses.
- Seeing sanitation in developing countries as a new business sector in which to achieve first mover advantage.
- Developing and investing in businesses all along the sanitation value chain.
- Encouraging municipalities and commercial investors to collaborate and co-invest, in order to gain scale.

CONCLUSION

Among all the complexity and detail, there are three fundamental messages to all stakeholders in urban sanitation. They are:

- Save huge amounts of money by moving emphasis from sewered sanitation to onsite and container-based sanitation.
- Increase financial flows by using a range of existing and new financing instruments and mechanisms.
- Attract new money into the sector by improving the governance conditions and the performance of the service providers.

If people of power, goodwill and vision come together boldly in this cause, they can attract the increased finance needed to achieve the sanitation SDG and to create cities in which healthy happy people can lead lives sustainably.

INTRODUCTION TO THE WORLD WATER COUNCIL'S WORK PROGRAMME ON SANITATION FINANCING

THE DEFINITION OF SANITATION FOR THE PURPOSE OF THIS WORK PROGRAMME

For this work programme, sanitation is defined as the management, treatment and re-use of human excreta. Greywater (waste water from kitchens, bathrooms etc) is often managed together with human excreta, and compostable solid waste can be co-managed with human excreta. So this work programme does also consider both greywater and compostable solid waste in those situations, based on the local context. Stormwater drainage is associated with sewerage in some cities, but this work programme does not study stormwater drainage itself.

The work programme is about financing sanitation, not about sanitation overall: it only studies enough about doing sanitation in order to inform the analysis about financing it.

THE REASONS FOR UNDERTAKING THE WORK PROGRAMME

Since the Millennium Development Goals (MDGs) were established in 2000, concerted global efforts have been made to improve sustainable access to safe drinking water and basic sanitation. The water MDG target was achieved, while the sanitation target was not: one third of the world's people still lack basic sanitation. Now that the MDGs have been superseded by the Sustainable Development Goals, the definition of adequate sanitation has become more stringent, notably through the concept of "safely managed sanitation", and so the sanitation figures look even worse.[1]

1 The authoritative definitions of all terms such as basic, adequate and safely-managed sanitation are on the Joint Monitoring Program's website www.washdata.org The biggest impact on sanitation finance is that safely-managed sanitation requires proper disposal or re-use of all the human excreta.

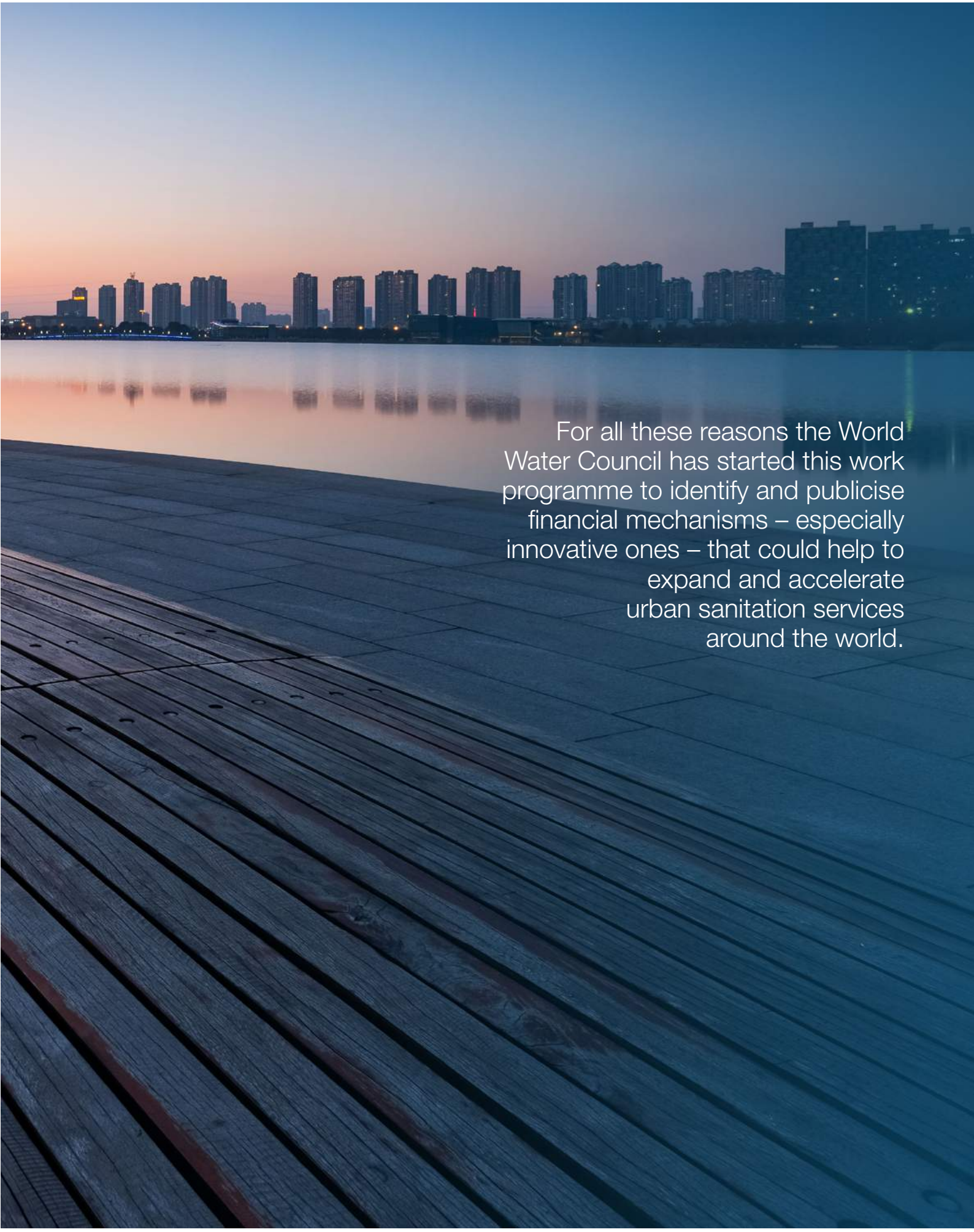
Despite the fact that the economic and health benefits of access to sanitation have been extensively researched and acknowledged, the issue is generally low on the priorities of national politicians and other decision-makers.

Compared to many other development sectors, sanitation is still a specialist and minor topic for donors and concessional financiers, let alone for commercial investors.

Although the absolute number of people in rural areas lacking access to adequate sanitation is still higher than in urban areas, rapid urban population growth and migration are making the situation more acute in urban areas. The urban statistics mask huge disparities between rich and poor people. Urban sanitation is technically more difficult and more expensive than rural. The health, economic and societal costs of inadequate urban sanitation are higher.

Urban sanitation has traditionally been seen as an adjunct to water, consisting of sewers and waste water treatment plants: this solution is convenient for those lucky enough to afford it but costs a lot of money and needs a lot of water. Adequate lower-cost solutions exist but are poorly explained or understood. Therefore, because they perceive that sanitation is expensive and difficult, many cities around the world have done very little about it. Householders themselves have had to improve their own sanitation, often on an ad hoc and unregulated basis.

For all these reasons the World Water Council has started this work programme to identify and publicise financial mechanisms – especially innovative ones – that could help to expand and accelerate urban sanitation services around the world.



For all these reasons the World Water Council has started this work programme to identify and publicise financial mechanisms – especially innovative ones – that could help to expand and accelerate urban sanitation services around the world.

THE CONTENT OF THE WORK PROGRAMME

The work programme has two main elements: case studies of eight cities by national consultants, and general analysis by the coordinating consultant.

The cities were selected by the World Water Council through its professional networks, on the basis of their expressed interest in this work and their readiness to try out innovative financing mechanisms. They are spread across Africa, Asia and South America, and they vary in population, in wealth, in political structures, and in sanitation coverage, technologies and service providers. The case studies illustrate successes, challenges and future aspirations relating to sanitation financing. Some of them have already started to innovate, but that was not mandatory in selecting them for this study. The cities are: Baguio (The Philippines), Blumenau (Brazil), Bogota (Colombia), Dakar (Senegal), eThekwini (Durban, South Africa), Jodhpur (India), Marrakech (Morocco) and Nairobi (Kenya).

Each national consultant has followed a consistent analytical framework comprising a short background on the country and on the study city, detailed information about sanitation financing in the study city, and analysis. Each has worked closely with the authority responsible for sanitation in that city, collecting data from that authority and from other relevant organizations. The output of this work is a set of eight case studies, published by the World Water Council, which can be read singly or alongside each other and this report.

The coordinating consultant's work is based on personal knowledge and study and on good work already done by other people on sanitation financing. It also draws on examples, opinions and information from the case studies of the eight cities. The output of this work is this report.

THE PURPOSE AND STRUCTURE OF THIS REPORT

This report is not an academic paper but a descriptive introduction to the subject of financing urban sanitation. Its purpose is to advocate for increased financial flows to sanitation in order to achieve a positive vision of the sector by 2030. It describes and analyses the subject and generates policy implications and messages to decision-makers. The World Water Council aims that this report will trigger relevant action by the target decision makers, and also that it will encourage other people to carry out more analyses of the financing needs, mechanisms and sources.

The report follows a logical sequence: first envisioning what urban sanitation services could look like by 2030, then analysing how those services would be financed, and then identifying what decisions need to be made now by whom in order to increase those financial flows.

The final section, on decisions to be made now, is also being summarised into a short leaflet that can be read quickly by busy senior people. That leaflet should contain all they need to know in order to make decisions, while their staff and colleagues can study the more detailed materials on their behalf.

This report combines generic material obtained by personal enquiry, expert interviews and study of publications, with specific lessons from the eight city case studies. These lessons are incorporated into the main text and the individual case studies are also briefly summarised in the Annexes.

NEXT STEPS IN THIS WORK

This will be an ongoing work programme for the World Water Council. Several sessions and activities are planned at the 8th World Water Forum in Brasilia, at which this report is being launched. After that Forum, the Council will continue with various work streams, including supporting the eight study cities to be early adopters and advocates on this subject. It will also work globally alongside others to help promote the innovative finance mechanisms described in this report.

I.
WHAT COULD URBAN SANITATION LOOK LIKE IN 2030?

For professionals who have already worked in this field for 20 or 30 years, projecting another 12 years is not speculative futurology but informed prediction based on current trends and upcoming ideas. That is the basis of this section of the report. The underlying tone is unapologetically positive and optimistic: envisioning that urban sanitation can be well-managed and adequately financed by 2030, while examining how that optimism can be justified.

1.1
THE DEMOGRAPHIC AND POLITICAL CONTEXT

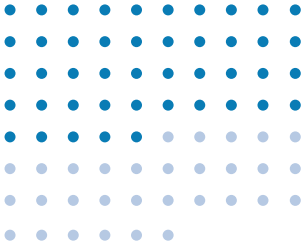
According to UN-DESA statistics and projections there are now 7.6 billion people in the world, of whom 3.1 billion live in urban areas in less developed regions. By 2030 there will be an extra 1.0 billion people, almost all of whom will live in those same urban areas in those same less developed regions. That is one billion more mouths to feed and one billion more bottoms to serve with sanitation.

The Sustainable Development Goals (SDGs) understandably set more rigorous targets than those of the Millennium Development Goals (MDGs). Specifically on urban sanitation, the UN's Joint Monitoring Program data show that in 2015 83% of the world's urban population had improved sanitation (this was the MDG target definition - facilities designed to hygienically separate excreta from human contact) but only 43% had safely-managed sanitation (this is the SDG target definition - improved sanitation facilities, not shared with other households, from which the excreta produced should either be treated and disposed in situ, stored temporarily and then emptied and transported to treatment off-site, or transported through a sewer with wastewater and then treated off-site). That means that 40% of the world's urban population either had improved sanitation facilities shared with other households or had improved sanitation facilities from which the excreta were not properly treated.

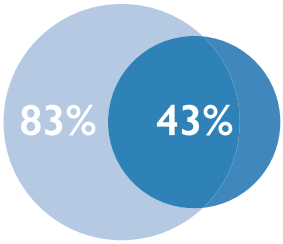
Those headline figures, onerous as they are, hide big disparities between rich and poor. Urban areas are diverse in terms of socio-economic conditions, settlement patterns, infrastructure and services. Rich neighbourhoods are often very well serviced with sanitation while poor (especially slum) areas are much worse off. This issue of inequity is a major political and demographic problem.

In order to achieve the SDG targets for sanitation, by 2030 an extra 3.2 billion urban people and an extra 2.1 billion rural people will need to achieve safely managed sanitation, while the excreta of all 8.6 billion people in the world must be treated.

By 2030 the leaders of mankind will be struggling to find a balance between improving the quality of life for ever-increasing billions of people and conserving the stability and health of the natural environment on which they and all other species depend. Decision-makers will need to take historically unprecedented measures to achieve and sustain that balance. Sanitation professionals can help those leaders by converting human excreta from a waste to a resource and offering urban sanitation as a tool for progress rather than as yet another problem to worry about. This can be done by revising conventional ways of working and applying some new ideas both about the sanitation service and about its financing.



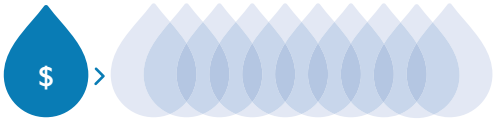
7.6 Billion
people in the world
3.1 Billion
live in urban areas
in less developed regions.



In 2015 **83%** of the world's urban population had improved sanitation but only **43%** had safely-managed sanitation
*UN's Joint Monitoring Program

1.2 THE ECONOMIC AND BUSINESS CASES FOR IMPROVED SANITATION

The economic case and the business case are similar phrases but they refer to different aspects of sanitation. The economic case for improved sanitation demonstrates that improved sanitation benefits the national or local economy. The business case for sanitation demonstrates that companies can run profitable businesses working in improving sanitation. Already in 2018 both the economic case and the business case are well-established as described below. Given the bases of their calculations and the current trends, by 2030 both cases will have become stronger.



Typical figures are that **$1** invested in water and sanitation yields in the order of **$5 -10** of economic benefits

The economic case

This essentially addresses the question of why politicians should care about urban sanitation in general and about universal safely-managed sanitation in particular. It builds an economic case by quantifying the benefits due to improved sanitation.

Several studies have demonstrated the good economic returns on investing in improved water and sanitation. Generally their format has been to calculate only the economic benefits most directly related, i.e. the time savings associated with better access to water and sanitation facilities, the gain in productive time due to less time spent ill, the health sector and patients costs saved due to less treatment of diarrhoeal diseases, and the value of prevented deaths. The recognised authority on these economic analyses is Guy Hutton, originally for WHO and latterly as part of a team conducting the Economics of Sanitation Initiative at the Water and Sanitation Program / World Bank. The WHO and ESI results are typically framed, at global, regional or national level, either in terms of the benefit:cost analysis of investing in sanitation or in terms of the GDP lost by poor sanitation. Typical figures are that $1 invested in water and sanitation yields in the order of $5-10 of economic benefits, and that poor sanitation costs countries 2-6% of their GDP. These are hugely significant numbers. While those earlier studies did not provide separate rural and urban analyses, Hutton's recent paper for the Copenhagen Consensus Center on the benefits and costs of water and sanitation does provide the breakdown specific to urban sanitation, based on 2015 numbers and costs. It gives a benefit:cost ratio of between 2.5 and 3, depending on the economic assumptions used.

Strong as these analyses are, overall they probably under-estimate the political case for sanitation because they do not quantify the benefits that are less directly related to sanitation such as the benefits to the environment, to people's feelings of safety, convenience, status and wellbeing, and ultimately to national economic development. The political case for sanitation can even acknowledge its impact on tourism, international trade and international economic investment, political stability and reduction of migration and displacement of people.

The above analysis of quantifying benefits is, in economics terminology, monetising the externalities of improved sanitation. This will be a vital aspect of the future financing solutions for sanitation, and is discussed further in section 2.6 below.

The business case

This addresses the question of why businesspeople should be interested in working in urban sanitation. In high-income countries there are already many companies of all sizes running successful businesses in sanitation; their shareholders and managers are well aware of the business case for working in urban sanitation. As to middle- and lower-income countries, the picture is more variable. There are certainly many companies making a living out of urban sanitation, but they tend to be smaller entrepreneurs or family businesses often operating in the informal economy rather than large companies operating at the city scale: for example out of the eight study cities only one, Blumenau, has a private company managing the sanitation for the whole city.

For almost 20 years since this topic was originally championed by the Government of Switzerland, various development agencies have worked to study, promulgate and advocate for businesses to be involved in urban sanitation. This movement has recently been boosted by the attention given to climate change, to the environment and to the concept of the circular economy, because those considerations are making sanitation-related businesses inherently more profitable than they used to be.

One of the agencies most actively promoting the business case for urban sanitation is the Toilet Board Coalition (the TBC), which is a membership organisation promoting the contributions that entrepreneurs and private sector companies can make to sanitation in developing countries. The TBC estimates that toilet resources (the new name that the TBC has coined for what were previously known as excreta or human waste) amount to 3.8 trillion litres per year globally, with an economic value of many billions of dollars. The TBC and other advocates are encouraging entrepreneurs to see urban sanitation in developing countries as a new business sector in which to achieve first mover advantage. They believe that entrepreneurs can develop businesses all along the sanitation value chain, to attract various different investors.

To strengthen the business case, investors look for factors that would mitigate the risks and costs for them. In addition to the specific characteristics of the business itself, these factors could include: a clear policy framework for urban sanitation; clear definition of the roles of different government and private sector organisations; legislation and regulation that is enforced in courts of law; a stable and committed municipality, preferably willing to co-invest alongside commercial investors. These governance factors are very important to build the business case. Investors' needs are mentioned again in section 2.6 below.

1.3 CITY-WIDE INCLUSIVE SANITATION

In 2018 this is an emerging concept[2]; by 2030 it should be the norm. The basic principle is plain common sense, that all organisations concerned with sanitation in a particular city come together and agree how best to serve all the people of that city. It sounds easy but it has not yet become widespread: for example of the eight study cities only eThekwini and Dakar have really understood and adopted it to date. It is essentially a governance concept that combines planning frameworks, agreed institutional roles, legislation and regulation. Every city is unique, but there are certain underlying principles that apply to all cities:

- Working in partnership to deliver the sanitation services across the whole city. Embed sanitation within urban governance as a whole; establish clear roles and responsibilities that use the strengths of the various types of organisation; articulate and build demand through civil society; work together on mapping, planning, designing and implementing sanitation services.
- Embracing diversity. Promote a diversity of governance concepts, planning frameworks, service providers, technical solutions and finance mechanisms in order to serve everybody; avoid trying to impose one solution for the whole city.
- Fulfilling the human right to sanitation. Address inequity; reach the most vulnerable and marginalised people; focus on informal settlements; ensure affordability for the poorest people; set tariff policies accordingly.
- Recognising that sanitation contributes to a thriving urban economy. Integrate sanitation into urban planning; use circular economy concepts to increase resource recovery and reuse; link improved sanitation to progress in other urban and social development sectors.
- Achieving safe management along the whole sanitation service chain. Allow diverse solutions and approaches; promote decentralised treatment rather than centralised systems; select and use the best technologies for each stage of the service chain.

None of these ideas are strange or difficult to grasp. The effort is in actually applying them. People, especially leaders and decision-makers, need to change how they work. Those who have previously held all the power – typically the municipal leaders – need to have the dignity and vision to see that they can share that power with others without belittling themselves. The other stakeholders need to acknowledge this and support this change.

Several external stakeholders are trying to stimulate municipal leaders to take up city-wide inclusive sanitation. One unusual method is by giving prizes. For example the Sanitation Challenge for Ghana is a mechanism, initiated by the UK Department for International Development, to stimulate interest among municipalities by offering them prizes for the best liquid waste management strategies. The challenge has generated huge interest among municipalities across the country and has recently been extended to private sector and NGO partners also. The Ghanaian government is very actively supporting the municipalities' work by revising governance arrangements and regulations. The whole process has helped municipalities to think creatively, work with others in inclusive partnerships, and design and implement sustainable liquid waste management strategies that are leading to city-wide sanitation service delivery.

2 This concept has been created by a group of organisations including the World Bank, the Gates Foundation, WaterAid, Emory and Leeds Universities and others.

1.4
SANITATION AS A SERVICE SECTOR

Since the pioneering municipal programmes of the nineteenth century, sanitation has generally been categorised as an infrastructure sector. That automatically directed it towards civil engineering, large capital projects that need correspondingly large amounts of money, centralised planning, sunk assets, rigid outcomes. Planners and engineers have dominated the sector. Meanwhile inadequate sanitation is frequently labelled a public health problem – laying the burden of solving it solely upon governments and concerned donors. Householders have been categorised as recipients or beneficiaries, which are essentially passive roles.

Telecommunications was also formerly categorised as an infrastructure sector, based on the sunk assets of fixed landlines. But now with all the flexible technologies and business models and the range of communications media available to the users, it has completely changed to a service sector and has attracted huge numbers of investors and service providers. So too with sanitation: with the proliferation of new ideas (business models, service options, technology solutions, etc.) all along the sanitation value chain and a new focus on the householders as customers, the established perceptions have already started to shift and by 2030 urban sanitation should no longer be categorised as infrastructure but as a service sector.

A service relationship needs customers and service providers. For urban sanitation the customers are people, usually categorised as householders because sanitation is predominantly a household-related service. The service providers are all the organisations, from both the public and private sectors, that provide services to those householders. These include, for example, educators who explain the benefits of improved sanitation, masons who build toilets and dig pits, contractors who empty pits, entrepreneurs who supply and service container-based toilets, community groups or companies that build and manage shared toilets and public toilets, utilities that construct sewerage networks and sewage treatment plants, specialist companies that process toilet resources into desirable commodities such as water, fuel, compost or chemicals. That is a wide range of types and sizes of enterprise with one common characteristic: they all make their living from meeting the sanitation needs of their customers. Among those service providers, one of them – typically the municipality or utility – is ultimately accountable for provision of this service and for coordinating the other service providers.

1.5 THE CIRCULAR SANITATION ECONOMY

In 2018 the circular sanitation economy is a relatively new concept[3] . It is a specific application of the general concept of a circular economy in which one organisation's waste can be another organisation's inputs. Circular economy concepts such as reusing resources and generating useful products from waste have been applied to sanitation at a small scale for decades – almost all the case study cities in this work programme have examples of this at a small scale. Now these concepts are being considered at the scale of the entire sanitation service chain. At the same time renaming "human excreta" or "waste" as "toilet resources" is a symbolic step forward reminding everybody to set aside their past thinking as they look to the future. Toilet resources have energy value (for gas and biomass fuel), nutrient value (for fertilizer and feed), organic matter value (for carbon storage) and water value (for non-potable applications). By 2030 all urban sanitation services should be an integral part of a circular sanitation economy. Toilet resources will be carefully contained, transported and transformed into products that can be used as inputs to other industrial and agricultural processes.

The circular sanitation economy has built upon principles associated with ecological sanitation and sustainable sanitation. Both of those concepts have been in use for many years but have struggled to become accepted mainstream practices. The circular sanitation economy will have a broader appeal and will bring the ideas from those concepts to a much larger scale and acceptance. Many sanitation sector agencies and commentators are now seeing the circular sanitation economy as a big driver of innovation in the sector.

In **2018** the **Circular Sanitation Economy** is a relatively new concept, in which one organisation's waste can be another organisation's inputs.

3 It has been particulary championed by the Toilet Coalition (TBC), which was introduced in section 1.2 above.

The circular sanitation economy is not a technology but a concept. Its principle of generating value out of reused toilet resources can apply to many different technologies, institutional settings, organisations and scales. Some of the characteristics and benefits of the circular sanitation economy are[4] as follows:

- Environmental protection and efficient resource use and/or protection are not seen as financial burdens but as financial opportunities. The motivation to engage in this is not tokenism or a feel-good attitude but rather a business interest and an economic and employment opportunity.
- Circular economy activities are most effective when carried out collaboratively by entrepreneurs, large companies, utilities and municipalities together, not by entrepreneurs acting alone. This should encourage traditional centralised utilities to join the circular sanitation economy rather than ignore or resist it.
- Circular sanitation business models can become profitable at a city-scale if they are encouraged by the appropriate regulation of products (e.g. on quality of re-used water; fertiliser for food crops; feed-in to electricity grids; solid fuel).
- Circular economy business models can also become profitable at a more local scale such as a single factory, hospital, university or housing estate.
- The circular sanitation economy can co-treat toilet resources with other biological resources (such as food waste from factories or restaurants and other compostable solid waste) that are otherwise wasted. That co-treatment boosts the volumes of products and can improve the profitability of the process.
- The circular sanitation economy concept can be applied to sewered sanitation (for example in managing sewage treatment plants) although it tends to be more inherently suited to decentralised technologies such as on-site and container-based sanitation in which the toilet resources are not diluted with water and so are easier to process.
- Recovering resources automatically involves appropriate treatment of the wastewater or faecal sludge. For example, generating biogas involves anaerobic digestion, which is a sludge treatment process after wastewater treatment. To use wastewater for agricultural irrigation, it must be treated. To use sludge for fertilizer on agricultural land, it must be treated. So if these end products are valued, more wastewater and faecal sludge will be treated than if the end products were regarded as valueless.

Circular sanitation economy processes at a city scale are already common in developed countries, notably in Europe, but not yet common in developing countries: for example, of the eight study cities only eThekwini has started applying circular sanitation economy concepts at scale. Most circular economy activities have tended to start at a smaller scale: Jodhpur is a good example of a city that tried this at too small a small scale to become profitable. The TBC's financial models suggest that these activities should be profitable at the city scale, or at worst they should need a much lower subsidy from the government than non-circular economy systems already receive.

4 This list is based on work by the TBC.

1.6 TECHNOLOGIES

Unless currently unforeseen technologies are invented very rapidly, by 2030 the three basic technologies for urban sanitation will still be as they are today: sewered sanitation, on-site sanitation, and container-based sanitation. Some cities plan to have 100% coverage by one technology (normally sewered sanitation) but this is a very difficult aim in middle- or low-income countries. Baguio and Nairobi are typical examples of cities with unrealistic and unfunded plans to do this. Other cities will use a mix of the three: Dakar provides an interesting case where the government's long-term vision is for 100% sewerage but it knows that is unaffordable so it is promoting on-site sanitation for the medium-term. There is no absolute rule about which technologies to use: what matters is that the right technical mix is chosen to serve the people of that particular city sustainably and affordably. Under the city-wide inclusive sanitation concept, sewered sanitation, onsite sanitation and container-based sanitation will exist alongside each other. They will interact in well-planned ways, for example transferring the toilet resources from on-site toilets and container toilets into suitably-designed wastewater treatment plants. The policy decisions about the technology will usually be based on economics, demography, topography and history.

Sewered sanitation

This describes a centrally-planned network of underground sewers running from houses to wastewater treatment plants, along which the toilet resources are transported by flushing with water. Around the world this system still seems to have the highest status, mainly because the user can flush and forget, i.e. it requires no personal interaction with the toilet itself, nor with service staff visiting the home for removing containers or emptying pits. The customer only has to pay the service provider, which is normally a municipal utility, for the service.

However sewered sanitation is increasingly becoming seen as unsustainable, or even obsolete, for a number of reasons. It consumes huge quantities of water for flushing. It sinks infrastructure into the ground which cannot be moved or sold or re-purposed. It is inflexible and slow to adapt to changed human settlement patterns. Above all, it is extremely expensive. Looking at the capital cost for new infrastructure, for example, none of the eight study cities can raise enough money from the user tariffs or their own resources to pay for the capital cost of sewered sanitation. Of them, the city utility that comes closest to doing so is Marrakech, which is lucky enough to be able to fund ⅔ of its capital expenditure by cross-subsidy from its electricity operations.

Gradually the dominance of sewered sanitation in the eyes of municipal leaders is diminishing as observed, for example, in the discussions at World Water Week in Stockholm. Today's engineers and administrators have been educated in many more technical options than their predecessors were, to whom sewered sanitation was taught as the only proper form of sanitation. By 2030 sewered sanitation is still likely to be predominant in cities that are rich enough to afford it and have the sewers in place with adequate water supply, collection and treatment. In urban areas in less developed countries it might still provide the infrastructure backbone for the citywide sanitation systems into which other technologies will be integrated, and it will tend to be the dominant technology in city centres. Simplified and cheaper piped infrastructure may also be used widely for grey water and storm water disposal.

Marrakech is lucky enough to be able to fund ⅔ of its capital expenditure on sanitation by cross-subsidy from its electricity operations.

On-site sanitation with faecal sludge management (FSM)

On-site sanitation describes a system in which the toilet and the containment of the toilet resources (usually a pit or septic tank) are both within the householder's property. Any liquid overflow from the on-site container either soaks into the ground or is connected into a sewer network. In some technologies, notably twin-pit offset toilets and the more recent Reinvented Toilets[5] , the treatment of the toilet resources also takes place on the site and the householders can be, in effect, their own service providers.

The main technical problem with on-site sanitation is that it requires one or more holes in the ground, and is therefore only applicable in premises that have outdoor space such as gardens. (Occasionally the pits can be dug indoors but this needs cultural acceptance and makes emptying very awkward.) Multiple-occupancy buildings such as apartment blocks need mini-sewer systems indoors leading to a communal septic tank or other treatment facility outdoors. Properties and neighbourhoods served with onsite sanitation also need separate systems for greywater and stormwater disposal.

Householders have used on-site sanitation for many years and it is still the majority technology in many big cities including until recently Tokyo, which is the largest city in the world. The main technological developments from now until 2030 will be in the transport and treatment of the toilet resources (faecal sludge) that is removed from the on-site sanitation facilities. This activity is called faecal sludge management (FSM) and is developing into a specialist service industry of itself. The quality of the treatment is improving and many FSM enterprises have already demonstrated that they can be profitable and viable through applying principles of the circular sanitation economy. Of the study cities, Dakar has the most extensive and best-planned systems of onsite sanitation and FSM and has particularly pioneered the governance aspects of FSM.

The best source of detailed information about FSM is the ongoing series of international FSM conferences with its supporting publications.

Container-based sanitation (CBS)

In 2018 CBS is a new concept within the mainstream sanitation sector in developing countries, although similar ideas have been used for decades in rich countries in niche markets such as vehicles and boats. By 2030 CBS could be widespread. It is technically different from either sewered sanitation or on-site sanitation in that the toilet unit itself is a movable asset that belongs to the sanitation service provider, not the household. It incorporates a hygienically sealable container that is removed from the household at an agreed frequency by the service provider, to whom the householder pays a tariff, usually weekly or monthly. The toilet resources are transported for treatment either at a facility owned by that service provider or at a treatment plant owned by the municipality – in either case product sales are an important part of the concept so it integrates even more easily into the circular economy concept than either sewered sanitation or onsite sanitation. By its nature it is a decentralised and flexible service with minimal sunk costs in capital assets so it can be revised, improved or scaled up indefinitely by one or several service providers. CBS allows the householders to use ecological sanitation approaches without needing to manage the toilet

5 The Reinvented Toilet, a concept vigorously promoted by the Gates Foundation, is a modular, transformative technology that aims to destroy all pathogens onsite and recover valuable resources, operate without sewer, water or electricity connections and cost less than $0.05/user/day in a sustainable business model. Various versions are currently at the prototype stage.

resources themselves. It also allows for management of large volumes of toilet resources and so is suitable for shared and public toilets.

One big advantage of CBS is that the toilet can be located anywhere on the household premises, so the householder does not have to have outdoor space for it. This is very advantageous for people who live in densely-populated urban locations. On the other hand, CBS has a potential image problem: people might associate it with the failed practice of night soil collection. That now-discontinued system involved sanitation staff collecting fresh excreta from householders' bucket toilets unhygienically and was acknowledged to be a humiliating enterprise. CBS advocates intend to explain clearly that contemporary CBS is entirely different from night soil collection in terms of safety and lack of health risk to staff. CBS has other disadvantages: it needs larger containers for householders who use anal cleansing with water, it generates extra truck traffic with associated air pollution, and the container emptying service must be extremely reliable.

Currently, CBS service providers are either small entrepreneurial companies or, in the case of Manila, a city-wide utility. The latter is currently only a pilot scheme but if successful it could point the way forward for CBS because a utility can achieve the economies of scale that are so difficult for entrepreneurs to attain.

Public and shared toilets

The three main technologies have been described above in the context of sanitation services for households and commercial premises. For people living in very crowded accommodation in certain countries, however, some national policies will still allow service provision by public or shared toilets. These toilets are typically in blocks with washing facilities and other services. They are usually either connected to sewers or constructed with their own large septic tanks.

By 2030 the quality of public or shared toilets should be significantly improved, because good practice in managing the toilets will have spread. At the present time many public or shared toilet blocks are already being sold, leased or rented by municipalities to NGO or private sector enterprises: for example in Jodhpur the public toilets are run profitably by private sector concessionaires. Regarding treatment of the toilet resources, the few public or shared toilet blocks that have enough space will have their own onsite treatment facility. The majority of public or shared toilet blocks will not have that capability, however, and so their toilet resources will need to be transported either through the sewerage network or by vehicle for treatment.

The boxes below summarise two recent (2017) studies of CBS.

STUDY EVALUATING THE POTENTIAL FOR CBS, BY THE WORLD BANK

This combines an overview of CBS and detailed studies of four companies, and is generally favourable towards CBS as part of a city-wide inclusive sanitation approach. Some important points coming through are:

- Overall CBS might be more cost-effective in the long term than sewered sanitation or on-site sanitation, although the World Bank does not yet feel that enough research has been done to be definitive about this.
- Most CBS service providers provide a good quality of service to their customers with very few complaints.
- It is currently difficult to judge the relative affordability of CBS to the customers because the service providers generally set their charges to match the existing sewerage tariffs (which are usually highly-subsidised by the government).
- The four companies are making progress towards being profitable. They will definitely be more profitable if they expand their scale of operations. The barriers to going to scale include: uncertain regulation of products; low support from municipalities; no grants being offered by the government (unlike for other types of sanitation).

PUBLICATION: THE WORLD CAN'T WAIT FOR SEWERS, BY WSUP

This publication analyses success factors for CBS enterprises and presents a vision for taking CBS to scale, based mainly on the example of Clean Team in Kumasi, Ghana.
Some important points from the paper are:

- CBS is profitable in theory but difficult in practice. Among the most important economic factors are the capital cost of the container and the frequency of collections per week. The enterprise needs to have a gross profit margin of at least 50% in order to be a sustainable business. That generally corresponds to charging say $8 per household per month which is probably too high for the poorest households.
- CBS is customer-centred work. The service must be reliable as well as hygienic. Realistically it may only appeal to, say, 20% of the total population of a city.
- The future for CBS is more likely to be in partnerships between an entrepreneur and the public sector than in standalone entrepreneur companies. Thus CBS can be an integral element of a city-wide inclusive sanitation programme.
- The capital expenditure requirement for a CBS service is much lower than for sewered sanitation. The cost of treatment is a significant element and can be kept low by integrating the planning of the CBS service into the sewage treatment and faecal sludge management for the city as a whole.

2. HOW WOULD THAT URBAN SANITATION BE FINANCED?

2.1
WHO WILL NEED FINANCING AND FOR WHAT

The first step in studying appropriate finance mechanisms is to identify the people and organisations who will need to be financed, and what they need that money for. This can be confusing, especially for non-finance professionals. Different analysts and commentators have different viewpoints and definitions regarding sanitation financing. Here is a simple list of the main people and organisations that need financing.

Householders

Householders need finance for capital expenditure to construct their own toilets and either sewer connections or on-site storage such as septic tanks or pits; in a few cities they even construct neighbourhood sewer networks also. These householders' capital expenditures add up to a very big proportion of total spending on sanitation, although its dispersed nature inevitably means that it is generally not well measured and receives much less attention than the municipality/utility financing described later in this list. Moreover, the existing gaps in urban sanitation are overwhelmingly for the urban poor, who are less able to finance their own sanitation. Depending on their wealth or poverty, some householders cannot afford the capital expenditures, so they need grants. Others can afford the capital expenditures but not in a lump-sum up front, so they need loans.

Ideally, if the appropriate sanitation services have been provided to them, the householders can afford to pay the full tariffs to their sanitation service provider – whether it is a contractor providing an emptying service for on-site sanitation paid once every few years (which can be a very expensive item for poor people), or a utility charging sewerage services as a surcharge on the water bill, or a container-based sanitation provider paid monthly or weekly, or a public toilet operator paid per visit. However, depending on their economic status, some householders need ongoing help to cover these tariffs: for example in both Bogota and eThekwini a defined basic service level is provided free to the users as a matter of government policy.

Depending on their wealth or poverty, some householders cannot afford the capital expenditures, so they need grants. Others can afford the capital expenditures but not in a lump-sum up front, so they need loans.

The existing gaps in **urban sanitation** are overwhelmingly for the urban poor, who are less able to finance their own sanitation.

MAINTAINING AFFORDABILITY FOR POOR AND VULNERABLE HOUSEHOLDERS

Poor and vulnerable householders may need special measures (i.e. grants, whether direct or indirect) to help them afford the capital and operational expenditures of the service. 60% of governments responding to the 2017 GLAAS report have affordability schemes in place, although sadly half of these schemes are not widely used. The schemes include:

- Government grants to the service providers to support free, reduced or discounted tariffs, for sewerage and/or pit emptying, for specific population groups.
- Linking the sanitation tariff directly to block tariff structures for water, with a highly subsidized first block to cover basic needs.
- Free or reduced connection fees for specific population groups.
- Government grants to microfinance institutions to lend money to low-income householders with little to no collateral and with payment plans that accommodate their circumstances.
- Various forms of payment plans and revolving loan funds. These concepts are discussed in various sections of this report.

Local-scale service providers: faecal sludge management contractors and container-based sanitation companies

These are contractors that empty householders' septic tanks, toilet pits or container toilets and transport the toilet resources (excreta, faecal sludge, septage) to treatment plants that are operated either by them or by a municipality/utility.

They need finance for capital expenditure to buy container toilets and pit-emptying and transport vehicles, which are usually their main assets. They might need finance for capital expenditure to build or buy the treatment plants that create sellable products.

Depending on the economic and regulatory setting in which they operate, the scale of their operations, the travel distances and traffic congestion, and the treatment infrastructure to which they link, these companies might or might not be profitable. So they might also need grant or loan finance for their operational work.

City-scale service providers: municipalities/utilities

These are large entities operating in sanitation at a city level. They might be departments within municipalities, or separate utilities – the latter could be public sector corporations or private sector concessionaires.

They need finance for capital expenditure to build sewerage networks and wastewater treatment plants, which are their main assets. Compared to all the other activities listed here, these tend to be by far the largest capital items needing the most money and attracting the most political attention and controversy. One much-quoted example is Dar es Salaam, where 99% of the sanitation budget was allegedly spent on the capital cost of a sewered sanitation system for 10% of the people[6].

6 The investigative work on this case was done by Sophie Trémolet for WaterAid.

They also need finance for working capital for capital maintenance and rehabilitation of these big assets. They might also need finance for working capital for their operational work (which itself includes the cost of borrowing money for their capital expenditure).

Depending on their customers' ability to pay and on the political and regulatory setting in which they operate, these entities might or might not be profitable. For example the International Benchmarking Network for Water and Sanitation Utilities (IBNET) website indicates that 43% of utilities monitored in middle- and low-income countries are unprofitable on their operational expenditures alone, even without considering their capital expenditures also. Of the study cities, the utilities in Bogota and eThekwini are profitable on operating expenditure basis, while those of Jodhpur and Nairobi are not. In Baguio the capital and operating expenditures are not accounted separately and overall the municipality has to receive 40% of its income in grants from the national government.

Others

There are many other players in the sector such as public sector or NGO hygiene educators and promotors of sanitation in general, pit diggers and septic tank builders, manufacturers and hardware suppliers, community or shared toilet operators, and specialists in the various parts of the supply chain. Their finance needs are either similar to those of the main players listed above or comparatively small, so they are not repeated here.

IBNET Website indicates that **43%** of utilities monitored in **middle and low-income** countries are unprofitable on their operational expenditures alone.

2.2 HOW MUCH MONEY THEY WILL NEED

Several organisations have been studying the global, regional and national finance requirements for water and for sanitation, usually expressed in terms of the finance required to achieve the Sustainable Development Goals. Of them, the most-quoted authority is the Water and Sanitation Program and World Bank paper of 2016 authored by Guy Hutton and Mili Varughese entitled "The Costs of Meeting the 2030 Sustainable Development Goal Targets on Drinking Water, Sanitation, and Hygiene". The authors stress that their figures are based on broad assumptions so each figure has a wide possible range - but they are generally acknowledged as the best figures available. They estimate that to meet the SDG target for safely-managed sanitation for all, approximately $45 billion per year is required for urban sanitation[7]. This figure includes capital expenditure, capital maintenance for new infrastructure, and operational expenditure, but they exclude maintenance of existing infrastructure. These are huge and rather abstract numbers - the authors do not discuss the question of who has to actually find and spend the cash. The answer is that the people and organisations listed in section 2.1 do.

Putting the Hutton and Varughese figures into context to indicate the task ahead, this future funding requirement for sanitation is approximately double the corresponding requirement for drinking water and it is approximately five times more than the investments made during the MDG period. In contrast the 2017 GLAAS report shows that currently expenditure on sanitation is about 25% less than expenditure on water, and that 87% of the countries responding to the GLAAS survey reported insufficient financing to reach their national targets for urban sanitation.
The requirements are shown on a diagram prepared from the data in Hutton and Varughese by Sophie Trémolet of the World Bank.

365 Days

$45 Billion

Hutton and Varughese estimate that to meet the **SDG target** for safely-managed sanitation for all, approximately **$45 billion per year** is required for urban sanitation.This figure includes capital expenditure, capital maintenance for new infrastructure, and operational expenditure

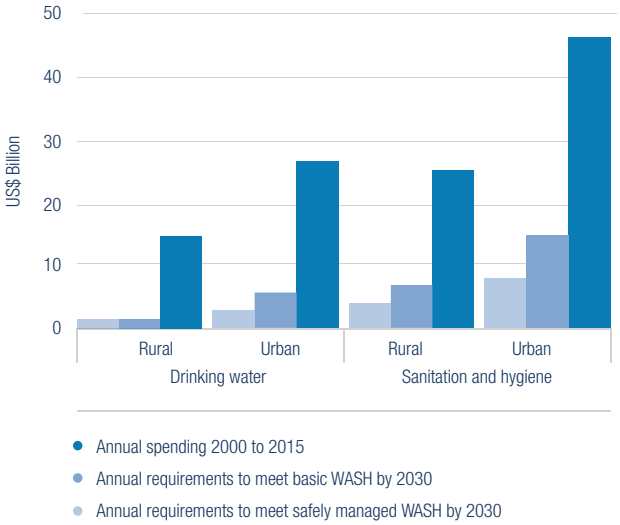


Fig 1 diagram based on data in Hutton and Varughese, Sophie Tremolet, World Bank.

7 They estimate a range of $25 to $70 billion depending on the assumptions made. The biggest factor is the balance between onsite (cheaper) and sewered (more expensive) sanitation.

Of the $45 billion headline figure, about two-thirds is for safely managing the toilet resources, and about one-third is for providing the basic level of services to the householders. Thus the inclusion of the important if deceptively innocuous phrase “safely managed” in the SDG wording triples the cost of sanitation compared to the MDG era, during which that aspect was neglected. Also, the global figures hide substantial regional and national discrepancies: for example the financing needs are greatest in Sub-Saharan Africa, and at the national level the poorest countries need to allocate a higher percentage of GDP for sanitation than the richer countries do.

Several organisations are currently working to generate updated and more nuanced estimates of various aspects of the costs of urban sanitation and to monitor expenditure on it. These include the World Bank, the UN Water GLAAS TrackFin programme, and the Climate and Costs in Urban Sanitation project implemented by the University of Leeds. During 2018 and 2019 they will generate more accurate disaggregated data which is to be welcomed, although it seems unlikely that their data will change significantly the basic arithmetic with which this report is concerned.

UN WATER GLAAS TRACKFIN PROGRAMME

This programme proposes a standard methodology for tracking financial flows in the water and sanitation sector. This methodology will be used for future GLAAS reports, and all sector players are strongly encouraged to adopt it also, in order to improve consistency and comparability of data. The methodology addresses four basic questions:

1. What is the total expenditure throughout the sector?
2. How are funds distributed between the different WASH services and types of expenditure, such as capital expenditure, operating and maintenance expenditures, and the cost of capital?
3. Who pays for WASH services?
4. Which entities are the main channels of funding for WASH and what is their respective share of total spending?

It has a comprehensive set of coded classifications covering uses of services, service providers, financing units, and financing types. Its main output is National WASH Accounts for each country. The methodology then links the information in the WASH Accounts to the key policy questions.

2.3 WHERE THAT MONEY WILL COME FROM

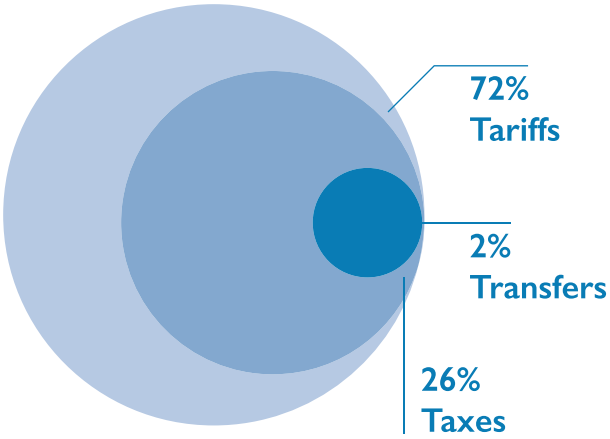
Ultimately there will only be three sources for the money needed both for capital expenditure and operational expenditure. They are generally known as the three Ts:

- Tariffs: paid by customers to the sanitation service providers. Those customers include the householders and businesses who receive sanitation services and the people and businesses who buy products generated from the toilet resources.
- Taxes: domestic taxes raised by local or national governments and given either to the householders or to the sanitation service providers.
- Transfers: grants from other sources, such as international donors, foundations, NGOs, individual people's remittances, given either to the householders or to the sanitation service providers.

As to the relative contributions of the three sources, the 2017 GLAAS report states that, in the 25 countries that responded to this part of its survey, an average of 72% of water, sanitation and hygiene funding comes from tariffs, 26% from taxes, and 2% from transfers[8] . With a few notable exceptions such as China, most countries have slow economic growth and extremely constrained public finances available for sanitation. In future therefore, given the current trends in international development financing and the general weakness of many national economies, the proportion from tariffs will probably rise: the cases of Baguio, Marrakech and Nairobi are typical in this respect.

Any other money flowing into sanitation will be loan money that has to be repaid. This is normally used for capital expenditure and only rarely (never in the eight study cities) for operational expenditure. It subdivides into several categories:

- Concessional loans: loans at below-market interest rates, typically with long repayment periods and grace periods, obtained from the development finance sector, e.g. multilateral development banks, national development banks, donors.



GLAAS report states that, in the **25 countries** that responded to this part of its survey, an average of 72% of water, sanitation and hygiene funding comes from tariffs, 26% from taxes, and 2% from transfers.

- Commercial loans: loans at market rates, obtained from the commercial finance sector, e.g. banks or the bond market, with or without loan guarantee mechanisms supported by governments or donors.
- Micro-finance: small loans offered to low-income people (often people who are otherwise excluded from the formal banking sector) with little or no collateral and specially-designed repayment schedules. This niche lending service can be provided by specialized microfinance institutions, banks, or NGOs.

Loan money can be useful for bridging short-term finance shortfalls or for financing large sums up front, but ultimately it all has to be repaid, either through tariffs, taxes or transfers.

The many permutations of sources of funds, types of recipients, capital and operating expenditure, grants and loans, can make a complicated picture. That complication itself is an obstacle to increasing financing because neither the recipients nor the funders fully understand how and where the money flows. To understand that complication, TrackFin has developed a standard diagram of financial flows (See Fig. 2 on following page).

8 These percentages are national not urban, and they cover water, sanitation and hygiene, but there is no inherent reason to suppose that the percentages for urban sanitation would be very different.

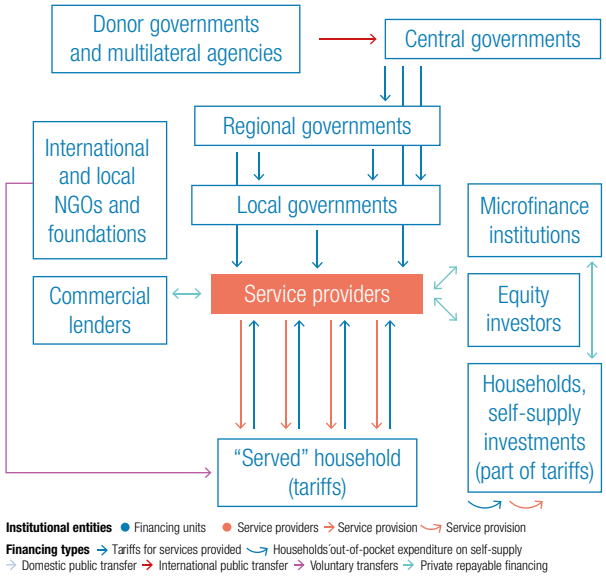


Fig 2: Trackfin, mapping financial flows for WASH service provision

The World Bank paper by Amanda Goksu et al covers this subject in considerable detail and emphasises the importance of understanding all the finance flows in order to decide policies and investments.

Understanding the financial overview for a whole city links well with the concept of city-wide inclusive sanitation described in section 1.3 above. The financing strategies for the various parts of the sanitation supply chain, across the city, need to add up to a coherent whole.

Sector commentators generally agree that grant finance from tariffs, taxes and transfers is very unlikely to increase five-fold as required by the figures in section 2.2 above, and that existing lenders are unlikely to increase their loan allocations to sanitation significantly. That means two things: that sanitation enterprises must become more viable for investment, which is the subject of section 2.4 below; and that new investors must be attracted to the sector, which is one of the subjects of section 2.5 below.

2.4 GENERIC FINANCIAL ANALYSIS OF A SANITATION SERVICE PROVIDER

Having identified the organisations that need finance and the amount and possible sources of it, this section concentrates on the financial analysis of a sanitation service provider. This is a generic analysis that could apply, with minor variations, to a small entrepreneur, a large company, a standalone utility or a part of a municipality – they are all enterprises.

The basic point is that if an enterprise is financially successful, it will attract investors. Off-grid solar power is one current example of a socially- and environmentally-beneficial utility sector in which successful enterprises are attracting significant commercial investment, and there is no inherent reason why sanitation enterprises cannot do the same. Whether an enterprise is for-profit or non-profit or even a hybrid of those two, and however it defines its criteria for financial success, there are some fundamental actions that it can take in order to become more financially successful, as follows.

EXPENDITURES AND HOW TO REDUCE THEM

Any sanitation enterprise has two types of expenditures: capital expenditures[9] and operational expenditures . To improve its financial viability, the enterprise must try to reduce both of them. Here are some suggestions for doing that.

Reducing capital expenditures

The single biggest way to reduce capital expenditure is to move the emphasis of future planning from sewered sanitation to

9 The TrackFin programme guide Table 12 has a useful standard classification of expenditures for any enterprise.

on-site and container-based sanitation. While container-based sanitation is a new concept with little historical data yet available, on-site sanitation has well-documented costs. For example Hutton and Varughese tabulate unit capital costs for sewerage with treatment and for onsite sanitation with FSM for 160 countries. While they do not tabulate unit capital costs for the world, their Fig 3.4 implies an average cost ratio of 2:1 between these two technologies. This study has calculated a weighted average cost ratio for the unserved urban people of the world, which is also 2:1 (see box for the methodology). Sewered sanitation with treatment costs twice as much per person as onsite sanitation with faecal sludge management. Switching future plans from sewered sanitation to onsite sanitation can halve the capital expenditure needed.

The current indications are that the capital expenditure for CBS would be comparable to that of on-site sanitation, i.e. about half that of sewerage, although the extra costs of grey water and storm water disposal would also need to be taken into account.

In addition to that major point, here are some other ways to reduce the enterprise's capital expenditures:

- When constructing sewered sanitation systems, adopt the most modern research on optimising pipe flows, networks and treatment processes.
- Ask the householders to invest more in their own infrastructure within their own properties - and sometimes, as with Orangi Pilot Project's neighbourhood or condominial sewers in South America, outside their properties.
- Produce larger numbers of units on an industrial scale to achieve unit cost savings.

Reducing operational expenditures

Here are some ways to reduce the enterprise's operational expenditure:

- Use Information Technology better. Tariffs can be paid by mobile money. A call centre or hotline coupled to a market platform can improve the flow of communications between customers and service providers e.g. toilet pit emptiers, improving competition and lowering the price to the customer. Vehicle tracking and fleet management can reduce the cost of transporting toilet resources. Flow and process monitoring can optimise the management of inputting faecal sludge into sewage treatment plants, reducing expenditures overall.
- In sewered systems, optimise flow performance and reduce pumping costs, which are typically a high proportion of operating expenditures.
- In onsite systems, reduce costs of pit emptying and transport which typically represent a very large proportion of total cost.
- Use clear regulatory and licensing frameworks to grant two or three Faecal Sludge Management operators licences extending across a whole city, thus achieving economies of scale[10] while maintaining competition.
- Reduce the cost of borrowing money by improving the credit rating of the enterprise, or even by persuading the national government to borrow and repay money on behalf of the enterprise, as happens in the case of Dakar.

10 A good example of this is the Blue Water Company in the city of Leh, India.

METHOD OF CALCULATING THE RELATIVE COSTS OF SEWERED AND ONSITE URBAN SANITATION

First, for each country:

- Use Annex 4 of the JMP 2017 report to calculate the number of urban people without at least basic sanitation: these are the people who currently need a full sanitation service of either sewerage or on-site sanitation with safe management of the excreta.
- Use Table E1 of Hutton and Varughese to find the incremental offsite sanitation cost per person (i) for sewerage with treatment and (ii) for onsite sanitation (septic tanks) with treatment. Note that the offsite cost is the cost to the service provider e.g. a utility, separate from the onsite cost borne by the householder.
- Multiply the number of people needing the service by the two costs per person to get the total capital costs for all the people to be served with either of the two technologies.
- Divide the sewerage figure by the on-site figure to get the ratio of the two costs.

Then, for the unserved people of the world:

- Tabulate the two total capital costs for the 59 countries that each have at least 1 million people needing the service. (Between them they have 96% of the people in the world needing the service.)
- Add up the two totals and divide by the total number of people in those 59 countries needing the service.
- This gives the two costs per person, as a global weighted averaged.
- Divide the sewerage figure by the on-site figure to get the global weighted ratio of the two costs.

REVENUES AND HOW TO INCREASE THEM

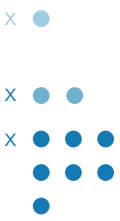
Any sanitation enterprise only has three possible revenues: tariffs from services rendered and from sales of products; grants; and equity investment. To improve its financial viability, the enterprise must try to increase some or all of them.

Increasing tariffs from households and commercial customers

This is the likeliest area for improvement – after all, this is how sanitation enterprises in rich countries are financed. Across many developing countries, current sanitation tariffs are very low and/or not collected; increasing and collecting tariffs is therefore an obvious way to improve the financial strength of the enterprise. The case study of Bogota gives a clear example; in 1996 the Mayor pushed through big tariff increases which have given the public-sector utility a strong financial position. Many studies show that people are able and willing to pay more for a better service. However, tariff policy is a complex and emotive topic. To give one much-quoted example, politicians like to keep tariffs low in order to win popular support. (The case study of Baguio is an example of this reticence by politicians, combined with an unusual tariff system in which the sewerage charge is calculated per toilet rather than per house or per volume of water.) One way around that conundrum is for the politicians to delegate the tariff-setting to an independent regulator who can set realistic tariffs. But even regulators can be reluctant to impose their decisions: for example, more than half of the urban utilities that reported to the 2011/12 GLAAS review stated that tariffs were either not regularly reviewed or were reviewed but not increased.

In rich countries tariffs for sanitation are typically higher than those for water, because the service providers and regulators have analysed the actual costs of the services and agreed to match the tariffs to the expenditures. In poorer countries the opposite is generally the case, that tariffs for sanitation are much lower than those for water. For example many utilities that provide both water and sanitation services charge a metered tariff for water and either no tariff or a pro-rata surcharge for sanitation. If the water tariff is set low, the sanitation tariff is also low. However if the two elements are separated out, the two tariffs can be set separately at viable rates to cover the utility's two respective expenditures. The case studies of Bogota and eThekwini provide examples of this separation.

The people who set tariffs need to decide which expenditures are to be covered by the tariff e.g.: operational expenditures; depreciation of capital assets; cost of new capital assets; finance costs; a profit for the service provider. This decision makes a huge difference to the tariffs. One example comes from a study of sanitation tariffs in Uganda commissioned by the National Water and Sanitation Corporation in 2015. The current sanitation tariff paid by people connected to the sewerage system just covered the operational expenditures of the sanitation service provider. To also cover the depreciation of capital assets it would need to double. To also cover the costs of new capital assets and the cost of finance (but not a profit for the service provider) it would have to increase seven times. For most countries, the latter feels politically and economically unrealistic, while the former would be a reasonable level to aim for. However at present



Tariff paid by people connected to the sewerage system

To also cover the depreciation of capital assets it would need to double. To cover the costs of new capital assets and finance it would have to increase **seven times.**

even that level is far from being achieved: only 39% of the countries responding to the 2017 GLAAS survey said that their urban sanitation tariffs cover more than 80% of operational expenditures. Of the study cities, only Blumenau, Bogota and eThekwini reach that benchmark.

When increasing tariffs overall there is a risk that the poorest people might not be able to afford higher tariffs. The regulator or the enterprise can design internal cross-subsidy mechanisms for them – utilities around the world have been doing that for decades already, and modern IT enables it to be done more easily. There are many such mechanisms including rising-block tariffs, means-tested tariff rebates, property-based tariffs. Whatever the chosen mechanism, the underlying principle of cross-subsidies is that the enterprise's total revenue from tariffs does not change, just the balance of payment levels among its various customers.

An equitable tariff policy would strike a balance between covering the operational expenditures for people who already have the services and enabling people who do not have the services (almost always poorer people) to gain access to them. That involves setting tariffs with an eye to the underlying social aim, by charging more to richer people and less to poorer people.

The above analysis of tariffs applies primarily to customers connected to sewered sanitation. Customers for onsite or container-based sanitation pay fees per operation or per time period which are more difficult to regulate. However, many of the same principles for tariff regulation and reform still apply: for example septic tank emptying contractors generally make their profits from their richer customers, so careful regulation and tariff-setting is needed to ensure that these companies must also serve poorer customers.

Increasing revenues from sales of products

Making money by selling the end products of excreta treatment processes is a relatively new concept. Only a few utilities have been doing this, notably in Europe: for example GENeco in Bristol, UK, is a very impressive example of a private sector company running a city's sewage treatment plant and generating a revenue from every single substance that leaves the premises. Human toilet resources contain nutrient and calorific value and can be processed into various commercially viable products notably water, fertiliser, biogas, solid fuel and chemicals. There are ready markets for all of those products. Of course the price must be right for the particular market, and that might mean that the vendor (the sanitation enterprise) will not receive a huge revenue from them, but it will create a revenue stream that augments the revenue from its customer tariffs.

Because this is a new concept, sales of these products can be hampered by stigma or regulation. For some years, the Public Utility Board of Singapore has produced potabe-quality water derived from its sewage treatment plants under the brand of "NEWater". It took years to overcome the public's sense of revulsion at drinking treated sewerage – when in fact this has been routine for water supplies in many cities for a long time. Similarly growing food fertilised by products derived from human excreta is not allowed in some countries, whereas in other countries even fresh human excreta have been used as fertiliser for centuries. Regulation tends to reflect public and cultural perceptions.

Receiving increased grants

The decisions about this are made by the national or regional government or donor agency that is giving the grants, rather than by the enterprise itself. Governments more commonly provide grants for capital expenditure than for operational expenditure.

Regarding grants for capital expenditure, on the one hand the Bogota case study gives an example of a national government

that regards it as its duty to provide the grant finance for capital expenditure on sanitation.
On the other hand, the Jodhpur case study gives an example of the unintended consequences of these grants. The Government of India invests huge sums into capital expenditure for sanitation. Consequently the service provider, Jodhpur Municipal Corporation, has little incentive to increase its customer tariffs and is financially wholly dependent on the national government and therefore vulnerable to any future change in national policy.

Regarding grants for operational expenditure, these are sometimes given directly to the enterprise, and sometimes to the householders to help them pay the tariffs (see the box in section 2.1 above).

Increasing equity investments

Equity investment is the regular mechanism for enterprises in all countries and business sectors to raise money to finance their operations. A sanitation enterprise will be competing for the investor's money against many other enterprises. Here are some ways to increase its chance of success:

- Prepare clear and understandable business models that explain its work and its financial requirements and prospects and that explain to the potential investors the balance between the risks they are taking and the returns they can anticipate.
- Demonstrate good understanding and engagement with the householders who are the enterprise's customers.
- Offer co-investment by the municipality because this demonstrates to potential investors that the municipality has a direct stake in the success of the enterprise.
- Demonstrate that the regulator and municipality have a good track record of enforcing regulations, by-laws, tariffs etc because this makes a potential investor feel more secure.
- Explain the positive effect of investing in sanitation on the local economy and on the health of the community and workforce. This will be of particular interest to the category of investor known as impact investors, who seek both societal and financial returns on their investments.

As the list indicates, several of these suggestions require close collaboration between the enterprise and the municipality where it works. In some cities this will require a significant change of mindset by the municipal leaders.

THE NEXT STEP IF THOSE MEASURES ARE INSUFFICIENT

Even after taking all the above measures, some sanitation service providers – either public or private – will still not be financially viable. The next step is for the national government, recognising that sanitation is an activity that generates societal gains, to put into the enterprise money that corresponds to the value of the societal gains. Of the study cities, Bogota receives money from the national government that recognise the societal gains from sanitation (although the national government does not use those exact words to describe it). This point cannot be over-stressed: the positive social and economic impact of sanitation on the society as a whole is of no help to the enterprise providing the service unless that impact can be translated into a positive financial benefit for that enterprise. For example, one of the overarching conclusions from World Water Week 2017 was that Resource Recovery and Reuse (i.e. circular economy) activities are economically viable but need to internalise the societal benefits in order to make them financially viable – this is the same message that the World Bank and others are saying.

Commonly called subsidies, these payments by the government to the enterprise are legitimate financial measures that recognise sanitation as a public good and as an investment that will increase the national GDP and therefore the tax base and reduce the government's health costs.
The word subsidy seems to agitate many critics, and yet it describes one of the fundamental duties of governments for mi-

llennia: to provide for the needs of their people. One source of the agitation is the perception that the subsidy is benefitting a profit-making entity and thus constitutes unfair government support - this perception can be diminished either by giving the grants directly to the householders or by labelling them transparently as payments for societal gains (also referred to variously as public goods or merit goods). Another source of agitation is a concern to avoid favouring individuals: ironically, many governments that are happy to subsidise off-site treatment by allocating huge sums to construct sewerage networks with centralised treatment plants that favour some communities over others refuse to subsidise (much cheaper) onsite treatment on the spurious grounds that it favours individual people.

Historically the sanitation sector has tended to be under-prioritised compared to other sectors when governments are making payments for societal gains, for two main reasons. First, sanitation has not been presented as a politically attractive subject. Secondly, the economic and social costs of poor sanitation have too often been under-estimated and not well-explained. Now several global organisations are generating better data and clearer messages for this advocacy work, which should lead to increased payments of this sort in future.

In summary, if an enterprise has done its best to reduce its expenditures and increase its revenues but still cannot become financially viable, it is both legitimate and sensible for the government to pay money to the enterprise that transparently represents the value of that enterprise's work to society as a whole. Those payments should secure the financial viability of the enterprise.

2.5 SOME INNOVATIVE FINANCIAL IDEAS

Part of this work programme's purpose was to examine whether there are innovations in sanitation finance that are already working[11]. The general conclusion is that many innovative financial ideas relevant to sanitation have been discussed or proposed, but that disappointingly few have actually been implemented. However, given the difficult financial situation described in the preceding sections of this report, and the short time frame to 2030, sanitation leaders and financiers must press ahead and apply these innovations now. Here are three lists of innovations: financiers; financial instruments; and financial mechanisms. Individual items have been included here based on a combination of their track record, their future usefulness, and their potential to deliver benefits at scale. Each idea is only described briefly: several organisations and websites such as the WSUP/IRC/Trémolet website www.publicfinanceforwash.com give more details about them.

The following section 2.6 contains some conceptual tools and building blocks to support them all.

NEW FINANCIERS

Several earlier sections of this report have observed that the traditional financiers (national governments and donors) have limited funds to invest in sanitation. This is just a symptom of a major global change that has occurred over the past few decades, accelerated by the financial crisis of 2007/2008, that governments have less money or willingness to invest while individual people have more wealth now than ever before in human history. They can become the new financiers of urban sanitation in developing countries.

The people of the world are collectively saving unprecedented sums of money measured in the trillions of dollars, and continue to save more every year. Much of that money is being saved

11 Note that not all innovations have to be brand-new: instead, the innovation could come from using a given approach within a sector in which it had not been previously applied.

within the very same countries that have the largest needs for sanitation finance; for example Pension Funds in developing countries are estimated to have over $1 trillion under their management. The individuals and the institutions to which they entrust this money, such as family offices, investment managers, pension funds, insurance companies, and (indirectly) Sovereign Wealth Funds, are constantly scouring the national and global financial markets looking for new investment opportunities. Investing even a tiny fraction of those savings would make a huge boost to the finance flows into urban sanitation. However these potential financiers do not currently invest much in sanitation because they cannot understand or reduce the risk, they cannot identify a suitable financial instrument through which to invest, and they all want to invest at different levels, timescales and currencies.

The sanitation enterprises therefore need to put in a lot of groundwork to communicate their investment propositions to these new financiers. It is difficult for the enterprises to contact the financiers directly. Instead they can communicate through intermediaries, trade groups, professional associations, the specialist media etc. Globally there are several intermediaries that have expressed particular interest in urban sanitation, for example the Global Impact Investors Network, Circularity Capital, and Social Finance Ltd. Nationally the intermediaries could include pension funds, banks and investors' groups.

INNOVATIVE FINANCING INSTRUMENTS

Cross-subsidies

Cross-subsidies are already quite common in sanitation tariff policies around the world. They enable rich people to help finance poor people's sanitation. They can be internal transfers within the design of the sanitation tariff itself, or transfers from the water tariff or even, as in the case of Marrakech, electricity tariff. A sanitation levy, which is used routinely in Burkina Faso and was tried in Lusaka, is a surcharge on the water tariff earmarked for onsite sanitation investments, so that people with house connections to water pay for those depending on onsite sanitation.

By their nature, cross-subsidies can be more effectively managed within a city-wide inclusive approach than by service providers working in isolation.

Impact investment

An impact investor is an investor who seeks both financial and social returns. The investor's desired financial return might be at market rates or below market rates, the latter being of course more desirable to the investee. The investor's desired social return must be measurable using good impact indicators – sanitation has exactly that quality of indicators, as mentioned in section 2.6 below. Impact investors have enormous amounts of money under their control and are said (by their membership organisation the Global Impact Investors Network) to be eager to contribute to the SDGs but they are short of investment opportunities.

When an impact investor checks a potential investment, the first hurdle is usually a financial one, at which stage many investments with unproven business models fail because their internal rates of return (IRR) are deemed too low for an impact investor to proceed to the next hurdle. Typically those IRRs are slightly ne gative – dubbed the "blue zone" by the Chair of the CDC Group[12].

12 The UK government´s Developtment Finance Institution formerly known as the Commonwealth Development Corporation.

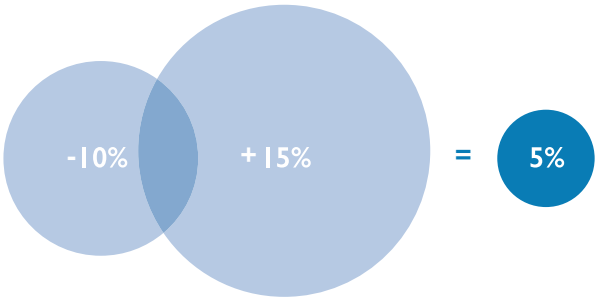
Many sanitation service providers, such as container-based sanitation contractors, are investees that operate in precisely this financial region. The IRR for the investor can be improved either by reducing the discount rate applied to the future revenues or by using grant funding from a donor to cover the loss, thus enabling an investment with slightly negative overall IRR to make a positive IRR for the impact investor[13]. This last scenario is an example of blended finance.

Blended finance

Blended finance is the strategic use of public finance to catalyse commercial finance, either where it would not have previously entered or at a scale that it would not have previously reached. Blended finance encompasses a range of instruments and processes in which public and commercial money can be invested side by side with different but complementary aims. To illustrate by some simple arithmetic: if a sanitation enterprise operates at a loss of, say, 10%, a public funder can give it a grant of 15% which would enable a commercial investor to invest in it and get a return of 5%. This is a win-win: the commercial investor benefits from lower risk and/or enhanced returns on its investment and the public funder can magnify the impact of its funding – in this example by only needing to give a grant of 15% of the value of the enterprise's work rather than 100% of it. The two financial streams are blended to achieve the desired overall result.

The World Bank is promoting blended finance that supports credit-worthy enterprises (defined as those that at least recover their operating costs) by reducing the financial risks of their work and hence helping them to reduce the interest rates at which they borrow from commercial banks.

Some organisations talk about crowding in private sector (i.e. commercial) finance, which means much the same as blended finance. For example the G20's working paper on crowding in private sector finance sets out principles for Multilateral Development Banks to follow; these include creating an investment-friendly environment, expanding and standardising credit enhancement, blending concessional finance and commercial finance. The underlying premise of the paper is the same as that of blended finance, to attract commercial finance to augment public sector funding because the latter is insufficient to achieve the SDGs. Meanwhile the OECD and the Global Impact Investors Network have both pointed out that there are currently very few commercial investors putting money into blended finance, so OECD is trying to encourage them by establishing blended finance principles.



This is a win-win: the commercial investor benefits from lower risk and/or enhanced returns on its investment and the public funder can magnify the impact of its funding – in this example by only needing to give a grant of 15% of the value of the enterprise's work rather than 100% of it. The two financial streams are blended to achieve the desired overall result.

13 The organisation Social Finance calls this concept a Missed Opportunities Fund because it has not yet been taken up at scale.

WATER CREDIT

An example of successful blended finance is Water.org's Water Credit programme, in which about $20 million-worth of institutional support by Water.org to micro-finance institutions has facilitated $600 million of commercial capital to flow from those institutions to lend to householders for water and sanitation improvements such as toilet construction.

To date, over 90% of borrowers are women, their repayment rates are well above 90%, and the finance institutions are largely incorporating these loan products into their mainstream loan portfolios. Water.org is using this positive experience to expand its work in advising and training more finance institutions to become involved in this lending sector.

Credit enhancement to reduce risk/return profiles e.g. catalytic first-loss capital

This is a particular form of blended finance in which one financier puts money into an enterprise and voluntarily positions itself at the back of the queue for repayment, thus enabling other financiers to put money in with more reliable expectation that they will recoup their investments. The United States Agency for International Development (USAID), for example, operates a Development Credit Authority (DCA), which will guarantee to cover the first stipulated percentage (often around 15%) of loss for a given investment. In that situation, the commercial investor is not at risk of losing money until 16 percent of borrowers have defaulted on a loan. This reduction of risk can convince sceptical potential investors to invest.

Output-based aid

Output-based aid (OBA), also sometimes entitled results-based aid, is an already established type of funding by governments and international development financiers that has become more prominent in recent years as development stakeholders have sought to make aid more efficient. OBA ties the release of public grant funding to the achievement of clearly specified results that support improved access to basic services. It works on a reimbursement basis: the service provider invests its own money and when the project or work programme is complete an assessment is made to determine whether the agreed results have been achieved. If they have, then usually around 50-70% of the project cost is reimbursed to the service provider. OBA has gradually emerged as an important way to finance access to basic services, albeit that the service provider still has to find the cash upfront to finance its work prior to being reimbursed. Evidence from existing projects suggests that OBA could improve the targeting and efficiency of delivering the grants.

Contingent funding, SIBs and DIBs

Contingent funding is similar to output-based aid funding. A public or philanthropic donor wishes to spend money to achieve a certain societal gain. Instead of giving that money up-front to an enterprise that tries to achieve that aim, this donor does nothing initially. Another financier, this one being a commercial investor, lends the money to the enterprise. The donor then pays money only if the gain actually ensues, i.e. its payment is contingent on the outcome being achieved. It is known as an outcome funder.

There are various ways to structure contingent funding. One idea that is becoming increasingly prominent is called a Social Impact Bond or a Development Impact Bond. This brief description of a Development Impact Bond (DIB) is based on a recent presentation by Jeremy Keele of the Sorenson Impact Centre speaking at the WASTE Conference entitled Beyond Development Aid:

- There are four parties involved in a DIB. An investor invests money through an intermediary into a service provider. The service provider delivers services to a target population. If those services succeed in achieving an agreed and measurable outcome, an outcome funder pays for that success to the intermediary. The intermediary uses that money to repay the original investor its capital plus interest.
- A DIB needs a reasonable time horizon, a meaningful and measurable outcome, appropriate legal and political conditions, and evidence of success using standard metrics that all four parties can all agree to use.
- Some problems with DIBs are lengthy negotiations, high transaction cost, insufficient data, and metrics that are difficult to agree.
- To date over 55 DIBs have raised approx. $180 million, but none of them are yet in sanitation.

One criticism of SIBs and DIBs is that they don't raise any more money for a programme of work, they just provide a way to mobilise the money up-front – ultimately the outcome funder pays for the work anyway, just as if it had given a grant to the service provider. This analysis overlooks a couple of aspects. One is that if the work fails to result in the desired outcome, the outcome funder pays nothing and the loss is borne by the investor. The other is that the pressure exerted by the investor onto the service provider's financial management skill increases the likelihood that the work will succeed. So the same aggregate amount of money put into sanitation programmes by the outcomes funder will result in more success overall than under a conventional system in which it gives grants to some programmes that succeed and to others that do not.

Tax Increment Financing

Tax Increment Financing is a public-sector finance tool in which a local government body such as a municipality borrows a loan from a commercial bank in order to fund a specific public infrastructure improvement, using the future increases in local tax revenue to repay the loan. The underlying logic is that the infrastructure improvement, for example improved sanitation, will increase the desirability of living in its area and hence the value of properties and hence the tax paid by the owners to the municipality. This instrument was first used in the USA in the 1950s and has not yet been used much in other countries. This study has not found an example of its use for sanitation but it is included in this list because it might be a useful instrument.

INNOVATIVE FINANCING MECHANISMS

Community Finance

This term refers mainly to savings schemes set up by poor people living in urban areas, in order to improve their own living conditions including sanitation. If the national regulators recognise these schemes and integrate them with the commercial market, other commercial finance can be mobilised to augment the community finance. This is a particularly valuable mechanism because it can bridge the gap between households spending their own money on their sanitation and utilities raising external finance to improve those householders' sanitation.

Guarantee Fund

This is a fund set up by a public or philanthropic financier to underwrite enterprises to lease or buy capital assets. One example in the sanitation sector comes from the study city of Dakar where the Gates Foundation provided a guarantee fund through the Government to a private bank, to enable private sector enterprises to borrow money on commercial terms to purchase trucks for emptying septic tanks. The guarantee is a safeguard for the bank in case of default by the borrowers. This mechanism has the advantage from the financier's viewpoint that if the borrower does not default, the guarantee is not called in and therefore it costs the financier nothing more than the administrative costs of setting it up. The advantage to the enterprises is that they can access loans that they would otherwise not access due to their low credit ratings or lack of collateral: in the case of the Dakar guarantee fund the interest rate is typically 7.5% rather than 11 or 12%, and only 8% of the loans are not performing fully.

Climate-related grant or loan funders, including the Green Climate Fund

The water and sanitation sector has been slow and unimaginative in trying to attract climate-related funds. There is no consistent intellectual approach. Some thought leaders, such as the Toilet Board Coalition, stress the positive aspect and promote the role that sanitation can have in mitigating climate change. Meanwhile some other thought leaders, such as the Sustainable Development Solutions Network which is a global think-tank for the UN chaired by Jeffrey Sachs, stress the negative aspect and suggest adding 25% to Hutton and Varughese's capital expenditure costs as the extra cost of adapting to climate change.

Meanwhile the Green Climate Fund, which is the largest fund that invests in climate change adaptation or mitigation, has only made one water or sanitation investment to date - for urban water supply in Fiji. The reason is apparently not that the Green Climate Fund discourages sanitation investments but that no potential sanitation investee has yet submitted a sufficiently robust proposal. There are admittedly technical difficulties, for example in verifying climate improvements due to dispersed activities such as household sanitation, but other sectors such as cookstoves and off-grid solar are addressing these problems much more vigorously than the sanitation sector. The Green Climate Fund and other climate-related funders could be big potential future funding mechanisms for urban sanitation programmes.

Sanitation Financing Facilities

A "sanitation financing facility" is the name that this study gives to a multi-stakeholder mechanism that enables many different grant and loan financiers to invest new money in many different sanitation enterprises simultaneously. It is an efficient one-stop platform. On the one hand it helps the investees to present their proposals to many potential investors simultaneously. On the

other hand it offers the investors many investable propositions into which they can place their money at the timescales, risk levels and currencies that they prefer.

This type of mechanism addresses many of the obstacles that have been described in previous sections of this report. It can use several of the innovative instruments described above such as impact investment, blended finance, and contingent funding. A sanitation finance facility could be set up in one country or across a region or even globally, to serve one technology type or all of them, for private sector contractors or municipal utilities. Different sanitation financing facilities could be independent or linked.

Several organisations have recognised the need for mechanisms or platforms of this sort. The Dutch Water Financing Facility has similar elements. The Sustainable Development Solutions Network has concluded that the WASH sector needs a dedicated pooled financing mechanism. The World Bank is proposing a conceptual framework combining three elements: public finances that are better planned and allocated; service providers that perform better; and commercial investors that are attracted in by the public finance. The African Development Bank and the Bill and Melinda Gates Foundation are setting up the Africa Urban Sanitation Investment Fund (AUSIF[14]) which will have several features similar to a sanitation financing facility notably the pooled funding and the range of investment ideas.

The overarching conclusions from World Water Week 2017 refer to innovative business models and financing mechanisms to attract all available sources of finance, the need for simplicity in the design of financial structures to mitigate perceived high risk and uncertainty, using innovations in partnerships, and designing business models to turn economically beneficial projects into bankable ones. Sanitation financing facilities correspond well to all these strategic concepts and directions.

No sanitation financing facility yet exists but a multisectoral team of thinkers, convened by Arthur Wood of Total Impact Advisers with the support of a group of far-sighted donors, is currently designing a generic finance facility applicable to regional water resources management or indeed to sanitation. This work can be traced back to 2009 when a similar team led by Wood had designed a World Sanitation Financing Facility. The idea did not progress beyond the planning stage: funders were reluctant to pay for creating a global platform with complex monitoring systems designed by a leading company of management consultants, its concept was ahead of its time in the eyes of the banking and finance sector which was unwilling to support collaborative finance models, and perhaps its designers did not explain it clearly enough within the sanitation sector. However the idea was never abandoned and was described in a paper written by Wood and Hutton in 2013 for UNESCAP, which drew on the previous design work; the paper used sanitation in Asia as a case study but was applicable around the world.

14 AUSIF will mobilise additional funding from a variety of donors including traditional development partners, the private sector and Governments to increase access to innovative sanitation in urban areas. It will: (i) support institutional development and capacity enhancement programs; (ii) provide incentives for enhanced focus on sustainable urban sanitation services delivery; (iii) increase attention on greater uptake of innovative approaches and technologies; and, (iv) support knowledge management for increased impact.

That concept was the starting point for Wood's current work. The design of the generic facility currently under development is summarised in the accompanying box, as applied to sanitation.

The conditions for the success of a financing facility are now significantly different from 2009. The design has been softened and scaled down so it does not create another intermediary competing with existing stakeholders but rather a platform to help those stakeholders collaborate. The technology platform now exists and is in use in other sectors such as housing and health, as is a standard and trusted monitoring system to measure outcomes. That monitoring system has evolved from a top-down global model to a local one that measures and monetises the outcomes of specified activities. It is still an unfamiliar concept to people in the sanitation sector, but organisations from other sectors[15] could share their experiences and give advice on how to get started and how to overcome the inevitable initial problems.

Sanitation financing facilities are innovative because they present the amount of funding needed to achieve the sanitation SDG as a market opportunity for investors rather than as a headache for grant funders. Sanitation financing facilities have the flexibility, the scope and the sheer vision to make a major contribution to financing urban sanitation by 2030.

15 For example the Greater Cincinnati Foundation's Collective Impact platform, or the National Affordable Housing Trust, both in USA.

THE MAIN FEATURES OF A SANITATION FINANCING FACILITY

A sanitation financing facility is a legally-registered non-profit association whose members can themselves be either for-profit or non-profit organisations (many legal systems around the world now permit these hybrid or mutual types of associations). Its member stakeholders would include:

- Sanitation service providers of all sorts
- A social intermediary to monitor the sanitation work
- A financial intermediary to set up the investment deals
- Investors of all sorts

Its governance structure is decided by those stakeholders.

Many different financial flows can pass through the facility in individual contractual arrangements designed by the stakeholders concerned (for example using the types of innovative financial instruments described above). The outcomes of the sanitation services are reported back through the facility, all using a common set of agreed indicators. The facility can simplify financial structures to reduce risk and uncertainty and transaction costs, achieve economies of scale, and improve the efficiency and impact of current and future investments and therefore significantly increase financial flows for sanitation.

2.6
SOME TOOLS TO ENHANCE AND ENABLE THESE INNOVATIONS

The following are some conceptual tools and building blocks that support the innovative financing instruments and mechanisms described in section 2.5 above and can improve the attractiveness of sanitation to new investors.

Measuring outcomes

Standard indicators are needed for measuring the outcomes of the sanitation work. They may be tangible or intangible, behavioural or financial, internal or external to the work itself. Their key characteristics are that they can be measured, recognised and trusted by all the stakeholders – this mutual trust is particularly important if the indicators are used to judge contractual progress and hence payments. Here are some relevant examples of devising indicators and measuring outcomes:

- The official indicators of progress towards the sanitation SDG targets are devised and monitored by the WHO/UNICEF Joint Monitoring Program (JMP) under the aegis of UN-Water. The JMP website provides full details of them, including the work currently being done to develop indicators for the aspects of the SDGs that were not present in the MDGs.
- The Social Progress Index has been devised by the Social Progress Imperative in order to objectively measure the well-being and quality of life of a population. It generates a single-number index that can be tabulated and analysed just as the GDP can be. It is intended to remind everybody that economic indicators are not the only ones that matter. There might be too many confounding variables for it to be used as a measure of outcomes of sanitation, but it could have a valuable role alongside health indicators and GDP.
- The organisation Integrity Action has developed a methodology for real-time monitoring that can be applied to many types of activities and indicators including improved sanitation. It is an open-source methodology in which everybody is encouraged to contribute to the monitoring process. In this model, the process for monitoring is as important as the indicators themselves.
- Just as mitigation of CO_2 equivalents is a measure of the impact of climate projects, this approach could be translated to sanitation with a comparable measure (for example mitigation of unmanaged excreta flow units). This study has not yet identified any organisations that are currently working on this idea.

An early example of an innovative finance instrument provides a salutary tale in devising indicators. In 2014 the State of Utah, USA, issued a Social Impact Bond to an investor to improve pre-school learning; the agreed outcome indicator was the reduction in percentage of children needing special needs education at the next stage of their schooling. The investor put its money into the service provider. At the end of the project period, the outcome funder stated that the outcome indicator had been attained and repaid the investor its capital plus interest. It later became clear that the achievement was extraordinarily high (99% reduction compared to a normal 10-20% reduction) and the financial investment unusually low (about half the normal amount), and hence that the indicator was probably faulty and should not have been used in the contract.

Monetising externalities

This concept is very important for the success of many of the new financing mechanisms. It simply means calculating a financial value for benefits that are traditionally regarded as being outside the financial arithmetic, such as environmental, health or social impacts. Several organisations are working to develop tools that everybody could use to monetise these externalities. Sanitation would be a candidate for this approach because

the benefits of improved sanitation, notably in public health, environmental cleanliness and productive time gain, are substantial[16] but have historically not been expressed in monetary terms. Some relevant examples are given below:

- The International Organization for Standardization, recognising the high level of interest and activity in this subject, is currently developing ISO 14008 on "monetary valuation of environmental impacts and related environmental aspects". The standard will provide organizations a common framework including established methods as well as common terms in the field of monetary valuations. It looks at environmental indicators, not at social indicators, but its methodology and language may also be useful for the latter.
- Natural Cost Accounting is an established methodology to assess the impact of an intervention in physical units and then convert those to monetary value. It could be used in the field of sanitation.
- The Gold Standard Foundation is a standards and certification body that develops methodologies to measure outcomes of development activities. Its original work was on climate-related outcomes, and it has subsequently broadened its work to include SDG-related outcomes under the general heading of Gold Standard for the Global Goals. The Gold Standard can certify projects or their impacts. The Foundation has recently developed Water Benefit Certificates which represent a volume of water supplied, treated or conserved, and also ADALYs Certification to quantify the health benefits of reduced air pollution (e.g. by improved cookstoves). Both Water Benefit Certificates and ADALYs Certifications are intended for purchase by donors, philanthropists and social investors, although they are not yet tradable instruments like carbon credits. The Foundation is willing to advise other organisations on how to develop ADALYs Certification to quantify the health – and potentially the economic – benefits of sanitation. This could become the recognised standard way to monetise the externalities of sanitation.

Building trust

This is itself a tool for financial progress. Many commentators stress that strong governance attracts investment because it helps newcomers to trust the service providers and governments. Investors are more likely to enter a particular country or marketplace if they can see that contracts are upheld in courts of law. Trustworthy information technology is vital for collecting clear objective data to measure outputs and outcomes that all parties can believe. For example, the monetised external benefits described above have not yet become tradable products because finance professionals have not yet become involved in making them so. If and when they do, they will need auditable results measurements so that the market has confidence in buying and selling the instruments.

16 Total Impact Advisors estimate them to be in the hundreds of billion of dollars.

3. WHAT CAN DECISION-MAKERS DO NOW TO INCREASE THE FINANCIAL FLOWS?

ALGERIA
TRIPOLITANIA
LIBYA
EGYPT
TROPIC OF CANCER
SAHARA
MAURITANIA
SENEGAL
MALI
NIGER
CHAD
NIGERIA
BENIN
BURKINA FASO
GULF OF GUINEA
CENTRAL AFRICAN REP.
SUDAN
DARFUR
DEM. REP. OF CONGO
ANGOLA
ZAMBIA
MALAWI
TANZANIA
NAMIBIA
ZIMBABWE
BOTSWANA
SOUTH AFRICA
KINGDOM OF LESOTHO
SWAZILAND
Cape Town
Port Elizabeth
East London
Tripoli
Niamey
Bamako
Ouagadougou
N'Djamena
Khartoum
El Fasher
Maputo
Walvis Ridge
South Eastern
Atlantic Basin
Tristan da Cunha
Gough Is.
Prince Edward Is.
Crozet
Kerguelen
Atlantic Indian Antarctic

3.1 DECISION-MAKERS AND HOW TO INFLUENCE THEM

This report aims to influence the decisions made by several groups of people and organisations associated with urban sanitation:

- National (and, to a lesser extent, regional) politicians set policies and decide legislation, and are consequently the primary target audience of this work programme.
- Municipal leaders make important decisions and also decide whether and how to implement the policies set by the national and regional politicians. They are the secondary target audience of this work programme.
- National regulators, entrepreneurs, bankers, investors, and the international development community are also decision-makers on this subject. They are all target audiences of this work programme.
- Householders decide their own needs and priorities for their sanitation but the World Water Council has no direct channel of communication to them. Therefore, they are only an indirect target group for this work programme.

All of these target audiences want to create healthy, happy, liveable cities. Sanitation can be an important element in achieving that aim. It competes for financial resources against many other economic and social development sectors. By making use of the latest ideas on financing for sanitation, the politicians, municipal leaders and other stakeholders can achieve more while spending less. This requires a change of mindset as explained in the previous sections of this report, essentially: to favour less expensive sanitation technologies, to put a financial value on the improvements created by sanitation, and to attract new investors into this sector.

The World Water Council encourages all the readers of this report to feel ownership of the ideas in it and commitment to carry the relevant message to the right target audience. The political leaders of the eight study cities have a special role because they themselves expressed interest in this subject. That is why the World Water Council chose to study their cities. The Council will work closely with them to make decisions for their own cities, and then support them to persuade other politicians at a peer-to-peer level to make similar decisions also.

3.2 MESSAGES TO THE DECISION-MAKERS

The main messages to the various groups of decision-makers have all been developed and described in sections 1 and 2 of the report, so this section is just a convenient summary of them. They are subdivided into lists for the various target audiences. Not all the items in a particular list will apply to every decision-maker or to every city.

Messages to national politicians

- Clearly define the roles of the various institutions and entities, to give investors confidence to support sanitation service providers.
- Legislate that service providers that supply both water and sanitation should keep the finances of the two activities separate.
- Introduce national standards and regulations for the quality and sale of the products made from treated toilet resources, to encourage circular economy concepts and activities to flourish.
- Take a strong hand in planning and financing the needed infrastructure. Adequate sanitation cannot be achieved by the private sector and NGO investment alone, no matter how well intentioned.
- To eliminate a historical backlog of sanitation services, provide grants to make it affordable to both the service provider and the customers. If this is not done, eradication of any backlog will take too long and will have adverse economic impacts that exceed the cost of not ensuring adequate safe sanitation.
- Re-allocate grant funds away from expensive sewered sanitation and treatment plants towards much cheaper decentralised systems, faecal sludge management and the infrastructure for container-based sanitation.
- Recognise sanitation's contribution to public health and the environment by contributing financially to service providers' operational expenses.
- Encourage commercial banks and investors to enter the sector by mitigating the risks and costs for them e.g. through strong enforcement of contracts, active regulation, minimum revenue guarantees and other forms of blended finance.
- Hold investor forums to attract new investors into the sanitation sector.

TECHNIQUES FOR INFLUENCING DECISION-MAKERS

Here are some techniques for influencing these target audiences, and especially the primary target audience of politicians:

- Understand their goals and priorities. Be ready to explain to them how your ideas can help them to achieve their goals. For example, you might think that a certain policy is technically a good one, but fail to understand the political aspects which could make it unattractive. Therefore consider the political advantages of adopting a certain policy, and explain those benefits to the decision-maker.
- Relationships matter. Ask a well-connected person who is willing to put time and effort into the initiative to be the lead advocate. Support that person to communicate verbally with the target decision-makers.
- Use written documents only to support verbal communication. Many decision-makers are overloaded and have no time to read the supporting documents. Relationships, attitudes and trust are more important.
- Use evidence based on local examples rather than examples from elsewhere. This can of course be difficult when introducing new ideas of which there are no local examples.
- Ensure that influential people are generally supportive. Try to ensure that there is not a strong politician, to whom a decision-maker might turn for approval, who opposes the ideas being put forward.
- Monitor and follow up any commitments made by your target decision-maker.

Messages to municipal leaders

- Adopt a city-wide inclusive sanitation approach.
- Avoid unrealistic city sanitation plans such as a plan that aims for 80% sewerage in a city that currently has only, say, 10%.
- Try container-based sanitation to serve customers in appropriate parts of the service area.
- Award contracts to entrepreneurs for on-site or container-based sanitation that cover large enough geographical areas to be financially viable.
- Collaborate actively with the government or regulator to review tariffs and implement the revisions proposed by the reviews.
- Maintain good cash flow and revenue collection rates that give lenders confidence in the ability of the municipality to repay loans.
- Introduce local standards and regulations for the quality and sale of the products made from treated toilet resources, to encourage circular economy concepts and activities to flourish, provided that they do not conflict with national standards under national regulation.
- Enforce all regulations and by-laws.
- Hold investor forums to attract new local investors into the sanitation sector.
- Co-invest in new enterprises alongside commercial investors.
- Activate and encourage markets for sanitation products by being a customer for fertiliser, energy and other products generated by circular sanitation economy businesses.

Messages to regulators

- Establish databases of sanitation service providers including their financial information, credit-worthiness etc.
- Allow service providers that supply both water and sanitation to keep the finances for the two operations separate.
- Regularly review tariffs and implement the revisions proposed by the reviews.
- Recognise container-based sanitation as a valid alternative to sewerage or on-site sanitation.
- Enforce national standards and regulations for the quality and sale of the products made from treated toilet resources.

Messages to entrepreneurs

- See sanitation in developing countries as a new business sector in which to achieve first mover advantage.
- Develop businesses all along the sanitation value chain, to attract various investors.
- Look to collaborate and co-invest with municipalities and utilities, in order to gain scale.
- Demonstrate that you have a commercial mindset allied to a strong governance structure, in order to attract more finance from banks and investors.

Messages to bankers

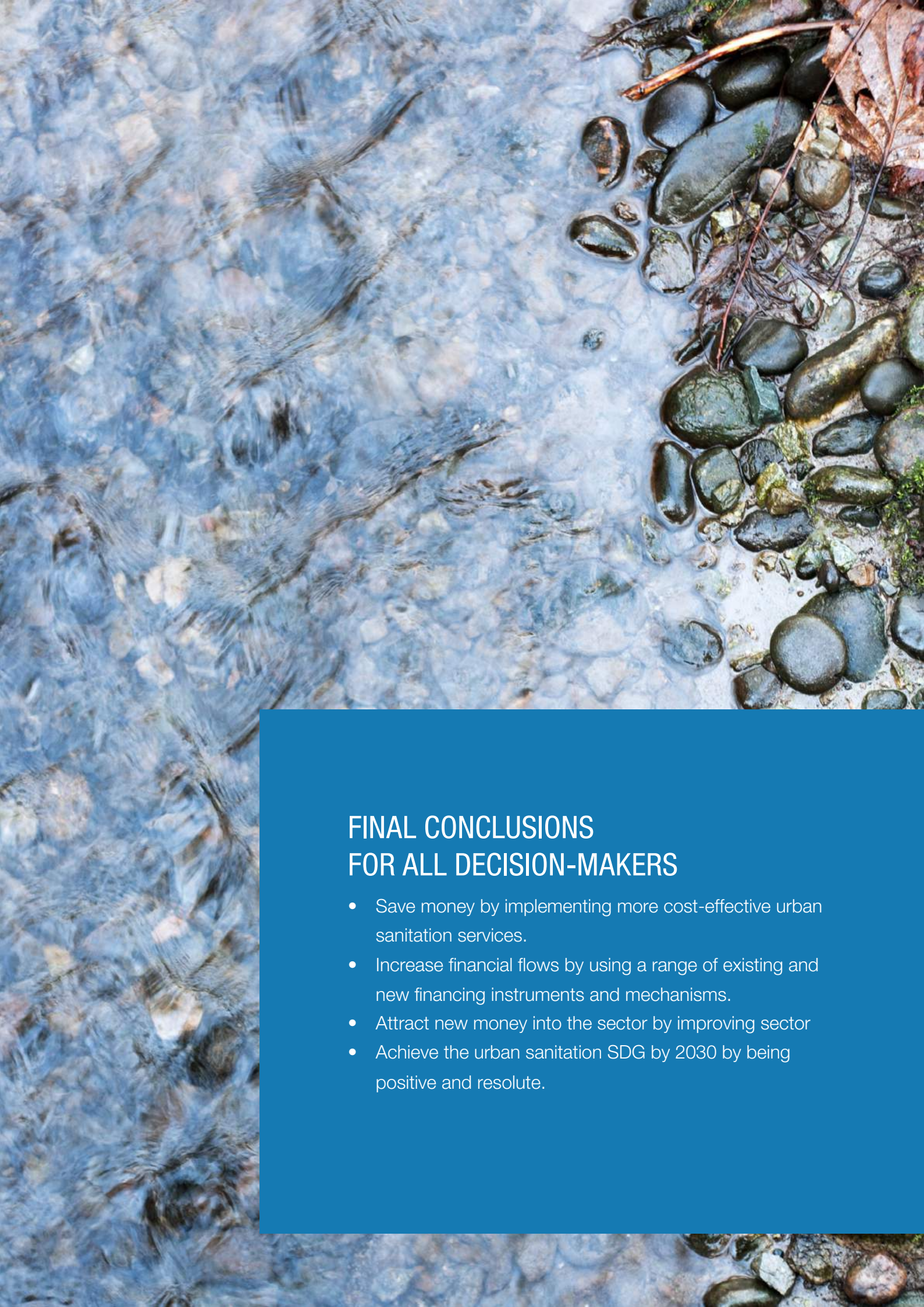
- Get first adopter advantage by becoming involved in sanitation now, before other banks do.
- Persuade your investors and clients that sanitation is now a bankable sector.
- Teach your potential borrowers (e.g. sanitation enterprises) to prepare investment-ready programmes.
- Take the lead in applying established financial instruments (e.g. pooled investment funds, municipal and corporate bonds) and new mechanisms (e.g. sanitation financing facilities) to sanitation.

Messages to national and international investors

- Invest in sanitation in developing countries because it combines financial and social returns.
- Get first adopter advantage by investing in sanitation now, before other investors do.
- Invest all along the sanitation value chain.
- Become involved in the creation of new mechanisms such as sanitation financing facilities.

Messages to the international development community

- Re-allocate grants and loans away from expensive sewered sanitation and treatment plants towards much cheaper decentralised systems, faecal sludge management and the infrastructure for container-based sanitation.
- Switch funding from fragmented expenditures on inputs to systematic solutions to achieve outcomes.
- Encourage commercial banks and investors to enter the sector by mitigating the risks and costs for them e.g. by offering guarantees or first-loss capital.
- Support the creation of new mechanisms such as sanitation financing facilities.
- Arrange and support study tours for decision-makers to specific places e.g. container-based sanitation companies.
- Embrace blended finance strategies to bring in commercial finance.
- Hold investor forums to attract new investors into the sanitation sector.



FINAL CONCLUSIONS FOR ALL DECISION-MAKERS

- Save money by implementing more cost-effective urban sanitation services.
- Increase financial flows by using a range of existing and new financing instruments and mechanisms.
- Attract new money into the sector by improving sector
- Achieve the urban sanitation SDG by 2030 by being positive and resolute.

ANNEX I: SUMMARIES OF THE CASE STUDIES OF CITIES

This annex only gives a very short summary of each case study. All the case studies, which are typically about 50 pages long, are being individually published by the World Water Council.

NAME OF STUDY CITY: **Baguio, Cordillera Administrative Region, The Philippines**

DATA AND CHARACTERISTICS OF THE COUNTRY AND CITY

The Philippines has a population of 103 million people of whom 45% live in urban areas. It is a unitary republic with several tiers of government: national, provincial and city/municipal. Sanitation is a city/municipality responsibility. The national government has many agencies and departments with indistinct, overlapping roles in sanitation policy, regulation and finance. Urban sanitation coverage is about 78%. The government has no clear single policy on sanitation financing. In practice, capital expenditure and operational expenditure for urban sanitation are accounted together, with funds coming from several different budget lines in the national government, funded out of taxation revenue, and from the cities/municipalities, also funded mainly out of their local tax revenue. Tariff collection for sanitation outside Metro Manila is inconsistent. The concept of the circular sanitation economy is not yet well-known in the Philippines, although some of its principles are used notably in solid waste management.

Baguio is the 25th largest highly urbanized city in the Philippines with a population of 0.35 million people. It is a compact city with high population density, known mainly for tourism and service industries. It is run by the city government, whose City Environment Office has a Wastewater, Water and Ambient Air Management Division (WAMD-CEPMO) that is responsible for sanitation, while the separate Baguio Water District (BWD) is responsible for water supply. The city has a small sewerage system which covers the city centre only and its main lines and sewage treatment plant were entirely grant-funded by the Government of Japan. About 67% of households have onsite sanitation (almost all septic tanks), while 28% are served by the sewerage system and about 5% by communal septic tanks. The city charges a sanitation tariff only to the households connected to the sewerage system – it is calculated per toilet, not per cubic metre of water used.

FINANCIAL MECHANISMS USED IN THIS CITY

For the city government, both capital expenditure and operational expenditure on sanitation are lumped together as a budget line. The city government regards sanitation as a basic service to be provided, so its expenditure on sanitation of c. $1 million far exceeds its revenue from tariffs of about $0.3 million. Of the shortfall, it puts in about 60% from its general revenues and gets about 40% in allowances from the national government. The city does not take out loans for any purposes.

For the large majority of householders, sanitation is entirely self-financed both for capital expenditure, which is mainly constructing the septic tank, and for operational expenditure, which is mainly desludging the septic tank. Desludging is done by weakly-regulated contractors who charge prices set by market conditions; only a small fraction of the faecal sludge reaches the sewage treatment plant.

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INNOVATIONS USED OR PLANNED IN THIS CITY

Baguio is not currently innovating in sanitation finance. It has some unusual features, for example charging tariffs per toilet rather than per cubic metre of water, but there is no evidence that these were done in order to innovate, and it wants to move away from them. It has a planning aspiration to provide universal sewerage by 2035 but this has no meaningful associated finance plan.

The city government and Mayor have expressed a strong interest to try out innovations in sanitation financing in order to improve quality of service.

The concept of the circular sanitation economy is not familiar by that name, but WAMD-CEPMO has tried a few activities on a small scale, such as selling treated sludge as soil conditioner.

MESSAGES TO DECISION-MAKERS SPECIFIC TO THIS CITY

Coordinate planning between BWD for water and WAMD-CEPMO for sanitation.

Ring-fence sanitation accounting in WAMD-CEPMO's budget and subdivide it into capital and operational expenditure so that the decision-makers can see the true financial picture and make decisions based on that evidence.

Plan using a city-wide inclusive approach that gives equal importance to onsite sanitation and to waterborne sewerage. Recognise that universal waterborne sewerage will not be affordable, and instead enable WAMD-CEPMO to take charge of financial planning for both onsite sanitation and waterborne sewerage.

Revise the basis of calculation and the mechanism of collecting sanitation tariffs and septage service fees, in order to fully cover WAMD-CEPMO's operational expenditure.

Recognise toilet resources as a valuable resource and not as waste to be disposed of. Encourage private entrepreneurs to become involved in this circular economy work. Increase WAMD-CEPMO's revenues from product sales.

NAME OF STUDY CITY: **Blumenau, Santa Catarina State, Brazil**

DATA AND CHARACTERISTICS OF THE COUNTRY AND CITY

Brazil has a population of 207 million people of whom 85% live in urban areas. Brazil has a federal structure with government powers shared between the national government and state governments. In water and sanitation, the national government is responsible for policies and guidance while municipal-owned corporations are responsible for service provision, except in metropolitan areas where this provision results from agreements between state-owned and municipal-owned water and sanitation corporations. In addition to that, similar agreements allow state-owned corporations to provide water and sanitation services to several municipalities in the states. Recently a few of those municipal corporations have started to contract private-sector concessionaires to deliver those urban services. 2015 data show that sanitation coverage is about 40% safely managed (i.e. through sewerage) and 50% basic (i.e. onsite). The government's policy is that capital expenditure on water and sanitation should be financed mainly from tariffs or loans, augmented by a small percentage in grants from national government funded out of taxation revenue. Operational expenditure should be financed by the municipalities through tariffs. The concept of the circular economy is familiar in solid waste management but new in sanitation: there are only a few examples of its application around the country.

Blumenau is the 78th largest city in Brazil with a population of 0.35 million people. It is a comparatively prosperous city in a prosperous state (Santa Catarina) although its sanitation coverage lags behind its economic status. The municipal water and sanitation corporation Serviço Autônomo Municipal de Água e Esgoto (SAMAE) is responsible for service delivery, and in 2010 it contracted sanitation to a private sector company on a 45-year contract. The city has an old sewerage system which covers a small area in the city centre. About 92% of households have improved sanitation, of whom only 27% are served by sewered sanitation and the balance by onsite sanitation.

FINANCIAL MECHANISMS USED IN THIS CITY

For capital expenditure on sanitation infrastructure (mainly sewers and treatment plants), the concessionaire is relying on commercial bank loans - there is considerable doubt whether that will be affordable.

For operational expenditure on sanitation, the concessionaire recovers the full cost through tariffs. The customers pay separate water and sanitation tariffs of which the sanitation tariff is slightly higher than the water one – both are based on volumetric consumption of water, with a means-tested element giving lower tariffs for poor people. The tariff collection rate is about 89%.

INNOVATIONS USED OR PLANNED IN THIS CITY

SAMAE's contract to a private sector concessionaire is itself quite innovative in the Brazilian context.

SAMAE and the concessionaire have expressed interest to try out innovations in sanitation financing in order to improve both the coverage and the quality of service.

MESSAGES TO DECISION-MAKERS SPECIFIC TO THIS CITY

Clarify the ownership of assets, the regulatory regime, and the long-term aims for sanitation services.

Recognise that sanitation has highly positive societal impact, and monetize that impact by, for example, reduced taxation of the service provider.

Improve tariff collection.

Change the future plans from expansion of sewered sanitation – which will probably be unaffordable – to improvement of the onsite sanitation services.

Integrate circular economy concepts into both the sewered sanitation and onsite sanitation services, in order to re-use resources and generate extra revenue for the concessionaire.

NAME OF STUDY CITY: **Bogota, Capital District, Colombia**

DATA AND CHARACTERISTICS OF THE COUNTRY AND CITY

Colombia has a population of 49 million people of whom 77% live in urban areas. It has a unitary constitutional structure with three levels of government (national, departmental, local) each with their own mandates and powers. In sanitation, the national government sets policies and the local governments (in urban areas: the municipalities) provide the services. Urban sanitation coverage is said to be about 93%. The government's policy on sanitation financing is that both capital expenditure and operational expenditure should be financed by the municipalities through tariffs. Those tariffs must recognise the human right to sanitation, so basic sanitation services are free to the householder and the national government can pay the municipality an extra recurrent grant to cover that cost. The national government has the intention to promote the concept of the circular sanitation economy but has not yet made incentives to encourage it, so there are very few examples of it in operation.

Bogota is the capital city of Colombia with a population of 8.1 million people. It is governed by a Municipal Council led by a directly-elected Mayor. The water and sanitation service provider is the Water Service, Sewerage and Sanitation Company of Bogota (EAB) which is owned by the municipality. The city has an extensive sewerage system which covers about 96% of households. However only 16% of sewerage is safely managed, the balance being discharged straight into a river. So the coverage figure has dropped dramatically with the change from MDG statistics to SDG statistics.

FINANCIAL MECHANISMS USED IN THIS CITY

EAB collects separate tariffs for water and for sanitation; they are almost the same cost per cubic metre. The accounts of both the water service and the sanitation service are ring fenced and audited separately. The tariffs rose significantly in the late 1990s due to strong leadership by the Mayor.

For capital expenditure on its regular sanitation infrastructure, EAB obtains all the funds either directly from the tariffs or from commercial loans repaid from the tariffs – EAB has a good credit rating and hence pays low interest rates on these loans. In the particular case of building new sewage treatment plants to improve the river water quality, the national government contributes about 40% of the cost in recognition of the environmental improvement.

For operational expenditure on sanitation, EAB has an annual budget of about $140 million, which is financed 95% from tariffs and 5% from government grants to cover the free basic sanitation provision.

INNOVATIONS USED OR PLANNED IN THIS CITY

The main financial innovation is a transparent and nationally-mandated cross-subsidy achieved by charging different tariffs to people living in houses of different values: thus property values are used as a proxy for householders' wealth.

The city of Medellin (the second-largest city in Colombia) has pioneered payment of tariffs by smart cards which are more convenient to customers and more efficient for the service provider. Bogota is considering adopting this system.

EAB is open to trying out innovations in sanitation financing in order to improve its quality of service and financial performance.

MESSAGES TO DECISION-MAKERS SPECIFIC TO THIS CITY

Universal sewered sanitation has already been achieved here – so the emphasis must be on the treatment and re-use of the toilet resources. EAB could generate revenues from selling the products of its sewage treatment plants, specifically fertiliser, biodiesel, chemicals and biomass for feed. All of these come within the concept of the circular sanitation economy. Toilet resources should be seen as a source of plant nutrients and energy and not as waste to be disposed of.

EAB could issues contracts to private sector companies for specific parts of its operations, for example running sewage treatment plants, meter reading, call centres.

NAME OF STUDY CITY: **Dakar, Dakar Region, Senegal**

DATA AND CHARACTERISTICS OF THE COUNTRY AND CITY

Senegal has a population of 15 million people of whom 44% live in urban areas. It has a unitary structure with government powers shared between the national and regional governments. In sanitation the national government is dominant, setting policies and regulations and also implementing work programmes through public sector bodies: in urban sanitation these are done through the National Office for Sanitation in Senegal (ONAS). Urban sanitation coverage is estimated between 62% and 82% depending on definitions. The government's policy on sanitation financing is that capital expenditure for urban sanitation comes mainly from concessionary and commercial loans, while operational expenditure should be financed through tariffs. The concept of the circular sanitation economy is officially recognised in Senegal but is very little practised to date.

Dakar is the capital and largest city in Senegal with a population of 3.3 million people. The municipal government has no involvement in sanitation, which is the responsibility of ONAS. The city has a small sewerage system which covers the historic city centre. About 78% of households have improved sanitation; of these two-thirds are served by onsite sanitation and only one third by sewered sanitation. ONAS places just as much emphasis on onsite sanitation as on sewered sanitation, and its future plans for Dakar cover both.

FINANCIAL MECHANISMS USED IN THIS CITY

ONAS does not keep separate accounts for Dakar, only for its overall work: figures for Dakar can be obtained by estimating that the city accounts for 80% of ONAS's work and hence money.

For capital expenditure on sanitation infrastructure, ONAS relies on concessionary and commercial loans.

ONAS collects a sanitation tariff that is calculated as a percentage of the water tariff. For operational expenditure on sanitation, ONAS recover 73% of the cost from that tariff and the remaining 27% from grants from the national government to make up the shortfall.

INNOVATIONS USED OR PLANNED IN THIS CITY

ONAS, with support from the Gates Foundation, has innovated considerably in faecal sludge management through the PSFSM programme. ONAS licences and regulates the pit emptying contractors and also leases the faecal sludge treatment plants to a contractor. These changes have significantly improved the financial performance of the service.

Within the PSFSM programme, ONAS has set up a guarantee fund to enable the pit emptying contractors to obtain bank loans to buy their equipment. This guarantee has enabled the commercial banks to reduce their interest rates from 12% to 7.5%. About 8% of the loans are not being correctly repaid by the contractors, so the contractors' trade association is trying to reduce this figure.

ONAS is upgrading the faecal sludge treatment plants to generate commercial products notably treated water, fertiliser and energy. At the scale of the whole city, this would be a significant circular economy innovation.

ONAS has expressed an interest to try out more innovations in sanitation financing in order to improve its coverage and its quality of service.

MESSAGES TO DECISION-MAKERS SPECIFIC TO THIS CITY

Continue to plan using a city-wide inclusive approach that gives equal importance to onsite sanitation and to sewered sanitation.

Increase sanitation tariffs to fully cover the operational expenditure.

Increase revenues from product sales.

Continue contracting more sanitation services to private sector operators, to increase efficiency and financial sustainability.

Improve the legal and regulatory environment to encourage commercial investors.

NAME OF STUDY CITY: **eThekwini (Durban), KwaZulu Natal Province, South Africa**

DATA AND CHARACTERISTICS OF THE COUNTRY AND CITY

South Africa has a population of 55 million people of whom 65% live in urban areas. It has a unitary constitutional structure with three spheres of government (national, provincial, local) each with their own mandates and powers. In sanitation, the national government sets policies and the local governments (in urban areas: the municipalities) provide the services. Urban sanitation coverage is about 76%. Legislation, regulations and institutional roles are all set out in detail. The government's policy on sanitation financing is that capital expenditure for urban sanitation comes mainly in precisely-calculated grants from national government funded out of taxation revenue, while operational expenditure should be financed by the municipalities through tariffs. Those tariffs must recognise the public health benefits of sanitation, so basic sanitation services are free to the householder and the national government pays the municipality an extra recurrent grant to cover that cost. The concept of the circular sanitation economy is well understood in South Africa and there are some examples of it in operation.

eThekwini municipality (also referred to as Durban) is the third-largest city in South Africa with a population of 3.7 million people. It is governed by the eThekwini Municipal Council. The water and sanitation service provider is eThekwini Water and Sanitation (EWS) which is owned by the municipality. The city has an extensive sewerage system which covers about 50% of households, while another 26% are served by improved onsite sanitation. EWS uses a city-wide inclusive sanitation approach to manage all types of sanitation services, and its future plans include both sewered sanitation and onsite sanitation.

EWS is an exceptionally well-managed utility. Many other municipalities in South Africa perform much worse than EWS in terms of tariff collection, use of capital grants, asset management and customer relations.

FINANCIAL MECHANISMS USED IN THIS CITY

For capital expenditure on sanitation infrastructure, EWS obtains approximately half the funds from national government grants and approximately half from commercial loans, repaid from operating revenues – EWS has a good credit rating and hence pays low interest rates on these loans.

For operational expenditure on sanitation, EWS has an annual budget of about $140 million, which is financed 84% from tariffs and 16% from government grants.

EWS collects separate tariffs for water and for sanitation; tariff collection rate is 100%. The accounts of both the water service and the sanitation service are ring fenced and audited separately from the other municipal accounts.

INNOVATIONS USED OR PLANNED IN THIS CITY

EWS has pioneered many policies in South Africa and has a managerial mindset open to innovation. It is keen to try out innovations in sanitation financing in order to improve its quality of service and financial performance.

EWS has started to generate revenues from selling the produce of its sewage treatment plants, specifically fertiliser, biodiesel, chemicals and biomass for feed. All of these come within the concept of the circular sanitation economy.

EWS issues contracts to private sector companies for specific parts of its operations, for example running sewage treatment plants, meter reading, call centres, toilet emptying.

MESSAGES TO DECISION-MAKERS SPECIFIC TO THIS CITY

The choice of sanitation technology determines the affordability of the option to both the utility and the customers. In any economic analysis, the externalities should be included when determining affordability for the utility.

Universal sewered sanitation would not be affordable here - or indeed in most developing country cities - and is impractical in dense urban slums.

Developments in onsite and container-based sanitation technology have the potential to make sewered sanitation systems redundant in the medium term, with a resultant overinvestment sunk into that infrastructure.

Tariffs must be designed to recognise the human right to sanitation and to be affordable to the poor. This involves an overt internal cross-subsidy from rich people to poor people.

Recognise toilet resources as a source of plant nutrients, chemicals and energy and not as waste to be disposed of.

NAME OF STUDY CITY: **Jodhpur, Rajasthan State, India**

DATA AND CHARACTERISTICS OF THE COUNTRY AND CITY

India has a population of 1,311 million people of whom 33% live in urban areas. 18% of the urban population live in slums. India has a federal structure with government powers shared among the national government, state government, and the municipalities. Sanitation is nominally a state responsibility, and the national government is very active in giving policies, guidance and implementing some centrally sponsored programmes notably the Swachh Bharat Mission, the Atal Mission for Rejuvenation and Urban Transformation, and the Smart Cities Mission. In urban areas improved sanitation coverage is about 65% and about 21% access shared sanitation facilities. Only about 32% of the toilets are connected to sewerage systems and, at best, only about 30% of faecal sludge is treated. The government's policy on sanitation financing is that capital expenditure for urban sanitation comes mainly in grants from national government and state governments, funded out of taxation revenue, while operational expenditure should be financed by the municipalities through tariffs. On average across India the tariffs collect only about 30-40% of the operational expenditure for water and even less for sanitation. The concept of the circular sanitation economy is still new in India and is hardly practised in any of the government programmes: their main focus is still on infrastructure building.

Jodhpur is the 45th largest city in India with a population of 1.1 million people. It is governed by the Jodhpur Municipal Corporation (JMC) which has responsibility for sanitation while the Rajasthan Public Health Engineering Department (PHED) is responsible for water supply. The city has an old sewerage system which covers about 70% of the city area although its treatment capacity is far less. About 65% of households have improved toilets. The city does not collect a separate tariff for sewerage; instead about 30% of the water charges collected by PHED are passed over to JMC for sanitation, although that money is not ring-fenced within JMC. JMC only has 5 staff for sanitation plus contractors for all construction and maintenance work; it has no system for capital asset management.

FINANCIAL MECHANISMS USED IN THIS CITY

For capital expenditure on sanitation infrastructure (mainly sewers and treatment plants), JMC relies on national and state government grants, which average about $5m per year.

For operational expenditure on sanitation, JMC has an annual revenue (almost all from its share of PHED's water tariffs) of $0.8m, an expenditure of $1.2m and it covers the shortfall of $0.4m from its other internal financial resources (ultimately from local tax). JMC is aware that its expenditure is very low, and wishes to spend a target expenditure, which it calculates as 5% of the capital value of its assets, of $7m. The Government of Rajasthan's state sanitation policy encourages cities to recover the full cost of operational expenditure through tariffs, and to generate revenue by selling treated wastewater for irrigation, but JMC has not yet been able to do either.

INNOVATIONS USED OR PLANNED IN THIS CITY

JMC has tried to generate revenues from selling the produce of its sewage treatment plants, specifically treated wastewater, biogas and compost, but the revenue was negligible. The main problems were that the products were seen by JMC as uneconomic in terms of the cost of producing them versus their market value, and that JMC experienced strong customer resistance stemming from the perception that public sector organisations' products should be free.

JMC has expressed a strong interest to try out innovations in sanitation financing in order to improve its coverage and its quality of service.

MESSAGES TO DECISION-MAKERS SPECIFIC TO THIS CITY

Improve JMC's tax collection in order to increase its general revenue.

Transfer authority to set and collect sanitation tariffs from PHED to JMC.

Ring-fence sanitation accounting in JMC's budget so that the decision-makers can see the true financial picture and make decisions based on that evidence.

Incentivise large institutions such as hospitals, hotels, education institutions etc to build their own wastewater treatment plants. These plants could be run by private sector contractors who would apply circular economy concepts and sell the products.

NAME OF STUDY CITY: **Marrakech, Marrakech-Safi Region, Morocco**

DATA AND CHARACTERISTICS OF THE COUNTRY AND CITY

Morocco has a population of 34 million people of whom 60% live in urban areas. It has a federal structure with government powers being increasingly decentralised from the national government to the regional and local governments. Sanitation is a responsibility of local government, while the national government sets policies and guidance. Urban sanitation coverage is about 90%. The government's policy on sanitation financing is that both capital and operational expenditure for urban sanitation should be financed by the municipalities through tariffs. The concept of the circular sanitation economy is still new in Morocco and is hardly practiced in any of the government programmes: their main focus is still on building sewered sanitation infrastructure.

Marrakech is the second-largest city in Morocco with a population of 1.3 million people. The public sector utility Régie Autonome de Distribution d'Eau et d'Electricité de Marrakech (RADEEMA) supplies electricity and water and sanitation services. The city has a large sewerage system which currently covers about 90% of households and is still being extended: RADEEMA plans to achieve 100% sewered sanitation coverage by 2030. The other 10% of households currently have onsite sanitation. About 90% of the sewage is adequately treated.

FINANCIAL MECHANISMS USED IN THIS CITY

For capital expenditure on sanitation infrastructure (mainly sewers and treatment plants), RADEEMA relies mainly on a cross-subsidy from the electricity part of the utility, augmented by some loans from commercial banks.

RADEEMA covers 59% of its operational expenditure on sanitation from the tariff that it charges for sanitation, with the balance being funded by a cross-subsidy from the electricity part of the utility.

INNOVATIONS USED OR PLANNED IN THIS CITY

RADEEMA's main unusual characteristic is that the electricity side of its business, which is profitable, subsidises the sanitation part, which is not.

RADEEMA generates about 10% of its total sanitation customer revenue through the sale of treated wastewater to golf courses.

RADEEMA is open to suggestions for innovations in sanitation financing that could help to make its sanitation service self-financing.

MESSAGES TO DECISION-MAKERS SPECIFIC TO THIS CITY

Revise the tariff policy and increase the actual sanitation tariff.

Increase RADEEMA's revenue from sales of products other than water. Find new customers (other than golf courses) for the treated wastewater.

Ring-fence sanitation accounting in RADEEMA's budget so that the decision-makers can see the true financial picture and make decisions based on that evidence. Then decide either to continue the current policy of cross-subsiding sanitation from electricity, or to find alternative revenue streams for sanitation.

RADEEMA could contract the business selling water, biogas and compost from the municipal sewage treatment plants to a private-sector entrepreneur which could operate it more effectively than RADEEMA can.

NAME OF STUDY CITY: **Nairobi, Nairobi County, Kenya**

DATA AND CHARACTERISTICS OF THE COUNTRY AND CITY

Kenya has a population of 49 million people of whom 25-30% live in urban areas. Kenya has a devolved governance system with governance powers and constitutional mandate shared between the national government and county governments. Sanitation is nominally a county responsibility while several different national government ministries set policies, guidance and regulations. Urban sanitation coverage is about 20% with sewerage and about 50% with on-site sanitation but neither are classified by the JMP as safely-managed; sanitation services are failing to keep up with rapid growth in urban populations. The government's policy on sanitation financing is that capital expenditure for urban sanitation comes partly from grants from national government funded out of taxation revenue and partly from tariffs, while operational expenditure should be financed completely through tariffs – the government acknowledges that tariffs are currently too low to achieve this. The concept of the circular sanitation economy is recognised in Kenya although there are few examples of it yet working.

Nairobi is the capital and largest city in Kenya with a rapidly-increasing population of 3.9 million people. The Athi Water Services Board (AWSB) is the asset holder while the County-government-owned Nairobi City Water and Sewerage Company (NCWSC) is the service provider, although there are overlaps and confusion about their roles. The city has a fairly extensive sewerage system serving about 45% of the households with the sanitation tariff set at 75% of the water tariff. Almost all the other households use on-site sanitation either solely-used or shared, with pits emptied by the small-scale private sector. The plan by 2030 is to expand waterborne sewerage but there is negligible money allocated or in prospect for this.

FINANCIAL MECHANISMS USED IN THIS CITY

For capital expenditure on water and sanitation, AWSB and NCWSC argue about ownership and responsibility and little progress is achieved: the finance is intended to come from a mixture of national government grants and commercial loans, to be repaid from tariff revenues. Sanitation budgets are small, not clearly ring-fenced, and distributed between county government, NCWSC and AWSB.

NCWSC's annual revenue from the combined water and sanitation tariffs is about $70 million which should cover its operating expenditure.

INNOVATIONS USED OR PLANNED IN THIS CITY

NCWSC, with World Bank technical support and a GPOBA grant, obtained a $6 million commercial loan for sanitation capital expenditure in 2016.

Several small-scale entrepreneurs and projects have started circular economy activities.

NCWSC has expressed interest to try out innovations in sanitation financing.

MESSAGES TO DECISION-MAKERS SPECIFIC TO THIS CITY

Clarify the roles of the different agencies responsible for sanitation and sort out the institutional conflicts between them.
Enforce regulations.

Ring-fence sanitation accounting in AWSB's and NCWSC's budgets so that the decision-makers can see the true financial picture and make decisions based on that evidence.

Recognise that expanding waterborne sewerage to the whole population is unaffordable, and instead use city-wide inclusive sanitation planning concepts to concentrate on improving the onsite and container-based sanitation services.

Develop and expand the remit of the Kenya Pooled Water Fund to finance sanitation also.

ANNEX 2: LIST OF PEOPLE CONSULTED FOR THIS WORK

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ANNEX 3: SELECTED BIBLIOGRAPHY STUDIED FOR THIS WORK

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AUGMENTATION DES FLUX FINANCIERS POUR L'ASSAINISSEMENT URBAIN

RAPPORT DU CONSEIL MONDIAL DE L'EAU

CONSEIL MONDIAL DE L'EAU

CONSEIL MONDIAL DE L'EAU

Le Conseil mondial de l'eau (CME) est une organisation internationale multipartite, fondatrice et co-organisatrice du Forum mondial de l'eau, dont la mission est de mobiliser des actions sur les questions critiques liées à l'eau à tous les niveaux, y compris au plus haut niveau décisionnel, en engageant les gens dans le débat et en remettant en question la pensée conventionnelle. Basé à Marseille (France) depuis sa création en 1996, le Conseil regroupe plus de 300 organisations membres de plus de 50 pays différents.
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PRÉFACE

Notre objectif initial au Conseil mondial de l'eau consiste à placer l'eau au cœur des priorités politiques les plus urgentes pour notre planète. La préoccupation principale du Conseil est de garantir la sécurité de l'eau au niveau mondial et, à cet effet, l'infrastructure qui fournit l'eau potable et l'assainissement doit être une priorité. Sans ces deux grands axes, les sociétés ne peuvent pas évoluer et les pays ne peuvent pas se développer. Chaque année, un enfant sur cinq de moins de cinq ans meurt prématurément de maladies liées à l'eau et près d'un tiers de la population mondiale ne dispose pas d'installations sanitaires satisfaisantes. Nous sommes face à une réalité effrayante, alors que le premier quart du 21ème siècle est déjà bien entamé.

Ces faits sont aggravés par la constatation que la cible en matière d'assainissement des objectifs du Millénaire pour le développement, qui visait à réduire de 50% la population non desservie dans le monde, fut loin d'être atteinte. Aujourd'hui, les objectifs de développement durable sont encore plus ambitieux et visent une couverture de 100% de la population mondiale. Comme le souligne ce rapport, au cours des 12 prochaines années, les services d'assainissement devront desservir 5,5 milliards de personnes au total, dont plus de trois milliards vivant dans les villes. Par conséquent, les dépenses annuelles destinées aux zones urbaines devront atteindre 45 milliards de dollars, ce qui correspond quasiment à cinq fois le montant qui est actuellement investi.

Continuer à agir comme si de rien n'était ne nous mènera nulle part. Bien que ces chiffres représentent un montant énorme pour nos fonds publics déjà surchargés, nous ne devons pas nous laisser décourager. Au lieu de cela, nous devons investir de façon plus lucide, tant au niveau financier qu'au niveau politique, afin de garantir que les financements pour l'assainissement soient octroyés de façon intelligente et en quantité suffisante. Une réflexion majeure sur notre façon de procéder quant à l'assainissement est nécessaire si nous voulons apporter une réponse convaincante à ces problèmes. Les conclusions de ce rapport offrent de nombreuses solutions prometteuses. De même, les recommandations politiques inclues dans cet ouvrage proposent des réponses préventives aux tendances qui, nous le savons, se poursuivront dans les années à venir.

J'ai auparavant évoqué le principe des trois 'I' qui correspond aux trois piliers essentiels sur lesquels repose une politique de l'eau efficace : les institutions, l'infrastructure et l'investissement. Ce rapport explique le rôle crucial que ces trois piliers peuvent jouer. Les institutions doivent s'unir pour promouvoir des économies circulaires des ressources en eaux usées traitées, et doivent faciliter les flux financiers via l'utilisation d'instruments de financement nouveaux et existants. L'infrastructure peut réduire les coûts en s'éloignant de l'assainissement traditionnel par égouts pour aboutir à des solutions localisées. Quant à l'investissement, il doit être augmenté grâce à une meilleure gouvernance et par la promotion du travail des prestataires de services.

Plus particulièrement, la gestion de l'eau et l'assainissement doivent être au cœur des discussions politiques mondiales, car seule une approche intégrée peut garantir un avenir durable. L'assainissement est à la fois un problème environnemental, social et économique. Un assainissement efficace a un impact positif sur la vie et les moyens de subsistance de millions de personnes à travers le monde.

Je vous invite donc à prendre connaissance de toutes les recommandations politiques présentées dans ce rapport et à prendre part au débat sur le changement.

Benedito BRAGA
Président
Conseil mondial de l'eau

En initiant ce premier projet sur les mécanismes innovants du financement de l'accès à l'assainissement urbain pour tous, le Conseil mondial de l'eau a élaboré une étude analytique sur huit villes, réparties sur plusieurs continents, qui ont accepté de participer à cette étude. Le Conseil mondial de l'eau reconnaît la contribution volontaire de ces huit villes et souhaite exprimer sa gratitude pour leur engagement à améliorer les services d'assainissement.

Ce projet a permis d'évaluer la capacité de ces villes à répondre à l'une des principales priorités qui permettront d'atteindre l'Objectif de développement durable n°6, les deux autres priorités étant la maitrise de la connaissance (principalement les technologies innovantes et adaptées) et la gouvernance liées à la gestion des eaux usées en milieu urbain.

Ce projet a également permis d'élaborer des principes de bases des nouveaux mécanismes financiers innovants, ainsi que l'identification des messages à porter à la connaissance des principales parties prenantes, à savoir les instances de décision, les professionnels, les bailleurs de fond et la société civile.

De ce fait, il y a lieu, dès la présentation et la restitution des résultats de ce projet de la part du Conseil mondial de l'eau et de ses partenaires au 8ème Forum Mondial de l'Eau à Brasilia (Brésil), de lancer une réflexion sur la poursuite de ce projet sur un nombre plus important de villes. Cette réflexion devrait initier dès le début de 2019 les prochaines étapes du projet à présenter lors du 9ème Forum mondial de l'eau à Dakar (Sénégal).

Un tel projet devra être poursuivi par le Conseil mondial de l'eau en parfaite coordination avec ses partenaires à l'instar des institutions et organismes internationaux.

Hachmi KENNOU
Président du groupe de travail du Conseil mondial de l'eau
« Les villes : au coeur de la croissance »
Conseil mondial de l'eau

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Ce rapport a été rédigé par Jon Lane, consultant coordinateur auprès du Conseil mondial de l'eau pour ce programme de travail. Quelconques erreurs, omissions ou opinions subjectives sont les siennes.

Les consultants nationaux qui ont réalisé les études de cas des villes étaient : Abdelaziz Enasri, Diego Fernandez, Vikki Ferrer, John Gathenya, Murty Jonnalagadda, Neil Macleod, Cesar Seara et Moustapha Sene.

Le Conseil mondial de l'eau et l'auteur remercient les collègues du secteur qui ont révisé les avant-projets de ce rapport : Guy Hutton (UNICEF), Dennis Mwanza (Fondation Gates), Maimuna Nalubega (Banque africaine de développement), Lesley Pories (Water.org), Sophie Trémolet (Banque mondiale) et Chris Zurbrügg (EAWAG).

Le Conseil mondial de l'eau et l'auteur remercient de nombreux collègues du secteur qui ont fourni des informations, des documents publiés et inédits, des avis et des conseils ; ils sont énumérés dans l'Annexe 2. Parmi eux, Sophie Trémolet de la Banque mondiale a été particulièrement généreuse en partageant des travaux publiés et non publiés et des données sur le financement de l'assainissement, sur lesquels ce rapport s'est basé en grande partie.

Le Conseil mondial de l'eau souhaite que ce travail soit ouvert, collaboratif et qu'il reconnaisse pleinement les contributions et les propriétés intellectuelles de chacun. En effet, le Conseil, avec son avantage unique en tant que créateur et organisateur des Forums mondiaux de l'eau, veut mettre ses canaux de communication et son plaidoyer à la disposition d'autres collègues et partenaires pour diffuser ses messages sur ce sujet.

RÉSUMÉ

L'analyse des tendances actuelles et des idées innovantes met en avant une vision optimiste pour l'année 2030, selon laquelle l'assainissement urbain sera un instrument de progrès, et non un problème dont il faut se soucier.

INTRODUCTION

L'assainissement a été l'un des secteurs les moins performants surveillés par les Objectifs de Développement du Millénaire (ODM). La cible des Objectifs de Développement Durable (ODD) est désormais beaucoup plus difficile à atteindre que la cible des OMD à deux égards. Tout d'abord, elle vise à garantir l'accès à l'assainissement pour tous, et non plus seulement de réduire de moitié le nombre de personnes sans accès à l'assainissement. Ensuite, elle vise à assurer un assainissement géré de manière sécuritaire (utilisation d'installations améliorées qui ne sont pas partagées avec d'autres ménages et où les excréments sont gardés sur place ou transportés et traités hors site) plutôt qu'un assainissement de base (l'utilisation d'installations améliorées qui ne sont pas partagées avec d'autres ménages). Par conséquent, atteindre la cible des ODD nécessite un effort opérationnel et financier immense. Le Conseil mondial de l'eau présente ce rapport, accompagné de huit études de cas sur les villes, en tant que contribution à cet effort mondial collectif.

Tout en reconnaissant que l'assainissement rural reste important, le Conseil concentre son attention sur l'assainissement urbain car les services d'assainissement urbains doivent atteindre plus de trois milliards de personnes au cours des 12 prochaines années, les défis techniques sont plus complexes, les coûts sont plus élevés, et les bénéfices économiques et sociaux de réussite sont bien plus importants. Ce rapport traite donc de l'assainissement urbain.

Le rapport suit un ordre logique : discuter tout d'abord de ce à quoi pourrait ressembler l'assainissement urbain d'ici 2030, pour ensuite examiner comment cet assainissement serait financé ; et enfin identifier ce que les décideurs peuvent faire maintenant pour augmenter ces flux financiers.

À QUOI RESSEMBLERAIT L'ASSAINISSEMENT URBAIN EN 2030 ?

L'analyse des tendances actuelles et des idées innovantes met en avant une vision optimiste pour l'année 2030, selon laquelle l'assainissement urbain sera un instrument de progrès, et non un problème il faut se soucier.

Les arguments économiques et commerciaux en faveur d'un assainissement amélioré seront bien compris. L'assainissement urbain sera un secteur de services et non un secteur d'infrastructures. La réutilisation sécuritaire et économiquement rentable des excréments humains en tant que ressources fera partie intégrante des services d'assainissement. L'assainissement collectif par égouts, l'assainissement autonome et l'assainissement à base de conteneurs coexisteront. Les rôles des gouvernements, des municipalités, du secteur privé et de la société civile reflèteront les forces de chacun. Ils suivront le concept d'assainissement à l'échelle de la ville, selon lequel toutes les organisations concernées par l'assainissement dans une ville donnée se réunissent et se mettent d'accord sur la meilleure façon de desservir toute la population.

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FINANCEMENT DE L'ASSAINISSEMENT URBAIN

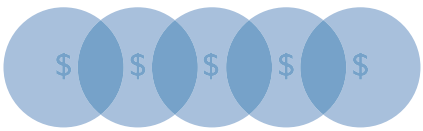
Le financement de ce travail en utilisant les stratégies actuelles demanderait environ 45 milliards de dollars par an pour l'assainissement urbain, soit cinq fois supérieur aux dépenses actuelles. Cela semble une perspective décourageante, mais il existe deux façons principales de l'atteindre. La première est de réduire le chiffre global de 45 milliards de dollars par an en opérant un changement stratégique de l'assainissement collectif à l'assainissement autonome et l'assainissement à base de conteneurs, qui ne coûtent que la moitié du coût de l'assainissement collectif. La deuxième est de rendre les prestataires de services d'assainissement (qu'il s'agisse de services publics municipaux, d'entreprises du secteur privé ou d'ONG, grandes ou petites) financièrement viables et stables en réduisant leurs dépenses et / ou en augmentant leurs revenus. Ce rapport propose plusieurs idées afin de répondre aux deux cas de figure. L'action principale pour réduire les dépenses est de loin le passage de l'assainissement collectif par égouts à l'assainissement autonome et à base de conteneurs mentionnés ci-dessus. L'action principale pour augmenter les revenus est que les régulateurs réforment les tarifs - notamment pour que les plus riches subventionnent les plus pauvres - et que les gouvernements nationaux reconnaissent et quantifient la valeur monétaire des bénéfices sociaux et économiques de l'assainissement et paient ce montant aux prestataires de services.

Si les prestataires de services sont financièrement viables et stables, ils peuvent attirer de nouveaux financements. Ce nouveau financement n'incombera pas aux gouvernements et donateurs déjà trop sollicités. Il viendra de sommes d'argent sans précédent épargnées par les gens du monde entier. Ces personnes ainsi que leurs conseillers financiers et intermédiaires sont toujours à la recherche d'entreprises dans lesquelles investir leur argent. Une fois qu'ils auront confiance dans l'analyse de rentabilité des entreprises d'assainissement, ils seront prêts à y investir. Ainsi, le financement nécessaire pour réaliser les ODD sur l'assainissement sera passé d'un casse-tête pour les bailleurs de fonds à une opportunité de marché pour les investisseurs.

L'élément essentiel de ce rapport est de savoir comment l'argent des investisseurs pourra atteindre les entreprises d'assainissement. Ce rapport propose donc diverses idées novatrices pour permettre cet accroissement des flux financiers. Certaines suggestions sont des instruments financiers spécifiques, tandis que d'autres sont des mécanismes financiers. Concernant ces derniers, la proposition ayant le plus grand impact potentiel concerne les mécanismes de financement multipartites qui peuvent permettre à de nombreux investisseurs différents de soutenir de nombreuses entreprises différentes simultanément au moyen d'une plateforme unique dotée de systèmes de suivi et de partages communs d'informations. Le titre provisoire que ce rapport donne à une telle plateforme est « structure de financement de l'assainissement ». Les structures de financement de l'assainissement pourraient prendre différentes formes juridiques et pourraient être créées au niveau national, régional ou même mondial. D'autres secteurs d'activité présentent des plateformes similaires, mais pour l'assainissement urbain, il s'agirait de concepts inconnus qui nécessiteraient l'intervention de pionniers.

Ces innovations financières seront soutenues par trois principaux éléments de collaboration : mesurer les résultats des services d'assainissement ; monétiser les bénéfices sociétaux de l'assainissement amélioré ; et bâtir la confiance entre toutes les parties-prenantes.

45 milliards de dollars
par an pour l'assainissement urbain



5 fois plus que le niveau actuel de dépenses

QUE PEUVENT FAIRE LES DÉCIDEURS POUR AUGMENTER LES FLUX FINANCIERS ?

La réussite de ces innovations financières dépend à plusieurs niveaux des décideurs. Ce rapport encourage donc tous les groupes de décideurs : principalement les politiques nationaux, mais aussi les dirigeants municipaux, les régulateurs, les entrepreneurs, les banquiers, les investisseurs et la communauté internationale du développement. Quelques-unes des actions essentielles à mener pour ces différents groupes sont listées ci-dessous :

- Mettre en place des organes statutaires indépendants pour fixer les tarifs et les réglementations.
- Définir clairement les rôles des différentes institutions et entités afin de donner aux investisseurs la confiance nécessaire dans le but de soutenir les prestataires de services d'assainissement.
- Introduire et faire respecter les normes et réglementations nationales et locales relatives à la qualité et à la vente des produits fabriqués à partir d'excréments humains traités, afin de promouvoir les concepts et activités de l'économie circulaire.
- Réaffecter les fonds des subventions des installations d'assainissement collectif et de traitement très couteuses vers des systèmes décentralisés beaucoup moins chers, la gestion des boues de vidange et des infrastructures pour l'assainissement à base de conteneurs.
- Encourager les banques commerciales et les investisseurs à entrer dans le secteur en atténuant les risques et les coûts pour eux.
- Reconnaître la contribution de l'assainissement à la santé publique et à l'environnement en contribuant financièrement aux dépenses opérationnelles des prestataires de services.
- Activer et soutenir les marchés des produits d'assainissement en étant des clients pour les engrais, l'énergie et d'autres produits générés par les entreprises d'économie circulaire d'assainissement.
- Considérer l'assainissement dans les pays en développement comme un nouveau secteur d'activité dans lequel obtenir l'avantage du premier arrivé.
- Développer et investir dans les entreprises tout au long de la chaîne de valeur de l'assainissement.
- Encourager les municipalités et les investisseurs commerciaux à collaborer et à co-investir, pour faire des économies d'échelle.

CONCLUSION

Dans cet ensemble complexe et détaillé, trois messages fondamentaux peuvent être identifiés et adressés aux acteurs de l'assainissement urbain :

- Économiser d'importantes sommes d'argent en mettant l'accent sur l'assainissement autonome et à base de conteneurs, et non plus sur l'assainissement collectif.
- Augmenter les flux financiers en utilisant une gamme d'instruments et de mécanismes de financement existants et nouveaux.
- Attirer de nouveaux capitaux dans le secteur en améliorant les conditions de gouvernance et la performance des prestataires de services.

Lorsque les décideurs convergeront vers la même cause et la même vision, ils pourront attirer le financement accru nécessaire pour réaliser les ODD en termes d'assainissement et créer des villes dans lesquelles des gens heureux et en bonne santé peuvent mener des vies de manière durable.

PRÉSENTATION DU PROGRAMME DE TRAVAIL DU CONSEIL MONDIAL DE L'EAU POUR LE FINANCEMENT DE L'ASSAINISSEMENT

DÉFINITION DE L'ASSAINISSEMENT DANS LE CADRE DE CE PROGRAMME DE TRAVAIL

Dans le cadre de ce programme de travail, l'assainissement est défini comme la gestion, le traitement et la réutilisation des excréments humains. Les eaux grises (eaux usées provenant des cuisines, salles de bains, etc.) sont souvent gérées conjointement avec les excréments humains, et les déchets solides compostables peuvent être cogérés avec les excréments humains. Ce programme de travail considère donc aussi bien les eaux grises que les déchets solides compostables dans ces situations, en fonction du contexte local. Le drainage des eaux pluviales est associé à l'assainissement dans certaines villes, mais ce programme de travail n'évalue pas le drainage des eaux pluviales en soi.

Le programme de travail porte sur le financement de l'assainissement, et non sur l'assainissement en général : il prend suffisamment en compte l'assainissement pour éclairer l'analyse de son financement.

MOTIVATIONS DU PROGRAMME DE TRAVAIL

Depuis la création des Objectifs du millénaire pour le développement (OMD) en 2000, des efforts concertés ont été déployés au niveau mondial pour améliorer l'accès durable à l'eau potable et à l'assainissement de base. La cible des OMD relative à l'eau a été atteinte, tandis que la cible de l'assainissement ne l'a pas été : un tiers de la population mondiale manque encore d'installations sanitaires de base. Maintenant que les OMD ont été remplacés par les Objectifs de développement durable (ODD), la définition de l'assainissement approprié est devenue plus stricte, notamment avec le concept de « assainissement géré de manière sécuritaire », et les chiffres de l'assainissement semblent encore plus mauvais[1] .

Malgré le fait que les bénéfices économiques et sanitaires de l'accès à l'assainissement ont fait l'objet de recherches approfondies et reconnues, la question est généralement placée en bas dans la liste des priorités des politiques et décideurs nationaux.

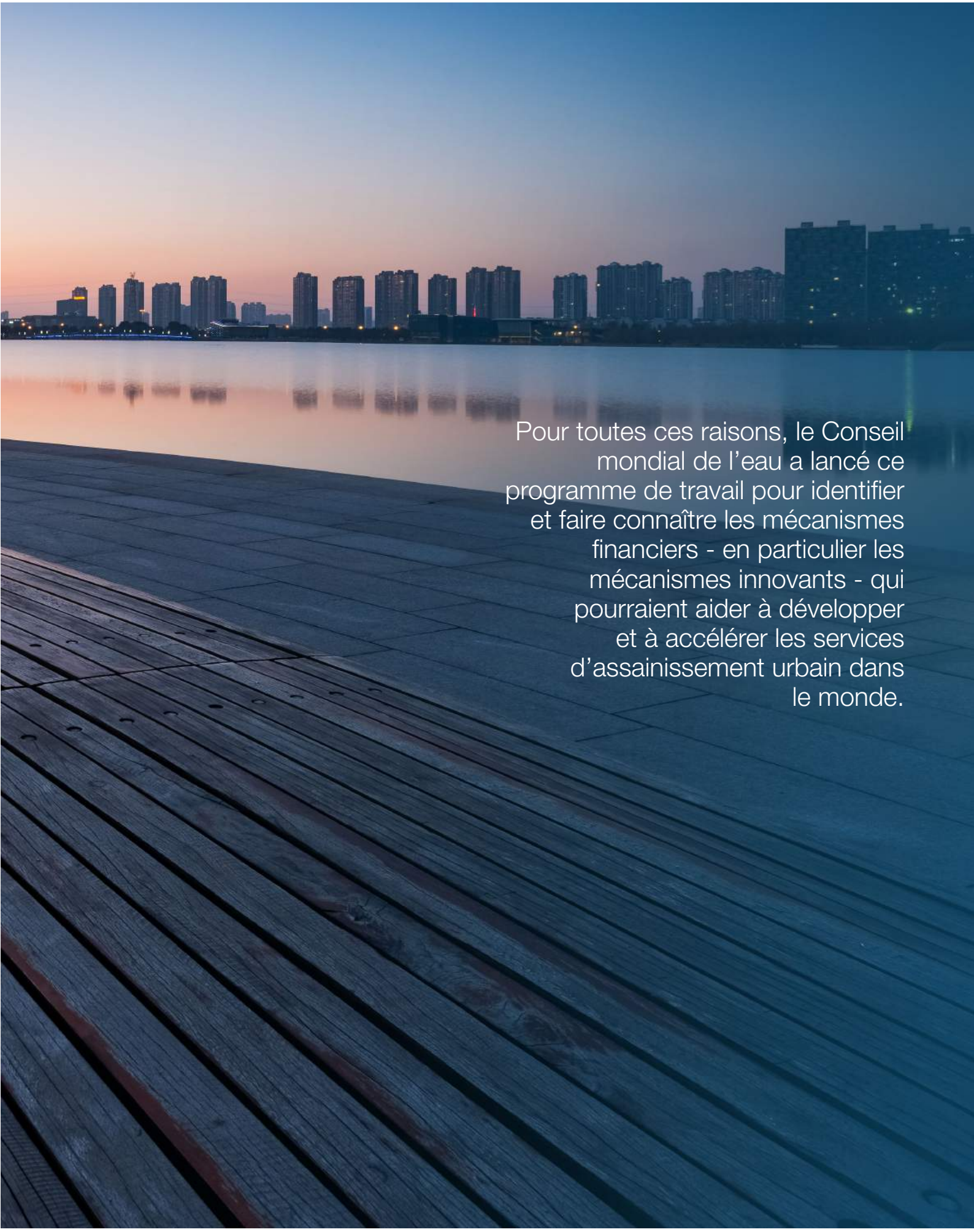
En comparaison avec de nombreux autres secteurs du développement, l'assainissement reste un sujet spécialisé et mineur destiné aux donateurs et bailleurs de fonds concessionnaires, sans parler des investisseurs commerciaux.

Bien que le nombre absolu de personnes dans les zones rurales n'ayant pas accès à un assainissement approprié soit toujours plus élevé que dans les zones urbaines, la croissance rapide de la population urbaine et les migrations aggravent la situation dans les zones urbaines. Les statistiques urbaines masquent d'énormes disparités entre riches et pauvres. L'assainissement urbain est techniquement plus difficile et plus cher que l'assainissement rural. Les coûts sanitaires, économiques et sociétaux de l'assainissement urbain inapproprié sont plus élevés.

L'assainissement urbain a traditionnellement été associé à l'eau, comprenant les égouts et les stations de traitement. Cette solution est pratique pour ceux qui ont la chance de se la permettre, mais coûte très cher et demande beaucoup de ressources en eau. Des solutions adéquates à moindre coût existent mais sont mal expliquées ou mal comprises. Par conséquent, parce qu'elles perçoivent que l'assainissement est coûteux et difficile, de nombreuses villes à travers le monde n'ont fait que très peu à ce sujet. Les ménages ont eux-mêmes dû améliorer leur propre assainissement, souvent de manière ad hoc et non réglementée.

Pour toutes ces raisons, le Conseil mondial de l'eau a lancé ce programme de travail pour identifier et faire connaître les mécanismes financiers - en particulier les mécanismes innovants - qui pourraient aider à développer et à accélérer les services d'assainissement urbain dans le monde.

1 Les définitions officielles de tous les termes tels que l'assainissement de base, approprié et l'assainissement géré de manière sécuritaire sont sur le site web du Programme Conjoint de Surveillance www.washdata.org. Le plus grand impact sur le financement de l'assainissement est que l'assainissement géré de manière sécuritaire exige une élimination ou une réutilisation appropriée de tous les excréments humains.



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CONTENU DE CE PROGRAMME DE TRAVAIL

Le programme de travail comporte deux éléments principaux : des études de cas de huit villes par des consultants nationaux et une analyse générale par le consultant coordinateur.

Les villes ont été sélectionnées par le Conseil mondial de l'eau à travers ses réseaux professionnels, sur la base de leur intérêt exprimé pour ce travail et de leur volonté d'expérimenter des mécanismes de financement innovants. Elles sont réparties à travers l'Afrique, l'Asie et l'Amérique du Sud, et varient en termes de population, de richesse, de structures politiques, et en ce qui concerne la couverture de l'assainissement, de technologies et de prestataires de services. Les études de cas illustrent les réussites, les futurs défis et les ambitions en matière de financement de l'assainissement. Certaines d'entre elles ont déjà commencé à innover, mais cela n'était pas obligatoire pour les sélectionner pour cette étude. Les villes sont : Baguio (Philippines), Blumenau (Brésil), Bogota (Colombie), Dakar (Sénégal), eThekwini (Durban, Afrique du Sud), Jodhpur (Inde), Marrakech (Maroc), Nairobi (Kenya).

Chaque consultant national a suivi un cadre analytique cohérent comprenant un bref aperçu du contexte du pays et de la ville d'étude, des informations détaillées sur le financement de l'assainissement dans la ville d'étude, et une analyse. Chacun a travaillé en étroite collaboration avec l'autorité responsable de l'assainissement dans la ville, recueillant des données auprès de cette autorité et d'autres organisations pertinentes. Le résultat de ce travail est un ensemble de huit études de cas, publiées par le Conseil mondial de l'eau, qui peuvent être lues séparément ou les unes après les autres.

Le travail du consultant coordinateur est basé sur les connaissances et études personnelles, et sur le bon travail déjà effectué par d'autres personnes sur le financement de l'assainissement. Il s'appuie également sur des exemples, des opinions et des informations tirés des études de cas des huit villes. Ce rapport est le résultat de ce travail.

OBJECTIF ET STRUCTURE DU RAPPORT

Ce rapport n'est pas un document académique mais une introduction descriptive au sujet du financement de l'assainissement urbain. Son but est de plaider en faveur d'une augmentation des flux financiers vers l'assainissement afin de parvenir à une vision positive du secteur d'ici 2030. Il décrit et analyse le sujet et génère des implications politiques et des messages pour les décideurs. Le Conseil mondial de l'eau vise à ce que ce rapport déclenche des actions pertinentes de la part des décideurs ciblés, et aussi qu'il encouragera d'autres personnes à effectuer davantage d'analyses sur les besoins, les mécanismes et les sources de financement.

Le rapport suit un ordre logique : d'abord imaginer à quoi pourraient ressembler les services d'assainissement urbain d'ici 2030, puis analyser comment ces services seraient financés, puis identifier quelles décisions doivent être prises maintenant pour augmenter ces flux financiers.

La dernière section, portant sur les décisions à prendre maintenant, est également résumée dans une courte brochure qui peut être lue rapidement par des personnes occupées. Cette brochure devrait contenir tout ce qu'il faut savoir pour prendre des décisions, tandis que leurs équipes et leurs collègues peuvent étudier les documents plus détaillés.

Ce rapport combine des informations génériques obtenues par une enquête personnelle, des interviews avec des experts et une étude des publications, avec des enseignements spécifiques tirés des huit études de cas de la ville. Ces leçons sont incorporées dans le texte principal et les études de cas individuelles sont brièvement résumées dans les Annexes.

PROCHAINES ÉTAPES DE CE TRAVAIL

Il s'agit d'un programme de travail en cours pour le Conseil mondial de l'eau. Plusieurs sessions et activités sont prévues lors du 8ème Forum mondial de l'eau à Brasilia, au cours duquel ce rapport sera divulgué. À l'issue de ce Forum, le Conseil poursuivra divers travaux, notamment en aidant les huit villes étudiées à être les premières à adopter et à défendre ce sujet. Il travaillera également à l'échelle mondiale avec d'autres pour aider à promouvoir les mécanismes de financement innovants décrits dans ce rapport.

I. À QUOI RESSEMBLERAIT L'ASSAINISSEMENT URBAIN EN 2030 ?

Pour les professionnels qui ont déjà travaillé dans ce secteur pendant 20 ou 30 ans, se projeter à 12 ans n'est pas une prospective spéculative, mais une prévision éclairée basée sur les tendances actuelles et les idées à venir. C'est la base de cette section du rapport. Le ton sous-jacent est positif et optimiste : en envisageant que l'assainissement urbain puisse être bien géré et correctement financé d'ici 2030, tout en examinant comment cet optimisme peut être justifié.

1.1 CONTEXTE DÉMOGRAPHIQUE ET POLITIQUE

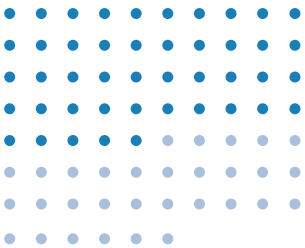
Selon les statistiques et les projections de l'ONU-DAES, il y a maintenant 7,6 milliards de personnes dans le monde, dont 3,1 milliards vivent dans les zones urbaines des régions moins développées. D'ici 2030, il y aura 1 milliard de personnes supplémentaires qui presque toutes vivront dans ces mêmes zones urbaines dans ces mêmes régions moins développées. Il s'agit d'un milliard de bouches de plus à nourrir et d'un milliard de derrières supplémentaires auxquels il faut fournir l'assainissement.

Les Objectifs de développement durable (ODD) établissent naturellement des objectifs plus rigoureux que ceux des Objectifs du millénaire pour le développement (OMD). En ce qui concerne l'assainissement urbain, les données du Programme conjoint de surveillance des Nations Unies montrent qu'en 2015, 83 % de la population urbaine mondiale disposait d'assainissement amélioré (Définition de la cible des OMD - installations conçues pour séparer de manière hygiénique les excréments du contact humain) mais seulement 43 % d'assainissement géré de manière sécuritaire (Définition de la cible des ODD - installations d'assainissement améliorée, non partagées avec d'autres ménages, à partir desquelles les excréments doivent être traités et éliminés sur place ou stockés temporairement puis vidés et transportés hors site ou transportés via des égouts et traités ensuite hors site). Cela signifie que 40 % de la population urbaine mondiale disposait soit d'installations d'assainissement améliorées partagées avec d'autres ménages, soit d'installations d'assainissement améliorées dont les excréments n'étaient pas correctement traités.

Ces chiffres, aussi importants soient-ils, cachent de grandes disparités entre riches et pauvres. Les zones urbaines sont diverses en termes de conditions socio-économiques, d'occupation du territoire, d'infrastructures et de services. Les quartiers riches sont souvent très bien desservis par l'assainissement alors que les zones pauvres (en particulier les bidonvilles) sont bien moins bien loties. Cette question d'iniquité est un problème politique et démographique majeur.

Pour atteindre les objectifs des ODD en matière d'assainissement, d'ici 2030, 3,2 milliards de citadins supplémentaires et 2,1 milliards de ruraux supplémentaires devront avoir un assainissement géré de manière sécuritaire, tandis que les excréments des 8,6 milliards de personnes dans le monde devront être traités.

D'ici 2030, les dirigeants de l'humanité s'efforceront pour trouver un équilibre entre l'amélioration de la qualité de vie de milliards de personnes et la préservation de la stabilité et de la santé de l'environnement naturel dont dépendent toutes les espèces. Les décideurs devront prendre des mesures historiques sans précédent afin d'atteindre et de maintenir cet équilibre. Les professionnels de l'assainissement peuvent aider ces dirigeants en transformant les excréments humains en ressources et en offrant un système d'assainissement urbain comme un instrument de progrès plutôt que comme un problème supplémentaire à résoudre.



7,6 milliards
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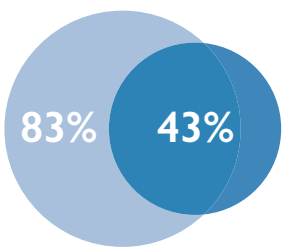
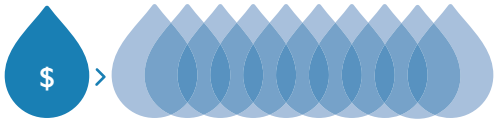


En 2015, **83%** de la population urbaine mondiale disposait d'un assainissement amélioré, mais seulement **43%** d'entre eux avaient une gestion saine de l'assainissement.

** Ensemble de surveillance des Nations unies.*

1.2 ANALYSE ÉCONOMIQUE ET DE RENTABILITÉ POUR UN ASSAINISSEMENT AMÉLIORÉ

L'analyse économique et l'analyse de rentabilité sont des expressions similaires, mais elles se réfèrent à différents aspects de l'assainissement. Les arguments économiques en faveur d'un assainissement amélioré montrent que l'assainissement amélioré bénéficie à l'économie nationale ou locale. L'analyse de rentabilité de l'assainissement démontre que les activités des entreprises visant à améliorer l'assainissement peuvent être rentables. Déjà en 2018, l'analyse économique et l'analyse de rentabilité ont été bien établies, comme décrit ci-dessous. Compte tenu des bases de leurs calculs et des tendances actuelles, d'ici 2030, les deux analyses se seront renforcées.



Les chiffres attestent que, typiquement, **1 $** investi dans l'eau et l'assainissement rapporte entre **5 et 10 $** de bénéfices économiques.

L'analyse économique

Cette partie répond essentiellement à la question de savoir pourquoi les politiques devraient se préoccuper de l'assainissement urbain en général et de l'assainissement universel géré en toute sécurité en particulier. Les arguments économiques sont construits en quantifiant les bénéfices dus à l'assainissement amélioré.

Plusieurs études ont démontré les bons résultats économiques de l'investissement dans l'amélioration de l'eau et de l'assainissement. Généralement, ces études se sont basées uniquement sur le calcul des bénéfices économiques les plus directs, à savoir le gain de temps associé à un meilleur accès aux installations d'eau et d'assainissement, le gain en temps de productivité associé à un temps de maladie réduit, et la valeur des décès évités. L'autorité reconnue pour ces analyses économiques est Guy Hutton, dans un premier temps pour l'OMS, puis dernièrement dans le cadre d'une équipe chargée de l'Initiative sur l'économie de l'assainissement du Programme Eau et Assainissement / Banque mondiale. Les résultats de l'OMS et de l'ESI sont généralement formulés, au niveau mondial, régional ou national, soit en termes de bénéfice : analyse des coûts d'investissement dans l'assainissement ou en termes de PIB perdu en raison d'un assainissement médiocre. Les chiffres les plus pertinents montrent que chaque dollar investi dans les rendements de l'eau et de l'assainissement rapporte des bénéfices économiques de l'ordre de 5 à 10 $, et que les coûts d'assainissement médiocres représentent de 2 à 6 % de leur PIB. Ce sont des chiffres extrêmement importants. Alors que ces études antérieures ne fournissaient pas d'analyses rurales et urbaines distinctes, le rapport récent de Hutton sur les bénéfices et les coûts de l'eau et de l'assainissement pour le Copenhagen Consensus Center fournit une ventilation spécifique à l'assainissement urbain, basée sur les chiffres et les coûts de 2015. Il donne un rapport bénéfice / coût compris entre 2,5 et 3, en fonction des hypothèses économiques retenues.

Aussi solides que soient ces analyses, elles sous-estiment probablement les arguments politiques en faveur de l'assainissement car elles ne quantifient pas les bénéfices moins directs de l'assainissement tels que les bénéfices pour l'environnement, le sentiment de sécurité, la commodité, le statut et le bien-être et, en fin de compte, le développement économique national. Les arguments politiques en faveur de l'assainissement peuvent même reconnaître son impact sur le tourisme, le commerce international et l'investissement économique international, la stabilité politique et la réduction des migrations et des déplacements de populations.

L'analyse ci-dessus de la quantification des bénéfices consiste, en termes économiques, à monétiser les externalités de l'assainissement amélioré. Ce sera un aspect essentiel des futures solutions de financement pour l'assainissement qui sera discuté plus en détail dans la section 2.6 ci-dessous.

L'analyse de rentabilité

Cette partie répond à la question de savoir pourquoi les hommes d'affaires devraient s'intéresser au travail dans l'assainissement urbain. Dans les pays à revenu élevé, il existe déjà de nombreuses entreprises de toutes tailles qui gèrent des activités prospères dans le domaine de l'assainissement ; leurs actionnaires et gestionnaires sont bien conscients des arguments de rentabilité en faveur du travail dans l'assainissement urbain. En ce qui concerne les pays à revenu intermédiaire et faible, la situation est plus variable. Certainement beaucoup d'entreprises vivent de l'assainissement urbain, mais ce sont généralement de petits entrepreneurs ou des entreprises familiales opérant dans l'économie informelle plutôt que de grandes entreprises opérant à l'échelle de la ville : par exemple, sur les huit villes étudiées, Blumenau a une société privée qui gère l'assainissement pour toute la ville.

Depuis que ce sujet a été défendu par le gouvernement de la Suisse il y a près de 20 ans, diverses agences de développement ont travaillé pour étudier, promulguer et plaider afin que les entreprises soient impliquées dans l'assainissement urbain. Ce mouvement a récemment été stimulé par l'attention accordée au changement climatique, à l'environnement et au concept d'économie circulaire, car ces considérations rendent les entreprises liées à l'assainissement intrinsèquement plus rentables qu'elles ne l'étaient.

L'une des agences les plus actives dans la promotion de l'assainissement urbain est la Toilet Board Coalition (la TBC), une organisation associative qui promeut les contributions que les entrepreneurs et les entreprises du secteur privé peuvent apporter à l'assainissement dans les pays en développement. La TBC estime que les ressources de toilettes (le nouveau nom que la TBC a inventé pour ce que l'on appelait auparavant excréments ou déchets humains) s'élèvent à 3,8 billions de litres par an dans le monde, avec une valeur économique de plusieurs milliards de dollars. La TBC et d'autres défenseurs encouragent les entrepreneurs à considérer l'assainissement urbain dans les pays en développement comme un nouveau secteur d'activité dans lequel ils devraient obtenir l'avantage du précurseur/premier arrivant. Ils croient que, dans le but d'attirer différents investisseurs, les entrepreneurs peuvent développer des entreprises tout au long de la chaîne de valeur de l'assainissement.

Pour renforcer les arguments de rentabilité, les investisseurs recherchent des facteurs qui leur atténueraient les risques et les coûts. En plus des caractéristiques spécifiques de l'activité elle-même, ces facteurs pourraient inclure : un cadre politique clair pour l'assainissement urbain ; une définition claire des rôles des différentes organisations gouvernementales et du secteur privé ; une législation et une réglementation appliquées par les tribunaux ; une municipalité stable et engagée, de préférence prête à co-investir avec des investisseurs commerciaux. Ces facteurs de gouvernance sont très importants pour construire l'analyse de rentabilité. Les besoins des investisseurs sont de nouveau mentionnés dans la section 2.6 ci-dessous.

1.3 ASSAINISSEMENT À L'ÉCHELLE DE LA VILLE

Il s'agit en 2018 d'un concept émergeant[2] , d'ici 2030, cela devrait être la norme. Le principe de base relève du bon sens : celui que toutes les organisations concernées par l'assainissement dans une ville particulière se réunissent et conviennent de la meilleure façon de desservir tous les habitants de cette ville. Cela semble facile mais il n'est pas encore répandu : par exemple, sur les huit villes étudiées, seules eThekwini et Dakar l'ont vraiment compris et adopté à ce jour. Il s'agit essentiellement d'un concept de gouvernance qui combine les cadres de planification, les rôles institutionnels convenus, la législation et la réglementation. Chaque ville est unique, mais certains principes sous-jacents s'appliquent à toutes les villes :

- Travailler en partenariat pour fournir des services d'assainissement dans toute la ville. Intégrer l'assainissement dans la gouvernance urbaine dans son ensemble ; établir des rôles et des responsabilités claires qui utilisent les forces des différents types d'organisations ; articuler et construire la demande par le biais de la société civile ; travailler ensemble sur la cartographie, la planification, la conception et la mise en œuvre des services d'assainissement.
- Promouvoir la diversité. Promouvoir la diversité des concepts de gouvernance, des cadres de planification, des prestataires de services, des solutions techniques et des mécanismes de financement afin de desservir tout le monde ; éviter d'essayer d'imposer une solution pour toute la ville.
- Respecter le droit de l'homme à l'assainissement. S'attaquer aux problèmes d'inégalités ; atteindre les personnes les plus vulnérables et marginalisées ; se concentrer sur les établissements précaires ; assurer l'accessibilité pour les personnes les plus pauvres ; définir les politiques tarifaires en conséquence.
- Reconnaître que l'assainissement contribue à une économie urbaine prospère. Intégrer l'assainissement dans la planification urbaine, utiliser les concepts d'économie circulaire pour accroître la récupération et la réutilisation des ressources, relier l'assainissement amélioré au progrès dans d'autres secteurs du développement urbain et social.
- Assurer une gestion sécuritaire tout au long de la chaîne de services d'assainissement. Permettre des solutions et des approches variées, promouvoir un traitement décentralisé plutôt que des systèmes centralisés, sélectionner et utiliser les meilleures technologies pour chaque étape de la chaîne de services.

Aucune de ces idées n'est étrange ou difficile à saisir. L'effort consiste à les appliquer réellement. Les gens, en particulier les dirigeants et les décideurs, doivent changer leur façon de travailler. Ceux qui ont eu auparavant tous les pouvoirs - typiquement les dirigeants municipaux - doivent faire preuve d'humilité en se rendant compte qu'ils peuvent partager ce pouvoir avec les autres sans se rabaisser eux-mêmes. Les autres parties prenantes doivent reconnaître cela et soutenir ce changement.

De nombreuses parties prenantes externes essaient d'encourager les dirigeants municipaux à adopter un système d'assainissement à l'échelle de la ville. Une méthode inhabituelle consiste à décerner des prix. Par exemple, le Défi Assainissement pour le Ghana est un mécanisme initié par le Département pour le développement international du Royaume-Uni, visant à stimuler l'intérêt des municipalités en leur décernant des prix pour les meilleures stratégies de gestion des déchets liquides. Le défi a suscité un grand intérêt parmi les municipalités à travers le pays et a récemment été étendu aux partenaires du secteur privé et aux ONG. Le gouvernement ghanéen soutient très activement le travail des municipalités en révisant les dispositions et la réglementation en matière de gouvernance. L'ensemble du processus a aidé les municipalités à penser de manière créative, à travailler avec d'autres dans des partenariats inclusifs, et à concevoir et à mettre en œuvre des stratégies durables de gestion des déchets liquides qui conduisent à la prestation de services d'assainissement à l'échelle de la ville.

2 Le concept a été créé par un groupe d'organisations dont la Banque Mondiale, la Fondation Gates, WaterAid, les Universités de Emory et Leeds entre autres.

1.4 ASSAINISSEMENT EN TANT QUE SERVICE

Depuis les programmes municipaux pionniers du dix-neuvième siècle, l'assainissement a généralement été classé comme un secteur d'infrastructures. Cela l'a automatiquement orienté vers le génie civil et les grands projets d'immobilisations, ce qui signifie de grandes sommes d'argent, une planification centralisée, des actifs irrécupérables et des résultats rigides. Les urbanistes et les ingénieurs ont dominé le secteur. Dans le même temps, un système d'assainissement inapproprié est souvent qualifié de problème de santé publique - en conséquence, il incombe aux gouvernements et aux donateurs concernés de le résoudre. Les ménages ont été catégorisés comme bénéficiaires, qui ont essentiellement des rôles passifs.

Les télécommunications étaient auparavant classées dans la catégorie des infrastructures à cause des actifs irrécupérables des lignes fixes. Mais maintenant, avec toutes les technologies et modèles d'affaires flexibles et la gamme de médias de communication disponibles pour les utilisateurs, elles ont complètement changé pour un secteur de services et attiré un grand nombre d'investisseurs et de prestataires de services. De même pour l'assainissement : avec la prolifération de nouvelles idées (modèles économiques, options de service, solutions technologiques, etc.) tout au long de la chaîne de valeur de l'assainissement et un nouvel accent sur les ménages comme clients, les idées reçues ont déjà commencé à changer, et d'ici 2030, l'assainissement urbain ne devrait plus être considéré comme un secteur d'infrastructures mais de services.

Une relation de service a besoin de clients et de prestataires de services. En ce qui concerne l'assainissement urbain, les clients sont des personnes, généralement classées dans la catégorie des ménages, car l'assainissement est principalement un service lié au foyer. Les prestataires de services sont tous les organismes, des secteurs public et privé, qui fournissent des services à ces ménages. Cela comprenant, par exemple, les éducateurs qui expliquent les avantages de l'assainissement amélioré, les maçons qui construisent des toilettes et creusent des fosses, les entrepreneurs qui vident les fosses, les entrepreneurs qui fournissent et entretiennent les conteneurs sanitaires, les groupes communautaires ou les entreprises qui construisent et gèrent des toilettes publiques ou communes, les services publics qui construisent des réseaux d'égouts et les stations de traitement, et les entreprises spécialisées qui transforment les ressources de toilettes en produits de base tels que l'eau, le carburant, le compost ou les produits chimiques. Il s'agit d'un large éventail de types et de tailles d'entreprises avec une caractéristique commune : elles se développent en répondant aux besoins d'assainissement de leurs clients. Parmi ces prestataires de services, l'un d'entre eux - généralement la municipalité ou le service public - est responsable de la provision du service et de la coordination des autres prestataires de services.

1.5 ÉCONOMIE CIRCULAIRE DE L'ASSAINISSEMENT

En 2018, l'économie circulaire de l'assainissement est un concept[3] relativement nouveau. C'est une application spécifique du concept général d'économie circulaire dans lequel les déchets d'une organisation peuvent servir d'apports à une autre. Des concepts d'économie circulaire tels que la réutilisation des ressources et la production de produits utiles à partir des déchets ont été appliqués à l'assainissement à petite échelle pendant des décennies - presque toutes les villes étudiées dans ce programme de travail en ont des exemples à petite échelle. Aujourd'hui, ces concepts sont considérés à l'échelle de toute la chaîne de services d'assainissement. Dans le même temps, renommer « excréments humains » ou « déchets » en tant que « ressources de toilettes » est un pas en avant symbolique rappelant à tous de mettre de côté leur ancienne manière de penser en se tournant vers l'avenir. Les ressources de toilettes ont une valeur en termes d'énergie (pour les gaz et carburants de biomasse), de nutriments (pour les engrais), de matières organiques (pour le stockage de charbon) et d'eau (pour un usage non potable). D'ici 2030, tous les services d'assainissement urbain devraient faire partie intégrante de l'économie circulaire d'assainissement. Les ressources de toilettes seront soigneusement confinées, transportées et transformées en produits pouvant être utilisés comme apports dans d'autres processus industriels et agricoles.

L'économie circulaire de l'assainissement s'est construite sur les principes associés à l'assainissement écologique et à l'assainissement durable. Ces deux concepts ont été utilisés pendant de nombreuses années, mais ont eu des difficultés à être acceptés comme des pratiques courantes. L'économie circulaire de l'assainissement aura un attrait et une acceptation plus large. De nombreux organismes et observateurs du secteur de l'assainissement considèrent désormais l'économie circulaire de l'assainissement comme un important moteur d'innovation dans le secteur.

En **2018, l'économie circulaire de l'assainissement** est un concept relativement nouveau. C'est une application spécifique du concept général d'économie circulaire dans lequel les déchets d'une organisation peuvent être les intrants d'une autre organisation.

3 Il a été particulièrement défendu par la Toilet Board Coalition (TBC), qui a été présentée dans la section 1.2 ci-dessus.

L'économie circulaire de l'assainissement n'est pas une technologie mais un concept. Son principe de création de valeur à partir de ressources de toilettes réutilisées peut être appliqué à de nombreuses technologies, contextes institutionnels, organisations et à des échelles différentes. Certaines des caractéristiques et des bénéfices de l'économie circulaire d'assainissement sont[4] les suivants :

- La protection de l'environnement et l'utilisation efficace et / ou la protection des ressources ne sont pas considérées comme des fardeaux financiers mais comme des opportunités financières. La motivation pour s'engager dans ces projets n'est pas une action symbolique ou une recherche de bien-être, mais présente un intérêt commercial et une opportunité économique et de création d'emploi.
- Les activités d'économie circulaire sont plus efficaces lorsqu'elles sont réalisées de manière collaborative par des entrepreneurs, de grandes entreprises, des services publics et des municipalités, et non par des entrepreneurs agissant seuls. Cela devrait encourager les services publics traditionnels à rejoindre l'économie circulaire de l'assainissement plutôt que de l'ignorer ou de lui résister.
- Les modèles d'affaires de l'assainissement circulaire peuvent devenir rentables à l'échelle de la ville s'ils sont soutenus par une réglementation appropriée des produits (par exemple sur la qualité de l'eau réutilisée, les engrais pour les cultures vivrières, l'injection dans les réseaux électriques, les combustibles solides).
- Les modèles d'affaires de l'économie circulaire peuvent également devenir rentables à une échelle plus locale, telle qu'une usine, un hôpital, une université ou un lotissement.
- L'économie circulaire de l'assainissement peut traiter en même temps les ressources de toilettes avec d'autres ressources biologiques (telles que les déchets alimentaires provenant d'entreprises ou restaurants et d'autres déchets solides compostables) qui sont de toute façon gaspillées. Ce co-traitement augmente les volumes de produits et peut améliorer la rentabilité du processus.
- Le concept d'économie circulaire de l'assainissement peut être appliqué à l'assainissement collectif par égouts (par exemple dans la gestion des stations de traitement), bien qu'il soit plus adapté aux technologies décentralisées telles que l'assainissement autonome et à base de conteneurs dans lesquels les ressources de toilettes ne sont pas diluées avec de l'eau et sont donc plus faciles à traiter.
- La récupération des ressources implique automatiquement un traitement approprié des eaux usées ou des boues de vidange. Par exemple, la production de biogaz implique la digestion anaérobie, qui est un processus de traitement des boues après le traitement des eaux usées. Pour utiliser les eaux usées pour l'irrigation agricole, il faut les traiter. Pour utiliser les boues comme engrais sur les terres agricoles, il faut les traiter. Donc, si ces produits finaux ont une valeur, plus d'eaux usées et de boues fécales seront traitées que si les produits finaux étaient considérés comme n'ayant aucune valeur.

Les processus d'économie circulaire de l'assainissement à l'échelle de la ville sont déjà courants dans les pays développés, notamment en Europe, mais encore peu dans les pays en développement : par exemple, sur les huit villes étudiées, seule eThekwini a commencé à appliquer des concepts de l'économie circulaire de l'assainissement à l'échelle de la ville. La plupart des activités de l'économie circulaire ont tendance à démarrer à une plus petite échelle : Jodhpur est un bon exemple d'une ville qui a essayé cela à trop petite échelle pour devenir rentable. Les modèles financiers de la TBC suggèrent que ces activités devraient être rentables à l'échelle de la ville, ou au pire, elles devraient nécessiter une subvention beaucoup plus faible de la part du gouvernement que les systèmes d'économie non circulaire.

4 Cette liste est basée sur le travail du TBC.

1.6 TECHNOLOGIES

À moins que de nouvelles technologies qui n'existent pas actuellement soient inventées très rapidement, d'ici 2030, les trois technologies de base pour l'assainissement urbain resteront telles qu'elles sont aujourd'hui : l'assainissement collectif par égouts, l'assainissement autonome et l'assainissement à base de conteneurs. Certaines villes prévoient d'avoir une couverture à 100 % par une technologie (normalement l'assainissement collectif par égouts) mais c'est un objectif très difficile à atteindre dans les pays à revenu faible ou moyen. Baguio et Nairobi sont des exemples typiques de villes avec des plans irréalistes et non financés pour le faire. D'autres villes utiliseront un mélange des trois : Dakar offre un cas intéressant où la vision à long terme du gouvernement est de 100 % égouts mais sachant que cet objectif est inaccessible, elle promeut l'assainissement autonome à moyen terme. Il n'y a pas de règle absolue quant aux technologies à utiliser : l'essentiel c'est que la bonne combinaison technique soit choisie pour servir les habitants de cette ville de façon durable et abordable. Dans le cadre du concept d'assainissement à l'échelle de la ville, l'assainissement collectif par égouts, l'assainissement autonome et l'assainissement à base de conteneurs existeront côte à côte. Ils interagiront de manière bien planifiée, par exemple en transférant les ressources de toilettes autonomes et des conteneurs sanitaires dans des stations de traitement convenablement conçues. Les décisions politiques concernant la technologie seront généralement basées sur l'économie, la démographie, la topographie et l'histoire.

Assainissement collectif par égouts

Ceci décrit un réseau central d'égouts souterrains allant des maisons aux stations de traitement, au long duquel les ressources de toilettes sont transportées par des chasses d'eau. Dans le monde entier, ce système semble toujours prévaloir, principalement parce que l'utilisateur peut tirer la chasse et oublier, c'est-à-dire ne pas avoir d'interaction personnelle avec les toilettes ni avec les employés venant enlever les conteneurs ou vider les fosses. Le client doit seulement payer le prestataire de services, celui-ci représentant normalement un service municipal.

Marrakech, a la chance de pouvoir financer $^{2}/_{3}$ de ses dépenses en capital sur l'assainissement par des subventions croisées provenant de ses activités électriques.

Cependant, l'assainissement collectif par égouts est de plus en plus considéré comme non-durable, voire obsolète, et ce pour un certain nombre de raisons. Il consomme d'énormes quantités d'eau pour la chasse. L'infrastructure est construite dans le sol, et ne peut donc pas être déplacée, vendue ou réutilisée. Ce système n'est pas flexible et n'est pas assez rapide pour s'adapter aux changements dans les modes d'habitat, et il est surtout extrêmement coûteux. En ce qui concerne le coût en capital de nouvelles infrastructures, par exemple, aucune des huit villes étudiées ne peut collecter suffisamment d'argent à partir des tarifs d'utilisation ou de ses propres ressources pour payer le coût en capital de l'assainissement collectif par égouts. Parmi elles, la ville qui en est le plus proche est Marrakech, ayant la chance de pouvoir financer $^{2}/_{3}$ de ses dépenses en capital par des subventions croisées provenant de ses activités électriques.

La prédominance de l'assainissement collectif par égouts diminue peu à peu aux yeux des dirigeants municipaux, comme on a pu le constater, par exemple, lors des discussions de la Semaine mondiale de l'eau à Stockholm. Les ingénieurs et les administrateurs d'aujourd'hui ont été formés à beaucoup plus d'options techniques que leurs prédécesseurs, à qui il avait été enseigné que l'assainissement collectif par égouts était la seule forme appropriée d'assainissement. D'ici 2030, l'assainissement collectif par égouts sera encore prédominant dans les villes qui sont suffisamment riches pour se permettre ce financement et qui ont des égouts en place avec un approvisionnement en eau, une collecte et un traitement adéquats. Dans les zones urbaines des pays les moins développés, cette solution pourrait encore constituer l'infrastructure de base des systèmes d'assainissement des villes, dans laquelle les autres technologies seront intégrées. Elle aura tendance à être la technologie dominante dans les centres villes. Des infrastructures canalisées simplifiées et moins coûteuses peuvent aussi être largement utilisées pour l'évacuation des eaux grises et des eaux pluviales.

Assainissement autonome avec gestion des boues de vidange (GBV)

L'assainissement autonome décrit un système dans lequel les toilettes et le confinement des ressources de toilettes (habituellement latrine ou fosse septique) se trouvent tous deux au sein de la propriété du ménage. Tout débordement de liquide provenant du conteneur pénètre dans le sol ou est raccordé à un réseau d'égouts. Avec certaines technologies, notamment les latrines à chasse avec double fosse et les plus récentes Toilettes Réinventées[5] , le traitement des ressources de toilettes a également lieu sur place et les ménages peuvent en effet être leurs propres prestataires de services.

Le principal problème technique avec l'assainissement autonome est qu'il nécessite un ou plusieurs trous dans le sol, et qu'il est donc uniquement applicable dans les locaux qui ont un espace extérieur comme un jardin. (Parfois, les fosses peuvent être creusées à l'intérieur mais cela nécessite une acceptation culturelle et rend la vidange très gênante.) Les bâtiments à logements multiples tels que les immeubles ont besoin d'un système de mini-égouts à l'intérieur menant à une fosse septique commune ou une autre installation de traitement extérieure. Les propriétés et les quartiers qui utilisent l'assainissement autonome ont également besoin de systèmes distincts pour l'évacuation des eaux grises et des eaux pluviales.

Les ménages ont utilisé l'assainissement autonome pendant de nombreuses années et il s'agit toujours de la technologie majoritaire dans de nombreuses grandes villes, dont Tokyo jusqu'à récemment, qui est la plus grande ville du monde. Les principaux développements technologiques d'ici 2030 concerneront le transport et le traitement des ressources de toilettes (boues de vidange) retirées des installations sanitaires situées sur place. Cette activité est appelée gestion des boues de vidange (GBV) et elle se développe en une industrie de services spécialisés. La qualité du traitement s'améliore et de nombreuses entreprises de GBV ont déjà démontré leur rentabilité et viabilité en appliquant les principes de l'économie circulaire de l'assainissement. Parmi les villes étudiées, Dakar dispose des systèmes d'assainissement autonomes et de GBV les plus étendus et les mieux planifiés, et a particulièrement été innovatrice dans les aspects de gouvernance de la GBV.

La meilleure source d'informations détaillées sur la GBV est la série de conférences internationales sur la GBV avec leurs publications.

Assainissement à base de conteneurs (ABC)

En 2018, l'assainissement à base de conteneurs est un nouveau concept dans le secteur de l'assainissement traditionnel dans les pays en développement, bien que des idées similaires aient été utilisées pendant des décennies dans les pays riches dans des marchés de niche tels que les véhicules et les bateaux. D'ici 2030, l'ABC pourrait être très répandu. Il est techniquement différent de l'assainissement collectif par égouts ou de l'assainissement autonome dans la mesure où les toilettes sont un bien mobilier qui appartient au prestataire de services d'assainissement, pas au ménage. Il contient un conteneur hygiéniquement scellé qui est retiré du domicile à une fréquence convenue par le prestataire de services, à qui le ménage paie un tarif, généralement hebdomadaire ou mensuel. Les ressources de toilettes sont transportées soit dans une installation appartenant à ce prestataire de services, soit dans une station de traitement appartenant à la municipalité. Dans les deux cas, les ventes de produits constituent une partie importante du concept et, de cette manière, l'ABC s'intègre plus facilement dans le concept d'économie circulaire que l'assainissement collectif par égouts ou l'assainissement autonome. De par sa nature, il s'agit d'un service décentralisé et flexible, avec

5 La Toilette Réinventée, un concept vigoureusement promu par la Fondation Gates, est une technologie modulaire et transformatrice qui vise à détruire sur place tous les agents pathogènes et à récupérer des ressources précieuses. Elle fonctionne sans raccord à l'égout, sans eau ou électricité et coûte moins de 0,05 $ par utilisateur par jour dans un modèle d'affaires durable. Il existe actuellement différentes versions au stade du prototype.

des coûts irrécupérables minimes pour les immobilisations, qui peut donc être révisé, amélioré ou étendu indéfiniment par un ou plusieurs prestataires de services. L'ABC permet aux ménages d'utiliser des approches d'assainissement écologique sans avoir besoin de gérer les ressources de toilettes eux-mêmes. Il permet également de gérer de grands volumes de ressources de toilettes et convient donc aux toilettes communes et publiques.

Un grand avantage de l'ABC est que les toilettes peuvent être situées n'importe où dans les locaux, de sorte que le ménage n'a pas besoin d'espace extérieur. Ceci est très avantageux pour les personnes qui vivent dans des zones urbaines densément peuplées. Cependant, l'ABC a un problème d'image potentiel : les gens pourraient l'associer à l'échec de la pratique de collecte nocturne d'excréments. Ce système, maintenant abandonné, impliquait que le personnel d'assainissement collectait les excréments frais des seaux de toilettes des propriétaires de façon insalubre. Cette pratique était considérée humiliante. Les défenseurs de l'ABC ont l'intention d'expliquer clairement que l'ABC contemporain est entièrement différent de la collecte nocturne d'excréments en termes de sécurité et de santé du personnel. L'ABC présente d'autres inconvénients : il est nécessaire d'avoir de plus gros conteneurs pour les ménages qui utilisent le nettoyage anal avec de l'eau, il génère la circulation de camions supplémentaires avec la pollution de l'air associée, et le service de vidange des conteneurs doit être extrêmement fiable.

À l'heure actuelle, les prestataires de services de l'ABC sont soit de petites entreprises ou, dans le cas de Manille, un service public à l'échelle de la ville. Ce dernier n'est actuellement qu'un projet pilote, mais s'il est couronné de succès ; il pourrait montrer la voie à suivre pour l'ABC parce qu'un service public peut réaliser des économies d'échelle qui sont si difficiles à réaliser pour les entrepreneurs.

Toilettes publiques et communes

Les trois technologies principales ont été décrites ci-dessus dans le contexte des services d'assainissement pour les ménages et les locaux commerciaux. Cependant, pour les personnes vivant dans des logements très surpeuplés dans certains pays, certaines politiques nationales continueront d'autoriser la prestation de services via des toilettes publiques ou communes. Ces toilettes se trouvent généralement dans des blocs avec des installations de lavage et d'autres services. Elles sont généralement soit reliées aux égouts ou construites avec leurs propres grandes fosses septiques.

D'ici 2030, la qualité des toilettes publiques ou communes devrait être sensiblement améliorée, car les bonnes pratiques de gestion des toilettes se seront répandues. Actuellement, de nombreux blocs sanitaires publics ou communs sont déjà vendus ou loués par des municipalités à des ONG ou à des entreprises du secteur privé : par exemple, à Jodhpur, les toilettes publiques sont exploitées de manière rentable par des concessionnaires du secteur privé. En ce qui concerne le traitement des ressources de toilette, les quelques blocs sanitaires publics ou communs disposant de suffisamment d'espace auront leur propre installation de traitement sur place. Cependant, la majorité des blocs de toilettes publics ou communs n'auront pas cette possibilité, et leurs ressources de toilettes devront donc être transportées soit par le réseau d'égouts, soit par véhicule pour traitement.

Les encadrés ci-dessous constituent un résumé de deux études récentes (2017) portant sur l'ABC.

ÉTUDE ÉVALUANT LE POTENTIEL DE L'ABC RÉALISÉE PAR LA BANQUE MONDIALE

Elle rassemble une vue d'ensemble de l'ABC et des études détaillées de quatre entreprises. L'étude est généralement favorable à l'ABC dans le cadre d'une approche d'assainissement à l'échelle de la ville. Voici quelques points importants :

- Globalement, l'ABC pourrait être plus rentable à long terme que l'assainissement collectif par égouts ou l'assainissement autonome, bien que la Banque mondiale pense encore qu'il n'y a pas eu suffisamment de recherches effectuées à ce sujet pour prendre une position définitive.
- La plupart des prestataires de services d'ABC offrent une bonne qualité de service à leurs clients avec très peu de plaintes.
- Il est actuellement difficile de juger si l'ABC est abordable pour les clients, car les prestataires de services fixent généralement leurs tarifs en fonction des tarifs d'égouts existants (qui sont habituellement fortement subventionnés par le gouvernement).
- Les quatre entreprises progressent vers la rentabilité. Elles seront certainement plus rentables si elles augmentent l'ampleur de leurs opérations. Les obstacles à la mise à l'échelle comprennent : une réglementation incertaine des produits ; un faible soutien des municipalités ; aucune subvention n'est offerte par le gouvernement (contrairement à d'autres types d'assainissement).

PUBLICATION : LE MONDE NE PEUT PAS ATTENDRE LES ÉGOUTS, PAR WSUP

Cette publication analyse les facteurs de succès des entreprises d'ABC et présente une vision de l'expansion de l'ABC, basée principalement sur l'exemple de Clean Team à Kumasi, au Ghana. Voici quelques points importants du document :

- L'ABC est rentable en théorie mais difficile en pratique. Le coût en capital du conteneur et la fréquence des collectes par semaine figurent parmi les facteurs économiques les plus importants. L'entreprise doit avoir une marge bénéficiaire brute d'au moins 50 % pour être une entreprise durable. Cela correspond généralement à des frais de 8 $ par ménage par mois, ce qui est probablement trop élevé pour les ménages les plus pauvres.
- L'ABC est un travail axé sur le client. Le service doit être fiable et hygiénique. D'un point de vue réaliste, il n'attire qu'environ 20 % de la population totale d'une ville.
- L'ABC est plus susceptible de se développer par le biais de partenariats entre entrepreneurs et secteur public que par des entreprises indépendantes. Ainsi, l'ABC peut faire partie intégrante d'un programme d'assainissement à l'échelle de la ville.
- L'exigence de dépenses en capital pour un service d'ABC est beaucoup plus faible que pour l'assainissement collectif par égouts. Le coût du traitement est un élément important et peut être maintenu à un bas niveau en intégrant la planification du service d'ABC dans le traitement des eaux usées et la gestion des boues de vidange pour la ville dans son ensemble.

2. FINANCEMENT DE L'ASSAINISSEMENT URBAIN

2.1 BÉNÉFICIAIRES DU FINANCEMENT ET MOTIVATIONS

La première étape dans l'étude des mécanismes de financement appropriés consiste à identifier les personnes et les organisations qui auront besoin d'être financées ainsi que les raisons pour lesquelles elles ont besoin de cet argent. Cela peut être déroutant, en particulier pour les professionnels non-financiers. Différents analystes et observateurs ont différents points de vue et définitions concernant le financement de l'assainissement. Voici une liste simple des principales personnes et organisations qui ont besoin de financement.

Ménages

Les ménages ont besoin de financement pour les dépenses d'investissement nécessaires pour construire leurs propres toilettes et soit des branchements aux réseaux d'égouts, soit un stockage sur place, telles que des fosses septiques ; dans certaines villes, ils construisent même des réseaux d'égouts de quartier. Ces dépenses en capital représentent une très grande proportion des dépenses totales d'assainissement, bien que leur nature dispersée signifie inévitablement qu'elles ne sont généralement pas bien mesurées et reçoivent beaucoup moins d'attention que le financement de la municipalité/service public décrit plus loin dans cette liste. De plus, les lacunes existantes en matière d'assainissement urbain sont massives pour les citadins pauvres, qui sont moins à même de financer leur propre assainissement. En fonction de leur richesse ou de leur pauvreté, certains ménages ne peuvent pas payer les dépenses en capital et ont donc besoin de subventions. D'autres peuvent se permettre les dépenses en capital, mais ne peuvent pas payer le montant en une fois. Ils ont donc besoin de prêts.

Idéalement, si les services d'assainissement appropriés leur ont été fournis, les ménages peuvent se permettre de payer le plein tarif de leur prestataire de services d'assainissement - que ce soit un entrepreneur fournissant un service de vidange pour l'assainissement autonome sur place payé une fois tous les deux ou trois ans (ce qui peut être un service très coûteux pour les personnes pauvres), ou un service publique pour les services d'égouts comme un supplément sur la facture d'eau, ou un prestataire d'ABC payé mensuellement ou hebdomadairement, ou encore un opérateur de toilettes publiques payé par visite. Cependant, en fonction de leur situation économique, certains ménages ont besoin d'aide pour couvrir ces tarifs : par exemple, à Bogota et eThekwini, un service de base défini est fourni gratuitement aux utilisateurs dans le cadre de la politique gouvernementale.

En fonction de leur richesse ou de leur pauvreté, certains ménages ne peuvent pas payer les dépenses en capital et ont donc besoin de subventions. D'autres peuvent se permettre les dépenses en capital, mais ne peuvent pas payer le montant en une fois. Ils ont donc besoin de prêts.

Les lacunes existantes en matière **d'assainissement urbain** sont massives pour les citadins pauvres, qui sont moins à même de financer leur propre assainissement.

MAINTENIR L'ACCESSIBILITÉ POUR LES MÉNAGES PAUVRES ET VULNÉRABLES

Les ménages pauvres et vulnérables peuvent avoir besoin de mesures spéciales (subventions directes ou indirectes) pour les aider à payer les dépenses en capital et les dépenses opérationnelles du service.
60 % des gouvernements ayant répondu au rapport GLAAS de 2017 ont mis en place des mécanismes d'accessibilité, même si malheureusement la moitié de ces systèmes ne sont pas largement utilisés. Les mécanismes comprennent :

- Subventions gouvernementales aux prestataires de services pour soutenir des tarifs gratuits ou réduits, pour l'évacuation des eaux usées et / ou la vidange des fosses, pour des groupes de population spécifiques.
- Liaison directe du tarif de l'assainissement aux structures tarifaires de l'eau, avec un premier bloc tarifaire fortement subventionné pour couvrir les besoins de base.
- Frais de connexion gratuits ou réduits pour des groupes de population spécifiques.
- Subventions gouvernementales aux institutions de microfinance pour prêter de l'argent aux ménages à faible revenu, avec peu ou pas de garanties, et avec des plans de paiement adaptés à leur situation.
- Différentes formes de plans de paiement et de fonds de prêts renouvelables.
- Ces concepts sont discutés dans diverses sections de ce rapport.

Prestataires de services locaux : entrepreneurs en gestion des boues de vidange et entreprises d'assainissement à base de conteneurs

Ce sont des entrepreneurs qui vidangent les fosses septiques ou les conteneurs sanitaires et transportent les ressources de toilettes (excréments, boues fécales, boues de fosses septiques) vers des stations de traitement exploitées par eux ou par une municipalité/service public.

Ils ont besoin de financement pour les dépenses en capital afin d'acheter des conteneurs sanitaires et des véhicules de vidange et de transport, qui sont généralement leurs principaux actifs. Ils pourraient avoir besoin de financement pour des dépenses d'investissement pour construire ou acheter les stations de traitement qui créent des produits vendables.

Ces entreprises peuvent être rentables ou non en fonction du contexte économique et réglementaire dans lequel ils opèrent, de l'échelle de leurs opérations, des distances de déplacement et des embouteillages, et de l'infrastructure de traitement à laquelle ils sont liés. Ainsi, elles pourraient aussi avoir besoin de subventions ou de prêts pour leur travail opérationnel.

Prestataires de services à l'échelle de la ville : municipalités / services publics

Ce sont de grandes entités opérant dans le domaine de l'assainissement au niveau de la ville. Il peut s'agir de départements au sein des municipalités ou de services publics distincts - ces derniers peuvent être des sociétés du secteur public ou des concessionnaires du secteur privé.

Elles ont besoin de financement pour les dépenses d'investissement pour construire des réseaux d'égouts et des stations de traitement des eaux usées, qui sont leurs principaux actifs. Par rapport à toutes les autres activités énumérées ici, celles-ci ont tendance à être de loin celles qui demandent le plus d'argent et retiennent le plus l'attention des politiques et créent la controverse. Dar es-Salaam en est un exemple très cité, où 99 % du budget d'assainissement aurait été dépensé dans un système d'égouts desservant 10 % de la population[6] .

6 Le travail d'investigation de cette étude de cas a été réalisé par Sophie Trémolet pour WaterAid.

Elles ont également besoin de financement pour le fonds de roulement pour l'entretien et la réhabilitation de ces grands actifs. Elles pourraient également avoir besoin de fonds de roulement pour leur travail opérationnel (qui comprend lui-même le coût de l'emprunt pour leurs dépenses d'investissement).

Ces entités peuvent être rentables ou non en fonction de la capacité de paiement de leurs clients et du contexte politique et réglementaire dans lequel elles opèrent. Par exemple, le site Internet de International Benchmarking Network for Water and Sanitation Utilities (IBNET) indique que 43 % des services publics dans les pays à revenu faible et intermédiaire ne sont pas rentables, même sans tenir compte de leurs dépenses en capital. Parmi les villes étudiées, les services publics de Bogota et d'eThekwini sont rentables sur la base des dépenses de fonctionnement, tandis que ceux de Jodhpur et de Nairobi ne le sont pas. À Baguio, les dépenses de capital et d'exploitation ne sont pas comptabilisées séparément et, dans l'ensemble, la municipalité doit recevoir 40 % de ses recettes sous forme de subventions du gouvernement national.

Autres

TIl y a beaucoup d'autres acteurs dans le secteur tels que les éducateurs en hygiène du secteur public ou des ONG et les promoteurs de l'assainissement en général, les constructeurs de fosses, les fabricants et les fournisseurs de matériel, les opérateurs des toilettes communautaires ou partagées, et des spécialistes des différentes parties de la chaîne d'approvisionnement. Leurs besoins financiers sont soit similaires à ceux des principaux acteurs énumérés ci-dessus ou relativement petits, de sorte qu'ils ne sont pas répétés ici.

Le site Web d'**IBNET** indique que **43%** des services publics contrôlés dans **les pays à revenu faible ou moyen** ne sont pas rentables sur leurs seules dépenses opérationnelles.

2.2
COÛTS D'ASSAINISSEMENT

Plusieurs organisations ont étudié les besoins de financement mondiaux, régionaux et nationaux pour l'eau et l'assainissement, généralement exprimés en termes de financement nécessaire pour atteindre les Objectifs de développement durable. Parmi elles, l'autorité la plus citée est le document du Programme pour l'eau et l'assainissement de la Banque mondiale de 2016 signés par Guy Hutton et Mili Varughese, intitulé « Les coûts de la réalisation des Objectifs de développement durable 2030 sur l'eau potable, l'assainissement et l'hygiène ». Les auteurs soulignent que leurs chiffres sont basés sur des hypothèses générales, de sorte que chaque chiffre se situe dans une large fourchette - mais ils sont généralement reconnus comme les meilleurs chiffres disponibles. Ils estiment que pour atteindre la cible des ODD en matière d'assainissement géré de manière sécuritaire, environ 45 milliards de dollars par an sont nécessaires pour l'assainissement urbain[7] . Ce chiffre comprend les dépenses d'investissement, le maintien du capital pour les nouvelles infrastructures et les dépenses opérationnelles, mais exclut la maintenance des infrastructures existantes. Ce sont des chiffres énormes et plutôt abstraits - les auteurs ne parlent pas de la question des financements, à savoir qui doit réellement trouver et dépenser l'argent. La réponse se trouve dans la section 2.1.

En replaçant les chiffres de Hutton et de Varughese dans leur contexte pour indiquer la tâche à venir, ce besoin de financement futur pour l'assainissement est environ deux fois supérieur à l'exigence équivalente pour l'eau potable et environ cinq fois supérieur à celle des OMD. En revanche, le rapport 2017 du GLAAS montre que les dépenses d'assainissement sont actuellement inférieures d'environ 25 % aux dépenses pour l'eau et que 87 % des pays ayant répondu à l'enquête GLAAS ont signalé un financement insuffisant pour atteindre leurs objectifs nationaux d'assainissement urbain.
Les exigences sont indiquées sur ce diagramme préparé à partir des données de Hutton et Varughese par Sophie Trémolet de la Banque mondiale.

7 Ils estiment une fourchette de 25 à 70 milliards de dollars selon les hypothèses. Le facteur le plus important est l'équilibre entre l'assainissement autonome (moins cher) et l'assainissement collectif par égouts (plus cher).

365 Jours

$45 Milliards

Hutton et Varughese estiment que pour atteindre **l'objectif des ODD** en matière d'assainissement sans risque pour tous, environ **45 milliards de dollars par an** sont nécessaires pour l'assainissement urbain. Ce chiffre comprend les dépenses en capital, le maintien du capital pour les nouvelles infrastructures et les dépenses opérationnelles.

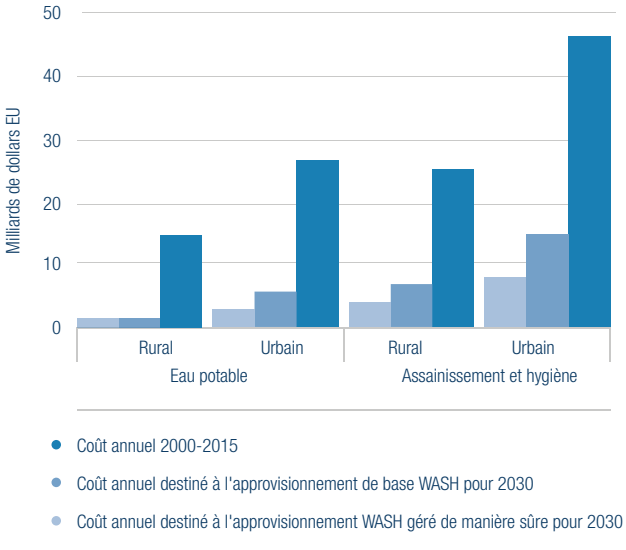


Fig 1 Diagramme préparé à partir des données de Hutton et Varughese par Sophie Trémolet de la Banque mondiale.

Sur le chiffre global de 45 milliards de dollars, environ les deux tiers sont consacrés à la gestion en toute sécurité des ressources de toilettes et environ un tiers à la prestation de services de base aux ménages. Ainsi, l'inclusion des mots « géré en toute sécurité » dans le libellé des ODD triple le coût de l'assainissement par rapport à la période des OMD, au cours de laquelle cet aspect a été négligé. En outre, les chiffres globaux masquent d'importantes disparités régionales et nationales : par exemple, les besoins de financement sont les plus importants en Afrique subsaharienne et, au niveau national, les pays les plus pauvres doivent allouer un pourcentage plus élevé du PIB que les pays riches.

Plusieurs organisations travaillent actuellement à produire des estimations mises à jour et plus nuancées sur divers aspects des coûts de l'assainissement urbain et à en contrôler les dépenses. Il s'agit notamment de la Banque mondiale, de l'initiative TrackFin du projet GLAAS (ONU-EAU) et du projet CACTUS (Climate and Costs in Urban Sanitation) sur le climat et les coûts de l'assainissement urbain mis en œuvre par l'Université de Leeds. En 2018 et 2019, ils produiront des données ventilées plus précises qui seront les bienvenues, bien qu'il semble improbable que leurs données modifient de manière significative l'arithmétique de base sur laquelle ce rapport est basé.

INITIATIVE TRACKFIN DU PROJET GLAAS (ONU-EAU)

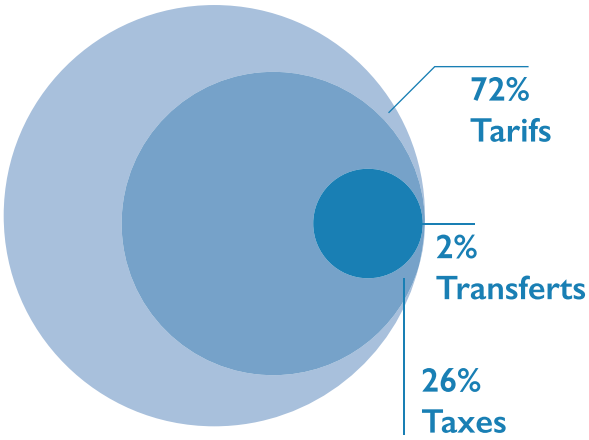
Ce programme propose une méthodologie standard pour le suivi des flux financiers dans le secteur de l'eau et de l'assainissement. Cette méthodologie sera utilisée pour les futurs rapports GLAAS, et tous les acteurs du secteur sont aussi fortement encouragés à l'adopter, afin d'améliorer la cohérence et la comparabilité des données.
La méthodologie répond à quatre questions fondamentales :

1. Quelle est la dépense totale dans l'ensemble du secteur ?
2. Comment les fonds sont-ils répartis entre les différents services WASH et les types de dépenses, comme les dépenses en capital, les dépenses d'exploitation et d'entretien, et le coût du capital ?
3. Qui paie pour les services WASH ?
4. Quelles entités sont les principaux canaux de financement pour WASH et quelles sont leurs parts dans les dépenses totales ?
5. Il dispose d'un ensemble complet de classifications codées couvrant l'utilisation des services, les prestataires de services, les unités de financement et les types de financement. Son principal résultat est constitué par les comptes nationaux WASH pour chaque pays. La méthodologie établit ensuite un lien entre les informations contenues dans les comptes WASH et les principales questions stratégiques.

2.3
SOURCES DE FINANCEMENT

En fin de compte, il n'y aura que trois sources d'argent pour les dépenses en capital et les dépenses opérationnelles. Elles sont généralement connues comme les trois T :

- Tarifs : payés par les clients aux prestataires de services d'assainissement. Ces clients comprennent les ménages et les entreprises qui reçoivent des services d'assainissement et les personnes et les entreprises qui achètent des produits générés par les ressources des toilettes ;
- Taxes : impôts nationaux perçus par les gouvernements locaux ou nationaux et attribués soit aux ménages, soit aux prestataires de services d'assainissement ;
- Transferts : subventions provenant d'autres sources, telles que des donateurs internationaux, des fondations, des ONG, des envois de fonds de particuliers, données soit aux ménages, soit aux prestataires de services d'assainissement.



Le rapport de **GLAAS** indique que, dans les **25 pays** ayant répondu à cette partie de son enquête, 72% du financement de l'eau, de l'assainissement et de l'hygiène proviennent en moyenne des tarifs, 26% des taxes et 2% des transferts

En ce qui concerne les contributions relatives des trois sources, le rapport 2017 du GLAAS indique que, dans les 25 pays ayant répondu à cette partie de l'enquête, 72 % des financements pour l'eau, l'assainissement et l'hygiène proviennent des tarifs, 26 % des taxes et 2 % des transferts[8] . À quelques exceptions notables comme la Chine, la plupart des pays ont une croissance économique lente et des finances publiques extrêmement limitées disponibles pour l'assainissement. À l'avenir donc, compte tenu des tendances actuelles du financement du développement international et de la faiblesse générale de nombreuses économies nationales, la part des tarifs augmentera probablement : les cas de Baguio, Marrakech et Nairobi sont des exemples typiques qui illustrent cette réalité.

Tout autre argent apporté à l'assainissement sera de l'argent emprunté qui doit être remboursé. Il est normalement utilisé pour les dépenses en capital et rarement (jamais dans les huit villes étudiées) pour les dépenses opérationnelles. Il se subdivise en plusieurs catégories :

- Prêts concessionnels : prêts obtenus à des taux d'intérêt inférieurs à ceux du marché, généralement assortis de longues périodes de remboursement et de périodes de grâce, obtenus du secteur du financement du développement, par exemple. banques multilatérales de développement, banques nationales de développement, donateurs.
- Prêts commerciaux : prêts au taux du marché, obtenus auprès du secteur du financement commercial, par exemple de banques ou du marché obligataire, avec ou sans mécanismes de garantie de prêts soutenus par les gouvernements ou les donateurs.
- Microfinance : petits prêts offerts aux personnes à faible revenu (souvent des personnes qui sont autrement exclues du secteur bancaire traditionnel) avec peu ou pas de garanties et des calendriers de remboursement spécialement conçus pour eux. Ce service de prêt de niche peut être fourni par des institutions de microfinance spécialisées, des banques ou des ONG.

L'argent emprunté peut être utile pour combler les déficits financiers à court terme ou pour financer d'importantes sommes à l'avance, mais finalement, tout doit être remboursé, que ce soit par le biais des tarifs, des taxes ou des transferts.

8 Ces pourcentages sont nationaux et non urbains, et ils couvrent l'eau, l'assainissement et l'hygiène, mais il n'y a aucune raison intrinsèque de supposer que les pourcentages pour l'assainissement urbain seraient très différents.

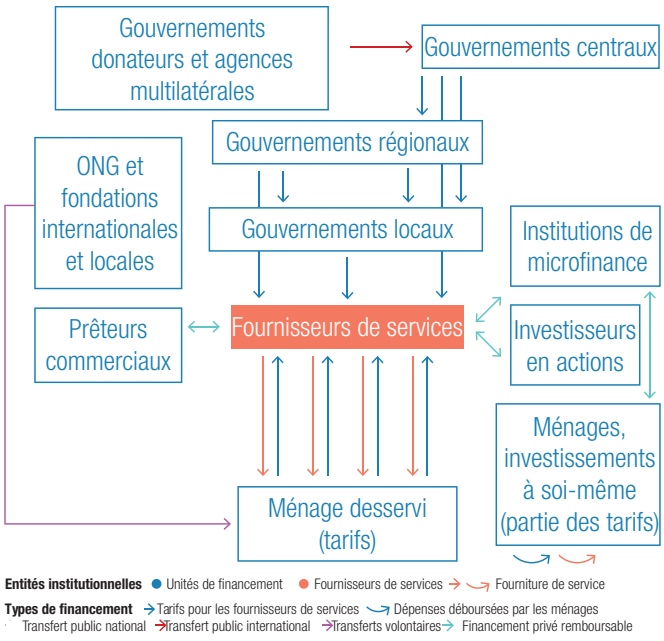


Fig. 2 : Diagramme standard de flux financiers TrackFin pour les fournitures de service

Les nombreuses permutations de sources de fonds, de types de bénéficiaires, de dépenses en capital et de fonctionnement, de subventions et de prêts peuvent donner une image compliquée. Cette complication elle-même est un obstacle à l'augmentation du financement parce que ni les bénéficiaires ni les bailleurs de fonds ne comprennent pleinement comment et où l'argent est versé. Pour comprendre cette complication, TrackFin a développé un diagramme standard de flux financiers (voir, fig. 2).

Le document de la Banque mondiale par Amanda Goksu couvre ce sujet de manière très détaillée et souligne l'importance de comprendre tous les flux financiers afin de décider des politiques et des investissements.

La compréhension de l'aperçu financier d'une ville entière est bien liée au concept d'assainissement à l'échelle de la ville décrit dans la section 1.3 ci-dessus. Les stratégies de financement pour les différentes parties de la chaîne d'approvisionnement de l'assainissement, à travers la ville, doivent s'inscrire dans un ensemble cohérent.

Les observateurs sectoriels sont généralement d'accord pour dire que le financement par les tarifs, les taxes et les transferts sont très peu susceptibles d'être multipliés par cinq, comme l'exigent les chiffres de la section 2.2 ci-dessus, et que les prêteurs existants n'augmenteront probablement pas significativement leurs prêts. Cela signifie deux choses : que les entreprises d'assainissement doivent devenir plus viables pour l'investissement, ce qui est l'objet de la section 2.4 ci-dessous ; et que les nouveaux investisseurs doivent être attirés par le secteur, qui est l'un des sujets de la section 2.5 ci-dessous.

2.4 ANALYSE FINANCIÈRE GÉNÉRIQUE D'UN PRESTATAIRE DE SERVICES D'ASSAINISSEMENT

Après avoir identifié les organisations qui ont besoin de financement, le montant et les sources possibles de celui-ci, cette section se concentre sur l'analyse financière d'un prestataire de services d'assainissement. Il s'agit d'une analyse générique qui pourrait être appliquée, avec des variations mineures, à un petit entrepreneur, à une grande entreprise, à une entreprise autonome ou à une partie d'une municipalité.

Le principe de base est le suivant : si une entreprise réussit financièrement, elle attirera des investisseurs. L'énergie solaire hors réseau est un exemple actuel d'un secteur de services publics socialement et écologiquement avantageux dans lequel les entreprises prospères attirent d'importants investissements commerciaux. Il n'y a pas de raison intrinsèque pour laquelle les entreprises d'assainissement ne peuvent pas faire de même. Qu'une entreprise soit à but lucratif ou non lucratif, voire hybride, et peu importe comment elle définit ses critères de réussite financière, il existe certaines mesures fondamentales qu'elle peut adopter pour devenir plus prospère sur le plan financier.

DÉPENSES ET COMMENT LES RÉDUIRE

Toute entreprise d'assainissement a deux types de dépenses : les dépenses en capital et les dépenses opérationnelles[9] . Pour améliorer sa viabilité financière, l'entreprise doit s'efforcer de réduire les deux. Voici quelques suggestions pour y parvenir.

Réduire les dépenses en capital

Le moyen le plus important de réduire les dépenses en capital consiste à donner la priorité dans la planification future à l'assainissement autonome et à base de conteneurs et non à l'assainissement collectif par égouts. Alors que l'assainissement à base de conteneurs est un nouveau concept avec peu de données historiques encore disponibles, l'assainissement autonome a des coûts bien documentés. Par exemple, Hutton et Varughese totalisent les coûts d'investissement unitaires pour l'assainissement collectif par égouts avec traitement et pour l'assainissement autonome avec la GBV pour 160 pays. Bien qu'ils ne compilent pas les coûts unitaires d'investissement, leur graphique 3.4 implique un ratio de coût moyen de 2:1 entre ces deux technologies. Cette étude a calculé un ratio de coût moyen pondéré pour les populations urbaines non desservies du monde, qui est également de 2:1 (voir encadré pour la méthodologie). L'assainissement collectif par égouts avec traitement coûte deux fois plus cher par personne que l'assainissement autonome avec gestion des boues de vidange. Modifier les projets futurs, en passant de l'assainissement collectif par égouts à l'assainissement autonome, peut réduire de moitié les dépenses d'investissement nécessaires.

Les indications actuelles montrent que les dépenses d'investissement pour l'assainissement à base de conteneurs seraient comparables à celles de l'assainissement autonome, à savoir environ la moitié de celles des égouts, bien qu'il faille également tenir compte des coûts supplémentaires liés aux eaux grises et à l'évacuation des eaux pluviales.

En plus de ce point majeur, voici d'autres façons de réduire les dépenses en capital de l'entreprise:

- Lors de la construction de systèmes d'assainissement collectif par égouts, adopter les recherches les plus récentes sur l'optimisation des flux de tuyaux, des réseaux et des processus de traitement.
- Demander aux ménages d'investir davantage dans les infrastructures dans leurs propres propriétés - et parfois, comme dans les quartiers et systèmes d'égouts en co-propriété du projet pilote Orangi en Amérique du Sud, en dehors de leur propriété.
- Produire un plus grand nombre d'unités à l'échelle industrielle pour réaliser des économies de coûts unitaires.

9 Le tableau 12 du guide de TrackFin présente une classification standard utile des dépenses pour toute entreprise.

MÉTHODE DE CALCUL DES COÛTS RELATIFS À L'ASSAINISSEMENT URBAIN COLLECTIF ET AUTONOME

D'abord, pour chaque pays :

- Utilisez l'annexe 4 du rapport JMP 2017 pour calculer le nombre de citadins dépourvus au moins de l'assainissement de base : les personnes qui ont actuellement besoin d'un service complet d'assainissement que ce soit l'assainissement collectif par égouts ou l'assainissement autonome avec une gestion sécuritaire des excréments.
- Utilisez le Tableau E1 de Hutton et Varughese pour trouver les coûts supplémentaires d'assainissement hors site par personne (i) pour les égouts avec traitement et (ii) pour les installations sanitaires autonomes (fosses septiques) avec traitement. Notez que le coût hors site est le coût pour le prestataire de services, par ex. un service public, distinct du coût sur place pris en charge par le ménage.
- Multipliez le nombre de personnes ayant besoin du service par les deux coûts par personne pour obtenir le total des coûts en capital pour toutes les personnes à desservir avec l'une ou l'autre des deux technologies.
- Divisez le chiffre d'assainissement collectif par égouts par le chiffre d'assainissement autonome pour obtenir le ratio des deux coûts.

Ensuite, pour les personnes non desservies du monde :

- Comptez les deux coûts d'investissement totaux pour les 59 pays qui ont chacun au moins 1 million de personnes ayant besoin du service. (Ces pays comptabilisent 96 % des personnes dans le monde ayant besoin du service.)
- Additionnez les deux totaux et divisez par le nombre total de personnes dans les 59 pays ayant besoin du service.
- Cela donne les deux coûts par personne, en moyenne pondérée globale.
- Divisez le chiffre de l'assainissement collectif par égouts par le chiffre de l'assainissement autonome pour obtenir le ratio global pondéré des deux coûts.

Réduire les dépenses opérationnelles

Voici quelques façons de réduire les dépenses opérationnelles de l'entreprise :

- Utiliser les technologies de l'information de manière plus efficace. Les tarifs peuvent être payés par téléphone mobile. Un centre d'appel ou une hotline associée à une plateforme de marché peuvent améliorer le flux de communications entre les clients et les prestataires de services, par exemple. les videurs de fosses de toilette, en améliorant la concurrence et en abaissant le prix au client. Le suivi et la gestion peuvent réduire le coût du transport des ressources de toilettes. Le suivi des flux et des processus peut optimiser la gestion de transport des boues de vidange dans les stations de traitement, réduisant ainsi les dépenses globales.
- Pour les réseaux d'égouts, optimiser le débit et réduire les coûts de pompage, qui représentent généralement une part élevée des dépenses d'exploitation.
- Pour les systèmes autonomes, réduire les coûts de vidange des fosses et de transport, qui représentent généralement une très grande partie du coût total.
- Utiliser des cadres de réglementation et d'autorisation clairs pour accorder deux ou trois licences d'opérateurs de gestion des boues de vidange réparties dans toute la ville, réalisant ainsi des économies d'échelle[10] tout en maintenant la concurrence.
- Réduire le coût de l'emprunt en améliorant la cote de crédit de l'entreprise, ou même en persuadant le gouvernement national d'emprunter et de rembourser de l'argent au nom de l'entreprise, comme c'est le cas à Dakar.

LES REVENUS ET COMMENT LES AUGMENTER

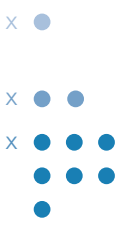
Toute entreprise d'assainissement dispose seulement de trois revenus possibles : les tarifs des services rendus et des ventes de produits ; les subventions ; et le placement en actions. Pour améliorer sa viabilité financière, l'entreprise doit essayer d'en augmenter certains ou tous.

Augmentation des tarifs des ménages et des clients commerciaux

Il s'agit du domaine le plus propice à l'amélioration- après tout, c'est ainsi que les entreprises d'assainissement sont financées dans les pays riches. Dans de nombreux pays en développement, les tarifs d'assainissement actuels sont très bas et / ou ne sont pas collectés ; augmenter et collecter ces tarifs est donc un moyen évident d'améliorer la solidité financière de l'entreprise. L'étude de cas de Bogota donne un exemple clair ; en 1996, le maire a imposé de fortes augmentations tarifaires qui ont donné à la compagnie publique une position financière solide. De nombreuses études montrent que les gens sont capables et désireux de payer plus pour un meilleur service. Cependant, la politique tarifaire est un sujet complexe et sensible. Pour donner un exemple très courant, les politiciens aiment garder des tarifs bas afin de gagner le soutien populaire. (L'étude de cas de Baguio est un exemple de cette réticence des politiciens, combinée à un système tarifaire inhabituel dans lequel la redevance d'assainissement est calculée par toilette plutôt que par maison ou par volume d'eau.)

Pour contourner ce problème, les politiciens pourraient déléguer la tarification à un régulateur indépendant qui pourrait fixer des tarifs réalistes. Mais même les régulateurs peuvent être réticents à imposer leurs décisions : par exemple, plus de la moitié des services publics urbains qui ont participé à la révision GLAAS de 2011/12 ont déclaré que les tarifs n'étaient pas régulièrement revus ou étaient révisés mais pas augmentés.

Dans les pays riches, les tarifs de l'assainissement sont généralement plus élevés que ceux de l'eau, car les prestataires de services et les régulateurs ont analysé les coûts réels des services et



Pour couvrir également la dépréciation des actifs immobilisés, il faut compter le double.

Pour couvrir les coûts des nouvelles immobilisations, il faut multiplier par sept.

10 Un bon exemple est la Blue Water Company dans la ville de Leh, en Inde.

ont convenu de faire correspondre les tarifs aux dépenses. Dans les pays pauvres, c'est généralement l'inverse qui se produit, à savoir les tarifs de l'assainissement sont beaucoup plus bas que ceux de l'eau. Par exemple, de nombreux services publics qui fournissent à la fois des services d'eau et d'assainissement facturent un tarif mesuré pour l'eau et aucun tarif ou un supplément au compteur pour l'assainissement. Si le tarif de l'eau est bas, le tarif d'assainissement est également bas. Toutefois, si les deux éléments sont séparés, les deux tarifs peuvent être fixés séparément à des taux viables pour couvrir les deux dépenses respectives de l'entreprise. Les études de cas de Bogota et eThekwini fournissent des exemples de cette séparation.

Les personnes qui fixent les tarifs doivent décider quelles dépenses doivent être couvertes par ce montant, par exemple : les dépenses opérationnelles ; l'amortissement des immobilisations ; le coût des nouvelles immobilisations ; les charges financières ; un bénéfice pour le prestataire de services. Cette décision fait une énorme différence pour les tarifs.
Un exemple provient d'une étude sur les tarifs d'assainissement en Ouganda commandée par la Société nationale de l'eau et de l'assainissement en 2015. Le tarif d'assainissement actuel payé par les gens connectés au système d'égouts couvre juste les dépenses opérationnelles du prestataire de services d'assainissement. Pour couvrir également la dépréciation des immobilisations, il faudrait doubler le montant. Pour couvrir également les coûts des nouvelles immobilisations et le coût du financement (mais pas un profit pour le prestataire de services), il faudrait augmenter sept fois le montant. Pour la plupart des pays, le coût du financement est considéré comme politiquement et économiquement irréaliste, tandis que les coûts des nouvelles immobilisations serait un objectif raisonnable. Cependant, à l'heure actuelle, même ce niveau est loin d'être atteint : seulement 39 % des pays ayant répondu à l'enquête GLAAS de 2017 ont déclaré que leurs tarifs d'assainissement urbain couvrent plus de 80 % des dépenses opérationnelles. Parmi les villes étudiées, seules Blumenau, Bogota et eThekwini atteignent ce point de référence.

Lorsque les tarifs augmentent globalement, il existe un risque que les personnes les plus pauvres ne puissent pas se les permettre. Le régulateur ou l'entreprise peut concevoir des mécanismes internes de subventions croisées pour eux - les services publics du monde entier le font déjà depuis des décennies, et les technologies de l'information modernes permettent de le faire plus facilement. Il existe de nombreux mécanismes de ce type, notamment des tarifs progressifs, des réductions tarifaires sous condition de ressources, des tarifs fondés sur les propriétés.
Quel que soit le mécanisme choisi, le principe sous-jacent des subventions croisées est le suivant : le revenu total des tarifs de l'entreprise ne change pas ; seuls changent les niveaux de balance des paiements entre les différents clients de l'entreprise.

Une politique tarifaire équitable trouverait un équilibre entre la couverture des dépenses opérationnelles pour les personnes qui bénéficient déjà des services et la possibilité pour les personnes qui n'en bénéficient pas (principalement les plus pauvres) d'y avoir accès. Cela implique de fixer les tarifs en fonction du but social sous-jacent, en faisant payer d'avantage les personnes plus riches et à moindre mesure les plus pauvres.

L'analyse des tarifs ci-dessus s'applique principalement aux clients connectés à l'assainissement des égouts. Les clients pour l'assainissement sur site ou sur conteneur payent des frais par opération ou par période de temps, ce qui est plus difficiles à réguler. Cependant, bon nombre des mêmes principes de réglementation et de réformes tarifaires sont toujours appliqués : par exemple, les vidangeurs de fosse septique tirent généralement leurs profits de leurs clients plus riches, de sorte qu'une réglementation et une tarification prudentes sont nécessaires pour que ces entreprises servent également les clients les plus pauvres.

Augmenter les revenus de la vente de produits

Gagner de l'argent en vendant les produits finaux des procédés de traitement des excréments est un concept relativement nouveau. Seuls quelques services publics l'ont fait, notamment en Europe. GENeco à Bristol, au Royaume-Uni, est un exemple très impressionnant d'entreprise privée exploitant une station

d'épuration d'une ville et générant un revenu de chaque substance qui quitte les lieux. Les ressources en toilettes humaines contiennent des éléments nutritifs et un pouvoir calorifique. Elles peuvent être transformées en divers produits commercialement viables, notamment l'eau, les engrais, le biogaz, les combustibles solides et les produits chimiques. Il existe des marchés prêts pour tous ces produits. Bien sûr, le prix doit être adapté au marché concerné, ce qui peut signifier que le prestataire (l'entreprise d'assainissement) ne recevra pas de revenus importants, mais créera une source de recettes qui augmentera les tarifs des clients.

Parce que c'est un nouveau concept, les ventes de ces produits peuvent être entravées par la stigmatisation ou la réglementation. Depuis quelques années, le Public Utility Board de Singapour produit de l'eau de qualité potable issue de ses stations d'épuration sous la marque « NEWater ». Il a fallu des années pour surmonter le sentiment de répulsion de la population à l'idée de boire des eaux usées traitées - alors qu'en fait, cela a longtemps été une habitude pour l'approvisionnement en eau dans de nombreuses villes. De même, la culture d'aliments fertilisés par des produits dérivés des excréta humains n'est pas autorisée dans certains pays, alors que dans d'autres pays, des excréments humains frais ont été utilisés comme engrais pendant des siècles. La réglementation tend à refléter les perceptions publiques et culturelles.

Recevoir des subventions accrues

Les décisions à ce sujet sont prises par le gouvernement national ou régional ou l'organisme donateur qui accorde les subventions, plutôt que par l'entreprise elle-même. Les gouvernements accordent plus souvent des subventions pour les dépenses en capital que pour les dépenses opérationnelles.

En ce qui concerne les subventions pour les dépenses en capital, d'une part, l'étude de cas de Bogota donne l'exemple d'un gouvernement national qui considère qu'il est de son devoir de financer les dépenses d'équipement en matière d'assainissement. D'un autre côté, l'étude de cas de Jodhpur donne un exemple des conséquences imprévues de ces subventions. Le gouvernement de l'Inde investit des sommes énormes dans les dépenses en capital pour l'assainissement. Par conséquent, le prestataire de services, Jodhpur Municipal Corporation, est peu incité à augmenter ses tarifs auprès de la clientèle et dépend entièrement financièrement du gouvernement national et est donc vulnérable à toute modification future de la politique nationale.

En ce qui concerne les subventions pour les dépenses opérationnelles, celles-ci sont parfois directement versées à l'entreprise et parfois aux ménages pour les aider à payer les tarifs (voir l'encadré de la section 2.1 ci-dessus).

Augmentation des investissements en actions

L'investissement en actions est le mécanisme habituel permettant aux entreprises de tous les pays et secteurs d'activité de lever des fonds pour financer leurs opérations. Une entreprise d'assainissement serait en concurrence pour l'argent de l'investisseur contre de nombreuses autres entreprises. Voici quelques façons d'augmenter ses chances de succès :

- Préparer des modèles d'affaires clairs et compréhensibles pour expliquer son travail et ses besoins, ainsi que les perspectives financières qui révèlent aux investisseurs potentiels l'équilibre entre les risques qu'ils prennent et les rendements qu'ils peuvent anticiper.
- Démontrer une bonne compréhension et une bonne communication avec les ménages qui sont les clients de l'entreprise.
- Offrir un co-financement par la municipalité, car cela montre aux investisseurs potentiels que la municipalité a un intérêt direct dans le succès de l'entreprise.
- Démontrer que l'organisme de réglementation et la municipalité ont de bons antécédents en matière d'application des règlements, des règlements administratifs, des tarifs, etc., car cela permet à un investisseur potentiel de se sentir plus en sécurité.
- Expliquer l'effet positif de l'investissement dans l'assainissement sur l'économie locale et sur la santé de la communauté et de la main-d'œuvre. Cela intéressera particulièrement la catégorie des investisseurs connus sous le nom d'investisseurs

d'impact, qui recherchent à la fois des retours sociaux et financiers sur leurs investissements.
Comme la liste l'indique, plusieurs de ces suggestions nécessitent une collaboration étroite entre l'entreprise et la municipalité où elle travaille. Dans certaines villes, il sera fondamental que les dirigeants municipaux changent significativement de mentalité.

L'ÉTAPE SUIVANTE SI CES MESURES SONT INSUFFISANTES

Même après avoir pris toutes les mesures ci-dessus, certains prestataires de services d'assainissement - publics ou privés - ne seront toujours pas financièrement viables. La prochaine étape est pour le gouvernement national, en reconnaissant que l'assainissement est une activité qui génère des bénéfices pour l'entreprise, d'investir dans la société de l'argent qui correspond à la valeur des gains sociétaux. Parmi les villes étudiées, Bogota (Colombie) reçoit de l'argent du gouvernement national qui reconnaît les bénéfices sociétaux de l'assainissement (bien que le gouvernement national n'utilise pas ces mots pour le décrire). Ce point doit être pris en compte : l'impact social et économique positif de l'assainissement sur la société dans son ensemble n'est d'aucune aide à l'entreprise fournissant le service, à moins que cet impact puisse se traduire par un avantage financier positif pour cette entreprise. Par exemple, l'une des principales conclusions de la Semaine mondiale de l'eau 2017 est que les activités de récupération et de réutilisation des ressources (par exemple, l'économie circulaire) sont économiquement viables. Cependant, ils doivent intérioriser les avantages sociétaux afin de les rendre financièrement viables comme le précise la Banque mondiale et d'autres organisations.

Ces paiements du gouvernement à l'entreprise, communément appelées subventions, sont des mesures financières légitimes qui reconnaissent l'assainissement comme un bien public et comme un investissement qui augmentera le PIB national et l'assiette fiscale, réduisant les coûts de santé du gouvernement.

Le mot « subvention » semble agiter de nombreuses critiques, et pourtant il décrit l'un des devoirs fondamentaux des gouvernements depuis des millénaires : pourvoir aux besoins de leur peuple. L'une des sources de cette agitation est la perception selon laquelle la subvention profite à une entité à but lucratif et constitue donc un soutien gouvernemental injuste - cette perception peut être diminuée soit en accordant directement les subventions aux ménages, soit en les étiquetant de manière transparente. Ironiquement, de nombreux gouvernements sont heureux de subventionner le traitement hors site en allouant des sommes énormes pour construire des réseaux d'égouts avec des stations d'épuration centralisées qui favorisent certaines communautés, alors que d'autres refusent de subventionner (beaucoup moins cher) le traitement sur place en évoquant de faux motifs selon lesquels il favoriserait des individus.

Historiquement, le secteur de l'assainissement a eu tendance à être sous-estimé par rapport à d'autres secteurs, notamment lorsque les gouvernements effectuent des paiements pour des gains sociétaux, pour deux raisons principales. Premièrement, l'assainissement n'a pas été présenté comme un sujet politiquement attrayant. Deuxièmement, les coûts économiques et sociaux d'un assainissement insuffisant ont trop souvent été sous-estimés et mal expliqués. Maintenant, plusieurs organisations mondiales génèrent de meilleures données et des messages plus clairs pour ce travail de plaidoyer, ce qui devrait conduire à une augmentation des paiements de ce type à l'avenir.

En résumé, si une entreprise a fait de son mieux pour réduire ses dépenses et augmenter ses revenus mais ne peut toujours pas devenir financièrement viable, il est légitime et raisonnable de verser la somme d'argent à l'entreprise qui représente de façon transparente la valeur du travail de cette entreprise pour la société dans son ensemble. Ces paiements devraient garantir la viabilité financière de l'entreprise.

2.5 QUELQUES IDÉES FINANCIÈRES INNOVANTES

Une partie du but de ce programme de travail était d'examiner s'il existe des innovations dans le financement de l'assainissement qui fonctionnent déjà[11] . La conclusion générale est que de nombreuses idées financières novatrices concernant l'assainissement ont été discutées ou proposées, mais que malheureusement peu ont été effectivement mises en œuvre. Cependant, compte tenu de la situation financière difficile décrite dans les sections précédentes de ce rapport, et de la courte période jusqu'à 2030, les responsables de l'assainissement et les financiers doivent aller de l'avant et appliquer ces innovations dès maintenant. Voici trois listes d'innovations : financiers ; instruments financiers ; et mécanismes financiers. Les éléments individuels ont été inclus ici en fonction d'une combinaison de leurs antécédents, de leur utilité future et de leur potentiel à générer des avantages à grande échelle. Chaque idée n'est décrite que brièvement, mais plusieurs organisations et sites internet tels que le site web WSUP / IRC / Trémolet www.publicfinanceforwash.com donnent plus de détails à leur sujet.

La section 2.6 suivante contient des outils conceptuels et des blocs de construction pour soutenir toutes ces idées.

NOUVEAUX FINANCIERS

Plusieurs sections précédentes de ce rapport ont observé que les bailleurs de fond traditionnels (gouvernements nationaux et donateurs) ont des budgets limités pour investir dans l'assainissement. Cette situation est le symptôme d'un changement global majeur survenu au cours des dernières décennies, accéléré par la crise financière de 2007/2008 : les gouvernements ont moins d'argent et moins de volonté d'investir alors que les individus ont plus de richesses que jamais. Ils peuvent devenir les nouveaux financiers de l'assainissement urbain dans les pays en développement.

Les citoyens du monde entier épargnent collectivement des sommes d'argent sans précédent, mesurées en milliers de milliards de dollars, et continuent d'économiser davantage chaque année. Une grande partie de cet argent est épargnée dans les mêmes pays qui ont le plus grand besoin d'investissement pour l'assainissement ; par exemple, on estime que les fonds de pension des pays en développement gèrent plus d'un billion de dollars. Les particuliers et les institutions auxquelles ils confient cet argent, tels que les family offices, les gestionnaires d'investissement, les fonds de pension, les compagnies d'assurance et les fonds souverains (indirectement) souverains, se trouvent constamment à la recherche de nouvelles opportunités d'investissement sur les marchés financiers nationaux et internationaux. Investir, ne serait-ce qu'une infime partie de ces économies, donnerait un énorme coup de pouce aux flux financiers destinés à l'assainissement urbain. Cependant, ces financeurs potentiels n'investissent pas beaucoup dans l'assainissement parce qu'ils ne comprennent pas ou ne réduisent pas le risque, ils n'arrivent pas à identifier un instrument financier approprié pour l'investissement, et ils veulent tous investir à différents niveaux, échelles de temps et devises.

Les entreprises d'assainissement doivent donc faire beaucoup de recherche et préparer le terrain pour communiquer leurs propositions d'investissement à ces nouveaux financiers. Il est difficile pour elles de contacter directement les financiers. Au niveau mondial, plusieurs intermédiaires ont manifesté un intérêt particulier pour l'assainissement urbain, par exemple le Global Impact Investors Network, Circularity Capital et Social Finance Ltd. A l'échelle nationale, les intermédiaires pourraient inclure les fonds de pension, les banques et les groupes d'investisseurs.

11 Il convient de noter que toutes les innovations ne doivent pas nécessairement être entièrement nouvelles : l'innovation pourrait plutôt provenir de l'utilisation d'une approche donnée dans un secteur où elle n'avait pas été appliquée auparavant.

INSTRUMENTS DE FINANCEMENT INNOVANTS

Subventions croisées

Les subventions croisées sont déjà assez courantes dans les politiques tarifaires d'assainissement du monde entier. Elles permettent aux riches d'aider à financer l'assainissement des pauvres. Il peut s'agir de transferts internes dans le cadre de la conception du tarif d'assainissement lui-même, ou de transferts du tarif de l'eau ou même, comme dans le cas de Marrakech, du tarif de l'électricité. Une taxe d'assainissement, utilisée couramment au Burkina Faso et testée à Lusaka, est une surtaxe sur le tarif de l'eau affectée aux investissements d'assainissement sur place, de sorte que les personnes ayant des raccordements à l'eau paient pour celles qui dépendent de l'assainissement.

De par leur nature, les subventions croisées peuvent être gérées plus efficacement dans le cadre d'une approche à l'échelle de la ville que par les prestataires de services isolés.

Investissement d'impact

Un investisseur à impact est un investisseur qui recherche à la fois des rendements financiers et sociaux. Le rendement financier souhaité de l'investisseur pourrait être aux taux du marché ou inférieur aux taux du marché, ce dernier étant bien sûr plus souhaitable pour l'entité en question. Le rendement social souhaité de l'investisseur doit être mesurable en utilisant de bons indicateurs d'impact - l'assainissement a exactement cette qualité d'indicateurs, comme mentionné dans la section 2.6 ci-dessous. Les investisseurs à impact ont d'énormes quantités d'argent sous leur contrôle et sont considérés (par leur organisation membre, le Global Impact Investors Network) comme très désireux de contribuer aux ODD, mais ils sont à court d'opportunités d'investissement.

Lorsqu'un investisseur d'impact vérifie un investissement potentiel, le premier obstacle est généralement financier. À ce stade, de nombreux investissements avec des modèles économiques qui n'ont pas encore fait leurs preuves échouent parce que leurs taux de rendement internes (TRI) sont jugés trop bas pour qu'un investisseur puisse passer au prochain obstacle. Typiquement, ces IRR sont légèrement négatifs - surnommés la « zone bleue » par le président du groupe CDC[12] . De nombreux prestataires de services d'assainissement, tels que les entrepreneurs en assainissement à base de conteneurs, sont des entreprises qui opèrent dans cette région financière. Le TRI de l'investisseur peut être amélioré soit en réduisant le taux d'actualisation appliqué aux revenus futurs, soit en utilisant le financement par un donateur pour couvrir la perte, permettant ainsi un investissement avec un TRI global légèrement négatif pour obtenir un TRI positif pour l'investisseur d'impact[13]. Ce dernier scénario est un exemple de financement mixte.

Financement mixte

Le financement mixte est l'utilisation stratégique des finances publiques pour catalyser le financement commercial, soit là où il ne l'aurait jamais fait auparavant, soit à une échelle qu'il n'aurait pas atteint auparavant. Le financement mixte englobe une gamme d'instruments et de processus dans lesquels l'argent public et commercial peut être investi côte à côte avec des objectifs différents mais complémentaires. Afin d'illustrer par une simple arithmétique : si une entreprise d'assainissement fonctionne à une perte de, disons, 10 %, un bailleur de fonds public peut lui donner une subvention de 15 % qui permettrait à un investisseur commercial d'y investir et d'obtenir un rendement de 5 %. Il s'agit d'une situation gagnant-gagnant : l'investisseur commercial bénéficie d'un moindre risque et / ou des rendements accrus sur son investissement et le bailleur de fonds public peut amplifier l'impact de son financement. Dans cet exemple, il suffit de donner une subvention de 15 % de la valeur du travail de l'entreprise plutôt que 100 %. Les deux flux financiers sont mélangés pour atteindre le résultat global souhaité.

12 Institution de financement du développement du gouvernement britannique anciennement connue sous le nom de Commonwealth Development Corporation.

13 L'organisation Social Finance appelle ce concept un Missed Opportunities Fund car il n'a pas encore été repris à grande échelle.

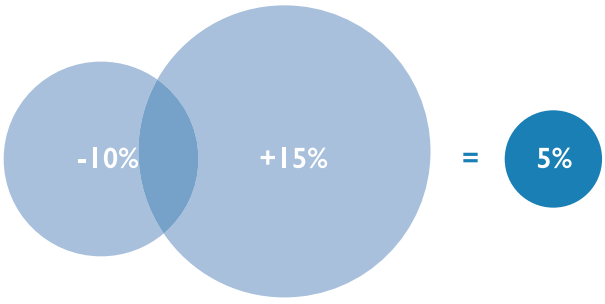
CRÉDIT DE L'EAU

Un exemple de financement mixte réussi est le programme de crédit d'eau de Water.org, dans lequel près de 20 millions de dollars d'aide institutionnelle apportée par Water.org aux institutions de microfinancement a permis d'acheminer 600 millions de dollars de capitaux commerciaux vers ces des améliorations d'eau et d'assainissement telles que la construction de toilettes.

À ce jour, plus de 90 % des emprunteurs sont des femmes, leurs taux de remboursement dépassent largement 90 % et les institutions financières intègrent largement ces produits de prêt dans leurs portefeuilles de prêts traditionnels. Water.org utilise cette expérience positive pour étendre son travail de conseil et de formation à plus d'institutions financières pour les impliquer dans ce secteur de prêt.

La Banque Mondiale encourage le financement mixte qui soutient les entreprises solvables (définies comme celles qui recouvrent au moins leurs coûts d'exploitation) en réduisant les risques financiers de leur travail et en les aidant ainsi à réduire les taux d'intérêt auxquels elles empruntent auprès des banques commerciales.

Certaines organisations parlent de crowding dans le secteur privé (c'est-à-dire commercial), ce qui signifie à peu près la même chose que le financement mixte. Par exemple, le document de travail du G20 sur la surpopulation dans le financement du secteur privé énonce les principes à suivre par les banques multilatérales de développement : créer un environnement favorable à l'investissement, élargir et normaliser l'amélioration du crédit, et associer le financement concessionnel et le financement commercial. L'hypothèse sous-jacente de ce document est la même que celle du financement mixte : attirer des financements commerciaux afin d'augmenter le financement du secteur public car ce dernier est insuffisant pour atteindre les ODD. Dans le même temps, l'OCDE et le Global Impact Investors Network ont tous deux souligné qu'il existe actuellement très peu d'investisseurs commerciaux qui placent de l'argent dans le financement mixte. Dans ce contexte, l'OCDE essaie de les encourager en établissant des principes de financement mixte.



Ceci profite à tous : l'investisseur commercial bénéficie d'un risque moindre et / ou d'un meilleur retour sur investissement et le financeur public peut amplifier l'impact de son financement. Dans cet exemple, vous n'avez besoin que d'une subvention de 15% de la valeur de l'emploi au lieu de 100%. Les deux flux se combinent pour atteindre le résultat général souhaité.

Amélioration du crédit pour réduire les profils de risque / rendement, par exemple capital catalytique de première perte

C'est une forme particulière de financement mixte dans laquelle un financier investit de l'argent dans une entreprise et se place volontairement en queue de liste pour le remboursement, permettant ainsi à d'autres financiers d'investir avec plus d'espoir de récupérer leurs investissements. L'Agence des États-Unis pour le développement international (USAID), par exemple, gère une Autorité de crédit de développement (DCA) pour garantir le premier pourcentage stipulé (souvent environ 15 %) de perte pour un investissement donné. Dans cette situation, l'investisseur commercial ne court pas le risque de perdre de l'argent jusqu'à ce que 16 % des emprunteurs aient manqué à leurs obligations. Cette réduction du risque peut convaincre les potentiels investisseurs potentiels sceptiques d'investir.

Aide basée sur le rendement

L'aide basée sur les résultats (en anglais Output-based aid ou OBA) est un type de financement déjà établi par les gouvernements et les bailleurs de fonds internationaux de développement qui est devenu plus important ces dernières années. L'OBA associe la libération des subventions publiques à l'obtention de résultats clairement définis qui favorisent un meilleur accès aux services de base. Il fonctionne sur la base du remboursement : le prestataire de services investit son propre argent et lorsque le projet ou le programme de travail est terminé, une évaluation est faite pour déterminer si les résultats convenus ont été atteints. Si c'est le cas, environ 50 à 70 % du coût du projet est généralement remboursé au prestataire de services. L'ABO est progressivement apparue comme un moyen important de financer l'accès aux services de base, bien que le prestataire de services doive encore trouver l'argent nécessaire pour financer son travail avant d'être remboursé. Les données provenant de projets existants suggèrent que l'ABO pourrait améliorer le ciblage et l'efficacité de la distribution des subventions.

Financement éventuel, SIB et DIB

Le financement éventuel est similaire au financement de l'aide basée sur les résultats. Un donateur public ou philanthropique souhaite dépenser de l'argent pour réaliser un certain gain sociétal. Au lieu de donner cet argent à l'avance à une entreprise qui tente d'atteindre cet objectif, ce donateur ne fait rien au départ. Un autre financier, celui-ci étant un investisseur commercial, prête l'argent à l'entreprise. Le donateur ne verse ensuite d'argent que si le gain en résulte, c'est-à-dire que son paiement dépend du résultat obtenu. Il est connu comme un bailleur de résultats.

Il existe différentes façons de structurer le financement conditionnel. Une idée qui devient de plus en plus importante est celle de lier l'impact social à l'impact du développement. Cette brève description d'un Development Impact Bond (DIB) est basée sur une récente présentation de Jeremy Keele du Sorenson Impact Center lors de la conférence WASTE intitulée Beyond Development Aid :

- Quatre parties sont impliquées dans un DIB. Un investisseur place son argent par l'entremise d'un intermédiaire dans un prestataire de services. Le prestataire de services fournit des services à une population cible. Si ces services parviennent à atteindre un résultat convenu et mesurable, un bailleur de fonds paye ce succès à l'intermédiaire. L'intermédiaire utilise cet argent pour rembourser à l'investisseur initial son capital plus les intérêts. Un DIB a besoin d'un horizon de temps raisonnable, d'un résultat significatif et mesurable, de conditions juridiques et politiques appropriées et de preuves de succès à l'aide de mesures standard que les quatre parties peuvent toutes accepter d'utiliser.
- Certains problèmes identifiés avec les DIB sont de longues négociations, un coût de transaction élevé, des données insuffisantes et des mesures difficiles à approuver.
- A ce jour, plus de 55 DIB ont levé environ 180 millions de dollars, mais aucun d'entre eux n'est encore dans le domaine de l'assainissement.

Une critique des SIB et des DIB est celle qu'ils ne collectent pas plus d'argent pour un programme de travail, ils fournissent simplement un moyen de mobiliser l'argent dès le départ. En fin de compte le bailleur de fonds paye le travail de toute façon, comme s'il avait donné une subvention au prestataire de services. Cette analyse néglige quelques aspects. L'un est que si le travail ne donne pas le résultat escompté, le bailleur de fonds ne paie rien et la perte est supportée par l'investisseur. L'autre est que la pression exercée par l'investisseur sur la compétence en gestion financière du prestataire de services augmente la probabilité que le travail réussisse. Ainsi, le même montant total versé aux programmes d'assainissement par le bailleur de fonds entraînera plus de succès dans l'ensemble que dans un système conventionnel dans lequel il accorde des subventions à certains programmes qui réussissent et à d'autres qui échouent.

Financement de l'augmentation des taxes

Le financement des augmentations d'impôts est un outil de financement public dans lequel une collectivité locale, telle qu'une municipalité, emprunte un prêt auprès d'une banque commerciale pour financer une amélioration spécifique des infrastructures publiques, en utilisant les futures augmentations des recettes fiscales locales pour rembourser le prêt. La logique sous-jacente est que l'amélioration de l'infrastructure, par exemple l'assainissement amélioré, augmentera le désir de vivre dans sa zone et donc la valeur des propriétés et donc la taxe payée par les propriétaires à la municipalité. Cet instrument a été utilisé pour la première fois aux États-Unis dans les années 1950 et n'a pas encore été utilisé dans d'autres pays. Il n'existe pas d'exemple concret de l'utilisation de cette étude pour l'assainissement à ce jour mais elle est incluse dans cette liste car elle pourrait être un instrument utile.

MÉCANISMES DE FINANCEMENT INNOVANTS

Finance communautaire

Ce terme se réfère principalement aux dispositifs d'épargne mis en place par les populations pauvres vivant en milieu urbain, afin d'améliorer leurs conditions de vie, y compris l'assainissement. Si les régulateurs nationaux reconnaissent ces régimes et les intègrent au marché commercial, d'autres financements commerciaux pourraient être mobilisés pour augmenter le financement communautaire. Ce mécanisme est particulièrement utile, car il permet de combler le fossé entre les ménages qui dépensent leur propre argent pour leur assainissement et les services publics qui collectent des fonds externes pour améliorer l'assainissement de ces ménages.

Fonds de garantie

Il s'agit d'un fonds créé par un bailleur public ou philanthropique pour souscrire des entreprises pour louer ou acheter des immobilisations. Un exemple dans le secteur de l'assainissement vient de la ville de Dakar, où la Fondation Gates a fourni un fonds de garantie par l'intermédiaire du gouvernement à une banque privée dans le but de permettre aux entreprises du secteur privé d'emprunter des camions pour vider les fosses septiques. La garantie est un gage de sûreté pour la banque en cas de défaillance des emprunteurs. Ce mécanisme a l'avantage, du point de vue du bailleur, que si l'emprunteur ne fait pas défaut, la garantie n'est pas appelée et, par conséquent, cela ne coûte au bailleur rien de plus que les frais administratifs de sa mise en place. L'avantage pour les entreprises est qu'elles peuvent accéder à des prêts auxquels elles n'auraient pas accès en raison de leur faible cote de solvabilité ou de leur manque de garanties : dans le cas du fonds de garantie de Dakar, le taux d'intérêt est généralement de 7,5 % plutôt que de 11 ou 12 %, et seulement 8 % des prêts ne fonctionnent pas pleinement.

Donateurs ou prêteurs liés au climat, y compris le Fonds vert pour le climat

Le secteur de l'eau et de l'assainissement a été lent et sans imagination pour tenter d'attirer des fonds liés au climat. Il n'y a pas d'approche intellectuelle cohérente. Certains leaders d'opinion, tels que la WC Board Coalition, soulignent l'aspect positif et favorisent le rôle que l'assainissement peut avoir dans l'atténuation du changement climatique. Pendant ce temps, d'autres leaders d'opinion, comme le Sustainable Development Solutions Network, qui est un groupe de réflexion mondial pour l'ONU présidé par Jeffrey Sachs, soulignent l'aspect négatif et suggèrent d'ajouter 25 % aux coûts d'investissement de Hutton et Varughese comme coût supplémentaire d'adaptation au changement climatique.

Pendant ce temps, le Fonds vert pour le climat, qui est le plus important fonds dans l'adaptation ou l'atténuation du changement climatique, n'a fait qu'un seul investissement dans l'eau ou l'assainissement à ce jour - pour l'approvisionnement urbain en eau aux Fidji. La raison n'est apparemment pas que le Fonds vert pour le climat décourage les investissements dans l'assainissement, mais qu'aucune entreprise d'assainissement potentielle n'a encore présenté une proposition suffisamment solide. Il existe certes des difficultés techniques, par exemple pour vérifier les améliorations climatiques dues à des activités dispersées telles que l'assainissement domestique, mais d'autres secteurs tels que l'énergie solaire hors réseau s'attaquent à ces problèmes beaucoup plus vigoureusement que le secteur de l'assainissement. Le Fonds vert pour le climat et d'autres bailleurs de fonds liés au climat pourraient constituer de gros mécanismes de financement potentiels pour les programmes d'assainissement urbain.

Structures de financement de l'assainissement

Une « structure de financement de l'assainissement » est le nom que cette étude donne à un mécanisme multi-acteurs qui permet à de nombreux et divers bailleurs de fonds d'investir de l'argent frais dans de nombreuses et diverses entreprises d'assainissement simultanément. C'est une plateforme efficace à guichet unique. D'un côté, il aide les entreprises à présenter simultanément leurs propositions à de nombreux investisseurs potentiels. D'autre part, il offre aux investisseurs de nombreuses propositions à investir dans lesquelles ils peuvent placer leur argent dans les délais, les niveaux de risque et les devises qu'ils préfèrent.

Ce type de mécanisme répond à plusieurs des obstacles qui ont été décrits dans les sections précédentes de ce rapport. On peut utiliser plusieurs des instruments novateurs décrits ci-dessus, tels que l'investissement d'impact, le financement mixte et le financement conditionnel. Une structure de financement de l'assainissement pourrait être mise en place dans un pays ou dans une région ou même dans le monde, pour desservir un type de technologie ou l'ensemble d'entre eux, pour les entrepreneurs du secteur privé ou les services publics municipaux. Différentes structures de financement de l'assainissement pourraient être indépendantes ou liées.

Plusieurs organisations ont reconnu le besoin de mécanismes ou de plateformes liées à ces structures de financements de l'assainissement. La structure néerlandaise de financement de l'eau a des éléments similaires. Le Réseau de solutions de développement durable a conclu que le secteur de l'assainissement de l'eau a besoin d'un mécanisme de financement groupé dédié. La Banque mondiale propose un cadre conceptuel combinant trois éléments : les finances publiques mieux planifiées et allouées ; les prestataires de services qui fonctionnent le mieux ; et les investisseurs commerciaux attirés par les finances publiques. La Banque africaine de développement et la Fondation Bill et Melinda Gates mettent en place le Fonds d'investissement

pour l'assainissement urbain en Afrique (AUSIF[14]) qui présentera plusieurs caractéristiques similaires à celles du financement de l'assainissement, notamment le financement groupé et la gamme d'idées d'investissement. Les conclusions globales de la Semaine mondiale de l'eau 2017 se réfèrent à des modèles commerciaux et des mécanismes de financement innovants pour attirer toutes les sources disponibles, à la nécessité de simplifier la conception des structures financières pour atténuer les risques et incertitudes perçus ainsi que pour transformer les projets économiquement bénéfiques en projets rentables. Les structures de financement de l'assainissement correspondent bien à tous ces concepts et orientations stratégiques.

Il n'existe pas encore de mécanisme de financement de l'assainissement mais une équipe multisectorielle de penseurs, convoquée par Arthur Wood de Total Impact Advisers avec l'appui d'un groupe de donateurs clairvoyants, qui est en train de concevoir un mécanisme de financement générique applicable à la gestion régionale des ressources en eau ou à l'assainissement. Ce travail remonte à 2009 lorsqu'une équipe similaire dirigée par Wood avait conçu un mécanisme mondial de financement de l'assainissement. L'idée n'a pas progressé au-delà de la phase de planification : les bailleurs de fonds étaient réticents à payer pour créer une plate-forme mondiale avec des systèmes de surveillance complexes conçus par une société leader de consultants en management. Son concept était trop novateur aux yeux du secteur bancaire et financier qui n'était pas disposé à soutenir des modèles de financement collaboratif et peut-être que ses concepteurs ne l'ont pas suffisamment expliqué dans le secteur de l'assainissement Cependant l'idée n'a jamais été abandonnée et a été décrite dans un document écrit par Wood et Hutton en 2013 pour UNESCAP, qui s'est inspiré du travail de conception précédent ; Le document utilisait l'assainissement en Asie comme étude de cas mais était applicable dans le monde entier.

14 AUSIF mobilisera des financements supplémentaires auprès de plusieurs bailleurs, comprenant les partenaires traditionnels de la coopération au développement, le secteur privé et les gouvernements, afin d'accroitre l'accès à un assainissement innovant dans les zones urbaines. Cela permettra : (i) soutenir le développement institutionnel et de renforcer les capacités pour étendre les programmes ; (ii) de mettre l'accent sur le rôle des services durables d'assainissement urbain ; (iii) favoriser une meilleure prise en compte des approches et des technologies innovantes ; et (iv) appuyer la gestion des connaissances afin d'avoir un plus grand impact.

LES PRINCIPALES CARACTÉRISTIQUES D'UNE STRUCTURE DE FINANCEMENT DE L'ASSAINISSEMENT

Une structure de financement d'assainissement est une association à but non lucratif légalement enregistrée dont les membres peuvent être eux-mêmes des organisations à but lucratif ou à but non lucratif (de nombreux systèmes juridiques dans le monde autorisent maintenant ces types d'associations hybrides ou mutuelles). Ses parties prenantes incluraient :

- Les prestataires de services d'assainissement de toutes sortes
- Un intermédiaire social pour surveiller les travaux d'assainissement
- Un intermédiaire financier pour mettre en place les offres d'investissement
- Les investisseurs de toutes sortes

Sa structure de gouvernance est décidée par ces parties prenantes.

De nombreux et divers flux financiers peuvent traverser la structure dans des arrangements contractuels individuels conçus par les parties prenantes concernées (par exemple en utilisant les types d'instruments financiers innovants décrits ci-dessus). Les résultats des services d'assainissement sont communiqués à l'établissement, tous en utilisant un ensemble commun d'indicateurs convenus. L'installation peut simplifier les structures financières pour réduire les risques et l'incertitude et les coûts de transaction, réaliser des économies d'échelle et améliorer l'efficacité et l'impact des investissements actuels et futurs, augmentant ainsi considérablement les flux financiers pour l'assainissement.

Ce concept était le point de départ du travail actuel de Wood. La conception de l'installation générique en cours de développement est résumée dans l'encadré ci-joint, tel qu'appliqué à l'assainissement.

Les conditions de succès d'une structure de financement sont maintenant sensiblement différentes de 2009. La conception a été adoucie et réduite afin de ne pas créer un autre intermédiaire en concurrence avec les parties prenantes existantes, mais plutôt une plate-forme pour aider ces parties prenantes à collaborer. La plate-forme technologique existe maintenant et est utilisée dans d'autres secteurs tels que le logement et la santé, tout comme un système de surveillance standard et fiable pour mesurer les résultats. Ce système de surveillance est passé d'un modèle global descendant à un modèle local qui mesure et monétise les résultats d'activités spécifiques. C'est encore un concept peu familier aux personnes du secteur de l'assainissement, mais les organisations d'autres secteurs[15] pourraient partager leurs expériences et donner des conseils sur la façon de commencer et de surmonter les inévitables problèmes initiaux.

Les installations de financement de l'assainissement sont innovantes car elles présentent le montant de financement nécessaire pour réaliser l'ODD sur l'assainissement en tant qu'opportunité de marché pour les investisseurs, plutôt que comme un casse-tête pour les bailleurs de fonds. Les installations de financement de l'assainissement ont la flexibilité, la portée et la vision d'apporter une contribution majeure au financement de l'assainissement urbain d'ici 2030.

15 Par exemple, la plate-forme Collective Impact de la Greater Cincinnati Foundation ou le National Affordable Housing Trust, tous deux situés aux États-Unis.

2.6 QUELQUES OUTILS POUR AMÉLIORER ET ACTIVER CES INNOVATIONS

Voici quelques outils conceptuels et éléments de base qui soutiennent les instruments et les mécanismes de financement innovants décrits à la section 2.5 ci-dessus et qui peuvent améliorer l'attrait de l'assainissement pour les nouveaux investisseurs.

Mesurer les résultats

Des indicateurs standards sont nécessaires pour mesurer les résultats du travail d'assainissement. Ils peuvent être tangibles ou intangibles, comportementaux ou financiers, internes ou externes au travail lui-même. Leurs principales caractéristiques sont qu'elles peuvent être mesurées, reconnues et approuvées par toutes les parties prenantes - cette confiance mutuelle est particulièrement importante si les indicateurs sont utilisés pour juger des progrès contractuels et donc des paiements. Voici quelques exemples pertinents d'élaboration d'indicateurs et de mesure des résultats :

- Les indicateurs officiels de progrès vers les objectifs d'ODD en matière d'assainissement sont élaborés et suivis par le Programme conjoint de suivi OMS / UNICEF (JMP) sous l'égide d'ONU-Eau. Le site Web du JMP en fournit des détails complets, y compris le travail en cours pour développer des indicateurs pour les aspects des ODD qui n'étaient pas présents dans les ODM.
- L'indice de progrès social a été conçu par l'impératif de progrès social afin de mesurer objectivement le bien-être et la qualité de vie d'une population. Il génère un index à numéro unique qui peut être classé et analysé comme le PIB peut l'être. Il est destiné à rappeler à tous que les indicateurs économiques ne sont pas les seuls indicateurs importants. Il pourrait y avoir trop de variables confusionnelles pour qu'il soit utilisé comme un

outil de mesure des résultats de l'assainissement, mais il pourrait avoir un rôle important en corrélation avec les indicateurs de santé et du PIB.

• L'organisation Integrity Action a développé une méthodologie de suivi en temps réel qui peut être appliquée à de nombreux types d'activités et d'indicateurs, y compris l'assainissement amélioré. C'est une méthodologie open-source dans laquelle tout le monde est encouragé à contribuer au processus de suivi. Dans ce modèle, le processus de suivi est aussi important que les indicateurs eux-mêmes.

• Tout comme l'atténuation des équivalents CO2 est une mesure de l'impact des projets climatiques, cette approche pourrait être traduite en assainissement avec une mesure comparable (par exemple l'atténuation des unités de flux d'excréta non gérées). Cette étude n'a pas encore identifié d'organisations travaillant actuellement sur cette idée.

Un exemple précoce d'un instrument de financement innovant fournit une histoire salutaire dans la conception d'indicateurs. En 2014, l'État de l'Utah, aux États-Unis, a fourni un « Social Impact Bond » à un investisseur afin d'améliorer l'apprentissage préscolaire. L'indicateur de résultat convenu était la réduction du pourcentage d'enfants ayant besoin d'une éducation spécialisée au stade suivant de leur scolarité. L'investisseur a investi son argent auprès du prestataire de service. À la fin de la période du projet, le bailleur de fonds a déclaré que l'indicateur de résultat avait été atteint et qu'il avait remboursé à l'investisseur son capital et ses intérêts. Il est apparu plus tard que la réalisation était extraordinairement élevée (réduction de 99 % par rapport à une réduction normale de 10-20 %) et l'investissement financier inhabituellement bas (environ la moitié du montant normal), et donc que l'indicateur utilisé dans le contrat était probablement défectueux.

Monétiser les externalités

Ce concept est très important pour le succès de nombreux nouveaux mécanismes de financement. Il s'agit simplement de calculer une valeur financière pour des avantages qui sont traditionnellement considérés comme étant en dehors de l'arithmétique financière, tels que les impacts environnementaux, sanitaires ou sociaux. Plusieurs organisations travaillent à développer des outils que tout le monde pourrait utiliser pour monétiser ces externalités. L'assainissement serait un candidat à cette approche car les avantages d'un assainissement amélioré, notamment en matière de santé publique, de propreté de l'environnement et de gain de temps productif, sont substantiels[16] mais n'ont jamais été exprimés en termes monétaires. Quelques exemples pertinents sont donnés ci-dessous :

• L'Organisation internationale de normalisation, reconnaissant le haut niveau d'intérêt et d'activité dans ce domaine, est en train d'élaborer la norme ISO 14008 sur « l'évaluation monétaire des impacts environnementaux et des aspects environnementaux connexes ». La norme fournira aux organisations un cadre commun comprenant des méthodes établies ainsi que des termes communs dans le domaine des évaluations monétaires. Il s'intéresse aux indicateurs environnementaux, pas aux indicateurs sociaux, mais sa méthodologie et son langage peuvent également être utiles pour ces derniers.

• La comptabilité du coût naturel est une méthode établie pour évaluer l'impact d'une intervention sur des unités physiques, puis les convertir en valeur monétaire. Il pourrait être utilisé dans le domaine de l'assainissement.

• La Gold Standard Foundation est un organisme de normalisation et de certification qui développe des méthodologies permettant de mesurer les résultats des activités de développement. Son travail initial s'appuyait sur les résultats liés au climat, et il a ensuite élargi son travail pour inclure les résultats liés aux

16 Total Impact Advisors estime qu'ils se chiffrent en centaines de milliards de dollars.

ODD sous la rubrique générale de l'étalon-or pour les objectifs mondiaux. Le Gold Standard peut certifier des projets ou leurs impacts. La Fondation a récemment mis au point des certificats de garantie de l'eau qui représentent un volume d'eau fourni, traité ou conservé, ainsi que la certification ADALYs pour quantifier les avantages pour la santé d'une réduction de la pollution atmosphérique (par exemple, foyers améliorés). Les certificats d'avantages de l'eau et les certifications ADALY sont destinés à être achetés par des donateurs, des philanthropes et des investisseurs sociaux, bien qu'ils ne soient pas encore des instruments négociables comme les crédits de carbone. La Fondation est prête à conseiller d'autres organisations sur la manière de développer la certification ADALYs pour quantifier les bénéfices sanitaires - et potentiellement économiques - de l'assainissement. Cela pourrait devenir la manière standard reconnue de monétiser les externalités de l'assainissement.

Établir une relation de confiance

C'est en soi un outil de progrès financier. De nombreux commentateurs soulignent qu'une gouvernance forte attire l'investissement, car elle aide les nouveaux arrivants à faire confiance aux prestataires de services et aux gouvernements. Les investisseurs sont plus susceptibles d'entrer dans un pays ou un marché particulier s'ils peuvent voir que les contrats sont confirmés devant les tribunaux. Une technologie de l'information fiable est essentielle pour recueillir des données objectives claires afin de mesurer les produits et les résultats auxquels toutes les parties peuvent croire. Par exemple, les avantages externes monétisés décrits ci-dessus ne sont pas encore devenus des produits négociables, vu que les professionnels de la finance ne sont pas encore impliqués dans leur réalisation. Si tel est le cas, ils auront besoin de mesures de résultats vérifiables pour que le marché ait confiance dans l'achat et la vente des instruments.

3. QUE PEUVENT FAIRE LES DÉCIDEURS POUR AUGMENTER LES FLUX FINANCIERS?

ALGERIA
TRIPOLITANIA
LIBYA
EGYPT
SAHARA
MAURITANIA
TROPIC OF CANCER
NIGERIA
CHAD
SUDAN
GULF OF GUINEA
CENTRAL AFRICAN REP.
DEM. REP. OF CONGO
ANGOLA
ZAMBIA
NAMIBIA
BOTSWANA
ZIMBABWE
MOZAMBIQUE
SOUTH AFRICA
LESOTHO
SWAZILAND
Cape Town
South Eastern
Atlantic Basin
Walvis Ridge
Tristan da Cunha
Gough Is.
St. Helena
Atlantic Ocean

3.1 LES DÉCIDEURS ET COMMENT LES INFLUENCER

Ce rapport vise à influencer les décisions prises par plusieurs groupes de personnes et d'organisations associés à l'assainissement urbain :

- Les politiciens nationaux (et, dans une moindre mesure, régionaux) définissent les politiques et décident de la législation, et sont, par conséquent, le public cible principal de ce programme de travail.
- Les dirigeants municipaux prennent des décisions importantes et décident également si et comment mettre en œuvre les politiques établies par les politiciens nationaux et régionaux. Ils constituent le public cible secondaire de ce programme de travail.
- Les régulateurs nationaux, les entrepreneurs, les banquiers, les investisseurs et la communauté internationale du développement sont également des décideurs sur ce sujet. Ils sont tous des publics cibles de ce programme de travail.
- Les propriétaires décident de leurs propres besoins et priorités en matière d'assainissement, mais le Conseil mondial de l'eau n'a pas de canal de communication directe avec eux. Par conséquent, ils ne constituent qu'un groupe cible indirect pour ce programme de travail.

Tous ces publics cibles veulent créer des villes saines, heureuses et vivables. L'assainissement peut être un élément important dans la réalisation de cet objectif. Il est en concurrence pour des ressources financières avec de nombreux autres secteurs de développement économique et social. En utilisant les dernières idées sur le financement de l'assainissement, les politiciens, les dirigeants municipaux et d'autres parties prenantes peuvent réaliser davantage avec moins de dépenses. Cela nécessite un changement de mentalité, comme expliqué dans les sections précédentes de ce rapport, essentiellement : favoriser des technologies d'assainissement moins coûteuses, valoriser financièrement les améliorations apportées par l'assainissement et attirer de nouveaux investisseurs dans ce secteur.

Le Conseil mondial de l'eau encourage tous les lecteurs de ce rapport à s'approprier les idées qui y sont contenues et à s'engager à transmettre le message pertinent au bon public cible. Les dirigeants politiques des huit villes étudiées ont un rôle particulier car ils ont eux-mêmes exprimé un intérêt pour ce sujet. C'est pourquoi le Conseil mondial de l'eau a choisi d'étudier leurs villes. Le Conseil travaillera en étroite collaboration avec eux pour prendre des décisions pour leurs propres villes, et les aidera ensuite à persuader d'autres politiciens au même niveau de prendre également des décisions similaires.

DES TECHNIQUES POUR INFLUENCER LES DÉCIDEURS

Voici quelques techniques pour influencer ces publics cibles, et en particulier le public cible principal des politiciens :

- Comprendre leurs objectifs et priorités. Soyez prêt à leur expliquer comment vos idées peuvent les aider à atteindre leurs objectifs. Par exemple, vous pourriez penser qu'une certaine politique est techniquement bonne, mais ne pas comprendre les aspects politiques qui pourraient la rendre inintéressante. Considérez donc les avantages politiques de l'adoption d'une certaine politique et expliquez ces avantages au décideur.
- Les relations comptent. Demandez à une personne avec un large réseau, qui est prête à consacrer du temps et des efforts à l'initiative, d'être l'avocate principale. Soutenir cette personne à communiquer verbalement avec les décideurs cibles.
- Utiliser des documents écrits uniquement pour soutenir la communication verbale. De nombreux décideurs sont surchargés et n'ont pas le temps de lire les pièces justificatives. Les relations, les attitudes et la confiance sont plus importants.
- Utiliser des preuves basées sur des exemples locaux plutôt que sur des exemples d'ailleurs. Cela peut évidemment être difficile lors de l'introduction de nouvelles idées dont il n'existe pas d'exemples locaux.
- Assurez-vous que les personnes influentes sont généralement favorables. Essayez de vous assurer qu'il n'y ait pas un politicien influent, à qui un décideur pourrait demander son approbation, qui s'opposerait aux idées avancées.
- Surveiller et suivre tous les engagements pris par votre décideur politique.

3.2 MESSAGES AUX DÉCIDEURS :

Les principaux messages adressés aux divers groupes de décideurs ont tous été développés et décrits dans les sections 1 et 2 du rapport, de sorte que cette section n'est qu'un résumé pratique de ces messages. Ils sont subdivisés en listes pour les différents publics cibles. Tous les éléments d'une liste particulière ne s'appliquent pas à tous les décideurs ou à toutes les villes.

Messages aux politiciens nationaux

- Mettre en place des organes statutaires indépendants pour fixer les tarifs et les réglementations.
- Définir clairement les rôles des différentes institutions et entités afin de donner aux investisseurs la confiance nécessaire pour soutenir les prestataires de services d'assainissement.
- Légiférer que les prestataires de services qui fournissent à la fois l'eau et l'assainissement devraient séparer les finances des deux activités.
- Introduire des normes et réglementations nationales pour la qualité et la vente des produits fabriqués à partir de la toilette traitée afin d'encourager les concepts et activités d'économie circulaire à s'épanouir.
- Prendre les devants dans la planification et le financement de l'infrastructure nécessaire. L'assainissement adéquat ne peut être réalisé par le secteur privé et les investissements des ONG seuls, aussi bien intentionnés soient-ils.
- Pour éliminer un arriéré historique des services d'assainissement, fournir des subventions pour le rendre abordable à la fois pour le prestataire de services et pour les clients. Si ce n'est pas fait, l'élimination de tout arriéré prendra trop de temps et aura des impacts économiques négatifs qui dépassent le coût de ne pas assurer un assainissement adéquat.
- Réaffecter les fonds des subventions des installations d'assainissement et de traitement des eaux usées à des systèmes décentralisés beaucoup moins chers, à la gestion des boues de vidange et à l'infrastructure d'assainissement par conteneur.
- Reconnaître la contribution de l'assainissement à la santé publique et à l'environnement en contribuant financièrement aux dépenses opérationnelles des prestataires de services.
- Encourager les banques commerciales et les investisseurs à entrer dans le secteur en atténuant les risques et les coûts pour eux, par exemple grâce à une forte application des contrats, une réglementation active, des garanties de revenu minimum et d'autres formes de financement mixte.
- Tenir des forums d'investisseurs pour attirer de nouveaux investisseurs dans le secteur de l'assainissement.

Messages aux dirigeants municipaux

- Adopter une approche d'assainissement inclusif à l'échelle de la ville.
- Éviter les plans d'assainissement urbains irréalistes, comme un plan qui vise 80 % d'égouts dans une ville qui n'en a actuellement que 10 %.
- Essayer l'assainissement à base de conteneurs pour servir les clients dans les parties appropriées de la zone de service.
- Attribuer aux entrepreneurs des contrats d'assainissement sur site ou par conteneur qui couvrent des zones géographiques suffisamment vastes pour être financièrement viables.
- Collaborer activement avec le gouvernement ou l'organisme de réglementation pour examiner les tarifs et mettre en œuvre les révisions proposées par les examens.
- Maintenir de bons taux de recouvrement des flux de trésorerie et des recettes qui donnent aux prêteurs confiance dans la capacité de la municipalité à rembourser les prêts.
- Introduire des normes et réglementations locales pour la qualité et la vente des produits fabriqués à partir des toilettes, afin d'encourager les concepts et les activités d'économie circulaire à condition qu'ils ne soient pas en conflit avec les normes nationales en vertu de la réglementation nationale.
- Appliquer tous les règlements.

• Tenir des forums d'investisseurs pour attirer de nouveaux investisseurs locaux dans le secteur de l'assainissement.
• Co-investir dans de nouvelles entreprises aux côtés d'investisseurs commerciaux.
• Activer et encourager les marchés pour les produits d'assainissement en étant un client pour les engrais, l'énergie et d'autres produits générés par les entreprises d'économie circulaire d'assainissement.

Messages aux régulateurs

• Établir des bases de données des prestataires de services d'assainissement, y compris leurs informations financières, leur solvabilité, etc.
• Permettre aux prestataires de services qui fournissent à la fois l'eau et l'assainissement de séparer les finances des deux opérations.
• Examiner régulièrement les tarifs et mettre en œuvre les révisions proposées par les examens.
• Reconnaître l'assainissement à base de conteneurs comme une alternative valable à l'assainissement ou à l'assainissement sur site.
• Appliquer les normes et réglementations nationales pour la qualité et la vente des produits fabriqués à partir des ressources des toilettes traitées.

Messages aux entrepreneurs

• Considérer l'assainissement dans les pays en développement comme un nouveau secteur d'activité dans lequel obtenir l'avantage du premier arrivé.
• Développer des entreprises tout au long de la chaîne de valeur de l'assainissement, pour attirer divers investisseurs.
• Chercher à collaborer et à co-investir avec les municipalités et les services publics afin de gagner en importance.
• Démontrer que vous avez une mentalité commerciale alliée à une structure de gouvernance solide, afin d'attirer davantage de financement de la part des banques et des investisseurs.

Messages aux banquiers

• Obtenir l'avantage de premier adoptant en s'impliquant maintenant dans l'assainissement, avant que d'autres banques le fassent.
• Convaincre vos investisseurs et clients que l'assainissement est désormais un secteur porteur.
• Enseigner à vos emprunteurs potentiels (par exemple, les entreprises d'assainissement) à préparer des programmes prêts pour l'investissement.
• Prendre les devants dans l'application des instruments financiers établis (par exemple, les fonds communs d'investissement, les obligations municipales et d'entreprise) et des nouveaux mécanismes (par exemple les structures de financement de l'assainissement) pour l'assainissement.

Messages aux investisseurs nationaux et internationaux

• Investir dans l'assainissement dans les pays en développement parce qu'il combine les rendements financiers et sociaux.
• Obtenir l'avantage d'un premier adoptant en investissant dans l'assainissement maintenant, avant que d'autres investisseurs le fassent.
• Investir tout au long de la chaîne de valeur de l'assainissement.
• S'impliquer dans la création de nouveaux mécanismes tels que les structures de financement de l'assainissement.

Messages à la communauté internationale du développement

• Réaffecter les subventions et les prêts des installations d'assainissement et de traitement des eaux usées à des systèmes décentralisés beaucoup moins chers, à la gestion des boues de vidange et à l'infrastructure d'assainissement par conteneur.
• Changer le financement des dépenses fragmentées en apports en solutions systématiques pour atteindre les résultats.
• Encourager les banques commerciales et les investisseurs à entrer dans le secteur en atténuant les risques et les coûts pour eux, par ex. en offrant des garanties ou du capital de première perte.
• Soutenir la création de nouveaux mécanismes tels que les installations de financement de l'assainissement.
• Organiser et soutenir des visites d'étude pour les décideurs à des endroits spécifiques, par ex. les entreprises d'assainissement à base de conteneurs.
• Adopter des stratégies de financement mixte pour apporter des financements commerciaux.
• Tenir des forums d'investisseurs pour attirer de nouveaux investisseurs dans le secteur de l'assainissement.

CONCLUSIONS FINALES POUR TOUS LES DÉCIDEURS

- Économiser de l'argent en mettant en œuvre des services d'assainissement urbain plus rentables.
- Augmenter les flux financiers en utilisant une gamme d'instruments et de mécanismes de financement existants et nouveaux.
- Attirer de nouveaux fonds dans le secteur en améliorant la gouvernance et la performance du secteur.
- Atteindre l'ODD sur l'assainissement urbain d'ici 2030 en étant positif et déterminé.

ANNEXE I : RÉSUMÉS DES ÉTUDES DE CAS DES VILLES

Cette annexe ne donne qu'un très bref résumé de chaque étude de cas. Toutes les études de cas, qui ont généralement une longueur d'environ 50 pages, sont publiées individuellement par le Conseil mondial de l'eau.

NOM DE LA VILLE D'ÉTUDE: **Baguio, Région administrative de la Cordillère, Philippines**

DONNÉES ET CARACTÉRISTIQUES DU PAYS ET DE LA VILLE

Les Philippines ont une population de 103 millions de personnes dont 45 % vivent dans les zones urbaines. C'est une république unitaire avec plusieurs niveaux de gouvernement : national, provincial et municipal. L'assainissement est une responsabilité de la ville / municipalité. Le gouvernement national a de nombreux organismes et départements avec des rôles indistincts et imbriqués dans la politique d'assainissement, la réglementation et la finance. La couverture de l'assainissement urbain est d'environ 78 %. Le gouvernement n'a pas de politique unique et claire sur le financement de l'assainissement. En pratique, les dépenses d'investissement et les dépenses opérationnelles pour l'assainissement urbain sont comptabilisées ensemble, les fonds provenant de différentes lignes budgétaires du gouvernement national, financés par les recettes fiscales, et des villes / municipalités, également financés principalement par leurs recettes fiscales locales. La collecte des tarifs pour l'assainissement à l'extérieur de Metro Manila est incohérente. Le concept de l'économie circulaire de l'assainissement n'est pas encore bien connu aux Philippines, bien que certains de ses principes soient utilisés notamment dans la gestion des déchets solides.

Baguio est la 25ème ville la plus urbanisée des Philippines avec une population de 0,35 million d'habitants. C'est une ville avec une forte densité de population, connue principalement pour le tourisme et les industries de service. Baguio est gérée par le gouvernement de la ville, dont la Division de la gestion des eaux usées, de l'eau et de l'air ambiant est responsable de l'assainissement, tandis que le District de l'eau de Baguio (BWD) est responsable de l'approvisionnement en eau. La ville dispose d'un petit système d'égouts qui ne couvre que le centre-ville et ses lignes principales et son usine de traitement des eaux usées ont été entièrement subventionnées par le gouvernement du Japon. Environ 67 % des ménages disposent d'un système d'assainissement sur place (presque toutes les fosses septiques), tandis que 28 % sont desservis par le réseau d'égouts et environ 5 % par des fosses septiques communales. La ville ne facture un tarif d'assainissement qu'aux ménages raccordés au système d'égouts - il est calculé par toilette et non par mètre cube d'eau utilisée.

MÉCANISMES FINANCIERS UTILISÉS DANS CETTE VILLE

Pour le gouvernement de la ville, les dépenses en capital et les dépenses opérationnelles en matière d'assainissement sont regroupées en une ligne budgétaire. Le gouvernement de la ville considère l'assainissement comme un service de base à fournir, de sorte que ses dépenses pour l'assainissement d'un million de dollars dépassent de loin ses revenus de tarifs d'environ 0,3 million de dollars. De ce déficit, il représente environ 60 % de ses recettes générales et reçoit environ 40 % des allocations du gouvernement national. La ville ne contracte pas de prêts à quelque fin que ce soit.

Pour la grande majorité des ménages, l'assainissement est entièrement autofinancé à la fois pour les dépenses d'investissement, qui consistent principalement à la construction de la fosse septique, et pour les dépenses opérationnelles, qui sont principalement la vidange de la fosse septique. Le débouchage est effectué par des entrepreneurs faiblement réglementés qui imposent des prix en fonction des conditions du marché ; seule une petite fraction des boues fécales parvient à la station d'épuration.

INNOVATIONS UTILISÉES OU PRÉVUES DANS CETTE VILLE

Baguio n'innove pas actuellement dans le financement de l'assainissement. Elle a des caractéristiques inhabituelles, par exemple des tarifs par toilette plutôt que par mètre cube d'eau, mais il n'y a aucune preuve que cela a été fait pour innover, et elle veut s'éloigner de ces caractéristiques. Elle a une aspiration de planification pour fournir l'égout universel d'ici 2035 mais ceci n'a aucun plan financier associé significatif.

Le gouvernement municipal et le maire ont exprimé un vif intérêt pour essayer des innovations dans le financement de l'assainissement afin d'améliorer la qualité du service.

Le concept d'économie circulaire de l'assainissement n'est pas familier sous ce nom, mais WAMD-CEPMO a essayé quelques activités à petite échelle, telles que la vente de boues traitées comme conditionneur de sol.

MESSAGES AUX DÉCIDEURS SPÉCIFIQUES À CETTE VILLE

Coordonner la planification entre BWD pour l'eau et WAMD-CEPMO pour l'assainissement.

L'assainissement des clôtures tient compte du budget de la WAMD-CEPMO et le subdivise en dépenses capitales et opérationnelles afin que les décideurs puissent voir la situation financière réelle et prendre des décisions sur la base de ces preuves.

Planifier en utilisant une approche à l'échelle de la ville qui accorde une importance égale à l'assainissement sur place et aux systèmes d'égouts hydriques. Reconnaître que les égouts universels à base d'eau ne seront pas abordables, et permettre à la WAMD-CEPMO de prendre en charge la planification financière à la fois de l'assainissement sur place et des réseaux d'égouts.

Réviser la base de calcul et le mécanisme de collecte des tarifs d'assainissement et des redevances de services de fosses septiques, afin de couvrir intégralement les dépenses opérationnelles de l'AMDD-CEPMO.

Reconnaître les ressources sanitaires comme une ressource précieuse et non comme un déchet à éliminer. Encourager les entrepreneurs privés à s'impliquer dans ce travail d'économie circulaire. Augmenter les revenus de WAMD-CEPMO à partir des ventes de produits.

Nom de la ville d'étude: **Blumenau, État de Santa Catarina, Brésil**

DONNÉES ET CARACTÉRISTIQUES DU PAYS ET DE LA VILLE

Le Brésil compte 207 millions d'habitants, dont 85 % vivent en zone urbaine. Le Brésil a une structure fédérale avec des pouvoirs gouvernementaux partagés entre le gouvernement national et les gouvernements des États. En matière d'eau et d'assainissement, le gouvernement national est responsable des politiques et des orientations tandis que les sociétés municipales sont responsables de la prestation de services, sauf dans les zones métropolitaines où cette disposition résulte des accords entre les sociétés publiques d'eau et d'assainissement. En plus de cela, des accords similaires permettent aux sociétés d'État de fournir des services d'eau et d'assainissement à plusieurs municipalités dans les États. Récemment, quelques-unes de ces sociétés municipales ont commencé à contracter des concessionnaires du secteur privé pour fournir ces services urbains. Les données de 2015 montrent que la couverture de l'assainissement est assurée à environ 40 % de manière sûre (c'est-à-dire par l'égout) et à 50 % de base (c'est-à-dire sur site). La politique du gouvernement établit que les dépenses en capital consacrées à l'eau et à l'assainissement doivent être financées principalement par des droits de douane ou des prêts, augmentés d'un faible pourcentage des subventions accordées par le gouvernement national et financées par les recettes fiscales. Les dépenses opérationnelles devraient être financées par les municipalités au moyen de droits de douane. Le concept de l'économie circulaire est familier dans la gestion des déchets solides mais nouveau dans l'assainissement : il existe peu d'exemples de son application dans le pays.

Blumenau est la 78ème ville du Brésil avec une population de 0,35 million d'habitants. C'est une ville relativement prospère dans un état prospère (Santa Catarina) bien que sa couverture d'assainissement soit en retard par rapport à son statut économique. La société municipale d'eau et d'assainissement Serviço Autónomo Municipal de Água e Esgoto (SAMAE) est responsable de la prestation des services et, en 2010, elle a signé des contrats d'assainissement avec une entreprise du secteur privé pour un contrat de 45 ans. La ville a un vieux système d'égouts qui couvre une petite zone dans le centre-ville. Environ 92 % des ménages disposent de systèmes d'assainissement améliorés, dont seulement 27 % sont desservis par un système d'égout et le reste par l'assainissement sur place.

MÉCANISMES FINANCIERS UTILISÉS DANS CETTE VILLE

Pour les dépenses d'investissement en infrastructures d'assainissement (principalement les égouts et les stations d'épuration), le concessionnaire compte sur des prêts bancaires commerciaux - il y a un doute considérable concernant la faisabilité de ce projet d'un point de vue financier.

Pour les dépenses opérationnelles d'assainissement, le concessionnaire récupère le coût intégral par le biais des tarifs. Les clients paient des tarifs distincts pour l'eau et l'assainissement, dont le tarif d'assainissement est légèrement supérieur à celui de l'eau - tous deux basés sur la consommation volumétrique de l'eau, avec un élément sous condition de ressources donnant des tarifs plus bas aux pauvres. Le taux de perception du tarif est d'environ 89 %.

INNOVATIONS UTILISÉES OU PRÉVUES DANS CETTE VILLE

Le contrat de SAMAE avec un concessionnaire du secteur privé est lui-même assez novateur dans le contexte brésilien.

SAMAE et le concessionnaire ont manifesté leur intérêt pour expérimenter des innovations dans le financement de l'assainissement afin d'améliorer à la fois la couverture et la qualité du service.

MESSAGES AUX DÉCIDEURS SPÉCIFIQUES À CETTE VILLE

Clarifier la propriété des actifs, le régime réglementaire et les objectifs à long terme pour les services d'assainissement.

Reconnaître que l'assainissement a un impact sociétal très positif et monétiser cet impact, par exemple en réduisant la fiscalité du prestataire de services.

Améliorer la collecte des tarifs.

Changer les plans futurs de l'expansion de l'assainissement des égouts - qui sera probablement inabordable - à l'amélioration des services d'assainissement sur place.

Intégrer les concepts d'économie circulaire dans les services d'assainissement des égouts et d'assainissement sur place, afin de réutiliser les ressources et générer des revenus supplémentaires pour le concessionnaire.

NOM DE LA VILLE D'ÉTUDE: **Bogota, District de la capitale, Colombie**

DONNÉES ET CARACTÉRISTIQUES DU PAYS ET DE LA VILLE

La Colombie compte 49 millions d'habitants dont 77 % vivent en zone urbaine. Le pays a une structure constitutionnelle unitaire avec trois niveaux de gouvernement (national, départemental, local) chacun avec leurs propres mandats et pouvoirs. En matière d'assainissement, le gouvernement national établit les politiques et les gouvernements locaux (dans les zones urbaines : les municipalités) fournissent les services. La couverture de l'assainissement urbain serait d'environ 93 %. La politique du gouvernement en matière de financement de l'assainissement établit que les dépenses en capital et les dépenses opérationnelles doivent être financées par les municipalités au moyen de tarifs. Ces tarifs doivent reconnaître le droit humain à l'assainissement, de sorte que les services d'assainissement de base sont gratuits pour le chef de famille et le gouvernement national peut verser à la municipalité une subvention supplémentaire récurrente pour couvrir ce coût. Le gouvernement national a l'intention de promouvoir le concept de l'économie circulaire de l'assainissement mais n'a pas encore développé de mesures incitatives pour l'encourager, donc il existe très peu d'exemples de fonctionnement.

Bogota est la capitale de la Colombie avec une population de 8,1 millions d'habitants. Elle est dirigée par un conseil municipal dirigé par un maire directement élu. Le prestataire de services d'eau et d'assainissement est la compagnie de services d'eau, d'égouts et d'assainissement de Bogota (EAB) qui appartient à la municipalité. La ville dispose d'un vaste réseau d'égouts qui couvre environ 96 % des ménages. Cependant, seulement 16 % des égouts sont gérés de manière sûre, le reste étant évacué directement dans une rivière. Ainsi, le chiffre de la couverture a chuté de manière spectaculaire avec le passage des statistiques sur les OMD aux statistiques sur les ODD.

MÉCANISMES FINANCIERS UTILISÉS DANS CETTE VILLE

L'EAB perçoit des tarifs distincts pour l'eau et pour l'assainissement ; ils ont presque le même coût par mètre cube. Les comptes du service d'eau et du service d'assainissement sont clôturés et audités séparément. Les tarifs ont augmenté considérablement à la fin des années 1990 en raison du leadership fort du maire.

Pour les dépenses d'investissement sur ses infrastructures d'assainissement régulières, l'EAB obtient tous les fonds directement des tarifs ou des prêts commerciaux remboursés par les tarifs - EAB a une bonne cote de crédit et paie donc des taux d'intérêt bas sur ces prêts. Dans le cas particulier de la construction de nouvelles stations d'épuration des eaux usées pour améliorer la qualité de l'eau de la rivière, le gouvernement national contribue à hauteur d'environ 40 % du coût en reconnaissance de l'amélioration de l'environnement.

Pour les dépenses opérationnelles d'assainissement, l'EAB dispose d'un budget annuel d'environ 140 millions de dollars, financé à 95 % par les droits de douane et à 5 % par les subventions gouvernementales pour couvrir la fourniture gratuite de services d'assainissement de base.

INNOVATIONS UTILISÉES OU PRÉVUES DANS CETTE VILLE

La principale innovation financière est une subvention croisée transparente et obligatoire au niveau national obtenue en imposant des tarifs différents aux personnes vivant dans des maisons de valeurs différentes : ainsi, les valeurs foncières sont utilisées comme approximation de la richesse des ménages.

La ville de Medellin (la deuxième plus grande ville de Colombie) a été pionnière dans le paiement des tarifs par cartes à puce, qui sont plus pratiques pour les clients et plus efficaces pour le prestataire de services. Bogota envisage d'adopter ce système.

L'EAB est ouverte à l'expérimentation d'innovations dans le financement de l'assainissement afin d'améliorer sa qualité de service et sa performance financière.

MESSAGES AUX DÉCIDEURS SPÉCIFIQUES À CETTE VILLE

L'assainissement universel des égouts a déjà été réalisé ici - l'accent doit donc être mis sur le traitement et la réutilisation des ressources sanitaires. L'EAB pourrait générer des revenus en vendant les produits de ses usines de traitement des eaux usées, en particulier les engrais, le biodiesel, les produits chimiques et la biomasse pour l'alimentation animale. Tout cela s'inscrit dans le concept de l'économie circulaire de l'assainissement. Les ressources en toilettes devraient être considérées comme une source de nutriments et d'énergie pour les plantes et non comme des déchets à éliminer.

L'EAB pourrait attribuer des contrats à des entreprises du secteur privé pour des parties spécifiques de ses opérations, par exemple des stations d'épuration des eaux usées, des compteurs, des centres d'appels.

NOM DE LA VILLE D'ÉTUDE: **Dakar, Région de Dakar, Sénégal**

DONNÉES ET CARACTÉRISTIQUES DU PAYS ET DE LA VILLE

Le Sénégal compte 15 millions d'habitants dont 44 % vivent en zone urbaine. Le pays a une structure unitaire avec des pouvoirs gouvernementaux partagés entre les gouvernements nationaux et régionaux. Dans le domaine de l'assainissement, le gouvernement national domine, établit des politiques et des réglementations et met en œuvre des programmes de travail par l'intermédiaire des organismes du secteur public ; dans le domaine de l'assainissement urbain, l'Office national de l'assainissement du Sénégal (ONAS) s'occupe de ces tâches. La couverture de l'assainissement urbain est estimée entre 62 % et 82 % selon les définitions. La politique du gouvernement en matière de financement de l'assainissement établit que les dépenses d'investissement pour l'assainissement urbain doivent provenir principalement de prêts concessionnels et commerciaux, tandis que les dépenses opérationnelles doivent être financées par des tarifs. Le concept d'économie circulaire de l'assainissement est officiellement reconnu au Sénégal mais très peu pratiqué à ce jour.

Dakar est la capitale et la plus grande ville du Sénégal avec une population de 3,3 millions d'habitants. Le gouvernement municipal n'a aucune implication dans l'assainissement, qui est la responsabilité de l'ONAS. La ville a un petit système d'égouts qui couvre le centre-ville historique. Environ 78 % des ménages ont amélioré l'assainissement ; de ces deux tiers sont desservis par l'assainissement sur place et seulement un tiers par l'assainissement des égouts. L'ONAS met autant l'accent sur l'assainissement sur place que sur l'assainissement des égouts, et ses plans futurs pour Dakar couvrent les deux.

MÉCANISMES FINANCIERS UTILISÉS DANS CETTE VILLE

L'ONAS ne tient pas de comptes séparés pour Dakar, mais seulement pour son travail global : les chiffres pour Dakar peuvent être obtenus en estimant que la ville représente 80 % du travail de l'ONAS et donc de l'argent.

Pour les dépenses d'investissement en infrastructures d'assainissement, l'ONAS s'appuie sur des prêts concessionnels et commerciaux.

L'ONAS perçoit un tarif d'assainissement calculé en pourcentage du tarif de l'eau. Pour les dépenses opérationnelles d'assainissement, l'ONAS récupère 73 % du coût de ce tarif et les 27 % restants des subventions du gouvernement national pour combler le déficit.

INNOVATIONS UTILISÉES OU PRÉVUES DANS CETTE VILLE

L'ONAS, avec le soutien de la Fondation Gates, a considérablement innové dans la gestion des boues de vidange par le biais du programme PSFSM. L'ONAS autorise et réglemente les entrepreneurs de vidange des fosses et loue également les usines de traitement des boues de vidange à un entrepreneur. Ces changements ont considérablement amélioré la performance financière du service.

Dans le cadre du programme PSFSM, l'ONAS a mis en place un fonds de garantie pour permettre aux entreprises de vidange de fosses d'obtenir des prêts bancaires pour l'achat de leur équipement. Cette garantie a permis aux banques commerciales de réduire leurs taux d'intérêt de 12 % à 7,5 %. Environ 8 % des prêts ne sont pas correctement remboursés par les entrepreneurs, de sorte que l'association professionnelle des entrepreneurs essaie de réduire ce chiffre.

L'ONAS modernise les usines de traitement des boues de vidange afin de générer des produits commerciaux, notamment de l'eau traitée, des engrais et de l'énergie. À l'échelle de la ville entière, ce serait une innovation significative de l'économie circulaire.

L'ONAS a exprimé son intérêt pour générer plus d'innovations dans le financement de l'assainissement afin d'améliorer sa couverture et sa qualité de service.

MESSAGES AUX DÉCIDEURS SPÉCIFIQUES À CETTE VILLE

Continuer à planifier en utilisant une approche à l'échelle de la ville qui accorde une importance égale à l'assainissement sur place et à l'assainissement des égouts.

Augmenter les tarifs d'assainissement pour couvrir entièrement les dépenses opérationnelles.

Augmenter les revenus provenant des ventes de produits.

Continuer de sous-traiter davantage de services d'assainissement aux opérateurs du secteur privé, afin d'accroître l'efficacité et la viabilité financière.

Améliorer l'environnement légal et réglementaire pour encourager les investisseurs commerciaux.

NOM DE LA VILLE D'ÉTUDE: **eThekwini (Durban), Province du KwaZulu Natal, Afrique du Sud**

DONNÉES ET CARACTÉRISTIQUES DU PAYS ET DE LA VILLE

L'Afrique du Sud compte 55 millions d'habitants, dont 65 % vivent en zone urbaine. Le pays a une structure constitutionnelle unitaire avec trois sphères de gouvernement (national, provincial, local) chacune avec leurs propres mandats et pouvoirs. En matière d'assainissement, le gouvernement national établit les politiques et les gouvernements locaux (dans les zones urbaines : les municipalités) fournissent les services. La couverture de l'assainissement urbain est d'environ 76 %. La législation, la réglementation et les rôles institutionnels sont tous décrits en détail. La politique du gouvernement en matière de financement de l'assainissement établit que les dépenses d'investissement pour l'assainissement urbain doivent provenir principalement de subventions calculées avec précision par le gouvernement national et financées par les recettes fiscales, tandis que les dépenses opérationnelles devraient être financées par les municipalités. Ces tarifs doivent tenir compte des avantages de l'assainissement pour la santé publique, de sorte que les services d'assainissement de base sont gratuits pour le chef de famille et que le gouvernement national verse à la municipalité une subvention supplémentaire récurrente pour couvrir ce coût. Le concept de l'économie circulaire de l'assainissement est bien compris en Afrique du Sud et il y en a quelques exemples en fonctionnement.

La municipalité d'eThekwini (aussi appelée Durban) est la troisième plus grande ville d'Afrique du Sud avec une population de 3,7 millions d'habitants. Elle est régie par le conseil municipal d'eThekwini. Le prestataire de services d'eau et d'assainissement est eThekwini Water and Sanitation (EWS), propriété de la municipalité. La ville dispose d'un vaste système d'égouts qui couvre environ 50 % des ménages, tandis que 26 % sont desservis par un assainissement amélioré sur place. EWS utilise une approche d'assainissement à l'échelle de la ville pour gérer tous les types de services d'assainissement, et ses plans futurs comprennent à la fois l'assainissement des égouts et l'assainissement sur place.

EWS est un utilitaire exceptionnellement bien géré. Beaucoup d'autres municipalités d'Afrique du Sud ont des performances bien inférieures à celles d'EWS en termes de perception des droits de douane, d'utilisation de subventions en capital, de gestion d'actifs et de relations avec la clientèle.

MÉCANISMES FINANCIERS UTILISÉS DANS CETTE VILLE

Pour les dépenses d'investissement en infrastructures d'assainissement, EWS obtient environ la moitié des fonds des subventions nationales et environ la moitié des prêts commerciaux, remboursés à partir des revenus d'exploitation - EWS a une bonne cote de crédit et paie donc des taux d'intérêt bas sur ces prêts.

Pour les dépenses opérationnelles d'assainissement, EWS dispose d'un budget annuel d'environ 140 millions de dollars, financé à 84 % par les tarifs et 16 % par les subventions gouvernementales.

EWS recueille des tarifs distincts pour l'eau et pour l'assainissement ; le taux de perception tarifaire est de 100 %. Les comptes du service d'eau et du service d'assainissement sont audités séparément des autres comptes municipaux.

INNOVATIONS UTILISÉES OU PRÉVUES DANS CETTE VILLE

EWS a été le pionnier de nombreuses politiques en Afrique du Sud et a un état d'esprit managérial ouvert à l'innovation. Il est désireux de tester des innovations dans le financement de l'assainissement afin d'améliorer sa qualité de service et sa performance financière.

EWS a commencé à générer des revenus en vendant les produits de ses usines de traitement des eaux usées, en particulier les engrais, le biodiesel, les produits chimiques et la biomasse pour l'alimentation animale. Tout cela s'inscrit dans le concept de l'économie circulaire de l'assainissement.

EWS attribue des contrats à des entreprises du secteur privé pour des parties spécifiques de ses opérations, par exemple des stations d'épuration des eaux usées, la lecture des compteurs, les centres d'appels, la vidange des toilettes.

MESSAGES AUX DÉCIDEURS SPÉCIFIQUES À CETTE VILLE

Le choix de la technologie d'assainissement détermine comment aborder l'option à la fois pour le service public et les clients. Dans toute analyse économique, les externalités doivent être incluses pour déterminer si elles sont abordables.

L'assainissement à l'égout universel ne serait pas abordable ici - ou même dans la plupart des villes des pays en développement - et n'est pas pratique dans les bidonvilles urbains denses.

L'évolution de la technologie de l'assainissement sur site et sur les conteneurs pourrait rendre inutiles les systèmes d'assainissement des égouts à moyen terme, ce qui entraînerait un surinvestissement dans ces infrastructures.

Les tarifs doivent être conçus pour reconnaître le droit humain à l'assainissement et être abordables pour les plus pauvres. Cela implique une subvention croisée interne manifeste des riches aux pauvres.

Reconnaître les ressources des toilettes comme une source de nutriments pour les plantes, de produits chimiques et d'énergie et non comme des déchets à éliminer.

NOM DE LA VILLE D'ÉTUDE: **Jodhpur, État du Rajasthan, Inde**

DONNÉES ET CARACTÉRISTIQUES DU PAYS ET DE LA VILLE

L'Inde compte 1 311 millions d'habitants dont 33 % vivent en zone urbaine. 18 % de la population urbaine vit dans des taudis. L'Inde a une structure fédérale avec des pouvoirs gouvernementaux partagés entre le gouvernement national, le gouvernement de l'État et les municipalités. L'assainissement est officiellement une responsabilité de l'État, et le gouvernement national est très actif dans l'élaboration de politiques, l'orientation et la mise en œuvre de programmes centralisés, notamment la Mission Swachh Bharat, la Mission Atal pour le rajeunissement et la transformation urbaine. Dans les zones urbaines, la couverture améliorée de l'assainissement est d'environ 65 % et environ 21 % ont accès à des installations sanitaires communes. Seulement environ 32 % des toilettes sont raccordées à des systèmes d'égouts et, au mieux, seulement environ 30 % des boues de vidange sont traitées. La politique du gouvernement en matière de financement de l'assainissement établit que les dépenses en capital pour l'assainissement urbain doivent provenir principalement des subventions des gouvernements nationaux et des États, financées par les recettes fiscales, tandis que les dépenses opérationnelles devraient être financées par les municipalités au moyen de tarifs. En moyenne, en Inde, les tarifs ne représentent qu'environ 30 à 40 % des dépenses opérationnelles pour l'eau et encore moins pour l'assainissement. Le concept de l'économie circulaire de l'assainissement est encore nouveau en Inde et n'est guère pratiqué dans aucun des programmes gouvernementaux : leur objectif principal reste la construction d'infrastructures.

Jodhpur est la 45ème plus grande ville en Inde avec une population de 1,1 million de personnes. Elle est régie par la Jodhpur Municipal Corporation (JMC), qui est responsable de l'assainissement, tandis que le Département de la santé publique du Rajasthan (PHED) est responsable de l'approvisionnement en eau. La ville dispose d'un ancien réseau d'égouts qui couvre environ 70 % de la superficie de la ville, bien que sa capacité de traitement soit bien moindre. Environ 65 % des ménages ont des toilettes améliorées. La ville ne perçoit pas de tarif distinct pour l'assainissement ; au lieu de cela, environ 30 % des redevances d'eau collectées par la PHED sont transférées à JMC pour l'assainissement, bien que cet argent ne soit pas isolé au sein de JMC. JMC n'a que 5 employés pour l'assainissement et des entrepreneurs pour tous les travaux de construction et d'entretien ; il n'a pas de système de gestion des immobilisations.

MÉCANISMES FINANCIERS UTILISÉS DANS CETTE VILLE

Pour les dépenses d'investissement en infrastructures d'assainissement (principalement les égouts et les stations d'épuration), JMC s'appuie sur des subventions du gouvernement national et des États, qui s'élèvent en moyenne à environ 5 millions de dollars par an.

Pour les dépenses opérationnelles d'assainissement, JMC a un revenu annuel de presque 0,8 million de dollars (presque toute sa part des tarifs PHED), une dépense de 1,2 million et couvre le manque à gagner de 0,4 million de dollars de ses autres ressources financières internes). JMC est conscient que ses dépenses sont très faibles, et souhaite dépenser d'une façon ciblée, qu'il calcule

comme 5 % de la valeur en capital de ses actifs, de 7 M$. La politique d'assainissement du gouvernement du Rajasthan encourage les villes à recouvrer le coût total des dépenses opérationnelles par le biais des tarifs, et à générer des revenus en vendant des eaux usées traitées pour l'irrigation, mais JMC n'a pas encore pu le faire.

INNOVATIONS UTILISÉES OU PRÉVUES DANS CETTE VILLE

JMC a essayé de générer des revenus en vendant les produits de ses usines de traitement des eaux usées, en particulier les eaux usées traitées, le biogaz et le compost, mais les revenus ont été négligeables. Les principaux problèmes étaient que les produits étaient jugés non rentables par JMC en termes de coût de production par rapport à leur valeur marchande, et que JMC avait une forte résistance de la part des clients qui estimaient que les produits des organisations du secteur public devaient être gratuits.

JMC a exprimé un vif intérêt pour générer des innovations dans le financement de l'assainissement afin d'améliorer sa couverture et sa qualité de service.

MESSAGES AUX DÉCIDEURS SPÉCIFIQUES À CETTE VILLE

Améliorer la collecte des impôts de JMC afin d'augmenter ses revenus généraux.

Transfert de l'autorité pour établir et collecter les tarifs d'assainissement de PHED à JMC.

L'assainissement des clôtures compte dans le budget de JMC afin que les décideurs puissent voir la situation financière réelle et prendre des décisions basées sur ces preuves.

Encourager les grandes institutions telles que les hôpitaux, les hôtels, les établissements d'enseignement, etc., à construire leurs propres stations d'épuration. Ces usines pourraient être gérées par des entrepreneurs du secteur privé qui appliqueraient des concepts d'économie circulaire et vendraient les produits.

NOM DE LA VILLE D'ÉTUDE: **Marrakech, Région de Marrakech-Safi, Maroc**

DONNÉES ET CARACTÉRISTIQUES DU PAYS ET DE LA VILLE

Le Maroc compte une population de 34 millions d'habitants dont 60 % vivent en zone urbaine. Le pays a une structure fédérale avec des pouvoirs de gouvernement étant de plus en plus décentralisés du gouvernement national aux gouvernements régionaux et locaux. L'assainissement est une responsabilité du gouvernement local, tandis que le gouvernement national établit des politiques et des directives. La couverture de l'assainissement urbain est d'environ 90 %. La politique du gouvernement en matière de financement de l'assainissement établit que les dépenses d'investissement et d'exploitation pour l'assainissement urbain doivent être financées par les municipalités au moyen de droits de douane. Le concept de l'économie circulaire de l'assainissement est encore nouveau au Maroc et n'est guère pratiqué dans aucun des programmes gouvernementaux : leur objectif principal reste la construction d'infrastructures d'assainissement.

Marrakech est la deuxième plus grande ville du Maroc avec une population de 1,3 million de personnes. La société d'utilité publique Régie Autonome de Distribution d'Eau et d'Electricité de Marrakech (RADEEMA) fournit de l'électricité et des services d'eau et d'assainissement. La ville dispose d'un vaste système d'égouts qui couvre actuellement environ 90 % des ménages et est toujours en cours d'extension : RADEEMA prévoit d'atteindre une couverture d'assainissement à 100 % d'ici 2030. Les autres 10 % des ménages disposent actuellement d'installations sanitaires. Environ 90 % des eaux usées sont traitées de manière adéquate.

MÉCANISMES FINANCIERS UTILISÉS DANS CETTE VILLE

Pour les dépenses d'investissement en infrastructures d'assainissement (principalement les égouts et les stations d'épuration), RADEEMA s'appuie principalement sur une subvention croisée de la partie électricité du service public, augmentée de certains prêts de banques commerciales.

RADEEMA couvre 59 % de ses dépenses opérationnelles d'assainissement à partir du tarif qu'elle facture pour l'assainissement, le solde étant financé par une subvention croisée provenant de la partie électricité du service public.

INNOVATIONS UTILISÉES OU PRÉVUES DANS CETTE VILLE

La principale caractéristique inhabituelle de RADEEMA est que le volet électricité de son activité, qui est rentable, subventionne la partie assainissement, qui ne l'est pas.

RADEEMA génère environ 10 % de son chiffre d'affaires total en assainissement grâce à la vente d'eaux usées traitées à des terrains de golf.

RADEEMA est ouvert aux suggestions d'innovations dans le financement de l'assainissement qui pourraient contribuer à rendre son service d'assainissement autofinancé.

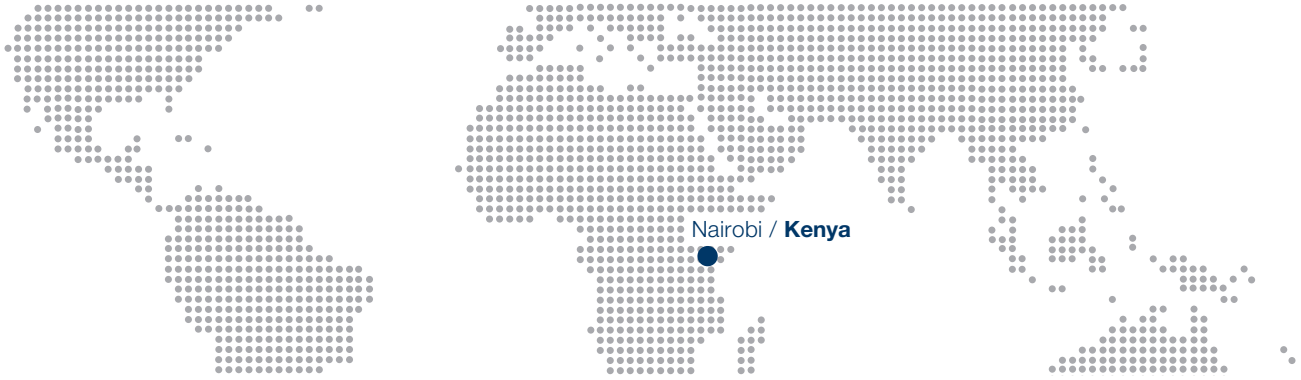
MESSAGES AUX DÉCIDEURS SPÉCIFIQUES À CETTE VILLE

Réviser la politique tarifaire et augmenter le tarif actuel de l'assainissement.

Augmenter les revenus de RADEEMA provenant des ventes de produits autres que l'eau. Trouver de nouveaux clients (autres que les terrains de golf) pour les eaux usées traitées.

L'assainissement des clôtures compte dans le budget de RADEEMA afin que les décideurs puissent voir la situation financière réelle et prendre des décisions basées sur ces preuves. Ensuite, décidez soit de poursuivre la politique actuelle de l'assainissement de l'électricité à partir de l'électricité, soit de trouver d'autres sources de revenus pour l'assainissement.

RADEEMA pourrait confier la vente d'eau, de biogaz et de compost provenant des stations d'épuration municipales à un entrepreneur privé qui pourrait l'exploiter plus efficacement que RADEEMA.



NOM DE LA VILLE D'ÉTUDE: **Nairobi, comté de Nairobi, Kenya**

DONNÉES ET CARACTÉRISTIQUES DU PAYS ET DE LA VILLE

Le Kenya a une population de 49 millions de personnes dont 25 à 30 % vivent dans les zones urbaines. Le Kenya a un système de gouvernance décentralisé avec des pouvoirs de gouvernance et un mandat constitutionnel partagé entre le gouvernement national et les gouvernements des comtés. L'assainissement est théoriquement une responsabilité du comté, tandis que plusieurs ministères nationaux différents établissent des politiques, des orientations et des réglementations. La couverture de l'assainissement urbain est d'environ 20 % avec l'assainissement et d'environ 50 % avec l'assainissement sur place, mais aucune d'entre elles n'est classée par le JMP comme gérée de manière sûre ; les services d'assainissement ne parviennent pas à suivre la croissance rapide des populations urbaines. La politique du gouvernement en matière de financement de l'assainissement établit que les dépenses d'assainissement urbain doivent provenir en partie des subventions gouvernementales financées par les recettes fiscales et en partie des droits de douane, tandis que les dépenses opérationnelles doivent être entièrement financées par les tarifs douaniers. Le concept de l'économie circulaire de l'assainissement est reconnu au Kenya bien qu'il existe peu d'exemples qui fonctionnent encore.

Nairobi est la capitale et la plus grande ville du Kenya avec une population en croissance rapide de 3,9 millions de personnes. Le Conseil des services d'eau d'Athi (AWSB) est le détenteur d'actifs tandis que la Société d'eau et d'égouts de Nairobi (NCWSC) est le prestataire de services, bien qu'il y ait chevauchement et confusion au sujet de leurs rôles. La ville dispose d'un réseau d'égouts assez étendu desservant environ 45 % des ménages, le tarif de l'assainissement étant fixé à 75 % du tarif de l'eau. Presque tous les autres ménages utilisent l'assainissement sur place, soit uniquement utilisé soit partagé, avec des fosses vidées par le secteur privé à petite échelle. Le plan d'ici 2030 est d'étendre les égouts d'origine hydrique, mais il existe des fonds négligeables alloués ou en perspective pour cela.

MÉCANISMES FINANCIERS UTILISÉS DANS CETTE VILLE

Pour les dépenses d'investissement dans l'eau et l'assainissement, AWSB et NCWSC se prononcent sur la propriété et la responsabilité et peu de progrès sont réalisés : le financement est destiné à provenir d'un mélange de subventions gouvernementales et de prêts commerciaux, à rembourser des recettes tarifaires. Les budgets d'assainissement sont petits, pas clairement délimités, et répartis entre le gouvernement du comté, le NCWSC et l'AWSB.

Les recettes annuelles de la NCWSC provenant des tarifs combinés de l'eau et de l'assainissement s'élèvent à environ 70 millions de dollars, ce qui devrait couvrir ses dépenses de fonctionnement.

INNOVATIONS UTILISÉES OU PRÉVUES DANS CETTE VILLE

Le NCWSC, avec l'appui technique de la Banque mondiale et une subvention du GPOBA, a obtenu un prêt commercial de 6 millions de dollars pour des dépenses d'investissement en assainissement en 2016.

Plusieurs petits entrepreneurs et projets ont démarré des activités d'économie circulaire.

Le NCWSC a exprimé son intérêt pour essayer des innovations dans le financement de l'assainissement.

MESSAGES AUX DÉCIDEURS SPÉCIFIQUES À CETTE VILLE

Clarifier les rôles des différentes agences responsables de l'assainissement et régler les conflits institutionnels entre elles.

Appliquer les règlements.

Protéger la tenue des comptes reliés à l'assainissement dans les budgets de l'AWSB et de la NCWSC afin que les décideurs puissent voir la situation financière réelle et prendre des décisions en fonction de ces preuves.

Reconnaître que l'extension des réseaux d'égouts à l'eau à l'ensemble de la population est inabordable et utiliser à la place des concepts de planification de l'assainissement à l'échelle de la ville pour améliorer les services d'assainissement sur place et sur les conteneurs.

Développer et élargir les compétences du Kenya Pooled Water Fund pour financer l'assainissement.

ANNEXE 2 : LISTE DES PERSONNES CONSULTÉES POUR CE TRAVAIL

Jamie Butterworth, Circularity Capital
Dominique Carrie, Social Finance
Dan Corry, New Philanthropy Capital
Barbara Evans, University of Leeds
Cheryl Hicks and Sandy Rodger, the Toilet Board Coalition
Guy Hutton, UNICEF
Dale Jacobson, American Society of Civil Engineers - Environmental & Water Resources Institute
Neil Jeffery, Water and Sanitation for the Urban Poor
Nabeela Khan, the CDC Group
Bernardo Lazo, the Gold Standard Foundation
Amanda Marlin, Sanitation and Water for All
Alex Money, Oxford University
Dennis Mwanza, Bill and Melinda Gates Foundation
Maimuna Nalubega and colleagues, African Development Bank
Lesley Pories and Heather Arney, Water.org
Manas Rath and colleagues, Bremen Overseas Research and Development Agency
Mohammed Saddiq, GENeco
Barbara Kazimbaye Senkwe and colleagues, Water, Sanitation and Hygiene Finance project
Tony Slatyer, Government of Australia
Simon Szreter, Cambridge University
Sophie Trémolet, World Bank
Arthur Wood, Total Impact Advisors
Christian Zurbrügg, Swiss Federal Institute of Aquatic Science and Technology

ANNEXE 3 : BIBLIOGRAPHIE SÉLECTIVE ÉTUDIÉE POUR CE TRAVAIL

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AUMENTO DOS FLUXOS FINANCEIROS PARA O SANEAMENTO URBANO

RELATÓRIO DO CONSELHO MUNDIAL DA ÁGUA

CONSELHO MUNDIAL DA ÁGUA

CONSELHO
MUNDIAL
DA ÁGUA

O Conselho Mundial da Água (World Water Council - WWC) é uma plataforma de organização internacional composta por diversas partes interessadas, fundadora e co-organizadora do Fórum Mundial da Água. A missão do Conselho visa mobilizar para questões críticas sobre a água em todos os níveis, incluindo o mais alto nível de decisão, envolvendo pessoas no debate e desafiando o pensamento convencional. O Conselho Mundial da Água, sediado em Marselha, França, foi criado em 1996. Ele agrega mais de 300 organizações-membro provenientes de mais de 50 países.
www.worldwatercouncil.org

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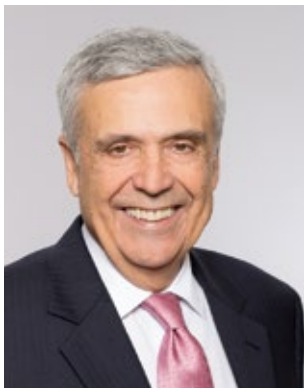
PREFÁCIO



O objetivo estabelecido na fundação do Conselho Mundial da Água foi o de posicionar a água no cerne das prioridades políticas mais urgentes do nosso planeta. A preocupação número um do Conselho é a segurança global da água, e a infraestrutura que fornece água, tanto potável quanto para o saneamento, deve ser uma prioridade. Sem isso, as sociedades não podem crescer, os países não podem se desenvolver. Uma em cada cinco crianças abaixo dos cinco anos de idade ainda morre prematuramente a cada ano por doenças relacionadas com a água e quase um terço da população mundial não dispõe de saneamento adequado. Uma realidade assustadora considerando que já estamos alcançando o primeiro quarto do Século 21.

Estes índices são agravados pelo fato de que a meta do Objetivo de Desenvolvimento do Milênio para o saneamento, que visava reduzir em 50% o percentual da população mundial sem atendimento, não esteve nem perto de ser alcançada. Agora, os Objetivos de Desenvolvimento Sustentável visam uma cobertura completa, o que é ainda mais ambicioso. Como a publicação frisa, nos próximos 12 anos os serviços de saneamento precisarão atender mais de 3 bilhões de pessoas em áreas urbanas, sendo 5,5 bilhões ao todo. Os gastos, portanto, devem seguir esta mesma tendência para cobrir os US$ 45 bilhões em custos anuais apenas nas áreas urbanas, valor até cinco vezes mais alto do que está investido atualmente.

A velha política de “negócios como sempre” não vai nos ajudar. Embora isso represente um enorme montante para o nosso já sobrecarregado fundo público, não devemos deixar nosso esforço ser enfraquecido. Em vez disso, devemos ser mais inteligentes quando se trata do nosso investimento, tanto de dinheiro quanto de vontade política, para garantir que o saneamento seja financiado de forma suficiente e inteligente.

Benedito BRAGA
Presidente
Conselho Mundial da Água

Uma grande mudança na forma de pensar sobre como fazemos o saneamento deve acontecer se quisermos oferecer uma resposta convincente a esses problemas, e as conclusões deste relatório fornecem muitas soluções promissoras. Aqui, as recomendações políticas oferecem respostas preventivas às tendências que sabemos que continuarão a se desenvolver ao longo dos próximos anos.

Já falei anteriormente sobre os três Is, três pilares essenciais sobre os quais uma política efetiva de água é estabelecida – Instituições, Infraestrutura e Investimento – e este relatório mostra como os três têm um papel a desempenhar. Instituições devem se unir para promover economias circulares dos recursos tratados de águas residuais e permitir fluxos financeiros através de instrumentos de financiamento novos e já existentes. A infraestrutura pode reduzir custos ao mudar do tradicional saneamento por redes de esgoto para as soluções localizadas. O investimento deve aumentar por meio de uma governança aperfeiçoada e de incentivo ao bom desempenho dos prestadores de serviços.

A gestão da água e o saneamento em particular precisam ser o cerne das discussões políticas globais já que abordagens integradas são a única garantia de um futuro sustentável. O saneamento é, ao mesmo tempo, uma questão ambiental, social e econômica e o saneamento efetivo impacta positivamente as vidas e os meios de subsistência de milhões em todo o mundo. Convido você a ler essas recomendações políticas e a se juntar ao debate necessário para a mudança.

Ao iniciar seu primeiro projeto sobre mecanismos financeiros inovadores para o saneamento urbano, o Conselho Mundial da Água preparou um estudo analítico baseado em oito cidades de diferentes continentes que concordaram em participar do programa. O Conselho Mundial da Água reconhece a contribuição voluntária dessas oito cidades e gostaria de expressar gratidão pelo compromisso em melhorar os serviços de saneamento.

Este projeto permitiu a avaliação da potencial capacidade dessas cidades em atingir um dos principais requisitos para se alcançar o Objetivo de Desenvolvimento Sustentável 6, tendo em mente que outras duas áreas prioritárias – nomeadamente a aquisição adequada de conhecimento e tecnologias adaptadas e a governança relacionada à gestão de águas residuais – também são necessárias para alcançar o ODS6. O projeto também contribui para a compreensão de princípios básicos de mecanismos financeiros inovadores para melhor apoiar o desenvolvimento do setor de saneamento e identifica as mensagens que serão destacadas às principais partes interessadas, especialmente os tomadores de decisão, profissionais, doadores e a sociedade civil.

Para o Conselho Mundial da Água e seus parceiros, a apresentação dos resultados do projeto no 8º Fórum Mundial da Água, em Brasília (Brasil), proporcionará a oportunidade de considerar a extensão da análise para um maior número de cidades. Esta análise poderia começar já em 2019 com o objetivo de compartilhar os resultados no 9ª Fórum Mundial da Água, em Dakar (Senegal).

O Conselho Mundial da Água deve prosseguir com este esforço, em perfeita coordenação com as instituições e organizações internacionais envolvidas no projeto.

Hachmi KENNOU
Presidente da Força-Tarefa do Conselho Mundial da Água
“Cidades: No cerne do crescimento”
Conselho Mundial da Água

AGRADECIMENTOS

Este programa de trabalho foi concebido e dirigido pela Força-Tarefa das Cidades do Conselho Mundial da Água sob a liderança de Hachmi Kennou; Teresa Liguori é a Diretora de Projetos para este programa de trabalho e comissionou e gerenciou todos os consultores; Tom Soo, então Diretor Executivo do Conselho Mundial da Água, deu conselhos estratégicos valiosos.

Este relatório foi escrito por Jon Lane, consultor-coordenador do Conselho Mundial da Água para este programa de trabalho. Quaisquer erros, omissões ou opiniões subjetivas são de sua responsabilidade.

Os consultores nacionais que realizaram os estudos de caso de cada cidade foram: Abdelaziz Enasri, Diego Fernandez, Vikki Ferrer, John Gathenya, Murty Jonnalagadda, Neil Macleod, Cesar Seara e Moustapha Sene.

O Conselho Mundial da Água e o autor agradecem aos seguintes colegas do setor que analisaram as versões preliminares deste relatório: Guy Hutton (UNICEF), Dennis Mwanza (Fundação Gates), Maimuna Nalubega (Banco Africano de Desenvolvimento), Lesley Pories (Water.org), Sophie Trémolet (Banco Mundial) e Chris Zurbrügg (EAWAG).

O Conselho Mundial da Água e o autor agradecem a muitos colegas do setor que forneceram informações, material publicado e não publicado, opiniões e conselhos; eles estão listados no Anexo 2. Dentre eles, Sophie Trémolet, do Banco Mundial, foi particularmente generosa em compartilhar o trabalho e os dados publicados e não publicados sobre financiamento do saneamento, sobre o qual este relatório se baseou amplamente.

O Conselho Mundial da Água quer que este trabalho seja aberto, colaborativo e reconheça plenamente as contribuições e propriedades intelectuais de outros. De fato, o Conselho, com a vantagem única de ser criador e organizador dos Fóruns Mundiais da Água, deseja disponibilizar seus canais de divulgação e comunicação para outros colegas e parceiros para propagar suas mensagens sobre esse assunto.

BREVE APRESENTAÇÃO

O relatório segue uma sequência lógica: primeiro discute como o saneamento urbano deveria ser até 2030, depois, examina como o saneamento seria financiado, e então identifica o que os decisores podem fazer agora para aumentar esses fluxos financeiros.

INTRODUÇÃO

O saneamento foi um dos setores monitorados pelos Millennium Development Goals (Objetivos de Desenvolvimento do Milênio) com pior desempenho. Agora, o Sustainable Development Goal (Objetivo de Desenvolvimento Sustentável) é significativamente mais oneroso do que o objetivo dos ODM foi em dois aspectos. Em primeiro lugar, visa ao saneamento para todos, em vez de apenas reduzir à metade as pessoas sem saneamento. Em segundo lugar, visa saneamento gerenciado de forma segura (o uso de instalações melhoradas que não são compartilhadas com outras famílias e onde os excrementos são descartados de forma segura ou transportados e tratados fora do local) em vez de apenas para saneamento básico (o uso de instalações melhoradas que não são compartilhadas com outras famílias). Alcançar a meta dos ODS, portanto, envolverá um enorme esforço operacional e financeiro. O Conselho Mundial da Água oferece este relatório, juntamente com oito estudos de caso de cidades anexos, como uma contribuição para esse esforço coletivo e global.

Embora o Conselho reconheça que o saneamento rural continua a ser importante, está concentrando sua atenção no saneamento urbano, porque os serviços de saneamento urbano precisam atingir mais de três bilhões de pessoas nos próximos 12 anos, os desafios técnicos são mais complicados, os custos são mais elevados e a economia e os benefícios sociais do sucesso são muito maiores. Por isso, este relatório diz respeito ao saneamento urbano.

O relatório segue uma sequência lógica: primeiro discute como o saneamento urbano deveria ser até 2030, depois, examina como o saneamento seria financiado, e então identifica o que os decisores podem fazer agora para aumentar esses fluxos financeiros.

COMO PODERIA SER O SANEAMENTO URBANO ATÉ 2030?

A análise das tendências atuais e ideias inovadoras gera uma visão otimista para o ano 2030. Nesta visão, o saneamento urbano será uma ferramenta para o progresso e não um problema que gere preocupação.

O caso econômico e comercial para melhorar o saneamento será bem compreendido. O saneamento urbano será um setor de serviços e não um setor de infraestrutura. A reutilização segura e economicamente produtiva de excrementos humanos como recursos será parte integrante dos serviços de saneamento. Saneamento por rede de esgotos, saneamento no local e saneamento com uso de recipientes coletores coexistirão. Os papéis dos governos, dos municípios, do setor privado e da sociedade civil refletirão os pontos fortes de cada um. Eles seguirão o conceito de saneamento inclusivo em toda a cidade, em que todas as organizações preocupadas com o saneamento em uma determinada cidade se reúnem e chegam a um acordo quanto à melhor forma de servir à população.

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COMO FINANCIAR O SANEAMENTO URBANO?

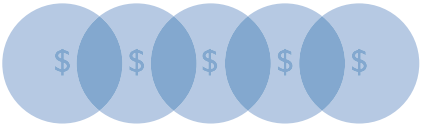
O tipo de financiamento que utiliza as estratégias atuais exigiria cerca de US$ 45 bilhões por ano para o saneamento urbano, o que é cinco vezes maior que o atual nível de gastos. Isso parece assustador, mas há duas maneiras principais para alcançá-lo. O primeiro é reduzir a cifra inicial de US$ 45 bilhões ao ano por uma mudança estratégica de ênfase do saneamento por rede de esgoto para o saneamento no local e por recipientes coletores, que custam apenas metade do saneamento por rede de esgoto. O segundo é tornar os prestadores de serviços de saneamento (sejam eles órgãos públicos municipais, empresas do setor privado ou ONGs, grandes ou pequenas) financeiramente viáveis e estáveis, reduzindo suas despesas e/ou aumentando suas receitas. Este relatório propõe várias ideias para fazer as duas coisas. De longe, a ideia mais significativa para reduzir as despesas é a mudança do saneamento por rede de esgoto para o saneamento no local e com uso de recipiente coletor mencionado acima. As ideias mais significativas para aumentar as receitas são que os reguladores reformulem as tarifas – notadamente, para que as pessoas ricas subsidiem as pessoas pobres – e que os governos nacionais reconheçam e quantifiquem o valor monetário dos benefícios sociais e econômicos do saneamento e paguem esse valor aos prestadores de serviço.

Se os prestadores de serviços forem financeiramente viáveis e estáveis, eles poderão atrair novos financiamentos. As fontes desse novo financiamento não serão os governos e os doadores que já estão sobrecarregados, serão as somas de dinheiro sem precedentes economizadas pelas pessoas em todo o mundo. Essas pessoas e seus consultores e intermediários financeiros estão sempre procurando empresas para investir seu dinheiro. Quando confiarem no business case para as empresas de saneamento, eles vão investir dinheiro nelas. Assim, o financiamento necessário para alcançar o ODS de saneamento deixará de ser uma dor de cabeça para organismos financiadores para se tornar uma oportunidade de mercado para os investidores.

O elemento crítico desta sequência é como o dinheiro dos investidores chegará às empresas de saneamento. Este relatório propõe várias ideias inovadoras para permitir o aumento de fluxo financeiro. Algumas sugestões são instrumentos financeiros específicos, enquanto outros são mecanismos financeiros. Deste modo, a proposta com o maior impacto potencial é o mecanismo de financiamento multipartidário que pode permitir que muitos investidores diferentes ofereçam suporte a muitas empresas diferentes simultaneamente, através de uma única plataforma com sistemas comuns de monitoramento e relatórios. Esse relatório dá o título de “estruturas de financiamento de saneamento” a essa plataforma. As estruturas de financiamento de saneamento poderiam assumir diferentes formas legais e poderiam ser criadas em nível nacional, regional ou mesmo global. Outros setores comerciais têm plataformas similares, mas para o saneamento urbano, seriam conceitos desconhecidos que exigiriam pioneiros resolutos.

Essas inovações financeiras serão apoiadas por três elementos colaborativos principais: medição dos resultados dos serviços de saneamento; monetização dos benefícios sociais do saneamento melhorado; e criação de confiança entre todas as partes interessadas.

US$ 45 bilhões por ano
no saneamento urbano



cinco vezes maior que o atual nível de gastos

O QUE OS DECISORES PODEM FAZER AGORA PARA AUMENTAR OS FLUXOS FINANCEIROS?

Essas inovações financeiras só terão sucesso se os decisores em muitos níveis as permitirem. Este relatório, portanto, estimula todos os grupos de decisores: em primeiro lugar, os políticos nacionais e, depois, os líderes municipais, reguladores, empresários, banqueiros, investidores e a comunidade internacional de desenvolvimento. Aqui estão algumas das ações importantes para esses vários grupos:

- Estabelecer órgãos estatutários independentes para definir as tarifas e regras.
- Definir claramente os papéis das várias instituições e entidades, para dar confiança aos investidores para apoiar os prestadores de serviços de saneamento.
- Introduzir e aplicar normas e regulamentos nacionais e locais para a qualidade e venda dos produtos fabricados a partir de excrementos humanos tratados, para incentivar o florescimento de conceitos e atividades de economia circular.
- Realocar os fundos de subsídios de estações de saneamento e tratamento de esgotos dispendiosos para sistemas descentralizados muito mais baratos, gestão de lama fecal e infraestrutura para saneamento com uso de recipientes coletores.
- Incentivar os bancos comerciais e os investidores a entrarem no setor, mitigando os riscos e os custos para eles.
- Reconhecer a contribuição do saneamento para a saúde pública e o meio ambiente, contribuindo financeiramente para as despesas operacionais dos prestadores de serviços.
- Ativar e incentivar os mercados de produtos de saneamento para serem clientes de fertilizantes, energia e outros produtos gerados pelas empresas de economia circular de saneamento.
- Ver o saneamento dos países em desenvolvimento como um novo setor empresarial para conseguir a vantagem de ser o pioneiro.
- Desenvolver e investir em empresas ao longo da cadeia de valor de saneamento.
- Incentivar os municípios e os investidores comerciais a colaborarem e investirem conjuntamente, a fim de obter ganhos de escala.

CONCLUSÃO

Entre toda a complexidade e detalhes, há três mensagens fundamentais para todos os interessados no saneamento urbano:

- Economizar enormes quantidades de dinheiro, deslocando a ênfase do saneamento por rede de esgoto para o saneamento no local e com uso de recipiente coletor.
- Aumentar os fluxos financeiros usando uma variedade de instrumentos e mecanismos de financiamento existentes e novos.
- Atrair dinheiro novo para o setor, melhorando as condições de governança e o desempenho dos prestadores de serviços.

Se as pessoas com poder, boa vontade e visão se juntarem audazmente nesta causa, elas podem atrair o aumento dos financiamentos necessários para alcançar o ODS de saneamento e criar cidades em que pessoas felizes e saudáveis possam levar vidas de forma sustentável.

INTRODUÇÃO AO PROGRAMA DE TRABALHO DO CONSELHO MUNDIAL DA ÁGUA SOBRE FINANCIAMENTO DE SANEAMENTO

A DEFINIÇÃO DE SANEAMENTO PARA OS FINS DESTE PROGRAMA DE TRABALHO

Para este programa de trabalho, o saneamento é definido como o gerenciamento, tratamento e reutilização de excrementos humanos. A água residual (águas disponíveis nas cozinhas, banheiros, etc.) é muitas vezes gerenciada com os excrementos humanos e os resíduos sólidos compostáveis podem ser gerenciados juntamente com excrementos humanos. Assim, este programa de trabalho também considera a água residual e os resíduos sólidos compostáveis nessas situações, com base no contexto local. A drenagem das águas pluviais está associada ao esgoto em algumas cidades, mas este programa de trabalho não estuda a drenagem das águas pluviais propriamente dita.

O programa de trabalho é sobre o financiamento de saneamento, não sobre saneamento em geral: só estuda o saneamento o suficiente para a análise de seu financiamento.

OS MOTIVOS PARA A REALIZAÇÃO DO PROGRAMA DE TRABALHO

Desde que os Objetivos de Desenvolvimento do Milênio (ODM) foram estabelecidos, em 2000, foram feitos esforços globais combinados para melhorar o acesso sustentável à água potável e ao saneamento básico. O objetivo dos ODM da água foi alcançado, enquanto o objetivo de saneamento não foi: um terço das pessoas do mundo ainda não têm saneamento básico. Agora que os ODMs foram substituídos pelos Objetivos de Desenvolvimento Sustentável (ODS), a definição de saneamento adequado tornou-se mais rigorosa, nomeadamente através do conceito de "saneamento gerenciado de forma segura", e assim os números de saneamento parecem ainda piores[1].

Apesar de os benefícios econômicos e de saúde do acesso ao saneamento terem sido amplamente pesquisados e reco-nhecidos, a questão geralmente tem baixa prioridade para os políticos nacionais e outros decisores.

Em comparação com muitos outros setores de desenvolvimento, o saneamento ainda é um tópico especializado e de menor importância para doadores e financiadores concessionais, e muito menos para investidores comerciais.

Embora o número absoluto de pessoas em áreas rurais sem acesso a saneamento adequado seja ainda maior do que nas áreas urbanas, a migração e o crescimento rápido da população urbana estão tornando a situação mais aguda em áreas urbanas. As estatísticas urbanas mascaram grandes disparidades entre pessoas ricas e pobres. O saneamento urbano é tecnicamente mais difícil e mais caro do que o rural. Os custos de saúde, econômicos e sociais do saneamento urbano inadequado são maiores.

O saneamento urbano tem sido tradicionalmente visto como um complemento para a água, consistindo em estações de tratamento de esgoto e águas residuais: esta solução é conveniente para aqueles que têm a sorte de poder pagar, mas custa muito dinheiro e precisa de muita água. Existem soluções adequadas de baixo custo, mas são mal explicadas ou compreendidas. Portanto, porque percebem que o saneamento é caro e difícil, muitas cidades ao redor do mundo fizeram muito pouco sobre isso. Os próprios moradores tiveram de melhorar o seu próprio saneamento, muitas vezes de forma ad hoc e não regulamentada.

Por todas estas razões, o Conselho Mundial da Água iniciou este programa de trabalho para identificar e divulgar mecanismos financeiros – especialmente inovadores – que poderiam ajudar a expandir e acelerar os serviços de saneamento urbano em todo o mundo.

1 As definições autorizadas de todos os termos, como gerenciamento adequado e seguro do saneamento básico, estão no site do Programa de Monitoramento Conjunto www.washdata.org. O maior impacto no financiamento de saneamento é que o saneamento gerenciado com segurança requer a eliminação ou reutilização adequada de todos os excrementos humanos.

Por todas estas razões, o Conselho Mundial da Água iniciou este programa de trabalho para identificar e divulgar mecanismos financeiros – especialmente inovadores – que poderiam ajudar a expandir e acelerar os serviços de saneamento urbano em todo o mundo.

O CONTEÚDO DO PROGRAMA DE TRABALHO

O programa de trabalho tem dois elementos principais: estudos de caso de oito cidades por consultores nacionais e análise geral pelo consultor-coordenador.

As cidades foram selecionadas pelo Conselho Mundial da Água através de suas redes profissionais, com base em seu interesse expresso neste trabalho e sua disposição para experimentar mecanismos de financiamento inovadores. Estão espalhadas pela África, Ásia e América do Sul, e variam em população, riqueza, estruturas políticas e de cobertura de saneamento, tecnologias e prestadores de serviços. Os estudos de caso ilustram sucessos, desafios e aspirações futuras relacionadas ao financiamento de saneamento. Alguns já começaram a inovar, mas isso não foi obrigatório ao selecioná-los para este estudo. As cidades são: Baguio (Filipinas), Blumenau (Brasil), Bogotá (Colômbia), Dakar (Senegal), eThekwini (Durban, África do Sul), Jodhpur (Índia), Marraquexe (Marrocos), Nairóbi (Quênia).

Cada consultor nacional seguiu um quadro analítico consistente que incluía um breve histórico sobre o país e sobre a cidade de estudo, informações detalhadas sobre financiamento de saneamento na cidade em estudo e análise. Cada um deles trabalhou em estreita colaboração com a autoridade responsável pelo saneamento nessa cidade, coletando dados dessa autoridade e de outras organizações relevantes. O resultado deste trabalho é um conjunto de oito estudos de caso, publicados pelo Conselho Mundial da Água, que podem ser lidos individualmente ou em paralelo a este relatório.

O trabalho do consultor coordenador baseia-se no conhecimento e estudo pessoal e no bom trabalho já realizado por outras pessoas no financiamento de saneamento. Também se baseia em exemplos, opiniões e informações dos estudos de caso das oito cidades. O resultado deste trabalho é esse relatório.

FINALIDADE E ESTRUTURA DO RELATÓRIO

Este relatório não é um documento acadêmico, mas uma introdução descritiva ao tema do financiamento do saneamento urbano. O objetivo é defender o aumento dos fluxos financeiros para o saneamento, a fim de ter uma visão positiva do setor até 2030. Descreve e analisa o assunto e gera implicações políticas e mensagens para os decisores. O Conselho Mundial da Água pretende que este relatório desencadeie ações relevantes dos decisores-alvo e que também estimule outras pessoas a realizarem mais análises das necessidades, mecanismos e fontes de financiamento.

O relatório segue uma sequência lógica: primeiro visando como os serviços de saneamento urbano deveriam ser em 2030, depois analisando como esses serviços seriam financiados, e, por último, identificando quais decisões precisam ser tomadas agora e por quem para aumentar esses fluxos financeiros.

A seção final, sobre as decisões a serem tomadas agora, também está sendo resumida em um pequeno folheto que pode ser lido rapidamente por líderes ocupados. Esse folheto deve conter tudo o que eles precisam saber para tomar decisões, enquanto sua equipe e colegas estudam as matérias mais detalhadas em seu nome.

Este relatório combina material genérico obtido por enquete pessoal, entrevistas com especialistas e estudo de publicações, com lições específicas extraídas dos oito casos de estudo de cidades. Essas lições são incorporadas no texto principal e os estudos de casos individuais são apresentados de forma resumida nos Anexos.

PRÓXIMAS ETAPAS NESTE TRABALHO

Este será um programa de trabalho permanente para o Conselho Mundial da Água. Várias sessões e atividades estão planejadas no 8º Fórum Mundial da Água em Brasília, no qual este relatório está sendo lançado. Após esse Fórum, o Conselho continuará com vários canais de trabalho, incluindo o apoio às oito cidades de estudo para serem as primeiras a adotar e a defender esta matéria. Também funcionará globalmente junto com outros para ajudar a promover os mecanismos de financiamento inovadores descritos neste relatório.

I. COMO PODERIA SER O SANEAMENTO URBANO EM 2030?

Para os profissionais que já trabalharam neste campo durante 20 ou 30 anos, projetar outros 12 anos não é uma prospectiva especulativa, mas uma previsão informada baseada nas tendências atuais e nas ideias vindouras. Essa é a base desta seção do relatório. O tom subjacente é flagrantemente positivo e otimista: imaginando que o saneamento urbano pode ser bem gerenciado e adequadamente financiado até 2030, ao mesmo tempo que examina como esse otimismo pode ser justificado.

1.1
O CONTEXTO DEMOGRÁFICO E POLÍTICO

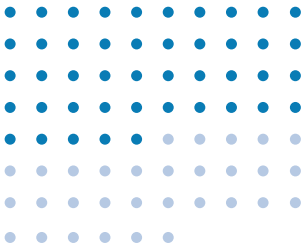
De acordo com as estatísticas e projeções do UN-DESA, existem agora 7,6 bilhões de pessoas no mundo, das quais 3,1 bilhões vivem em áreas urbanas em regiões menos desenvolvidas. Até 2030 haverá 1 bilhão de pessoas a mais, as quais, quase todas, viverão nas mesmas áreas urbanas nas mesmas regiões menos desenvolvidas. Isso significa mais um bilhão de bocas para alimentar e mais um bilhão de indivíduos com necessidades de saneamento adequado.

Os Objetivos de Desenvolvimento Sustentável (ODS), compreensivelmente, definem metas mais rigorosas do que os do Desenvolvimento do Milênio (ODM). Especificamente, no saneamento urbano, os dados do Programa Conjunto de Monitoramento da ONU mostram que, em 2015, 83% da população urbana do mundo melhoraram o saneamento (esta foi a definição do objetivo do ODM – instalações projetadas para separar higienicamente excrementos do contato humano) mas apenas 43% tinham saneamento gerenciado com segurança (esta é a definição-alvo do ODS – instalações de saneamento melhoradas, não compartilhadas com outras famílias, das quais os excrementos produzidos devem ser tratados e descartados in situ, armazenados temporariamente e depois esvaziados e transportados para tratamento fora do local ou transportados através de um esgoto com águas residuais e depois tratados fora do local). Isso significa que 40% da população urbana mundial melhoraram as instalações de saneamento compartilhadas com outras famílias ou melhoraram as instalações de saneamento, nas quais os excrementos não eram devidamente tratados.

Esses números em destaque, onerosos como são, escondem grandes disparidades entre ricos e pobres. As áreas urbanas são diversas em termos de condições socioeconômicas, padrões de assentamento, infraestrutura e serviços. Os bairros ricos são muitas vezes muito bem atendidos com o saneamento, enquanto as áreas pobres (especialmente as favelas) estão muito piores. Esta questão da desigualdade é um grande problema político e demográfico.

A fim de alcançar os objetivos de ODS para o saneamento, até 2030, um extra de 3,2 bilhões de pessoas urbanas e mais 2,1 bilhões de pessoas rurais terão de conseguir um saneamento gerenciado de forma segura, enquanto os excrementos de todos os 8,6 bilhões de pessoas no mundo devem ser tratados.

Até 2030, os líderes da humanidade estarão lutando para encontrar um equilíbrio entre melhorar a qualidade de vida para bilhões de pessoas em crescimento e conservar a estabilidade e a saúde do ambiente natural de que eles e todas as outras espécies dependem. Os decisores precisam tomar medidas historicamente sem precedentes para alcançar e manter esse equilíbrio. Os profissionais de saneamento podem ajudar esses líderes a transformar os excrementos humanos de um desperdício em um recurso e oferecendo saneamento urbano como uma ferramenta para o progresso e não como outro problema que gere preocupação. Isso pode ser feito revendo maneiras convencionais de trabalhar e aplicando algumas ideias novas tanto sobre o serviço de saneamento quanto sobre seu financiamento.



7,6 bilhões
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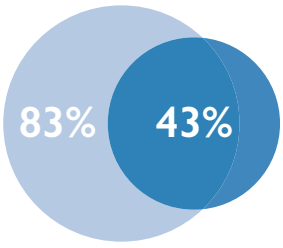
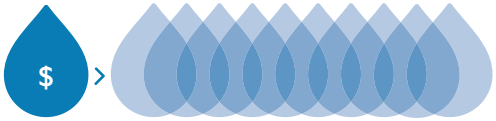


Em 2015, **83%** da população urbana mundial dispunha de saneamento aperfeiçoado mas apenas **43%** tinha saneamento gerenciado de forma segura *Programa Conjunto de Monitoramento da ONU

1.2 CASOS ECONÔMICO E DE NEGÓCIOS PARA MELHORAR O SANEAMENTO

O caso econômico e o caso de negócios são frases semelhantes, mas se referem a diferentes aspectos do saneamento. O caso econômico para melhorar o saneamento demonstra que o saneamento melhorado beneficia a economia nacional ou local. O caso de negócios para saneamento demonstra que as empresas podem administrar empresas lucrativas que trabalham na melhoria do saneamento. Já em 2018, tanto o caso econômico como o caso de negócios estão bem estabelecidos, como descrito abaixo. Dadas as bases de seus cálculos e as tendências atuais, até 2030 ambos os casos se tornarão mais fortes.



As cifras típicas mostram que **US$ 1** investido em água e saneamento rende algo na ordem de **US$ 5 a US$ 10** de benefícios econômicos

O caso econômico

Isso aborda essencialmente a questão de por que os políticos devem se preocupar com o saneamento urbano em geral e com o saneamento universal de gestão segura em particular. Constrói-se um caso econômico através da quantificação dos benefícios devido ao saneamento melhorado.

Vários estudos demonstraram o bom retorno econômico ao investir em água e saneamento melhorados. Geralmente, seu formato tem sido calcular apenas os benefícios econômicos mais diretamente relacionados, ou seja, as economias de tempo associadas a um melhor acesso às instalações de água e saneamento, o ganho de tempo produtivo devido ao menor tempo gasto, o setor de saúde e os custos economizados dos pacientes devido a menor tratamento de doenças diarreicas e óbitos prevenidos. A autoridade reconhecida nessas análises econômicas é Guy Hutton, originalmente para a OMS e, posteriormente, como parte de uma equipe que conduziu a Iniciativa Econômica de Saneamento no Programa Água e Saneamento / Banco Mundial. Os resultados da OMS e da IES são tipicamente enquadrados, no nível global, regional ou nacional, tanto em termos de benefício: análise de custos de investimento em saneamento quanto em termos do PIB perdido por saneamento deficiente. Os números típicos são que US$ 1 investido em água e saneamento rende de US$ 5 a 10 em benefícios econômicos e que o saneamento deficiente custa de 2 a 6% de seu PIB. Estes são números extremamente significativos. Embora esses estudos anteriores não proporcionassem análises separadas de áreas rurais e urbanas, o artigo recente de Hutton para o Centro de Consenso de Copenhague sobre os benefícios e os custos de água e saneamento fornece a repartição específica para o saneamento urbano, com base em números e custos de 2015. Dá um benefício: custo entre 2,5 e 3, dependendo dos pressupostos econômicos utilizados.

Por mais fortes que essas análises sejam, em geral, elas provavelmente subestimam o caso político para o saneamento porque não quantificam os benefícios que não se relacionam tão diretamente com saneamento, como os benefícios para o meio ambiente, os sentimentos de segurança, conveniência, status e bem-estar das pessoas e, finalmente, com o desenvolvimento econômico nacional. O caso político para o saneamento pode até mesmo reconhecer seu impacto no turismo, no comércio internacional e no investimento econômico internacional, na estabilidade política e na redução da migração e do deslocamento de pessoas.

A análise dos benefícios de quantificação acima é, em terminologia econômica, a monetização das externalidades de saneamento melhorado. Este será um aspecto vital das futuras soluções de financiamento para o saneamento e será discutido mais adiante na seção 2.6 abaixo.

O caso de negócios

Isso aborda a questão de por que os empresários deveriam estar interessados em trabalhar em saneamento urbano. Em países de alta renda, já existem muitas empresas de todos os tamanhos que administram negócios bem-sucedidos em saneamento; seus acionistas e gerentes estão bem cientes do caso de negócios para trabalhar em saneamento urbano. Quanto aos países de média e baixa renda, o quadro é mais variável. Certamente, muitas empresas estão tirando seus sustentos do saneamento urbano, mas tendem a ser empreendedores menores ou empresas familiares que operam frequentemente na economia informal, em vez de grandes empresas que operam na escala da cidade: por exemplo, das oito cidades de estudo, só uma, Blumenau, tem uma empresa privada que gerencia o saneamento para toda a cidade.

Durante quase 20 anos desde que este tema foi originalmente defendido pelo Governo da Suíça, várias agências de desenvolvimento trabalharam para estudar, divulgar e defender que as empresas participem no saneamento urbano. Este movimento, mais recentemente, tem sido impulsionado pela atenção dada às mudanças climáticas, ao meio ambiente e ao conceito da economia circular, pois essas considerações estão fazendo os negócios relacionados com o saneamento intrinsecamente mais rentáveis do que costumavam ser.

Uma das agências mais ativas na promoção do caso de negócios para o saneamento urbano é o Toilet Board Coalition – TBC (Conselho de Coalizão de Toaletes), que é uma organização para promover as contribuições que empresários e empresas do setor privado possam fazer para o saneamento em países em desenvolvimento. O TBC estima que os recursos dos toaletes (o novo nome que o TBC criou para o que era anteriormente conhecido como excrementos ou dejetos humanos) totalizavam 3,8 trilhões de litros por ano globalmente, com um valor econômico de muitos bilhões de dólares. O TBC e outros defensores estão encorajando os empreendedores a ver o saneamento urbano nos países em desenvolvimento como um novo setor empresarial para conseguir a vantagem de ser o pioneiro. Eles acreditam que os empresários podem desenvolver negócios ao longo da cadeia de valor de saneamento, para atrair vários investidores diferentes.

Para fortalecer o caso de negócios, os investidores procuram fatores que atenuem os riscos e os custos para eles. Além das características específicas do próprio negócio, esses fatores poderiam incluir: um quadro político claro para o saneamento urbano; definição clara dos papéis de diferentes organizações governamentais e do setor privado; legislação e regulamentação aplicada em tribunais; uma prefeitura estável e comprometida, preferivelmente disposta a coinvestir junto com investidores comerciais. Esses fatores de governança são muito importantes para construir o caso de negócios. As necessidades dos investidores são mencionadas novamente na seção 2.6 abaixo.

1.3 SANEAMENTO INCLUSIVO EM TODA A CIDADE

Em 2018, este é um conceito emergente[2]; até 2030 deve ser a norma. O princípio básico é o simples senso comum, que todas as organizações preocupadas com o saneamento em uma determinada cidade se unam e cheguem a um acordo sobre a melhor forma de atender a todas as pessoas dessa cidade. Parece fácil, mas ainda não se generalizou: por exemplo, do estudo de oito cidades apenas eThekwini e Dakar realmente compreenderam e adotaram até a data. É essencialmente um conceito de governança que combina marcos de planejamento, papéis institucionais acordados, legislação e regulamentação. Cada cidade é única, mas existem certos princípios subjacentes que se aplicam a todas as cidades:

- Trabalhar em parceria para entregar os serviços de saneamento em toda a cidade. Incorporar o saneamento dentro da governança urbana como um todo; estabelecer papéis e responsabilidades claras que utilizem os pontos fortes dos vários tipos de organização; articular e construir demanda através da sociedade civil; trabalhar juntos no mapeamento, planejamento, concepção e implementação de serviços de saneamento.
- Abraçar a diversidade. Promover uma diversidade de conceitos de governança, estruturas de planejamento, prestadores de serviços, soluções técnicas e mecanismos financeiros para atender a todos; evitar tentar impor uma solução para toda a cidade.
- Cumprir o direito humano ao saneamento. Identificar desigualdade; alcançar as pessoas mais vulneráveis e marginalizadas; focar em assentamentos informais; garantir acessibilidade para as pessoas mais pobres; definir políticas tarifárias em conformidade.
- Reconhecer que o saneamento contribui para uma economia urbana próspera. Integrar o saneamento no planejamento urbano; usar conceitos de economia circular para aumentar a recuperação e reutilização de recursos; associar saneamento melhorado ao progresso em outros setores de desenvolvimento urbano e social.
- Alcançar o gerenciamento seguro ao longo de toda a cadeia de serviços de saneamento. Permitir soluções e abordagens diversas; promover o tratamento descentralizado em vez dos sistemas centralizados; selecionar e usar as melhores tecnologias para cada etapa da cadeia de serviços.

Nenhuma dessas ideias é estranha ou difícil de entender. O esforço está em realmente aplicá-las. Pessoas, especialmente líderes e decisores, precisam mudar a forma de trabalhar. Aqueles que anteriormente assumiram todo o poder – tipicamente os líderes municipais – precisam ter dignidade e visão para ver que podem compartilhar esse poder com os outros sem se depreciar. As outras partes interessadas precisam reconhecer isso e apoiar essa mudança.

Várias partes externas interessadas estão tentando estimular líderes municipais a assumirem o saneamento inclusivo em toda a cidade. Um método incomum é dar prêmios. Por exemplo, o Desafio do Saneamento para Gana é um mecanismo, iniciado pelo Departamento do Reino Unido para o Desenvolvimento Internacional, para estimular o interesse entre as prefeituras, oferecendo-lhes prêmios para as melhores estratégias de gerenciamento de dejetos líquidos. O desafio gerou grande interesse entre os municípios de todo o país e recentemente foi ampliado para parceiros do setor privado e ONGs. O governo de Gana apoia fortemente o trabalho das prefeituras através da revisão de acordos e regulamentos de governança. Todo o processo ajudou as prefeituras a pensarem de forma criativa, trabalharem com outros em parcerias inclusivas e a projetarem e implementarem estratégias sustentáveis de gerenciamento de dejetos líquidos que conduzam à entrega de serviços de saneamento em toda a cidade.

2 Este conceito foi criado por um grupo de organizações, incluindo o Banco Mundial, a Fundação Gates, WaterAid, Emory, Universidade de Leeds e outras.

1.4 SANEAMENTO COMO SETOR DE SERVIÇOS

Desde os pioneiros programas municipais do século XIX, o saneamento tem sido, geralmente, classificado como um setor de infraestrutura. Isso o direcionou automaticamente para engenharia civil, grandes projetos de capital que precisam de grandes montantes de dinheiro, planejamento centralizado, recursos a fundos irrecuperáveis, resultados rígidos. Planejadores e engenheiros dominaram o setor. Enquanto isso, o saneamento inadequado é frequentemente rotulado como um problema de saúde pública – colocando a carga de resolvê-lo unicamente sobre os governos e os doadores interessados. Os proprietários de casas foram classificados como destinatários ou beneficiários, que são essencialmente papéis passivos.

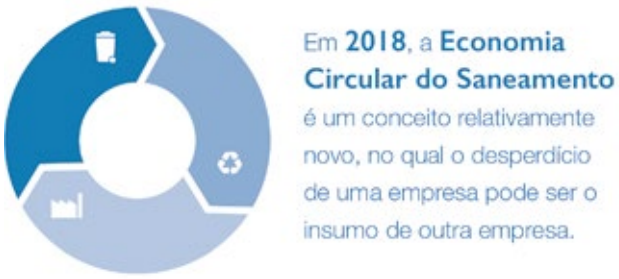
As telecomunicações também foram anteriormente classificadas como um setor de infraestrutura, financiado com recursos a fundo perdido de telefones fixos. Mas agora, com todas as tecnologias flexíveis e modelos de negócios e a gama de meios de comunicação disponíveis para os usuários, transformou-se completamente em um setor de serviços e atraiu muitos investidores e prestadores de serviços. Assim também com o saneamento: com a proliferação de novas ideias (modelos de negócios, opções de serviços, soluções tecnológicas, etc.) ao longo da cadeia de valor de saneamento e um novo foco nos proprietários de casas como clientes, as percepções estabelecidas já começaram a mudar, e até 2030 o saneamento urbano não deverá ser mais classificado como infraestrutura, mas como setor de serviços.

Um relacionamento de serviço precisa de clientes e prestadores de serviços. Para o saneamento urbano, os clientes são pessoas, geralmente classificadas como proprietários de casas porque o saneamento é predominantemente um serviço relacionado à vida doméstica. Os prestadores de serviços são todas as organizações, tanto do setor público quanto do privado, que prestam serviços a esses proprietários de casas. Estes incluem, por exemplo, educadores que explicam os benefícios do saneamento melhorado, os pedreiros que constroem os sanitários e escavam fossas, os empreiteiros que esvaziam as fossas, os empresários que fornecem e atendem sanitários com uso de recipientes coletores, grupos comunitários ou empresas que criam e gerenciam sanitários compartilhados e públicos, concessionárias que constroem redes de esgoto e estações de tratamento de esgoto, empresas especializadas que processam os recursos sanitários transformando-os em commodities desejáveis, como água, combustível, composto ou produtos químicos. É uma grande variedade de tipos e tamanhos de empresas com uma característica comum: todos ganham a vida atendendo às necessidades de saneamento de seus clientes. Entre esses prestadores de serviços, um deles – tipicamente a prefeitura ou as concessionárias – é, em última instância, responsável pela prestação deste serviço e pela coordenação dos outros prestadores de serviços.

1.5 ECONOMIA CIRCULAR DE SANEAMENTO

Em 2018, a economia circular de saneamento é um conceito relativamente novo[3]. É uma aplicação específica do conceito geral de uma economia circular em que os resíduos de uma organização podem ser os insumos de outra organização. Os conceitos de economia circular, como a reutilização de recursos e a geração de produtos úteis a partir de resíduos, têm sido aplicados ao saneamento em pequena escala há décadas – quase todas as cidades do estudo de caso deste programa de trabalho têm exemplos disso em pequena escala. Agora, esses conceitos estão sendo considerados na escala de toda a cadeia de serviços de saneamento. Ao mesmo tempo, renomear "excrementos humanos" ou "dejetos" como "recursos sanitários" é um passo simbólico que lembra a todos que deixem de lado seus conceitos passados e olhem para o futuro. Os recursos sanitários têm valor energético (para combustível de gás e biomassa), valor nutritivo (para fertilizantes e rações para animais), valor como matéria orgânica (para armazenamento de carbono) e valor hídrico (para aplicações não-potáveis). Até 2030, todos os serviços de saneamento urbano devem ser parte integrante de uma economia circular de saneamento. Os recursos sanitários serão cuidadosamente armazenados, transportados e transformados em produtos que possam ser utilizados como insumos para outros processos industriais e agrícolas.

A economia circular do saneamento foi construída sobre princípios associados com saneamento ecológico e saneamento sustentável. Ambos os conceitos estão em uso há muitos anos, mas têm lutado para se tornarem práticas convencionais aceitas. A economia circular de saneamento terá um apelo mais amplo e conduzirá as ideias desses conceitos para uma escala e aceitação muito maiores. Muitas agências do setor de saneamento e especialistas estão agora vendo a economia circular de saneamento como um grande motor de inovação no setor.



3 Foi particularmente defendido pela Toilet Board Coalition (TBC), que foi apresentada na seção 1.2 acima.

A economia circular de saneamento não é uma tecnologia, mas um conceito. O seu princípio de gerar valor a partir de recursos sanitários reutilizados pode ser aplicado a muitas tecnologias, configurações institucionais, organizações e portes diferentes. Algumas das características e benefícios da economia circular de saneamento são[4] as seguintes:

- A proteção ambiental e o uso e/ou proteção eficiente dos recursos não são vistos como encargos financeiros, mas como oportunidades financeiras. A motivação para se envolver nisso não é fazer concessões ou uma atitude de bom senso, mas sim um interesse comercial e uma oportunidade econômica e de emprego.
- As atividades de economia circular são mais eficazes quando realizadas em colaboração com empresários, grandes empresas, concessionárias e prefeituras, não por empresários que atuam sozinhos. Isso deve incentivar as tradicionais concessionárias centralizadas a se unirem à economia circular de saneamento em vez de ignorá-la ou resistir a ela.
- Os modelos de negócios circulares de saneamento podem se tornar rentáveis em uma escala municipal se forem encorajados pela regulamentação adequada dos produtos (por exemplo, sobre a qualidade da água reutilizada, fertilizantes para culturas alimentares, insumos para redes elétricas, combustível sólido).
- Os modelos de negócios da economia circular também podem se tornar rentáveis em uma escala mais local, como uma única fábrica, hospital, universidade ou residência.
- A economia circular de saneamento pode tratar os recursos sanitários junto com outros recursos biológicos (como resíduos alimentares de fábricas ou restaurantes e outros resíduos sólidos compostáveis) que de outra forma seriam desperdiçados. Esse tratamento conjunto aumenta os volumes de produtos e pode melhorar a rentabilidade do processo.
- O conceito de economia circular de saneamento pode ser aplicado ao saneamento por rede de esgotos (por exemplo, na gestão de estações de tratamento de esgoto), embora ele seja mais adequado às tecnologias descentralizadas, como o saneamento no local e com uso de recipientes coletores, em que os recursos sanitários não são diluídos com água e, portanto, são mais fáceis de processar.
- Recuperar recursos envolve automaticamente um tratamento adequado das águas residuais ou das lamas fecais. Por exemplo, gerar biogás envolve a digestão anaeróbica, que é um processo de tratamento de lama após o tratamento de águas residuais. Para usar as águas residuais para irrigação agrícola, elas devem ser tratadas. Para usar a lama para fertilizantes agrícolas, ela deve ser tratada. Então, se esses produtos finais forem avaliados, mais águas residuais e lamas fecais serão tratadas do que se os produtos finais fossem considerados sem valor.

Os processos de economia circular de saneamento a uma escala municipal já são comuns nos países desenvolvidos, principalmente na Europa, mas ainda não são comuns nos países em desenvolvimento: por exemplo, das oito cidades estudadas apenas eThekwini começou a aplicar conceitos de economia circular de saneamento em grande escala. A maioria das atividades de economia circular tendem a começar em uma escala menor: Jodhpur é um bom exemplo de uma cidade que tentou isso em uma escala pequena demais para se tornar rentável. Os modelos financeiros do TBC sugerem que essas atividades devem ser rentáveis na escala municipal ou, na pior das hipóteses, devem precisar de um subsídio muito menor do governo do que aqueles que os sistemas de economia não-circular já recebem.

4 Esta lista é baseada no trabalho da TBC.

1.6 TECNOLOGIAS

A menos que tecnologias ainda não previstas sejam inventadas muito rapidamente, até 2030 as três tecnologias básicas para o saneamento urbano ainda serão as de hoje: saneamento por rede de esgoto, saneamento no local e saneamento com uso de recipientes coletores. Algumas cidades planejam ter uma cobertura de 100% por uma tecnologia (normalmente saneamento por rede de esgoto), mas este é um objetivo muito difícil em países de renda média ou baixa. Baguio e Nairóbi são exemplos típicos de cidades com planos irrealistas e não-financiados para fazer isso. Outras cidades usarão uma combinação dos três: Dakar oferece um caso interessante onde a visão de longo prazo do governo é para esgoto de 100%, mas sabe que é economicamente inviável e, por isso, está promovendo o saneamento no local para o médio prazo. Não existe regra absoluta sobre quais tecnologias usar: o que importa é que a combinação técnica seja bem escolhida para atender ao povo daquela cidade específica, de forma sustentável e viável. Sob o conceito de saneamento inclusivo de toda a cidade, coexistirão o saneamento por rede de esgotos, o saneamento no local e o com uso de recipiente coletor. Eles irão interagir de maneiras bem planejadas, por exemplo, transferindo os recursos sanitários no local e com uso de recipiente coletor para instalações de tratamento de águas residuais adequadamente projetadas. As decisões políticas sobre a tecnologia geralmente serão baseadas em economia, demografia, topografia e história.

Saneamento por rede de esgotos

Isso descreve uma rede centralmente planejada de esgotos subterrâneos que circulam das casas para as estações de tratamento de águas residuais, ao longo das quais os recursos sanitários são transportados por descarga com água. Em todo o mundo, este sistema ainda parece ter o status mais elevado, principalmente porque o usuário pode dar a descarga e esquecer, ou seja, não requer nenhuma interação pessoal com o próprio sanitário, nem com a equipe de manutenção que visita a casa para remover recipientes coletores ou drenar fossas. O cliente só precisa pagar ao prestador de serviços, que normalmente é uma concessionária municipal, pelo serviço.

No entanto, o saneamento por rede de esgoto é visto cada vez mais como insustentável, ou mesmo obsoleto, por uma série de razões. Consome enormes quantidades de água para descarga. Ele enterra a infraestrutura no solo, que não pode ser movida, vendida ou reproposta. É inflexível e lento para se adaptar aos padrões de assentamento humanos em modificação. Acima de tudo, é extremamente caro. Olhando para o custo de capital para novas infraestruturas, por exemplo, nenhuma das oito cidades de estudo pode arrecadar dinheiro suficiente das tarifas dos usuários ou de seus próprios recursos para pagar o custo de capital do saneamento por rede de esgoto. Dentre elas, a concessionária da cidade que se aproxima mais disso é a de Marraqueche, que tem a sorte de poder financiar dois terços de suas despesas de capital por meio de subsídio cruzado de suas operações de eletricidade.

Gradualmente, o domínio do saneamento por rede de esgoto aos olhos dos líderes municipais está diminuindo, como observado, por exemplo, nas discussões da Semana Mundial da Água em Estocolmo. Os engenheiros e administradores de hoje foram educados em muitas mais opções técnicas do que os seus predecessores, para os quais o saneamento por rede de esgoto foi ensinado como a única forma adequada de saneamento. Até 2030, é provável que o saneamento por rede de esgoto ainda predomine nas cidades ricas o suficiente para pagar e ter os esgotos no local com abastecimento de água, coleta e tratamento adequados. Em áreas urbanas em países menos desenvolvidos, ainda pode

Marraquexe, cidade com sorte suficiente para arcar com $^{2}/_{3}$ do financiamento de suas despesas de capital no saneamento ao fazer subsídio cruzado com suas operações de eletricidade.

proporcionar a espinha dorsal de infraestrutura para os sistemas de saneamento da cidade em que outras tecnologias serão integradas, e tenderá a ser a tecnologia dominante nos centros das cidades. A infraestrutura de canalização simplificada e mais barata também pode ser usada amplamente para a deposição de águas residuais e pluviais.

Saneamento no local com gerenciamento de lamas fecais (GLF)

O saneamento no local descreve um sistema no qual o sanitário e o armazenamento dos recursos sanitários (geralmente um poço ou fossa séptica) estão dentro da propriedade residencial. Qualquer transbordamento de líquido do recipiente coletor no local é absorvido pelo solo ou é conectado a uma rede de esgoto. Em algumas tecnologias, especificamente os sanitários de compensação de duas fossas e os mais recentes Sanitários Reinventados[5], o tratamento dos recursos sanitários também ocorre no local e proprietários de casa podem ser, de fato, seus próprios prestadores de serviços.

O principal problema técnico com o saneamento no local é que ele requer um ou mais buracos no chão e, portanto, só é aplicável em instalações que possuem espaço ao ar livre, como jardins. (Ocasionalmente, os poços podem ser cavados em interiores, mas isso exige aceitação cultural e torna a drenagem muito incômoda). Os edifícios de ocupação múltipla, como os blocos de apartamentos, precisam de sistemas de esgoto pequenos no interior, levando a uma fossa séptica comunal ou a outra instalação de tratamento ao ar livre. As propriedades e os bairros atendidos com saneamento no local também precisam de sistemas separados para deposição de águas residuais e pluviais.

5 O Sanitário Reinventado, um conceito vigorosamente promovido pela Fundação Gates, é uma tecnologia modular e transformadora que visa destruir todos os agentes patogênicos no local e recuperar recursos valiosos, operar sem conexões de esgoto, água ou eletricidade e custar menos de US$ 0,05 por usuário/dia em um modelo de negócio sustentável. Várias versões estão atualmente na fase de protótipo.

As residências usaram o saneamento no local por muitos anos e ainda é a tecnologia majoritária em muitas grandes cidades, incluindo, até recentemente, Tóquio, que é a maior cidade do mundo. Os principais desenvolvimentos tecnológicos de hoje até 2030 estarão no transporte e tratamento dos recursos sanitários (lama fecal) que são removidos das instalações de saneamento no local. Esta atividade é chamada de gerenciamento de lamas fecais (GLF) e está se desenvolvendo como um setor próprio de serviços especializados. A qualidade do tratamento está melhorando e muitas empresas de GLF já demonstraram que podem ser lucrativas e viáveis por meio da aplicação de princípios da economia circular de saneamento. Das cidades estudadas, Dakar tem os sistemas mais abrangentes e melhor planejados de saneamento no local e GLF e tem sido particularmente pioneiro nos aspectos de governança dos GLF.

A melhor fonte de informações detalhadas sobre GLF é a atual série de conferências internacionais sobre GLF, com suas publicações de apoio.

Saneamento baseado em recipientes coletores (SBC)

Em 2018, o SBC é um novo conceito no setor de saneamento geral nos países em desenvolvimento, embora ideias semelhantes tenham sido usadas há décadas em mercados de nicho em países ricos, como os de veículos e barcos. Até 2030, o SBC poderá estar generalizado. É tecnicamente diferente do saneamento por rede de esgoto ou do saneamento no local, na medida em que a própria unidade do sanitário é um bem móvel que pertence ao prestador do serviço de saneamento e não ao proprietário da casa. Incorpora um recipiente higienicamente vedável que é removido da casa pelo prestador do serviço, com uma frequência combinada, a quem o proprietário da casa paga uma tarifa, geralmente semanal ou mensal. Os recursos sanitários são transportados para tratamento, quer em uma instalação de propriedade desse prestador de serviços ou em uma estação municipal de tratamento – em qualquer caso, as vendas de pro-

dutos são uma parte importante do conceito, de modo que ele se integre ainda mais facilmente no conceito de economia circular do que o saneamento por rede de esgoto ou saneamento no local. Por sua natureza é um serviço descentralizado e flexível com mínimos custos a fundo irrecuperável em bens de capital que pode ser revisto, melhorado ou ampliado indefinidamente por um ou vários prestadores de serviços. O SBC permite que os proprietários usem abordagens de saneamento ecológico sem a necessidade de gerir os próprios recursos sanitários. Também permite o gerenciamento de grandes volumes de recursos sanitários e, portanto, é adequado para sanitários compartilhados e públicos.

Uma grande vantagem do SBC é que o sanitário pode ser localizado em qualquer lugar da residência, então o proprietário não precisa ter espaço ao ar livre para isso. Isso é muito vantajoso para as pessoas que vivem em cidades densamente povoadas. Por outro lado, o SBC tem um problema de imagem potencial: as pessoas podem associá-lo à prática fracassada da coleta noturna de dejetos. Esse sistema agora descontinuado envolvia pessoal de saneamento coletando sem higiene excrementos frescos do balde do banheiro das famílias e foi considerado como uma atividade humilhante. Os defensores do SBC pretendem explicar claramente que o SBC contemporâneo é inteiramente diferente da coleta noturna de dejetos em termos de segurança e ausência de risco para a saúde da equipe. O SBC tem outras desvantagens: precisa de recipientes coletores maiores para os proprietários domésticos que fazem higiene retal com água, gera tráfego adicional de caminhão com a decorrente poluição do ar e o serviço de drenagem do recipiente coletor deve ser extremamente confiável.

Atualmente, os prestadores de serviços de SBC são pequenas empresas ou, no caso de Manila, uma concessionária para toda a cidade. Este último é atualmente apenas um esquema-piloto, mas, se for bem-sucedido, poderia apontar o caminho a seguir para o SBC, porque uma concessionária única pode alcançar as economias de escala que são tão difíceis de obter pelos empresários.

Sanitários públicos e compartilhados

As três principais tecnologias foram descritas acima no contexto dos serviços de saneamento para residências e instalações comerciais. Para as pessoas que vivem em acomodações muito lotadas em certos países, no entanto, algumas políticas nacionais ainda permitirão a prestação de serviços por sanitários públicos ou compartilhados. Estes sanitários são tipicamente em blocos com instalações de lavagem e outros serviços. Geralmente, estão conectados a esgotos ou construídos com suas próprias fossas sépticas grandes.

Até 2030, a qualidade dos sanitários públicos ou compartilhados deve ser significativamente melhorada, porque as boas práticas na gestão dos sanitários terão se espalhado. Neste momento, muitos blocos de sanitários públicos ou compartilhados já estão sendo vendidos, alugados ou arrendados pelos municípios para ONG e empresas do setor privado: por exemplo, em Jodhpur, os sanitários públicos são explorados lucrativamente pelas concessionárias do setor privado. No que diz respeito ao tratamento dos recursos sanitários, os poucos blocos sanitários públicos ou compartilhados que têm espaço suficiente terão sua própria instalação de tratamento no local. A maioria dos blocos de sanitários públicos ou compartilhados não terá, no entanto, essa capacidade e seus recursos sanitários precisarão ser transportados pela rede de esgotos ou por veículo até o tratamento.

Os quadros abaixo resumem dois estudos recentes (2017) do SBC.

ESTUDO DE AVALIAÇÃO DO POTENCIAL DO SBC, PELO BANCO MUNDIAL

Combina uma visão geral do SBC com estudos detalhados de quatro empresas e, em geral, é favorável ao SBC como parte de uma abordagem de saneamento inclusivo em toda a cidade. Alguns pontos importantes a que chegam são:

- O SBC global pode ser mais rentável no longo prazo do que o saneamento por rede de esgoto ou o saneamento no local, embora o Banco Mundial ainda não considere que se tenha realizada suficiente pesquisa para se considerar isso definitivo.
- A maioria dos prestadores de serviços de SBC oferece uma boa qualidade de serviço aos seus clientes, com poucas queixas.
- Atualmente, é difícil avaliar a acessibilidade relativa dos clientes ao SBC, porque os prestadores de serviços geralmente estabelecem seus preços em combinação com as tarifas de esgoto existentes (que em geral são altamente subsidiadas pelo governo).
- As quatro empresas estão progredindo para serem lucrativas. Definitivamente, serão mais lucrativas se expandirem sua escala de operações. As barreiras para alcançar a grande escala incluem: regulamentação incerta dos produtos; baixo apoio das prefeituras; nenhum subsídio oferecido pelo governo (ao contrário de outros tipos de saneamento).

PUBLICAÇÃO: O MUNDO NÃO PODE ESPERAR POR ESGOTOS, PELO WSUP

Esta publicação analisa fatores de sucesso para as empresas de SBC e apresenta uma visão para a adoção do SBC em grande escala, com base principalmente no exemplo do Clean Team, em Kumasi, Gana. Alguns pontos importantes do artigo são:

- O SBC é lucrativo em teoria, mas é difícil na prática. Entre os fatores econômicos mais importantes estão os custos de capital do recipiente coletor e a frequência de coletas por semana. A empresa precisa ter uma margem de lucro bruto de pelo menos 50% para ser um negócio sustentável. Isso geralmente corresponde à cobrança de oito dólares mensais por casa, o que provavelmente é muito caro para os proprietários mais pobres.
- O SBC é um trabalho centrado no cliente. O serviço deve ser confiável e higiênico. Realisticamente, só pode atrair, digamos, 20% da população total de uma cidade.
- O mais provável é que o futuro do SBC esteja mais em parcerias entre um empresário e o setor público do que em empresas autônomas. Assim, o SBC pode ser um elemento integral de um programa de saneamento inclusivo em toda a cidade.
- O requisito de despesas de capital para um serviço de SBC é muito menor do que para o saneamento por rede de esgoto. O custo do tratamento é um elemento significativo e pode ser reduzido ao integrar o planejamento do serviço de SBC no tratamento de esgoto e manejo de lamas fecais para a cidade como um todo.

2. COMO FINANCIAR O SANEAMENTO URBANO?

2.1 QUEM VAI PRECISAR DE FINANCIAMENTO E PARA O QUE?

O primeiro passo para estudar os mecanismos de financiamento adequados é identificar as pessoas e as organizações que precisarão ser financiadas e para o que elas precisam. Isso pode ser confuso, especialmente para profissionais não-financeiros. Diferentes analistas e comentaristas têm pontos de vista e definições diferentes em relação ao financiamento de saneamento. Aqui está uma lista simples das principais pessoas e organizações que precisam de financiamento.

Proprietários de casas

Os proprietários de casas precisam de financiamento para as despesas de construção dos seus próprios sanitários e conexões de esgoto ou armazenamento no local, como fossas sépticas ou poços; em algumas cidades, eles também constroem redes de esgoto no bairro. As despesas dos proprietários de casas constituem uma proporção muito grande dos gastos totais em saneamento, embora sua natureza dispersa signifique inevitavelmente que geralmente não sejam bem mensuradas e recebam muito menos atenção do que o financiamento municipal/concessionário descrito abaixo nesta lista. Além disso, as falhas existentes no saneamento urbano são esmagadoras para os moradores urbanos pobres, que são menos capazes de financiar seu próprio saneamento. Dependendo da sua riqueza ou pobreza, alguns dos proprietários de casas não podem pagar os gastos, portanto precisam de subsídios. Outros podem pagar os gastos, mas não em um montante fixo, por isso precisam de empréstimos.

Idealmente, se foram prestados os serviços de saneamento adequados, os proprietários podem pagar as tarifas completas para o prestador de serviços de saneamento – seja um empreiteiro que preste um serviço de drenagem para saneamento no local, pago uma vez a cada poucos anos (o que pode ser um item muito caro para pessoas pobres), ou uma concessionária cobrando serviços de esgoto como uma sobretaxa na conta d'água, ou um prestador de saneamento com uso de recipiente coletor pago mensal ou semanalmente, ou um serviço de sanitário público pago por visita. No entanto, dependendo da sua condição econômica, alguns proprietários de casas precisam de ajuda contínua para cobrir essas tarifas: por exemplo, tanto em Bogotá como em eThekwini, um nível de serviço básico definido é fornecido gratuitamente aos usuários como uma questão de política governamental.

Dependendo da sua riqueza ou pobreza, alguns dos proprietários de casas não podem pagar os gastos, portanto precisam de subsídios. Outros podem pagar os gastos, mas não em um montante fixo, por isso precisam de empréstimos.

Os desafios existentes no **saneamento urbano** são bem maiores para o pobre de áreas urbanas, que tem menos condição de financiar seu próprio sistema de saneamento.

MANUTENÇÃO DE ACESSIBILIDADE PARA OS PROPRIETÁRIOS DE CASAS POBRES E VULNERÁVEIS

Os proprietários de casas pobres e vulneráveis podem precisar de medidas especiais (ou seja, subsídios, diretos ou indiretos) para ajudá-los a pagar as despesas operacionais do serviço. Dos governos que responderam ao relatório GLAAS de 2017, 60% deles têm planos de acessibilidade disponíveis, embora, infelizmente, a metade desses esquemas não seja amplamente utilizada. Os esquemas incluem:

- O governo concede subsídios aos prestadores de serviços para sustentar tarifas gratuitas, reduzidas ou com desconto, para esgoto e/ou drenagem de poços, para grupos de população específicos.
- Vinculando a tarifa de saneamento diretamente para bloquear as estruturas tarifárias da água, com um primeiro bloco altamente subsidiado para cobrir as necessidades básicas.
- Taxas de conexão gratuitas ou reduzidas para grupos populacionais específicos.
- Subsídios governamentais para instituições de microcrédito para emprestar dinheiro a famílias de baixa renda com pouca ou nenhuma garantia e com planos de pagamento que se acomodem às suas circunstâncias.
- Várias formas de planos de pagamento e fundos de empréstimos renováveis. Esses conceitos são discutidos em várias seções do presente relatório.

Prestadores de serviços em escala local: empreiteiros de gestão de lamas fecais e empresas de saneamento com uso de recipientes coletores

São empreiteiros que drenam as fossas sépticas dos proprietários de casas, os poços ou os recipientes coletores e transportam os recursos sanitários (excrementos, lamas fecais, septos) para as estações de tratamento operadas por eles ou por uma prefeitura/concessionária.

Eles precisam de financiamento para despesas de capital para comprar sanitários de recipientes coletores e veículos de drenagem de poços e transporte, que geralmente são seus principais ativos. Eles podem precisar de financiamento para despesas de capital para construir ou comprar as estações de tratamento que geram produtos vendáveis.

Dependendo da configuração econômica e regulatória em que operam, da escala de suas operações, das distâncias de viagem e do congestionamento do tráfego e da infraestrutura de tratamento a que se vinculam, essas empresas podem ser ou não lucrativas. Então, elas também podem precisar de financiamento ou empréstimos para o seu trabalho operacional.

Prestadores de serviços em escala municipal: prefeituras/concessionárias

Estas são grandes entidades que operam em saneamento em nível municipal. Podem ser departamentos dentro das prefeituras, ou concessionárias separadas – as últimas podem ser empresas do setor público ou do setor privado.

Eles precisam de financiamento para as despesas de capital para construir redes de saneamento e tratamento de águas residuais, que são seus principais ativos. Em comparação com todas as outras atividades listadas aqui, elas tendem a ser, de longe, os maiores itens de capital, as que precisam de mais dinheiro e atraem a maior atenção e controvérsia política. Um exemplo muito citado é Dar es Salaam, onde 99% do orçamento de saneamento foi supostamente gasto no custo de um sistema de saneamento por rede de esgoto para 10% das pessoas[6] .

Eles também precisam de financiamento para capital de giro para manutenção e reabilitação desses grandes ativos. Eles talvez também possam necessitar de financiamento para o seu trabalho operacional (que por sua vez inclui o custo dos empréstimos de dinheiro para suas despesas de capital).

Dependendo da capacidade de pagamento dos seus clientes e do cenário político e regulatório em que operam, essas entidades podem ser rentáveis ou não. Por exemplo, o site do International Benchmarking Network for Water and Sanitation Utilities (IBNET) indica que 43% dos serviços públicos monitorados em países de média e baixa renda não são rentáveis em suas despesas operacionais, mesmo sem considerar os gastos de capital. Das cidades de estudo, os serviços públicos em Bogotá e eThekwini são lucrativos na base de despesas operacionais, enquanto os de Jodhpur e Nairóbi não são lucrativos. Em Baguio, as despesas de capital e de operação não são contabilizadas separadamente e, em geral, o município deve receber 40% do seu rendimento em subvenções do governo nacional.

Outras

Existem muitos outros atores no setor, como educadores de higiene em ONGs ou em setores públicos e promotores de saneamento em geral, cavadores de poços e construtores de fossas sépticas, fabricantes e fornecedores de equipamentos, operadores de sanitários comunitários e especialistas nas diversas partes da cadeia de abastecimento. Suas necessidades financeiras são semelhantes às dos principais atores listados acima ou comparativamente pequenas, então não são repetidas aqui.

O site **IBNET** indica que **43%** dos órgãos de serviços públicos monitorados em países de **média e baixa renda** não rendem lucros apenas com suas despesas operacionais

6 O trabalho de pesquisa sobre este caso foi feito por Sophie Trémolet para WaterAid.

2.2
DE QUANTO DINHEIRO PRECISARÃO

Várias organizações têm estudado os requisitos financeiros globais, regionais e nacionais para a água e para o saneamento, geralmente expressos em termos de finanças necessárias para alcançar os Objetivos de Desenvolvimento Sustentável. Entre eles, a autoridade mais citada é o Programa de Água e Saneamento e o documento do Banco Mundial de 2016, escrito por Guy Hutton e Mili Varughese, intitulado "Os Custos de Cumprir as Metas dos Objetivos de Desenvolvimento Sustentável de 2030 sobre Água Potável, Saneamento e Higiene". Os autores salientam que seus números são baseados em pressupostos amplos, portanto cada número tem uma ampla gama possível – mas eles são geralmente reconhecidos como os melhores dados disponíveis. Eles estimam que, para atender o objetivo do ODS para o saneamento gerenciado de forma segura para todos, são necessários cerca de US$ 45 bilhões por ano para o saneamento urbano[7]. Este valor inclui despesas de capital, manutenção de capital para novas infraestruturas e despesas operacionais, mas excluem a manutenção da infraestrutura existente. Estes são números enormes e bastante abstratos – os autores não discutem a questão de quem tem que realmente encontrar e gastar o dinheiro. A resposta é que as pessoas e organizações listadas na seção 2.1 o façam.

Colocando os números de Hutton e Varughese no contexto para indicar a tarefa pela frente, este requisito de financiamento futuro para o saneamento é aproximadamente o dobro do requisito correspondente para a água potável e é aproximadamente cinco vezes maior do que os investimentos realizados durante o período dos ODM. Em contraste, o relatório GLAAS de 2017 mostra que atualmente as despesas com saneamento são cerca de 25% menores do que as despesas com água e que 87% dos países que responderam à pesquisa do GLAAS relataram financiamento insuficiente para atingir seus objetivos nacionais de saneamento urbano.
Os requisitos são mostrados neste diagrama elaborado a partir dos dados de Hutton e Varughese por Sophie Trémolet do Banco Mundial.

365 **Dias**

$45 **Bilhões**

Hutton e Varughese estimam que para se alcançar a **meta dos ODS** para o saneamento gerenciado com segurança para todos, são necessários aproximadamente **US$ 45 bilhões** por ano para o saneamento urbano. Este valor inclui despesas de capital, manutenção de capital para novas infraestruturas e despesas operacionais.

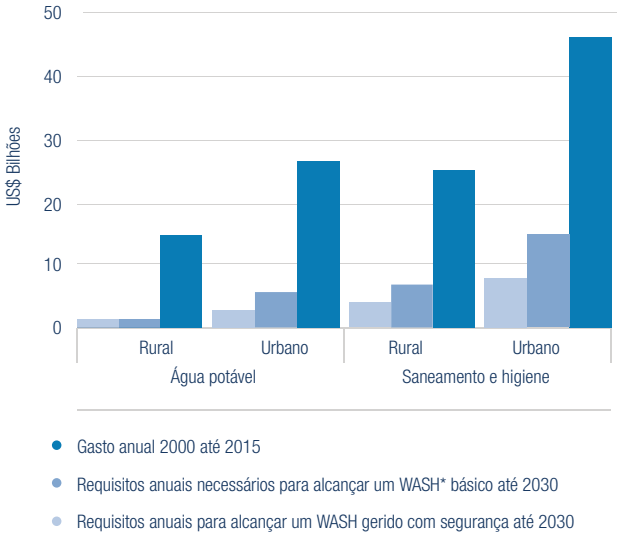


Fig 1 Diagrama elaborado a partirdos dados de Hutton e Varughese por Sophie Trémolet do Banco Mundial.

7 Eles estimam uma faixa de US$ 25 a US$ 70 bilhões, dependendo dos pressupostos feitos. O maior fator é o equilíbrio entre o saneamento no local (mais barato) e o de rede de esgoto (mais caro).

Dos US$ 45 bilhões, cerca de dois terços são para gerenciar com segurança os recursos sanitários, e cerca de um terço é para prestar o nível básico de serviços aos proprietários de casa. Portanto, a inclusão da importante frase, quando não enganosamente inócua, "gerenciada com segurança" na formulação dos ODS triplica o custo do saneamento em comparação com a era dos ODM, durante o qual esse aspecto foi negligenciado. Além disso, os números globais escondem discrepâncias regionais e nacionais substanciais: por exemplo, as necessidades de financiamento são maiores na África Subsaariana e, em nível nacional, os países mais pobres precisam alocar uma porcentagem maior de PIB para o saneamento do que os países mais ricos.

Várias organizações atualmente estão trabalhando para gerar estimativas atualizadas e mais matizadas de vários aspectos dos custos do saneamento urbano e monitorar suas despesas. Estas incluem o Banco Mundial, o programa UN Water GLAAS TrackFin e o projeto Clima e Custos em Saneamento Urbano implementado pela Universidade de Leeds. Durante 2018 e 2019, eles gerarão dados desagregados mais precisos, o que é bem-vindo, embora pareça improvável que seus dados alterem significativamente a aritmética básica referida neste relatório.

PROGRAMA UN WATER GLAAS TRACKFIN

Este programa propõe uma metodologia padrão para acompanhar os fluxos financeiros no setor de água e saneamento. Esta metodologia será usada para futuros relatórios GLAAS, e todos os atores do setor são fortemente encorajados a também adotá-la, para melhorar a consistência e comparabilidade dos dados.
A metodologia aborda quatro questões básicas:

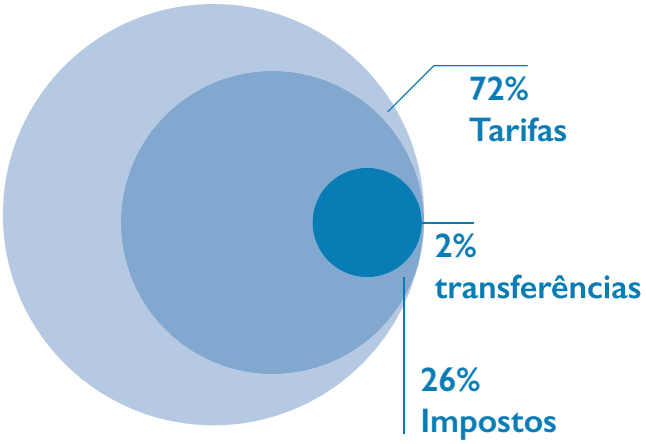
1. Qual é a despesa total em todo o setor?
2. Como os fundos são distribuídos entre os diferentes serviços WASH e os tipos de despesas, tais como despesas de capital, despesas operacionais e de manutenção e o custo do capital?
3. Quem paga pelos serviços WASH?
4. Quais entidades são os principais canais de financiamento para o WASH e quais são as respectivas parcelas da despesa total?

Possui um conjunto abrangente de classificações codificadas que cobrem os usos de serviços, prestadores de serviços, unidades de financiamento e tipos de financiamento. Sua principal saída são as contas WASH nacionais para cada país. A metodologia vincula as informações das contas WASH às questões-chave de política.

2.3
DE ONDE VIRÁ ESSE DINHEIRO

Em última análise, haverá apenas três fontes para o dinheiro necessário, tanto para despesas de capital quanto para despesas operacionais. Eles são geralmente conhecidos como os três T:

- Tarifas: pagas pelos clientes aos prestadores de serviços de saneamento. Esses clientes incluem proprietários de casas e empresas que recebem serviços de saneamento e pessoas e empresas que compram produtos gerados a partir dos recursos sanitários.
- Taxas: impostos ou tributos internos levantados pelos governos locais ou nacionais e entregues aos proprietários de casas ou aos prestadores de serviços de saneamento.
- Transferências: subsídios de outras fontes, tais como doadores internacionais, fundações, ONGs, remessas de pessoas individuais, tanto para os proprietários de casas quanto para os prestadores de serviços de saneamento.



o relatório **GLAAS de 2017** afirma que nos **25 países** que responderam a esta parte de sua pesquisa, uma média de 72% do financiamento de água, saneamento e higiene vem de tarifas, 26% de impostos, e 2% das transferências.

Quanto às contribuições relativas das três fontes, o relatório GLAAS de 2017 afirma que nos 25 países que responderam a esta parte de sua pesquisa, uma média de 72% do financiamento de água, saneamento e higiene vem de tarifas, 26% de impostos, e 2% das transferências[8]. Com algumas exceções notáveis, como a China, a maioria dos países tem um lento crescimento econômico e finanças públicas extremamente restritas disponíveis para o saneamento. No futuro, portanto, dadas as tendências atuais no financiamento do desenvolvimento internacional e a fraqueza geral de muitas economias nacionais, a proporção das tarifas provavelmente aumentará: os casos de Baguio, Marraqueche e Nairóbi são típicos a este respeito.

Qualquer outro dinheiro que flua para o saneamento será dinheiro do empréstimo que deve ser reembolsado. Isso normalmente é usado para despesas de capital e raramente (nunca nas oito cidades de estudo) para despesas operacionais. Subdivide-se em várias categorias:

- Empréstimos concessionários: empréstimos a taxas de juros abaixo do mercado, tipicamente com longos períodos de reembolso e períodos de carência, obtidos no setor de financiamento ao desenvolvimento, por exemplo, bancos multilaterais de desenvolvimento, bancos nacionais de desenvolvimento, doadores.
- Empréstimos privados: empréstimos a taxas de mercado, obtidos do setor de crédito privado, por exemplo, bancos ou mercado de títulos, com ou sem mecanismos de garantia de empréstimos apoiados por governos ou doadores.
- Microcrédito: pequenos empréstimos oferecidos a pessoas de baixa renda (muitas vezes pessoas excluídas do setor bancário formal) com pouca ou nenhuma garantia e planos de reembolso especialmente projetados. Este serviço de crédito de nicho pode ser fornecido por instituições de microcrédito especializadas, bancos ou ONGs.

O dinheiro do empréstimo pode ser útil para reduzir os déficits financeiros de curto prazo ou para financiar grandes somas adiante, mas, em última instância, tudo deve ser reembolsado, seja por meio de tarifas, impostos ou transferências.

As muitas permutações de fontes de recursos, tipos de destinatários, de capital e operacionais, despesas, doações e empréstimos, podem formar um quadro complicado. Essa complicação é um obstáculo em si para o aumento do financiamento

8 Estas percentagens são nacionais, não urbanas, e elas cobrem água, saneamento e higiene, mas não há nenhuma razão inerente para supor que as percentagens para saneamento urbano seriam muito diferentes.

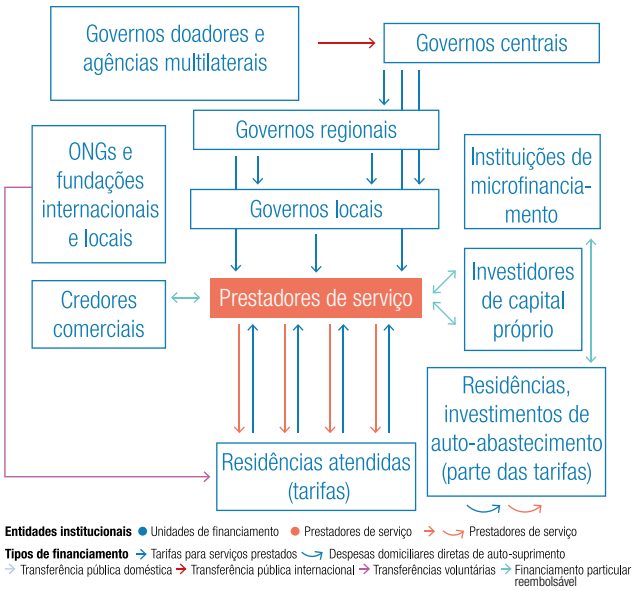


Fig 2: Rastreamento, mapeamento dos fluxos financeiros para fornecimento de serviços WASH

porque nem os beneficiários nem os financiadores entendem completamente como e onde o dinheiro flui. Para entender essa complicação, TrackFin desenvolveu um diagrama padrão de fluxos financeiros.

O documento do Banco Mundial de Amanda Goksu et al aborda este assunto em detalhes consideráveis e enfatiza a importância de entender todos os fluxos financeiros para decidir políticas e investimentos.

Compreender a visão geral financeira de uma cidade inteira vincula-se bem com o conceito de saneamento inclusivo em toda a cidade descrito na seção 1.3 acima. As estratégias de financiamento para as várias partes da cadeia de abastecimento de saneamento, por toda a cidade, precisam se somar a um todo coerente.

Os analistas do setor geralmente concordam que é muito pouco provável que o financiamento da concessão de tarifas, impostos e transferências aumente cinco vezes, conforme exigido pelos números na seção 2.2 acima, e que os credores existentes provavelmente não aumentarão suas alocações de empréstimos para saneamento significativamente. Isso significa duas coisas: as empresas de saneamento devem tornar-se mais viáveis para o investimento, que é objeto da seção 2.4 abaixo; e que novos investidores devem ser atraídos para o setor, que é um dos assuntos da seção 2.5 abaixo.

2.4 ANÁLISE FINANCEIRA GENÉRICA DE UM PRESTADOR DE SERVIÇOS DE SANEAMENTO

Tendo identificado as organizações que precisam de financiamento, o montante e possíveis fontes, esta seção concentra-se na análise financeira de um prestador de serviços de saneamento. Esta é uma análise genérica que pode ser aplicada, com pequenas variações, a um pequeno empresário, a uma grande empresa, a uma concessionária autônoma ou a uma parte de uma prefeitura – todas elas são empresas.

O ponto básico é que, se uma empresa tiver sucesso financeiro, atrairá investidores. A energia solar fora da rede é um exemplo atual de um setor de utilidade social e econômica em que as empresas bem-sucedidas estão atraindo investimentos comerciais significativos e não há nenhuma razão intrínseca pela qual as empresas de saneamento não possam fazer o mesmo. Seja uma empresa com fins lucrativos ou sem fins lucrativos, ou mesmo um híbrido desses dois, e embora isso defina seus critérios de sucesso financeiro, existem algumas ações fundamentais que podem ser tomadas para se tornarem mais bem-sucedidas financeiramente, da seguinte forma.

DESPESAS E COMO REDUZI-LAS

Qualquer empresa de saneamento possui dois tipos de despesas: despesas de capital e despesas operacionais[9]. Para melhorar sua viabilidade financeira, a empresa deve tentar reduzir as duas. Aqui estão algumas sugestões para fazer isso.

Reduzindo as despesas de capital

A única maneira mais importante de reduzir a despesa de capital é mudar a ênfase do planejamento futuro do saneamento por rede de esgoto para o saneamento no local e com uso de

9 O guia do programa TrackFin Tabela 12 tem uma classificação padrão útil de despesas para qualquer empresa.

recipientes coletores. Embora o saneamento baseado em recipientes coletores seja um conceito novo ainda com poucos dados históricos disponíveis, o saneamento no local tem custos bem documentados. Por exemplo, Hutton e Varughese tabularam os custos de capital unitário para rede de esgotos com tratamento e saneamento no local com o MLF para 160 países. Embora não tabulem custos unitários de capital para o mundo, sua Fig. 3.4 implica uma razão de custo médio de 2:1 entre essas duas tecnologias. Este estudo calculou uma relação de custo médio ponderado para moradores urbanos não atendidos do mundo, que também é 2:1 (ver quadro para a metodologia). O saneamento por rede de esgoto com tratamento custa duas vezes mais por pessoa que o saneamento no local com manejo de lama fecal. A mudança de planos futuros do saneamento por rede de esgoto para o saneamento no local pode diminuir pela metade as despesas de capital necessárias.

As indicações atuais são que a despesa de capital para SBC seria comparável à do saneamento no local, ou seja, cerca de metade da do esgoto, embora os custos adicionais da deposição das águas residuais e pluviais também precisassem ser levados em consideração.

Além desse ponto importante, aqui estão algumas outras formas de reduzir os gastos de capital da empresa:

- Ao construir sistemas de saneamento de águas residuais, adote a pesquisa mais moderna sobre otimização de fluxos de tubos, redes e processos de tratamento.
- Peça aos proprietários de casas para investir mais em sua própria infraestrutura dentro de suas próprias propriedades – e, às vezes, como no bairro do Projeto-Piloto Orangi ou esgotos condominiais na América do Sul, fora de suas propriedades.
- Produza um número maior de unidades em uma escala industrial para obter economia de custos unitários.

Reduzindo as despesas operacionais

Aqui estão algumas maneiras de reduzir as despesas operacionais da empresa:

- Use melhor a tecnologia da informação. As tarifas podem ser pagas por dinheiro móvel. Uma central de atendimento ou linha direta acoplada a uma plataforma de mercado pode melhorar o fluxo de comunicações entre clientes e prestadores de serviços, por exemplo, drenadores de fossas sépticas, melhorando a concorrência e reduzindo o preço ao cliente. O rastreamento de veículos e o gerenciamento de frotas podem reduzir o custo do transporte de recursos sanitários. O monitoramento de fluxo e processo pode otimizar o gerenciamento da entrada de lama fecal em estações de tratamento de esgoto, reduzindo os gastos em geral.
- Nos sistemas de esgoto, otimizar o desempenho do fluxo e reduzir os custos de bombeamento, que geralmente são uma proporção elevada dos gastos operacionais.
- Nos sistemas locais, reduza os custos de drenagem e transporte do poço, que normalmente representam uma proporção muito grande do custo total.
- Use estruturas claras de regulamentação e licenciamento para conceder dois ou três licenciamentos de operação de gerenciamento de lamas fecais que se estendem por toda uma cidade, conseguindo economias de escala[10] e mantendo a concorrência.
- Reduzir o custo do empréstimo de dinheiro, melhorando a classificação de crédito da empresa, ou mesmo persuadindo o governo nacional a emprestar e pagar em nome da empresa, como acontece no caso de Dakar.

10 Um bom exemplo disso é a Blue Water Company, na cidade de Leh, na Índia.

MÉTODO DE CÁLCULO DOS CUSTOS RELATIVOS DO SANEAMENTO URBANO DE ESGOTO E NO LOCAL PRIMEIRO, PARA CADA PAÍS:

Primeiro, para cada país:

- Use o Anexo 4 do relatório JMP 2017 para calcular o número de moradores urbanos sem, pelo menos, saneamento básico: estas são as pessoas que atualmente precisam de um serviço completo de saneamento por rede de esgoto ou saneamento no local com gerenciamento seguro dos excrementos.
- Use a Tabela E1 de Hutton e Varughese para encontrar o custo incremental de saneamento externo por pessoa (i) para esgoto com tratamento e (ii) para saneamento no local (fossas sépticas) com tratamento. Observe que o custo fora do local é o custo para o prestador de serviços, por exemplo, um concessionário, separado do custo no local por conta do proprietário da casa.
- Multiplique o número de pessoas que precisam do serviço pelos dois custos por pessoa para obter os custos de capital totais para que todas as pessoas sejam atendidas com qualquer uma das duas tecnologias.
- Divida a número do saneamento por rede de esgoto pelo número de saneamento no local para obter a proporção dos dois custos.

Então, para as pessoas não atendidas do mundo:

- Tabule os dois custos de capital total para os 59 países que tenham pelo menos 1 milhão de pessoas que precisem do serviço. (Entre eles, estão 96% das pessoas no mundo que precisam do serviço).
- Adicione os dois totais e divida pelo número total de pessoas nos 59 países que necessitam do serviço.
- Isso dá os dois custos por pessoa, como uma média global ponderada.
- Divida o número do esgoto pelo número do no local para obter a média global ponderada dos dois custos.

RECEITAS E COMO AUMENTÁ-LAS

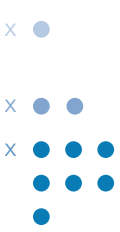
Qualquer empresa de saneamento tem apenas três receitas possíveis: tarifas de serviços prestados e de vendas de produtos; concessões; e investimento em capital próprio. Para melhorar sua viabilidade financeira, a empresa deve tentar aumentar alguns ou todos eles.

Aumento de tarifas de proprietários de casas e clientes comerciais

Esta é a área mais provável para a melhoria – afinal, é assim que as empresas de saneamento dos países ricos são financiadas. Em muitos países em desenvolvimento, as tarifas de saneamento atuais são muito baixas e/ou não são cobradas; aumentar e cobrar tarifas é, portanto, uma maneira óbvia de reforçar financeiramente a empresa. O estudo de caso de Bogotá dá um exemplo claro; em 1996, o prefeito adotou grandes aumentos tarifários que deram ao setor público uma forte posição financeira. Muitos estudos mostram que as pessoas são capazes e dispostas a pagar mais por um serviço melhor. No entanto, a política tarifária é um tema complexo e emocional. Para dar um exemplo muito citado, os políticos gostam de manter as tarifas baixas para ganhar apoio popular. (O estudo de caso de Baguio é um exemplo dessa reticência dos políticos, combinado com um sistema tarifário incomum em que a carga de esgoto é calculada por banheiro, em vez de por casa ou por volume de água). Uma maneira de contornar esse enigma é que os políticos deleguem a configuração tarifária a um regulador independente que possa estabelecer tarifas realistas. Mas mesmo os reguladores podem ser relutantes em impor suas decisões: por exemplo, mais de metade dos serviços públicos urbanos que responderam ao relatório GLAAS 2011/12 declararam que as tarifas não eram regularmente revisadas ou então eram revisadas, mas não aumentadas.

Nos países ricos, as tarifas para o saneamento são tipicamente mais elevadas que as da água, porque os prestadores de serviços e os reguladores analisaram os custos reais dos serviços e concordaram em combinar as tarifas com as despesas. Nos países mais pobres, o contrário é geralmente o caso, as tarifas de saneamento são muito inferiores às da água. Por exemplo, muitas empresas de serviços públicos que fornecem serviços de água e saneamento cobram uma tarifa mensurada pela água e nenhuma tarifa ou sobretaxa proporcional pelo saneamento. Se a tarifa de água estiver baixa, a tarifa de saneamento também é baixa. No entanto, se os dois elementos estiverem separados, as duas tarifas podem ser definidas separadamente para taxas viáveis para cobrir as duas despesas da concessionária. Os estudos de caso de Bogotá e eThekwini fornecem exemplos desta separação.

As pessoas que estabelecem tarifas devem decidir quais despesas devem ser cobertas pela tarifa, por exemplo: despesas operacionais; depreciação de bens de capital; custo de novos ativos de capital; custos financeiros; um lucro para o prestador de serviços. Esta decisão faz uma enorme diferença para as tarifas. Um exemplo vem de um estudo de tarifas de saneamento em Uganda encomendado pela National Water and Sanitation Corporation em 2015. A tarifa de saneamento atual paga por pessoas ligadas ao sistema de esgotos cobria apenas as despesas operacionais do prestador do serviço de saneamento. Para cobrir também a depreciação dos bens de capital, seria necessário duplicar. Para cobrir também os custos de novos ativos de capital e o custo do financiamento (mas não um lucro para o prestador de serviços), precisaria aumentar sete vezes. Para a maioria dos países, este último parece política e economicamente pouco realista, enquanto o primeiro seria um nível razoável para se apontar. Contudo, no momento, mesmo esse nível está longe de ser alcançado: apenas 39% dos países que responderam à pesquisa do GLAAS de



A tarifa do saneamento atualmente paga por pessoas conectadas ao sistema de esgoto Para também cobrir a depreciação de bens de capital, seria preciso duplicá-la. Para cobrir, ainda, os custos de novos bens de capital seria necessário aumentá-la em **sete vezes.**

2017 disseram que suas tarifas de saneamento urbano cobrem mais de 80% das despesas operacionais. Das cidades estudadas, apenas Blumenau, Bogotá e eThekwini alcançam essa referência.

Ao aumentar as tarifas em geral, existe o risco de as pessoas mais pobres não poderem pagar tarifas mais elevadas. O regulador ou a empresa podem projetar mecanismos internos de subsídio cruzado para eles – concessionárias em todo o mundo vem fazendo isso há décadas e a TI moderna permite que isso seja feito com mais facilidade. Existem muitos desses mecanismos, incluindo tarifas em bloco crescente, descontos tarifários assistenciais, tarifas baseadas em propriedades. Seja qual for o mecanismo escolhido, o princípio subjacente dos subsídios cruzados é que a receita total da empresa das tarifas não muda, mas apenas o saldo dos níveis de pagamento entre seus diversos clientes.

Uma política tarifária equitativa traria um equilíbrio entre cobrir os gastos operacionais para as pessoas que já possuem os serviços e permitir que as pessoas que não possuem os serviços (quase sempre pessoas mais pobres) tenham acesso a eles. Isso envolve a fixação de tarifas com vistas ao objetivo social subjacente, cobrando mais das pessoas mais ricas e menos das pessoas mais pobres.

A análise das tarifas acima aplica-se principalmente aos clientes conectados ao saneamento por rede de esgoto. Os clientes para serviços de saneamento no local ou com uso de recipientes coletores pagam taxas por operação ou por período de tempo, que são mais difíceis de regulamentar. No entanto, muitos dos mesmos princípios para a regulamentação e a reforma tarifária ainda se aplicam: por exemplo, os contratados para drenagem de fossas sépticas geralmente ganham seus lucros de seus clientes mais ricos, então é necessária uma regulamentação cuidadosa e a configuração de tarifas para garantir que essas empresas também devam atender aos clientes mais pobres.

Aumento das receitas de vendas de produtos

Ganhar dinheiro vendendo os produtos finais dos processos de tratamento de excrementos é um conceito relativamente novo. Apenas alguns concessionários estão fazendo isso, especialmente na Europa: por exemplo, a GENECO, em Bristol, no Reino Unido, é um exemplo muito impressionante de uma empresa do setor privado que administra uma estação de tratamento de esgotos de uma cidade e gera receita de cada substância que sai das instalações. Os recursos sanitários humanos contêm nutrientes e poder calorífico e podem ser processados em vários produtos comercialmente viáveis, especificamente água, fertilizantes, biogás, combustível sólido e produtos químicos. Existem mercados prontos para todos esses produtos. Claro que o preço deve ser correto para o mercado em particular, e isso pode significar que o fornecedor (a empresa de saneamento) não receberá uma receita enorme, mas criará um fluxo de receita que aumenta a receita de suas tarifas de consumidores.

Por ser um conceito novo, as vendas desses produtos podem ser dificultadas pelo estigma ou pela regulamentação. Por alguns anos, o Public Utility Board de Cingapura produziu água de qualidade potável derivada de suas estações de tratamento de esgoto sob a marca de “NEWater”. Levaram anos para superar a sensação de repulsa do público ao beber esgotos tratados – quando na verdade isso tem sido rotineiro para o abastecimento de água em muitas cidades há muito tempo. Do mesmo modo, o cultivo de alimentos fertilizados por produtos derivados de excrementos humanos não é permitido em alguns países, enquanto que em outros países até mesmo os excrementos humanos frescos têm sido utilizados como fertilizantes há séculos. A regulamentação tende a refletir as percepções públicas e culturais.

Recebendo aumentos nos subsídios

As decisões sobre isso são tomadas pelo governo nacional ou regional ou pela agência que está concedendo os subsídios, e não pela própria empresa. Os governos geralmente concedem mais subsídios para despesas de capital do que para despesas operacionais.

No que se refere aos subsídios para despesas de capital, por um lado, o estudo de caso de Bogotá dá um exemplo de um governo nacional que considera seu dever fornecer o financiamento de subsídios para despesas de saneamento. Por outro lado, o estudo de caso de Jodhpur dá um exemplo das consequências não-intencionais dessas concessões. O Governo da Índia investe enormes quantias em despesas de capital para o saneamento. Consequentemente, o prestador de serviços, Jodhpur Municipal Corporation, tem pouco incentivo para aumentar as tarifas de seus clientes e é financeiramente totalmente dependente do governo nacional e, portanto, vulnerável a qualquer mudança futura na política nacional.

No que diz respeito aos subsídios para despesas operacionais, estes são às vezes dados diretamente à empresa, e às vezes aos proprietários de casas para ajudá-los a pagar as tarifas (veja o quadro na seção 2.1 acima).

Aumento de investimentos de capital próprio

O investimento em capital é o mecanismo regular para empresas em todos os países e setores empresariais para arrecadar fundos para financiar suas operações. Uma empresa de saneamento estará competindo pelo dinheiro do investidor com muitas outras empresas. Aqui estão algumas maneiras de aumentar sua chance de sucesso:

- Prepare modelos de negócios claros e compreensíveis que expliquem seu trabalho e suas necessidades e perspectivas financeiras e que expliquem aos potenciais investidores o equilíbrio entre os riscos que estão assumindo e os retornos que podem antecipar.
- Demonstrar boa compreensão e envolvimento com os proprietários de casas que são clientes da empresa.
- Oferecer investimento conjunto pelo município, porque isso demonstra aos potenciais investidores que o município tem participação direta no sucesso da empresa.
- Demonstrar que o regulador e o município têm um bom histórico de aplicação de regulamentos, estatutos, tarifas, etc., porque isso faz com que um investidor em potencial se sinta mais seguro.
- Explicar o efeito positivo de investir no saneamento na economia local e na saúde da comunidade e da força de trabalho. Esta será de particular interesse para a categoria de investidor conhecido como investidor de resultado, que busca retornos sociais e financeiros sobre seus investimentos.

Como a lista indica, várias dessas sugestões exigem uma estreita colaboração entre a empresa e o município onde ela funciona. Em algumas cidades, isso exigirá uma mudança significativa de mentalidade dos líderes municipais.

O PRÓXIMO PASSO SE ESSAS MEDIDAS FOREM INSUFICIENTES

Mesmo depois de tomadas todas as medidas acima, alguns prestadores de serviços de saneamento – públicos ou privados – ainda não serão financeiramente viáveis. O próximo passo é com o governo nacional, ao reconhecer que o saneamento é uma atividade que gera benefícios para a sociedade, para colocar no capital da empresa aquilo que corresponda ao valor dos benefícios sociais. Das cidades estudadas, Bogotá recebe dinheiro do governo nacional que reconhece os benefícios sociais do saneamento (embora o governo nacional não use exatamente estas palavras para descrever isto). Este ponto não pode ser exagerado: o impacto social e econômico positivo do saneamento na sociedade como um todo não ajuda a empresa a prestar o serviço, a menos que esse impacto possa se traduzir em um benefício financeiro positivo para essa empresa. Por exemplo, uma das conclusões gerais da Semana Mundial da Água 2017 foi que as atividades de Recuperação de Recursos e Reutilização (isto é, economia circular) são economicamente viáveis, mas precisam internalizar os benefícios para a sociedade para torná-las financeiramente viáveis - esta é a mesma mensagem que a Banco Mundial e outros estão dizendo.

Geralmente chamados de subsídios, esses pagamentos pelo governo para a empresa são medidas financeiras legítimas que reconhecem o saneamento como um bem público e como um investimento que aumentará o PIB nacional e, portanto, a base tributária e reduzirá os custos de saúde do governo.

A palavra subsídio parece incomodar muitos críticos e, no entanto, descreve um dos deveres fundamentais dos governos há milênios: atender às necessidades de seus habitantes. Uma das fontes desse incômodo é a percepção de que o subsídio está beneficiando uma entidade com fins lucrativos e, portanto, constitui um apoio governamental injusto – essa percepção pode ser atenuada, quer concedendo os subsídios diretamente às famílias ou rotulando-os de forma transparente como pagamentos por benefícios sociais (também referidos a vários produtos públicos ou bens de interesse social). Outra fonte de incômodo é a preocupação em evitar favorecer os indivíduos: ironicamente, muitos governos que estão felizes em subsidiar o tratamento fora do local, alocando somas enormes para construir redes de esgoto com estações de tratamento centralizadas que favorecem algumas comunidades mais que outras, recusam-se a subsidiar tratamento no local (muito mais barato) baseando-se erroneamente em que isso favorece indivíduos.

Historicamente, o setor de saneamento tendeu a ser subpriorizado em comparação com outros setores quando os governos fazem pagamentos por benefícios sociais, por duas razões principais. Primeiro, o saneamento não foi apresentado como um tema politicamente atraente. Em segundo lugar, os custos econômicos e sociais do saneamento deficiente têm sido frequentemente subestimados e mal explicados. Agora, diversas organizações globais geram dados melhores e mensagens mais claras para este trabalho de promoção, o que deverá levar a um aumento dos investimentos desse tipo no futuro.

Em resumo, se uma empresa fez o seu melhor para reduzir as suas despesas e aumentar as suas receitas, mas ainda assim não pode se tornar financeiramente viável, é legítimo e importante para o governo pagar monetariamente à empresa o que corresponda transparentemente ao valor do trabalho dessa empresa para sociedade como um todo. Esses pagamentos devem garantir a viabilidade financeira da empresa.

2.5 ALGUMAS IDEIAS FINANCEIRAS INOVADORAS

Parte do objetivo desse programa de trabalho foi examinar se existem inovações em financiamento de saneamento que já funcionem[11]. A conclusão geral é a de que muitas ideias financeiras inovadoras relevantes para o saneamento foram discutidas ou propostas, mas que, infelizmente, poucas foram efetivamente implementadas. No entanto, dada a difícil situação financeira descrita nas seções anteriores deste relatório e o curto espaço de tempo até 2030, os líderes de saneamento e os financiadores devem avançar e aplicar essas inovações agora. Aqui estão três listas de inovações: financiadores; instrumentos financeiros; e mecanismos financeiros. Os itens individuais foram incluídos aqui com base em uma combinação de seus antecedentes, sua utilidade futura e seu potencial para proporcionar benefícios em grande escala. Cada ideia é descrita sucintamente: várias organizações e sites como o do WSUP/IRC/Trémolet, www.publicfinanceforwash.com, fornecem mais detalhes sobre eles.

A seção 2.6 a seguir contém algumas ferramentas conceituais e blocos de construção para apoiar todas elas.

NOVOS FINANCIADORES

Em várias seções acima deste relatório observa-se que os financiadores tradicionais (governos nacionais e doadores) têm verbas limitadas para investir em saneamento. Isto é apenas um sintoma de uma grande mudança global que ocorreu nas últimas décadas, acelerada pela crise financeira de 2007/2008; que os governos têm menos dinheiro ou vontade de investir, enquanto os indivíduos têm mais riqueza do que nunca na história da humanidade. Eles podem se tornar os novos financiadores do saneamento urbano nos países em desenvolvimento.

11 Observa-se que nem todas as inovações precisam ser completamente novas: em vez disso, a inovação poderia vir do uso de uma determinada abordagem em um setor no qual ela não havia sido aplicada anteriormente.

As pessoas ao redor do mundo estão coletivamente economizando somas sem precedentes estimadas em trilhões de dólares, e continuam a economizar ainda mais a cada ano. Grande parte desse dinheiro está sendo poupado nos mesmos países que têm as maiores necessidades de financiamento de saneamento; por exemplo, estima-se que os fundos de pensão em países em desenvolvimento disponham de mais de US$ 1 trilhão sob sua administração. Os indivíduos e as instituições às quais confiam este dinheiro, como escritórios familiares, gestores de investimentos, fundos de pensão, companhias de seguros e (indiretamente) os fundos soberanos, estão sempre explorando os mercados financeiros nacionais e globais à procura de novas oportunidades de investimento. Investir mesmo que fosse uma pequena fração dessa poupança daria um grande impulso aos fluxos financeiros para o saneamento urbano. No entanto, esses potenciais financiadores atualmente não investem muito em saneamento porque não conseguem entender ou reduzir o risco; eles não conseguem identificar um instrumento financeiro adequado pelo qual investir e todos querem investir em diversos níveis, prazos e moedas.

As empresas de saneamento, portanto, precisam realizar muito trabalho de base para comunicar as suas propostas de investimento a esses novos financiadores. É difícil para as empresas entrar em contato direto com os financiadores. Em vez disso, elas podem se comunicar por intermediários, grupos comerciais, associações profissionais, mídia especializada, etc. Globalmente, existem diversos intermediários que têm expressado particular interesse no saneamento urbano, como, por exemplo, a Global Impact Investors Network, a Circularity Capital e a Social Finance Ltd. Em termos nacionais, os intermediários podem incluir fundos de pensão, bancos e grupos de investidores.

INSTRUMENTOS DE FINANCIAMENTO INOVADORES

Subsídios cruzados

Os subsídios cruzados já são bastante comuns nas políticas tarifárias de saneamento ao redor do mundo. Permitem que as pessoas abastadas ajudem a financiar o saneamento das pessoas pobres. Estes instrumentos podem ser transferências internas dentro do projeto da tarifa de saneamento em si, ou transferências a partir da tarifa de água ou até mesmo, como no caso de Marraqueche, da tarifa elétrica. Um tributo de saneamento, que é usado rotineiramente em Burkina Faso e foi tentado em Lusaka, é uma sobretaxa na tarifa de água destinada a investimentos de saneamento no local, de modo que as pessoas com conexões domésticas para a água paguem por aqueles que dependem do saneamento no local.

Por sua natureza, os subsídios cruzados podem ser gerenciados de forma mais eficaz dentro de uma abordagem que inclua a cidade inteira do que por prestadores de serviços que trabalhem isoladamente.

Investimento de impacto

Um investidor de impacto é um investidor que busca retornos financeiros e sociais. O retorno financeiro desejado do investidor pode acompanhar as taxas de mercado ou estar abaixo delas, sendo este último o mais desejável para o receptor do investimento. O retorno social desejado do investidor deve ser mensurável por bons indicadores de impacto – o saneamento tem exatamente a qualidade dos indicadores, como mencionado na seção 2.6 abaixo. Os investidores de impacto têm enormes montantes de dinheiro sob seu controle e são considerados (pelos membros da organização Global Impact Investors Network) ávidos para contribuir com os Objetivos de Desenvolvimento Sustentável (ODS), mas são limitadas às oportunidades de investimento.

Quando um investidor de resultado verifica um potencial investimento, o primeiro obstáculo, geralmente, é o financeiro,

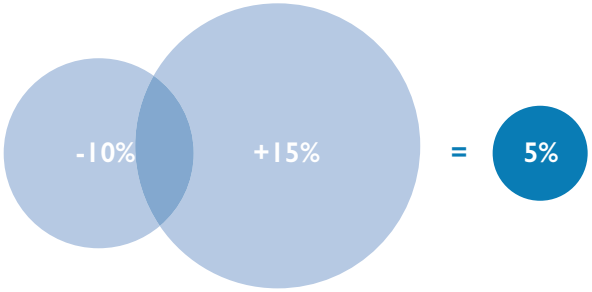
etapa em que muitos investimentos com modelos de negócios não comprovados fracassam porque suas taxas internas de retorno (TIR) são consideradas muito baixas para que um investidor de resultado prossiga para o próximo obstáculo. Usualmente, essas TIR são ligeiramente negativas – o que é apelidado de "zona azul" pelo presidente do Grupo CDC[12]. Muitos prestadores de serviços de saneamento, como os empreiteiros de saneamento baseados em recipientes coletores, são receptores de investimento que operam precisamente nesta região financeira. A TIR para o investidor pode ser melhorada, reduzindo-se a taxa de desconto aplicada às receitas futuras ou utilizando fundos de subsídio de um doador para cobrir as perdas, permitindo que um investimento com TIR geral ligeiramente negativa produza uma TIR positiva para o investidor de resultado[13]. Este último cenário é um exemplo de financiamento combinado.

Financiamento combinado

O financiamento combinado é o uso estratégico de financiamento público para catalisar o financiamento privado, ou quando este não tiver entrado ou quando não tiver atingido a escala anteriormente. O financiamento combinado abrange uma série de instrumentos e processos em que o capital público e o privado podem ser investidos conjuntamente com objetivos diferentes, mas complementares. Para ilustrá-lo, usando uma aritmética simples: se uma empresa de saneamento opera com um prejuízo de, digamos, 10%, um financiador público pode outorgar uma concessão de 15%, o que permitiria a um investidor privado investir e obter um retorno de 5%. Esta é uma situação vantajosa para ambas as partes: o investidor privado se beneficia de um menor risco e/ou melhores retornos do seu investimento e o financiador público pode ampliar o resultado do seu financiamento – neste exemplo, apenas precisando de uma concessão de 15% do valor do trabalho da empresa em vez de 100% disso. Os dois fluxos financeiros são combinados para alcançar o resultado geral desejado.

O Banco Mundial está promovendo financiamentos combinados que apoiam empresas dignas de crédito (definidas como aquelas que, recuperam, pelo menos, seus custos operacionais), reduzindo os riscos financeiros do seu trabalho ajudando-as, portanto, a reduzir as taxas de juros de seus empréstimos nos bancos comerciais.

Algumas organizações falam de crowding no financiamento do setor privado (ou seja, comercial), o que significa em grande parte o mesmo que financiamento combinado. Por exemplo, o documento de trabalho do G20 sobre o crowding no financiamento do setor privado estabelece os princípios a serem seguidos pelos bancos multilaterais de desenvolvimento; entre eles a criação de um ambiente favorável ao investimento, ampliação e padronização do aprimoramento de crédito, combinando financiamento de concessão e financiamento privado. A premissa subjacente do trabalho é a mesma do financiamento combinado, para atrair financiamentos privados para incrementar o financiamento do setor público porque este último é insuficiente para alcançar os Objetivos de Desenvolvimento Sustentável (ODS). Enquanto isso, tanto a OCDE quanto a Global Impact Investors Network afirmaram que atualmente há poucos investidores privados que colocam dinheiro em financiamentos combinados, por isso a OCDE está tentando incentivá-los estabelecendo princípios para estes financiamentos.



Este é um caso onde todos saem ganhando:
o investidor comercial se beneficia de um risco menor e/ou retornos aprimorados de seu investimento e o financiador público pode ampliar o impacto de seu financiamento - neste exemplo, apenas precisando de uma concessão de 15% do valor do trabalho da empresa em vez de 100%. Os dois fluxos financeiros são misturados para alcançar o resultado geral desejado.

12 A Instituição de Financiamento do Desenvolvimento do governo do Reino Unido, anteriormente conhecida como Commonwealth Development Corporation (CDC)

13 A organização Social Finance chama este conceito de Fundo de Oportunidades Perdidas porque ainda não foi aplicado em grande em escala.

CRÉDITO HÍDRICO

Um exemplo de financiamento combinado bem-sucedido é o programa Water Credit da Water.org que, com o apoio institucional da Water.org às instituições de microcrédito no valor de cerca de US$ 20 milhões, facilitou o fluxo de US$ 600 milhões de capital privado em empréstimos dessas instituições a proprietários de imóveis para realizar melhorias de água e saneamento, como construção de sanitários. Até o momento, mais de 90% dos mutuários são mulheres, suas taxas de reembolso estão bem acima de 90% e as instituições financeiras estão incorporando esses produtos de empréstimo às suas principais carteiras de crédito. A Water.org está usando essa experiência positiva para expandir seu trabalho de assessoria e capacitação para mais instituições financeiras envolvidas neste setor de crédito.

Melhoria de crédito para minimizar perfis de risco/retorno, por exemplo, capital catalítico de primeiro prejuízo

Esta é uma forma específica de financiamento combinado em que um financiador coloca dinheiro em uma empresa e posiciona-se voluntariamente no final da fila para recuperar o dinheiro, permitindo que outros financiadores coloquem dinheiro com expectativa maior de retorno dos seus investimentos. A Agência dos Estados Unidos para o Desenvolvimento Internacional (USAID), por exemplo, opera uma Autoridade de Crédito ao Desenvolvimento (DCA, na sigla em inglês), que garantirá a cobertura da primeira porcentagem estipulada (em geral em torno de 15%) do prejuízo por determinado investimento. Nessa situação, enquanto não houver 16% dos mutuários inadimplentes em algum empréstimo, o investidor privado não corre o risco de perder dinheiro. Essa redução de risco pode convencer potenciais investidores céticos a investirem.

Ajuda baseada em resultados

A Ajuda Baseada em Resultados (ABR) é um tipo de financiamento já estabelecido por governos e financiadores internacionais de desenvolvimento que se tornou mais proeminente nos últimos anos, já que as partes interessadas no desenvolvimento tentaram tornar a ajuda mais eficaz. A ABR vincula a liberação do financiamento público à obtenção de resultados claramente especificados que apoiem a melhoria de acesso aos serviços básicos. Isso funciona em regime de reembolso: o prestador de serviços investe o seu próprio capital e, quando o projeto ou o programa de trabalho estiver concluído, é feita uma avaliação para determinar se os resultados acordados foram alcançados. Em caso positivo, geralmente entre 50 e 70% do custo do projeto são reembolsados ao prestador de serviços. A ABR surgiu gradualmente como um meio importante para financiar o acesso aos serviços básicos, embora o prestador de serviços ainda tenha que encontrar o dinheiro antecipado para financiar o seu trabalho antes de ser reembolsado. A experiência dos projetos existentes sugere que a ABR poderia melhorar a segmentação e a eficiência da entrega de subsídios.

Financiamento de contingência, Contratos de Impacto Social (SIB) e Contratos de Impacto de Desenvolvimento (DIB)

O financiamento de contingência é semelhante ao financiamento da Ajuda Baseada em Resultados. Um doador público ou filantrópico pretende gastar dinheiro para obter certo benefício social. Em vez de doar esse dinheiro diretamente para uma empresa que tente alcançar esse objetivo, esse doador não faz nada inicialmente. Outro financiador, um investidor privado, empresta o dinheiro à empresa. O doador só pagará então o dinheiro se houver benefício real, ou seja, o seu pagamento depende do resultado alcançado. Isso é conhecido como financiador de resultados.

Existem várias maneiras de estruturar o financiamento de contingência. Uma ideia que está se tornando cada vez mais importante são os chamados Contratos de Impacto Social (Social Impact Bond – SIB) e Contratos de Impacto de Desenvolvimento (Development Impact Bond – DIB). Esta breve descrição de um Contrato de Impacto de Desenvolvimento (DIB) baseia-se em uma apresentação recente de Jeremy Keele, do Sorenson Impact Center, na Conferência WASTE, intitulada "Para Além da Ajuda ao Desenvolvimento":

- Há quatro partes envolvidas em um DIB. Um investidor investe dinheiro por meio de um intermediário para um prestador de serviços. O prestador de serviços presta serviços para uma população-alvo. Se esses serviços conseguirem alcançar um resultado acordado e mensurável, um financiador de resultados pagará por esse sucesso ao intermediário. O intermediário emprega esse dinheiro para pagar ao investidor original o seu capital acrescido de juros.
- Um DIB precisa de um horizonte de tempo razoável, um resultado significativo e mensurável, condições legais e políticas apropriadas e evidências de sucesso, usando métricas padrão que todas as quatro partes possam concordar em usar.
- Alguns problemas com os DIB são as longas negociações, alto custo de transação, dados insuficientes e métricas difíceis de acordar.
- Até o presente, mais de 55 DIBs captaram cerca de US$ 180 milhões, mas nenhum deles ainda em saneamento.

Uma crítica aos SIB e DIB é que eles não captam nenhum dinheiro a mais para um programa de trabalho, apenas proporcionam uma maneira de mobilizar o dinheiro abertamente – em última análise, o financiador de resultados paga o trabalho de qualquer maneira, como se tivesse concedido um subsídio ao prestador de serviços. Esta análise negligencia alguns aspectos. Um deles é que se o trabalho não produz o resultado desejado, o financiador do resultado não paga nada e o prejuízo é suportado pelo investidor. O outro é que a pressão exercida pelo investidor sobre a habilidade de gerenciamento financeiro do prestador de serviços aumenta a probabilidade de sucesso do trabalho. Então, a mesma quantidade agregada de capital colocada em programas de saneamento pelo financiador de resultados normalmente terá mais sucesso que em um sistema convencional em que são dados subsídios a alguns programas bem-sucedidos e a outros não.

Financiamento de Incremento Fiscal

O financiamento de incremento fiscal é uma ferramenta de financiamento do setor público em que uma instância governamental local, como um município, contrai um empréstimo de um banco comercial para financiar uma melhoria específica da infraestrutura pública, usando os futuros aumentos nas receitas fiscais locais para reembolsar o empréstimo. A lógica subjacente é que a melhoria da infraestrutura, como, por exemplo, o saneamento melhorado, aumentará a conveniência de viver em sua área e, portanto, o valor das propriedades e, consequentemente, o imposto pago pelos proprietários ao município. Este instrumento foi usado pela primeira vez nos EUA na década de 1950 e ainda não foi muito empregado em outros países. Este estudo não encontrou um exemplo desse uso para o saneamento, mas está incluído nesta lista porque pode vir a ser um instrumento útil.

MECANISMOS DE FINANCIAMENTO INOVADORES

Financiamento comunitário

Este termo refere-se principalmente a mecanismos de poupança criados por pessoas pobres que vivem em áreas urbanas, a fim de melhorar suas próprias condições de vida, incluindo o saneamento. Se os reguladores nacionais reconhecem esses mecanismos e os integram ao mercado privado, outros financiamentos privados podem ser mobilizados para aumentar o financiamento comunitário. Isto é um mecanismo particularmente valioso porque pode preencher o fosso entre os proprietários de imóveis que usam o seu próprio dinheiro em seus serviços de saneamento e serviços públicos, aumentando o financiamento externo para melhorar o saneamento familiar.

Fundo de garantia

Este é um fundo criado por um financiador público ou filantrópico para ter empresas para aluguel ou compra de bens de capital. Um exemplo no setor de saneamento vem da cidade de estudo de Dakar, onde a Fundação Gates forneceu um fundo de garantia através do governo a um banco privado, para permitir que as empresas do setor privado emprestassem dinheiro em condições comerciais para a compra de caminhões para esvaziamento de fossas sépticas. A garantia é uma salvaguarda do banco em caso de inadimplência dos mutuários. Esse mecanismo tem a vantagem do ponto de vista do financiador de que, se o devedor não estiver inadimplente, a garantia não é invocada e, portanto, os custos para o financiador são apenas os custos administrativos de implementá-lo. A vantagem para as empresas é que elas podem acessar empréstimos aos quais, de outra forma, não teriam acesso devido à baixa classificação de crédito ou falta de garantia: no caso do fundo de garantia de Dakar, a taxa de juros é geralmente de 7,5% em vez dos 11 ou 12%, e apenas 8% dos empréstimos não funcionam totalmente.

Financiadores relacionados com o clima ou financiadores de empréstimos, incluindo o Fundo Verde do Clima (GCF)

O setor de água e saneamento tem sido lento e não-imaginativo na tentativa de atrair fundos relacionados ao clima. Não há uma abordagem intelectual consistente. Algumas lideranças de opinião, como a Toilet Board Coalition (TBC), enfatizam o aspecto positivo e promovem o papel que o saneamento pode ter na mitigação das mudanças climáticas. Enquanto isso, outras lideranças de opinião, como a Rede de Soluções de Desenvolvimento Sustentável (Sustainable Development Solutions Network), que é um grupo de reflexão global para a ONU, presidido por Jeffrey Sachs, enfatizam o aspecto negativo e sugerem adicionar 25% aos custos de despesas de capital de Hutton e Varughese como custo adicional de adaptação às mudanças climáticas.

Enquanto isso, o Fundo Verde do Clima (Green Climate Fund – GCF), que é o maior fundo investidor em adaptação ou mitigação das mudanças climáticas, realizou apenas um investimento de água ou saneamento até o momento – para abastecimento urbano de água em Fiji. A razão, aparentemente, não é que o Fundo Verde do Clima (GCF) desencoraje os investimentos em saneamento, mas que ainda nenhum utilizador potencial de investimento de saneamento apresentou uma proposta suficientemente robusta. Existem, reconhecidamente, dificuldades técnicas, por exemplo, na verificação das melhorias climáticas devido às atividades dispersas, como o saneamento doméstico, mas outros setores, como fogões e instalações autônomas solares, estão lidando com esses problemas muito mais vigorosamente do que o setor de saneamento. O Fundo Verde do Clima (GCF) e outros financiadores relacionados ao clima poderiam ser grandes mecanismos em potencial de financiamento futuro para os programas de saneamento urbano.

Estruturas de financiamento de saneamento

Uma “estrutura de financiamento de saneamento” é o nome que este estudo atribui a um mecanismo com várias partes interessadas que permite que diversos financiadores de subsí-

dios e empréstimos invistam dinheiro novo simultaneamente em várias empresas de saneamento diferentes. É uma plataforma unificada eficiente. Por um lado, ajuda os utilizadores de investimentos a apresentarem as suas propostas a vários potenciais investidores simultaneamente. Por outro lado, proporciona aos investidores muitas propostas de investimento nas quais podem colocar o seu capital nos prazos, níveis de risco e moedas que preferirem.

Este tipo de mecanismo lida com muitos dos obstáculos que foram descritos em seções anteriores deste relatório. Pode-se usar vários dos instrumentos inovadores descritos acima, tais como investimentos de impacto, financiamento combinado e financiamento de contingência. Um mecanismo de financiamento de saneamento poderia ser configurado em um país ou em uma região ou até mesmo globalmente, para proporcionar um tipo de tecnologia ou todos eles, para empreiteiros do setor privado ou serviços públicos municipais. Os diversos mecanismos de financiamento de saneamento podem ser independentes ou vinculados.

Várias organizações reconheceram a necessidade de mecanismos ou plataformas desse tipo. O Dutch Water Financing Facility tem elementos semelhantes. A Sustainable Development Solutions Network concluiu que o setor WASH necessita de um mecanismo de financiamento conjunto especializado. O Banco Mundial propõe um quadro conceitual que combina três elementos: financiamentos públicos que sejam melhores planejados e alocados; prestadores de serviços com melhor desempenho; e investidores privados que sejam atraídos pelos financiamentos públicos. O Banco Africano de Desenvolvimento e a Fundação Bill e Melinda Gates estão criando o Fundo de Investimento de Saneamento Urbano da África (AUSIF[14]) que terá vários recursos semelhantes a um serviço de financiamento de saneamento, especificamente o financiamento conjunto e a série de ideias de investimento. As conclusões gerais da Semana Mundial da Água 2017 referem-se a modelos de negócios inovadores e mecanismos de financiamento para atrair todas as fontes de financiamento disponíveis, a necessidade de simplicidade no projeto de estruturas financeiras para mitigar riscos e incertezas percebidas, usando inovações em parcerias e projetando modelos de negócios para transformar projetos economicamente benéficos em projetos viáveis. Os serviços de financiamento de saneamento correspondem a todos esses conceitos e direcionamentos estratégicos.

Ainda não existe um serviço de financiamento de saneamento, mas uma equipe multissetorial de especialistas, convocada por Arthur Wood, da Total Impact Advisers, com o apoio de um grupo de doadores perspicazes, que está atualmente projetando um serviço de financiamento genérico aplicável à gestão regional de recursos hídricos ou mesmo ao saneamento. Este trabalho pode ser rastreado até 2009, quando uma equipe similar liderada por Wood projetou um Serviço Mundial de Financiamento para o Saneamento. A ideia não prosperou além da fase de planejamento: os financiadores se mostraram relutantes em pagar pela criação de uma plataforma global com sistemas de monitoramento complexos projetada por uma empresa líder de consultoria de gestão; o conceito estava à frente do seu tempo para o setor bancário de financiamento, que não estava disposto a apoiar modelos de financiamento colaborativo e, talvez, seus projetistas não o tenham explicado claramente dentro do setor de saneamento. No entanto, a ideia nunca foi abandonada e foi descrita em um artigo escrito por Wood e Hutton, em 2013, para a UNESCAP, que se baseou no trabalho de concepção anterior; o trabalho usava o saneamen-

14 O AUSIF mobilizará recursos adicionais de vários doadores, incluindo os parceiros de desenvolvimento tradicionais, o setor privado e os governos para aumentar o acesso ao saneamento inovador em áreas urbanas. Irá: (i) apoiar o desenvolvimento institucional e os programas de melhoria da capacidade; (ii) proporcionar incentivos para o foco aprimorado na prestação de serviços de saneamento urbano sustentável; (iii) dar mais atenção à maior aceitação de abordagens e tecnologias inovadoras; e, (iv) apoiar o gerenciamento do conhecimento para aumentar os resultados.

to na Ásia como um estudo de caso, mas era aplicável em todo o mundo. Esse conceito foi o ponto de partida para o trabalho atual de Wood. O projeto do serviço genérico atualmente em desenvolvimento é resumido no anexo complementar, conforme se aplica ao saneamento.

As condições para o sucesso de um serviço de financiamento são agora significativamente diferentes daquelas de 2009. O design foi suavizado e simplificado para não criar outro intermediário concorrente com as partes interessadas existentes, mas sim uma plataforma para ajudar essas partes interessadas a colaborar. A plataforma tecnológica agora existe e está em uso em outros setores como habitação e saúde, na medida em que é um sistema de monitoramento padrão e confiável para medir resultados. Esse sistema de monitoramento evoluiu de um modelo global de cima para baixo para um local que mede e monetiza os resultados de atividades especificadas. Ainda é um conceito desconhecido para as pessoas no setor de saneamento, mas organizações de outros setores[15] poderiam compartilhar as suas experiências e dar conselhos sobre como começar e superar os inevitáveis problemas iniciais.

Os serviços de financiamento de saneamento são inovadores porque apresentam o montante de financiamento necessário para alcançar o Objetivo de Desenvolvimento Sustentável (ODS) de saneamento como uma oportunidade de mercado para investidores e não como uma dor de cabeça para financiadores de subsídios. Os serviços de financiamento de saneamento têm a flexibilidade, o escopo e a visão integral para contribuir de forma importante para o financiamento do saneamento urbano até 2030.

15 Por exemplo, a Plataforma de Impacto Coletivo da Greater Cincinnati Foundation, ou o National Affordable Housing Trust, ambos nos EUA.

AS PRINCIPAIS CARACTERÍSTICAS DE UM SERVIÇO DE FINANCIAMENTO DE SANEAMENTO

Um serviço de financiamento de saneamento é uma associação sem fins lucrativos legalmente registrada, cujos membros podem ser organizações com fins lucrativos ou sem fins lucrativos (muitos sistemas legais em todo o mundo agora permitem esses tipos de associações híbridas ou mútuas). Os membros envolvidos incluiriam:

- Prestadores de serviços de saneamento de todos os tipos
- Um intermediário social para monitorar o trabalho de saneamento
- Um intermediário financeiro para estabelecer as propostas de investimento
- Investidores de todos os tipos. Sua estrutura de governança é decidida por essas partes interessadas.

Diversos fluxos financeiros podem passar pelo serviço em acordos contratuais individuais projetados pelas partes interessadas (por exemplo, usando os tipos de instrumentos financeiros inovadores descritos acima). Os resultados dos serviços de saneamento são relatados por meio do serviço, todos usando um conjunto comum de indicadores acordados. O serviço pode simplificar as estruturas financeiras para reduzir o risco e a incerteza e os custos de transação, alcançar economias de escala e melhorar a eficiência e o resultado dos investimentos atuais e futuros e, portanto, aumentar significativamente os fluxos financeiros para o saneamento

2.6 ALGUMAS FERRAMENTAS PARA APRIMORAR E HABILITAR ESSAS INOVAÇÕES

A seguir estão algumas ferramentas conceituais e blocos de construção que apoiam os instrumentos e mecanismos de financiamento inovadores descritos na seção 2.5 acima e que podem melhorar a atratividade do saneamento para novos investidores.

Medindo resultados

São necessários indicadores padrão para medir os resultados do trabalho de saneamento. Estes podem ser tangíveis ou intangíveis, comportamentais ou financeiros, internos ou externos ao próprio trabalho. Sua principal característica é a de serem mensuráveis, reconhecidos e confiáveis por todas as partes interessadas – essa confiança mútua é particularmente importante se os indicadores forem usados para avaliar o progresso contratual e, portanto, os pagamentos. Aqui estão alguns exemplos relevantes de elaboração de indicadores e medição de resultados:

- Os indicadores oficiais do progresso em direção aos Objetivos de Desenvolvimento Sustentável de saneamento são elaborados e monitorados pelo Programa Conjunto de Monitoramento da OMS/UNICEF (JMP) sob a égide da UN-Water. O site fornece detalhes completos sobre eles, incluindo o trabalho que está sendo realizado para desenvolver indicadores para os aspectos dos Objetivos de Desenvolvimento Sustentável que não estavam presentes nos Objetivos de Desenvolvimento do Milênio (ODM).
- O Índice de Progresso Social foi concebido pelo Social Progress Imperative, a fim de medir objetivamente o bem-estar e a qualidade de vida de uma população. Ele gera um índice de um único número que pode ser tabulado e analisado, assim como o PIB. Foi concebido para lembrar a todos que os indicadores econômicos não são os únicos que importam. Pode haver muitas variáveis confusas para que isso seja usado como uma medida de resultados de saneamento, mas pode ter um papel valioso em conjunto com indicadores de saúde e PIB.
- A organização Integrity Action desenvolveu uma metodologia de monitoramento em tempo real que pode ser aplicada em diversos tipos de atividades e indicadores, incluindo saneamento melhorado. É uma metodologia open-source na qual todos são estimulados a contribuir para o processo de monitoramento. Neste modelo, o processo de monitoramento é tão importante quanto os próprios indicadores.
- Assim como a mitigação dos equivalentes de CO2 é uma medida do efeito dos projetos climáticos, essa abordagem poderia ser traduzida para o saneamento com uma medida comparável (por exemplo, mitigação de unidades de fluxo de dejetos não-gerenciados). Este estudo ainda não identificou quaisquer organizações que estejam trabalhando atualmente nesta ideia.

Um exemplo pioneiro de um instrumento financeiro inovador proporciona um salutar relato na elaboração de indicadores. Em 2014, o estado de Utah, EUA, emitiu um Contrato de Impacto Social para um investidor a fim de melhorar a aprendizagem pré-escolar; o indicador de resultado acordado foi a redução na percentagem de crianças com necessidades educativas especiais na etapa seguinte da sua escolaridade. O investidor colocou seu dinheiro no prestador de serviços. No final do período do projeto, o financiador de resultados declarou que o indicador de resultado havia sido atingido e o investidor teve o seu capital reembolsado acrescido de juros. Mais tarde, ficou claro que o avanço era extraordinariamente elevado (99% de redução em comparação com uma redução normal de 10 a 20%) e o investimento financeiro singularmente baixo (cerca de metade do valor normal) e, portanto, que o indicador provavelmente era falho e não deveria ter sido usado no contrato.

Monetizando externalidades

Este conceito é muito importante para o sucesso de muitos dos novos mecanismos de financiamento. Significa simplesmente calcular um valor financeiro para benefícios tradicionalmente considerados fora da matemática financeira, como impactos ambientais, sanitários ou sociais. Várias organizações estão trabalhando para desenvolver ferramentas que poderiam ser usadas por todos para monetizar essas externalidades. O saneamento seria um candidato para essa abordagem, porque os benefícios de um saneamento melhorado, principalmente em saúde pública, limpeza ambiental e ganho de tempo produtivo, são substanciais[16], mas historicamente não têm sido expressos em termos monetários. Alguns exemplos relevantes são:

- A Organização Internacional de Normalização, reconhecendo o alto nível de interesse e atividade neste tema, está desenvolvendo atualmente o ISO 14008 sobre "avaliação monetária de impactos ambientais e aspectos ambientais relacionados". A norma proporcionará às organizações um quadro comum, incluindo métodos estabelecidos, bem como termos comuns no campo das avaliações monetárias. Isso analisa indicadores ambientais, não indicadores sociais, mas sua metodologia e linguagem também podem ser úteis para estes últimos.
- Contabilidade de custo natural é uma metodologia estabelecida para avaliar o impacto de uma intervenção em unidades físicas e, em seguida, convertê-las em valor monetário. Isso poderia ser útil no campo do saneamento.
- A Gold Standard Foundation é um organismo de padrões e certificação que desenvolve metodologias para medir os resultados das atividades de desenvolvimento. O seu trabalho original foi sobre os resultados relacionados ao clima, e posteriormente o seu trabalho foi ampliado para incluir resultados relacionados ao ODS sob o título geral de Padrão de Ouro para os Objetivos Globais. A Gold Standard pode certificar projetos ou seus impactos. A Fundação desenvolveu recentemente os Certificados de Benefícios Hídricos que representam um volume de água fornecida, tratada ou preservada, e também a certificação ADALY para quantificar os benefícios para a saúde da redução da poluição do ar (por exemplo, por fogões de cozinha aperfeiçoados). Tanto os certificados de benefícios hídricos quanto as certificações ADALY são destinados a serem adquiridos por doadores, filantropos e investidores sociais, embora ainda não sejam instrumentos negociáveis, como créditos de carbono. A Fundação está disposta a assessorar outras organizações sobre como desenvolver a certificação ADALY para quantificar a saúde – e, potencialmente, os benefícios econômicos do saneamento. Isso poderia se tornar o modo padrão reconhecido de monetizar as externalidades do saneamento.

Construção de confiança

Esta é uma ferramenta para o progresso financeiro. Muitos comentadores enfatizam que uma governança forte atrai investimentos porque ajuda os recém-chegados a confiar nos prestadores de serviços e governos. Os investidores são mais propensos a entrar em determinado país ou mercado se podem ver que os contratos são sustentados nos tribunais. A tecnologia de informação confiável é vital para coletar dados claros e objetivos para medir resultados e consequências em que todas as partes possam acreditar. Por exemplo, os benefícios externos monetizados descritos acima ainda não se tornaram produtos comercializáveis porque os profissionais de finanças ainda não se engajaram em fazê-lo. Se e quando o fizerem, precisarão de medições de resultados auditáveis para que o mercado tenha confiança em comprar e vender os instrumentos.

16 A Total Impact Advisors estima que estejam em centenas de bilhões de dólares.

3. O QUE OS DECISORES PODEM FAZER AGORA PARA AUMENTAR OS FLUXOS FINANCEIROS?

ALGERIA
TRIPOLITANIA
LIBYA
EGYPT
TROPIC OF CANCER
SAHARA
DESERT
MAURITANIA
NIGER
CHAD
NIGERIA
GULF OF GUINEA
ANGOLA
ZAMBIA
ZIMBABWE
NAMIBIA
BOTSWANA
SOUTH AFRICA
Cape Town
South Eastern
Atlantic Basin
Walvis Ridge
Atlantic Indian Antarctic

3.1 OS DECISORES E COMO INFLUENCIÁ-LOS

Este relatório pretende influenciar as decisões tomadas por vários grupos de pessoas e organizações associadas ao saneamento urbano:

- Os políticos nacionais (e, em menor medida, os regionais) estabelecem políticas e decidem a legislação e, consequentemente, são o principal público-alvo deste programa de trabalho.
- Os líderes municipais tomam decisões importantes e também decidem se e como implementar as políticas estabelecidas pelos políticos nacionais e regionais. Eles são o público-alvo secundário deste programa de trabalho.
- Reguladores nacionais, empresários, banqueiros, investidores e a comunidade internacional de desenvolvimento também são decisores sobre esse assunto. Eles formam todos os públicos-alvo deste programa de trabalho.
- Os proprietários de imóveis decidem suas próprias necessidades e prioridades para o seu saneamento, mas o Conselho Mundial da Água não dispõe de um canal direto de comunicação com eles. Portanto, são apenas um grupo-alvo indireto para este programa de trabalho.

Todos esses públicos-alvo querem criar cidades saudáveis, felizes e habitáveis. O saneamento pode ser um elemento importante para se alcançar esse objetivo. Ele compete por recursos financeiros com muitos outros setores de desenvolvimento econômico e social. Ao fazer uso das ideias mais recentes sobre financiamento para saneamento, os políticos, os líderes municipais e outras partes interessadas podem conseguir mais e gastar menos. Isso exige uma mudança de mentalidade, como explicado nas seções acima deste relatório, essencialmente: favorecer tecnologias de saneamento mais baratas, valorizar as melhorias geradas pelo saneamento e atrair novos investidores para esse setor.

O Conselho Mundial da Água incentiva todos os leitores deste relatório a se sentirem proprietários das ideias nele contidas e compromete-se em levar a mensagem relevante ao público-alvo certo. Os líderes políticos das oito cidades de estudo têm um papel especial, porque eles próprios manifestaram interesse por esse tema. É por isso que o Conselho Mundial da Água escolheu estudar as suas cidades. O Conselho trabalhará em estreita colaboração com eles para tomar decisões para suas próprias cidades e, em seguida, apoiá-los para persuadir outros políticos em nível de igualdade para também tomarem decisões semelhantes.

TÉCNICAS PARA INFLUENCIAR DECISORES

Aqui estão algumas técnicas para influenciar esses públicos-alvo, e especialmente o público-alvo principal dos políticos:

- Entender os seus objetivos e prioridades. Estar preparado para explicar como suas ideias podem ajudá-los a alcançar os seus objetivos. Por exemplo, você pode considerar que determinada política é tecnicamente boa, mas não consegue entender os aspectos políticos que poderiam torná-la pouco atraente. Portanto, considere as vantagens políticas de adotar determinada política e explique esses benefícios para o tomador de decisões.
- Relacionamentos importam. Pedir a uma pessoa bem conectada que esteja disposta a colocar tempo e esforço na iniciativa para ser o principal defensor. Apoiar essa pessoa para se comunicar verbalmente com os decisores-alvo.
- Usar documentos escritos apenas para apoiar a comunicação verbal. Muitos decisores estão sobrecarregados e não têm tempo para ler os documentos de apoio. Relacionamentos, atitudes e confiança são mais importantes.
- Comprovar com base em exemplos locais e não em exemplos de outros lugares. Naturalmente, isso pode ser difícil ao apresentar novas ideias sobre as quais não existem exemplos locais.
- Certificar-se de que as pessoas influentes sejam geralmente apoiadoras. Tentar garantir que não haja um político forte, a quem um decisor possa recorrer para aprovação, que se oponha às ideias que estão sendo apresentadas.
- WWMonitorar e acompanhar os compromissos assumidos pelo seu decisor-alvo.

3.2 MENSAGENS AOS DECISORES:

As principais mensagens para os vários grupos de decisores foram desenvolvidas e descritas nas seções 1 e 2 do relatório, portanto esta seção é apenas um resumo sucinto delas. Estão subdivididas em listas para os vários públicos-alvo. Nem todos os itens de uma lista específica serão aplicados a cada decisor ou a todas as cidades.

Mensagens aos políticos nacionais

- Estabelecer órgãos estatutários independentes para definir tarifas e regulamentos
- Definir claramente os papéis das várias entidades e instituições, gerando confiança para que os investidores apoiem os prestadores de serviços de saneamento.
- Legislar para que os prestadores de serviço que fornecem tanto água quanto saneamento tenham de manter as finanças das duas atividades separadas.
- Introduzir padrões e regulamentos nacionais para a qualidade e venda de produtos feitos com recursos sanitários tratados (dejetos humanos), a fim de incentivar o crescimento das atividades e conceitos da economia circular.
- Ser firme no planejamento e financiamento da infraestrutura necessária. Não se pode atingir um saneamento adequado somente através do investimento privado ou de ONGs, independentemente do quão bem-intencionados estes estejam.
- Realocar fundos de subsídios dos caros sistemas de saneamentos por redes e estações de tratamento de esgoto para os sistemas descentralizados e muito mais baratos, como a gestão de lodo fecal e a infraestrutura para o saneamento baseado em contêineres.
- Reconhecer o valor monetário da contribuição do saneamento à rede pública de saúde e ao meio ambiente, e repassar estes valores para os prestadores de serviço a fim de ajudar cobrir despesas operacionais.
- Incentivar bancos comerciais e investidores a participar do setor, aliviando seus riscos e custos, por exemplo através da consistente aplicação de contratos, regulação ativa, garantia de receitas mínimas e outras formas de financiamento combinado.
- Manter fóruns de investidores a fim de atrair novos financiadores para o setor de saneamento.

Mensagens aos líderes municipais

- Adotar uma abordagem inclusiva de saneamento para toda a cidade.
- Evitar planos de saneamento não-realistas como um projeto que prevê 80% de rede de esgoto em uma cidade que no presente possui apenas 10%, por exemplo.
- Experimentar saneamento baseado em contêineres para atender clientes em partes apropriadas da área atendida.
- Conceder contratos para empreendedores em saneamento no local e saneamento baseado em contêineres que compreendam uma área geográfica grande o suficiente para ser financeiramente viável.
- Colaborar ativamente com o governo ou regulador na revisão de tarifas e na implementação das revisões propostas.
- Manter bom fluxo de caixa e de taxas de cobrança de receitas, que transmitam aos credores confiança na capacidade do município em quitar seus empréstimos.
- Introduzir padrões e regulamentos locais para a qualidade e venda de produtos feitos com recursos sanitários tratados, a fim de incentivar o crescimento das atividades e conceitos da economia circular, desde que não sejam conflitantes com os padrões nacionais sob regulamentação nacional.
- Aplicar todos os regulamentos e estatutos.
- Manter fóruns de investidores a fim de atrair novos financiadores locais para o setor de saneamento.

• Investir em novas empresas em parceria com investidores comerciais.
• Ativar e incentivar mercados para produtos de saneamento tornando-se um cliente para fertilizantes, energia e outros produtos gerados por negócios de saneamento de economia circular.

Mensagens aos reguladores

• Estabelecer uma base de dados dos prestadores de serviço de saneamento, incluindo sua informação financeira, registro de bom pagador etc.
• Permitir que os prestadores de serviço que fornecem tanto água quanto saneamento mantenham as finanças das duas atividades separadas.
• Revisar regularmente tarifas e implementar as revisões propostas.
• Reconhecer o saneamento baseado em contêineres como alternativa válida ao saneamento por redes de esgoto ou no local.
• Aplicar padrões e regulamentos nacionais para qualidade e venda de produtos feitos com recursos sanitários tratados.

Mensagens aos empresários

• Ver o saneamento dos países em desenvolvimento como um novo setor empresarial para alcançar a vantagem do pioneiro.
• Desenvolver negócios ao longo da cadeia de valor de saneamento, para atrair vários investidores.
• Procurar colaborar e investir conjuntamente com prefeituras e concessionários, para ganhar escala.
• Demonstrar que você tem uma mentalidade comercial aliada a uma estrutura de governança forte, a fim de atrair mais financiamento de bancos e investidores.

Mensagens aos banqueiros

• Obter a vantagem de pioneiro, engajando-se agora no saneamento, antes que outros bancos o façam.
• Persuadir os seus investidores e clientes de que o saneamento já é um setor negociável em banco.
• Ensinar os seus potenciais mutuários (por exemplo, empresas de saneamento) a preparar programas prontos para investimentos.
• Assumir a liderança na aplicação de instrumentos financeiros estabelecidos (por exemplo, fundos de investimento em comum, títulos municipais e corporativos) e novos mecanismos (por exemplo, estruturas de financiamento de saneamento) para o saneamento.

Mensagens aos investidores nacionais e internacionais

• Investir em saneamento em países em desenvolvimento porque isso combina retornos financeiros e sociais.
• Obter a vantagem de pioneiro, investindo agora em saneamento, antes que outros investidores o façam.
• Investir ao longo da cadeia de valor de saneamento.
• Participar da criação de novos mecanismos como estruturas de financiamento de saneamento.

Mensagens à comunidade de desenvolvimento internacional

• Realocar os subsídios e empréstimos de estações de saneamento e tratamento de esgotos dispendiosas para sistemas descentralizados muito mais baratos, gestão de lama fecal e infraestrutura para saneamento baseado em recipientes coletores.

- Converter o financiamento a partir de despesas fragmentadas em insumos para soluções sistemáticas para alcançar resultados.
- Incentivar os bancos e os investidores privados a entrar no setor, mitigando os riscos e os custos, por exemplo, oferecendo garantias ou capital de primeiro prejuízo.
- Apoiar a criação de novos mecanismos como serviços de financiamento de saneamento.
- Organizar e apoiar visitas de estudo para decisores em locais específicos como, por exemplo, empresas de saneamento baseadas em recipientes coletores.
- Adotar estratégias de financiamento combinado para trazer financiamentos privados.
- Manter fóruns de investidores para atrair novos investidores para o setor de saneamento.

CONCLUSÕES FINAIS PARA TODOS OS DECISORES

- Economizar dinheiro implementando serviços de saneamento urbano mais rentáveis.
- Aumentar os fluxos financeiros usando uma variedade de instrumentos e mecanismos de financiamento existentes e novos.
- Atrair capital novo para o setor, melhorando a governança e o desempenho setorial.
- Alcançar o Objetivo de Desenvolvimento Sustentável (ODS) de saneamento urbano até 2030 sendo positivo e resoluto.

ANEXO I: RESUMOS DOS ESTUDOS DE CASO DAS CIDADES

Este anexo fornece apenas um breve resumo de cada estudo de caso. Todos os estudos de caso, que têm em geral cerca de 50 páginas, estão sendo publicados individualmente pelo Conselho Mundial da Água.

NOME DA CIDADE DE ESTUDO: **Baguio, Região Administrativa de Cordilllera, Filipinas**

DADOS E CARACTERÍSTICAS DO PAÍS E DA CIDADE

As Filipinas têm uma população de 103 milhões de pessoas, das quais 45% vivem em áreas urbanas. É uma república unitária com vários níveis de governo: nacional, provincial e municipal. O saneamento é uma responsabilidade municipal. O governo nacional tem muitas agências e departamentos com papéis indistintos e sobrepostos na política de saneamento, regulamentação e financiamento. A cobertura de saneamento urbano é de cerca de 78%. O governo não tem uma política unificada clara sobre financiamento de saneamento. Na prática, as despesas de capital e operacionais para o saneamento urbano são contabilizadas, com fundos provenientes de várias rubricas orçamentárias diferentes no governo nacional, financiadas com base na receita tributária e nos municípios, também financiadas principalmente pela receita fiscal local. A coleta tarifária para saneamento fora de Metro Manila é inconstante. O conceito de economia circular de saneamento ainda não é bem conhecido nas Filipinas, embora alguns de seus princípios sejam utilizados, principalmente, no gerenciamento de resíduos sólidos.

Baguio é a 25ª maior cidade altamente urbanizada nas Filipinas, com uma população de 350 mil pessoas. É uma cidade compacta com alta densidade populacional, conhecida principalmente pelos setores de turismo e serviços. É administrada pelo governo municipal, cujo Escritório do Meio Ambiente Urbano dispõe de uma Divisão de Gerenciamento de Águas Residuais, Água e Ambiente (WAMD-CEPMO) que é responsável pelo saneamento, enquanto o Distrito de Água de Baguio (BWD) é responsável pelo abastecimento de água. A cidade possui um pequeno sistema de esgoto que cobre apenas o centro da cidade e suas linhas principais e estações de tratamento de esgoto foram totalmente financiadas pelo governo do Japão. Cerca de 67% dos domicílios têm saneamento no local (quase todos com fossas sépticas), enquanto 28% são atendidos pelo sistema de esgoto e cerca de 5% por fossas sépticas comunitárias. A cidade cobra uma tarifa de saneamento apenas para as famílias conectadas ao sistema de esgotos – é calculada por sanitário, não por metro cúbico de água utilizada.

MECANISMOS FINANCEIROS UTILIZADOS NESTA CIDADE

Para o governo municipal, as despesas de capital e operacionais em saneamento são agrupadas como uma rubrica orçamentária. O governo municipal considera o saneamento como um serviço básico a ser fornecido, de modo que suas despesas com saneamento de cerca de um milhão de dólares ultrapassa a receita de tarifas de cerca de 300 mil dólares. Desse déficit, coloca cerca de 60% de suas receitas gerais e recebe cerca de 40% em subsídios do governo nacional. A cidade não toma empréstimos para quaisquer fins.

Para a grande maioria dos proprietários de imóveis, o saneamento é totalmente autofinanciado tanto para as despesas de capital, que é principalmente a construção da fossa séptica, quanto para as despesas operacionais, que são principalmente a extração de lama da fossa séptica. A extração da lama é feita por empreiteiros pouco regulamentados que cobram preços estabelecidos pelas condições de mercado; apenas uma pequena fração da lama fecal alcança a estação de tratamento de esgoto.

INOVAÇÕES USADAS OU PLANEJADAS NESTA CIDADE

Baguio não está inovando atualmente no financiamento de saneamento. Tem características incomuns, por exemplo, a cobrança de tarifas por sanitário em vez de por metro cúbico de água, mas não há evidências de que isso seja feito para inovar e pretende abandonar isso. Tem um planejamento que aspira fornecer cobertura de esgoto universal até 2035, mas isso não conta com um plano de financiamento associado significativo.

O governo municipal e o prefeito expressaram um firme interesse em experimentar inovações no financiamento de saneamento para melhorar a qualidade do serviço.

O conceito de economia circular de saneamento não é conhecido por esse nome, mas a WAMD-CEPMO tentou algumas atividades em pequena escala, como vender lama tratada como condicionador de solo.

MENSAGENS PARA DECISORES ESPECÍFICOS DESTA CIDADE

Coordenar o planejamento entre BWD para água e WAMD-CEPMO para saneamento.

Discriminar a contabilidade de saneamento no orçamento da WAMD-CEPMO e subdividi-la em despesas de capital e operacionais para que os decisores possam ver a imagem financeira real e tomar decisões com base nessa evidência.

Planejar adotando uma abordagem que inclua a cidade inteira, dando igual importância ao saneamento no local e ao esgoto canalizado. Reconhecer que o esgoto canalizado universal não será financeiramente viável e, em vez disso, habilitar a WAMD-CEPMO a se encarregar do planejamento financeiro tanto para o saneamento no local quanto para o esgoto canalizado.

Revisar a base de cálculo e o mecanismo de cobrança de tarifas de saneamento e taxas de serviço de tratamento de esgoto, a fim de cobrir integralmente as despesas operacionais da WAMD-CEPMO.

Reconhecer os recursos sanitários como um recurso valioso e não como resíduo a ser descartado. Incentivar os empresários privados a se envolverem nesse trabalho de economia circular. Incrementar as receitas da WAMD-CEPMO com as vendas de produtos.

NOME DA CIDADE DE ESTUDO: **Blumenau, estado de Santa Catarina, Brasil**

DADOS E CARACTERÍSTICAS DO PAÍS E DA CIDADE

O Brasil tem uma população de 207 milhões de pessoas, das quais 85% vivem em áreas urbanas. O Brasil tem uma estrutura federativa com poderes governamentais compartilhados entre os governos nacional e estaduais. Quanto à água e saneamento, o governo nacional é responsável por políticas e diretrizes, enquanto os órgãos municipais são responsáveis pela prestação de serviços, exceto nas áreas metropolitanas onde esta prestação resulta de acordos entre órgãos de água e saneamento estaduais e municipais. Além disso, acordos similares permitem que empresas estaduais prestem serviços de água e saneamento a vários municípios nos estados. Recentemente, alguns desses órgãos municipais começaram a contratar concessionárias do setor privado para prestar esses serviços urbanos. Os dados de 2015 mostram que a cobertura de saneamento gerenciada com segurança é de cerca de 40% (ou seja, por meio de sistema de esgoto) e 50% da cobertura é básica (ou seja, no local). A política do governo é de que as despesas de capital em água e saneamento devem ser financiadas principalmente por tarifas ou empréstimos, acrescida por uma pequena percentagem de subsídios do governo federal financiada por receitas fiscais. As despesas operacionais devem ser financiadas pelos municípios por meio de tarifas. O conceito de economia circular é familiar no gerenciamento de resíduos sólidos, mas novo no saneamento: existem apenas alguns exemplos de sua aplicação em todo o país.

Blumenau é a 78ª maior cidade do Brasil, com uma população de 350 mil pessoas. É uma cidade comparativamente próspera em um estado próspero (Santa Catarina), embora sua cobertura de saneamento esteja atrasada em relação ao seu status econômico. A corporação municipal de água e saneamento, Serviço Autônomo Municipal de Água e Esgoto (SAMAE), é responsável pela prestação dos serviços e, em 2010, contratou saneamento a uma empresa do setor privado em um contrato de 45 anos. A cidade tem um sistema de esgoto antigo que cobre uma pequena área no centro da cidade. Cerca de 92% das famílias melhoraram o saneamento, dos quais apenas 27% são atendidas pelo saneamento por rede de esgoto e as restantes por saneamento no local.

MECANISMOS FINANCEIROS UTILIZADOS NESTA CIDADE

Para as despesas de capital em infraestrutura de saneamento (principalmente rede de esgotos e estações de tratamento), a concessionária dependente de empréstimos bancários privados – há dúvidas consideráveis se isso seja economicamente viável.

Para as despesas operacionais em saneamento, a concessionária recupera o custo total por meio de tarifas. Os clientes pagam tarifas separadas de água e esgoto, das quais a tarifa de esgoto é ligeiramente maior do que a da água – ambas são baseadas no consumo volumétrico de água, com um elemento assistencial que oferece tarifas mais baixas para pessoas pobres. A percentagem de tarifa cobrada é de cerca de 89%.

INOVAÇÕES USADAS OU PLANEJADAS NESTA CIDADE

O contrato da SAMAE com uma concessionária do setor privado é bastante inovador no contexto brasileiro.

A SAMAE e a concessionária manifestaram interesse em experimentar inovações no financiamento de saneamento, a fim de melhorar a cobertura e a qualidade do serviço.

MENSAGENS PARA DECISORES ESPECÍFICOS DESTA CIDADE

Esclarecer a propriedade dos ativos, o regime regulatório e os objetivos de longo prazo para os serviços de saneamento.

Reconhecer que o saneamento tem impacto social altamente positivo e monetizar esse impacto, por exemplo, pela redução da tributação do prestador de serviços.

Melhorar a cobrança de tarifas.

Modificar os planos futuros de expansão do saneamento por rede de esgoto – que provavelmente será economicamente inviável – para a melhoria dos serviços de saneamento no local.

Integrar conceitos de economia circular tanto no saneamento por rede de esgoto quanto nos serviços de saneamento no local, para reutilizar recursos e gerar receita adicional para a concessionária.

NOME DA CIDADE DE ESTUDO: **Bogotá, capital, Colômbia**

DADOS E CARACTERÍSTICAS DO PAÍS E DA CIDADE

A Colômbia tem uma população de 49 milhões de pessoas, das quais 77% vivem em áreas urbanas. Tem uma estrutura constitucional unitária com três níveis de governo (nacional, departamental, local) cada qual com seus próprios mandatos e poderes. No saneamento, o governo nacional estabelece políticas e os governos locais (nas áreas urbanas: os municípios) prestam os serviços. A cobertura de saneamento urbano é de cerca de 93%. A política governamental em matéria de financiamento de saneamento é que as despesas de capital e as despesas operacionais devem ser financiadas pelos municípios por meio de tarifas. Essas tarifas devem reconhecer o direito humano ao saneamento, por isso os serviços básicos de saneamento são gratuitos para os proprietários de imóveis e o governo nacional pode pagar ao município um subsídio extra recorrente para cobrir esse custo. O governo nacional pretende promover o conceito de economia circular de saneamento, mas ainda não produziu incentivos para incentivar isso, portanto há muito poucos exemplos em operação.

Bogotá é a capital da Colômbia com uma população de 8,1 milhões de pessoas. É governada por uma Câmara Municipal liderada por um prefeito eleito diretamente. O prestador de serviços de água e saneamento é a Empresa de Serviço de Água, Esgoto e Saneamento de Bogotá (EAB), de propriedade do município. A cidade tem um extenso sistema de esgotos que cobre cerca de 96% das famílias. No entanto, apenas 16% do esgoto é gerenciado com segurança, sendo o restante despejado diretamente em um rio. Assim, o índice de cobertura desabou com a mudança das estatísticas dos Objetivos de Desenvolvimento do Milênio para as estatísticas dos Objetivos de Desenvolvimento Sustentável.

MECANISMOS FINANCEIROS UTILIZADOS NESTA CIDADE

A EAB cobra tarifas separadas para água e saneamento; elas apresentam quase o mesmo custo por metro cúbico. As contas do serviço de água e do serviço de saneamento são discriminadas e auditadas separadamente. As tarifas aumentaram significativamente no final da década de 1990 devido à forte liderança do prefeito.

Para as despesas de capital em sua infraestrutura de saneamento regular, a EAB obtém todos os fundos diretamente das tarifas ou de empréstimos privados reembolsados das tarifas – a EAB tem uma boa classificação de crédito e, portanto, paga taxas de juros baixas sobre esses empréstimos. No caso específico de construção de novas estações de tratamento de esgoto para melhorar a qualidade da água fluvial, o governo nacional contribui com cerca de 40% do custo em reconhecimento da melhoria ambiental.

Para as despesas operacionais em saneamento, a EAB tem um orçamento anual de cerca de US$ 140 milhões, que é financiado em 95% pelas tarifas e 5% por subsídios governamentais para cobrir o fornecimento gratuito de saneamento básico.

INOVAÇÕES USADAS OU PLANEJADAS NESTA CIDADE

A principal inovação financeira é um subsídio cruzado transparente e com mandato nacional obtido por meio da cobrança de tarifas diferenciadas para pessoas que vivem em casas de diferentes valores: portanto, os valores das propriedades são usados como indicador da riqueza familiar.

A cidade de Medellín (a segunda maior cidade da Colômbia) foi pioneira no pagamento de tarifas por cartões inteligentes, mais conveniente para os clientes e mais eficiente para o prestador de serviços. Bogotá está considerando adotar esse sistema.

A EAB está aberta para experimentar inovações em financiamento de saneamento para melhorar sua qualidade de serviço e desempenho financeiro.

MENSAGENS PARA DECISORES ESPECÍFICOS DESTA CIDADE

O saneamento por rede de esgoto universal já foi alcançado aqui – então a ênfase deve ser no tratamento e reutilização dos recursos sanitários. A EAB poderia gerar receitas de venda dos produtos de suas estações de tratamento de esgoto, especificamente fertilizantes, biodiesel, produtos químicos e biomassa para ração. Tudo isso vem dentro do conceito de economia circular de saneamento. Os recursos sanitários devem ser vistos como uma fonte de nutrientes de plantas e energia e não como resíduos a serem descartados.

A EAB poderia lançar contratos para empresas do setor privado para partes específicas de suas operações, por exemplo operação de estações de tratamento de esgoto, leitura de contadores, centrais de atendimento.

NOME DA CIDADE DE ESTUDO: **Dakar, Região de Dakar, Senegal**

DADOS E CARACTERÍSTICAS DO PAÍS E DA CIDADE

O Senegal tem uma população de 15 milhões de pessoas, das quais 44% vivem em áreas urbanas. Tem uma estrutura unitária com poderes governamentais compartilhados entre os governos nacional e regionais. No setor de saneamento, o governo nacional é dominante, estabelecendo políticas e regulamentos e também implementando programas de trabalho por meio de órgãos do setor público: no saneamento urbano, estes são realizados pelo Escritório Nacional de Saneamento no Senegal (ONAS). A cobertura de saneamento urbano é estimada entre 62% e 82%, dependendo das definições. A política do governo no financiamento de saneamento é a de que a despesa de capital para o saneamento urbano venha principalmente de empréstimos concessionários e privados, enquanto as despesas operacionais devem ser financiadas por meio de tarifas. O conceito de economia circular de saneamento é oficialmente reconhecido no Senegal, mas é muito pouco praticado até o presente.

Dakar é a capital e maior cidade do Senegal com uma população de 3,3 milhões de pessoas. O governo municipal não tem participação no saneamento, que é responsabilidade do ONAS. A cidade tem um pequeno sistema de esgotos que cobre o centro histórico da cidade. Cerca de 78% dos proprietários de imóveis melhoraram o saneamento, dos quais dois terços são atendidos pelo saneamento no local e apenas um terço pelo saneamento por rede de esgoto. O ONAS coloca a mesma ênfase no saneamento no local que no saneamento por rede de esgoto e seus planos futuros para Dakar abarcam ambos.

MECANISMOS FINANCEIROS UTILIZADOS NESTA CIDADE

O ONAS não mantém contas separadas para Dakar, apenas pelo seu trabalho geral: os números para Dakar podem ser obtidos estimando-se que a cidade representa 80% do trabalho da ONAS e, portanto, do dinheiro.

Para despesas de investimento em infraestrutura de saneamento, o ONAS conta com empréstimos concessionários e privados.

O ONAS cobra uma tarifa de saneamento que é calculada como uma percentagem da tarifa de água. Para as despesas operacionais em saneamento, o ONAS recupera 73% do custo dessa tarifa e os restantes 27% provêm de subsídios do governo nacional para compensar o déficit.

INOVAÇÕES USADAS OU PLANEJADAS NESTA CIDADE

O ONAS, com o apoio da Fundação Gates, inovou consideravelmente na gestão das lamas fecais graças ao programa PSFSM. O ONAS licita e regula os empreiteiros de drenagem de poços e também aluga as estações de tratamento de lamas fecais a um empreiteiro. Essas mudanças têm melhorado significativamente o desempenho financeiro do serviço.

Dentro do programa PSFSM, o ONAS criou um fundo de garantia para permitir que os empreiteiros de drenagem de poços obtenham empréstimos bancários para comprar os seus equipamentos. Essa garantia permitiu que os bancos comerciais reduzissem suas taxas de juros de 12% para 7,5%. Cerca de 8% dos empréstimos não estão sendo devidamente reembolsados pelos empreiteiros; portanto, a associação comercial dos contratantes está tentando reduzir esse valor.

O ONAS está atualizando as estações de tratamento de lamas fecais para gerar produtos comerciais, especificamente água tratada, fertilizantes e energia. Na escala da cidade inteira, esta seria uma importante inovação da economia circular.

O ONAS manifestou interesse em tentar outras inovações no financiamento de saneamento para melhorar sua cobertura e sua qualidade de serviço.

MENSAGENS PARA DECISORES ESPECÍFICOS DESTA CIDADE

Continuar a planejar adotando uma abordagem que inclua a cidade inteira, dando igual importância ao saneamento no local e ao esgoto canalizado.

Aumentar as tarifas de saneamento para cobrir integralmente as despesas operacionais.

Incrementar as receitas com as vendas de produtos.

Continuar a contratação de mais serviços de saneamento a operadores do setor privado, para aumentar a eficiência e a sustentabilidade financeira.

Melhorar o ambiente legal e regulatório para incentivar os investidores privados.

NOME DA CIDADE DE ESTUDO: **eThekwini (Durban), província de KwaZulu-Natal, África do Sul**

DADOS E CARACTERÍSTICAS DO PAÍS E DA CIDADE

A África do Sul tem uma população de 55 milhões de pessoas, das quais 65% vivem em áreas urbanas. Tem uma estrutura constitucional unitária com três esferas de governo (nacional, provincial, local) cada qual com seus próprios mandatos e poderes. No saneamento, o governo nacional estabelece políticas e os governos locais (nas áreas urbanas: os municípios) prestam os serviços. A cobertura de saneamento urbano é de cerca de 76%. Legislação, regulamentos e papéis institucionais estão todos detalhadamente estabelecidos. A política do governo no financiamento de saneamento é a de que a despesa de capital para o saneamento urbano venha principalmente de subsídios criteriosamente calculados provenientes do governo nacional financiados com receitas fiscais, enquanto as despesas operacionais devem ser financiadas pelos municípios por meio de tarifas. Essas tarifas devem reconhecer pelos benefícios do saneamento para a saúde pública, por isso os serviços básicos de saneamento são gratuitos para o proprietário de imóvel e o governo nacional paga ao município um subsídio extra recorrente para cobrir esse custo. O conceito de economia circular de saneamento é bem compreendido na África do Sul e há alguns exemplos dela em operação.

O município de eThekwini (também conhecido como Durban) é a terceira maior cidade da África do Sul, com uma população de 3,7 milhões de pessoas. É governado pela Câmara Municipal de eThekwini. O prestador de serviços de água e saneamento é a Água e Saneamento de eThekwini (EWS), de propriedade do município. A cidade possui um extenso sistema de esgoto que cobre cerca de 50% das residências, enquanto outras 26% são atendidas por saneamento no local melhorado. A EWS adota uma abordagem inclusiva de saneamento em toda a cidade para gerenciar todos os tipos de serviços de saneamento e seus planos futuros incluem saneamento por rede de esgoto e saneamento no local.

A EWS é um serviço público excepcionalmente bem gerenciado. Muitos outros municípios da África do Sul apresentam um desempenho muito pior do que o da EWS em termos de cobrança tarifária, uso de subsídios de capital, gestão de ativos e relacionamento com clientes.

MECANISMOS FINANCEIROS UTILIZADOS NESTA CIDADE

Para as despesas de capital em sua infraestrutura de saneamento, a EWS obtém aproximadamente metade dos fundos de subsídios do governo nacional e aproximadamente metade de empréstimos privados reembolsados pelas receitas operacionais – a EWS tem uma boa classificação de crédito e, portanto, paga taxas de juros baixas sobre esses empréstimos.

Para as despesas operacionais em saneamento, a EWS tem um orçamento anual de cerca de US$ 140 milhões, que é financiado em 84% pelas tarifas e 16% por subsídios governamentais.

EWS cobra tarifas separadas para água e saneamento; a percentagem de cobrança de tarifa é de 100%. As contas do serviço de água e do serviço de saneamento são discriminadas e auditadas separadamente das demais contas municipais.

INOVAÇÕES USADAS OU PLANEJADAS NESTA CIDADE

A EWS foi pioneira em muitas políticas na África do Sul e tem uma mentalidade gerencial aberta à inovação. A EWS está interessada em experimentar inovações em financiamento de saneamento para melhorar sua qualidade de serviço e desempenho financeiro.

A EWS começou a gerar receitas de venda da produção das suas estações de tratamento de esgoto, especificamente fertilizantes, biodiesel, produtos químicos e biomassa para ração. Tudo isso vem dentro do conceito de economia circular de saneamento.

A EWS lança contratos para empresas do setor privado para partes específicas de suas operações, por exemplo operação de estações de tratamento de esgoto, leitura de contadores, centrais de atendimento, drenagem de sanitários.

MENSAGENS PARA DECISORES ESPECÍFICOS DESTA CIDADE

A escolha da tecnologia de saneamento determina a acessibilidade da opção tanto para o serviço público quanto para os clientes. Em qualquer análise econômica, as externalidades devem ser incluídas ao se determinar a acessibilidade para o serviço público.

O saneamento canalizado de esgoto universal não seria acessível aqui – ou, de fato, nem na maioria das cidades dos países em desenvolvimento – e é impraticável em favelas urbanas densas.

A evolução das tecnologias de saneamento no local e nos recipientes coletores tem potencial para tornar os sistemas de saneamento por rede de esgoto redundantes no médio prazo, com um sobreinvestimento a fundo irrecuperável resultante nessa infraestrutura.

As tarifas devem ser projetadas para reconhecer o direito humano ao saneamento e para serem acessíveis aos pobres. Isso envolve um subsídio cruzado interno aberto das pessoas ricas para as pessoas pobres.

Reconhecer que os recursos sanitários devem ser vistos como uma fonte de nutrientes de plantas, produtos químicos e energia e não como resíduos a serem descartados.

NOME DA CIDADE DE ESTUDO: **Jodhpur, estado do Rajastão, Índia**

DADOS E CARACTERÍSTICAS DO PAÍS E DA CIDADE

A Índia tem uma população de 1,311 bilhão de pessoas, das quais 33% vivem em áreas urbanas. Da população urbana, 18% vivem em favelas. A Índia tem uma estrutura federativa com poderes governamentais compartilhados entre os governos nacional e estaduais e os municípios. O saneamento é nominalmente uma responsabilidade dos estados, e o governo nacional é muito ativo em proporcionar políticas, diretrizes e em implementar alguns programas patrocinados centralmente, especificamente a Missão Swachh Bharat, a Missão Atal para Reforma e Transformação Urbana e a Missão das Cidades Inteligentes. Nas áreas urbanas, a cobertura de saneamento melhorada é de cerca de 65% e cerca de 21% têm acesso a instalações de saneamento compartilhado. Apenas cerca de 32% dos sanitários estão conectados a sistemas de esgoto e, na melhor das hipóteses, apenas cerca de 30% das lamas fecais são tratadas. A política do governo no financiamento de saneamento é a de que a despesa de capital para o saneamento urbano venha principalmente de subsídios provenientes do governo nacional e dos governos estaduais, financiados com receitas fiscais, enquanto as despesas operacionais devem ser financiadas pelos municípios por meio de tarifas. Em média, em toda a Índia, as tarifas cobrem apenas cerca de 30 a 40% das despesas operacionais para a água e ainda menos para o saneamento. O conceito de economia circular de saneamento ainda é novo na Índia e pouquíssimo praticado em quaisquer dos programas governamentais: o foco principal destes ainda é a construção de infraestrutura.

Jodhpur é a 45ª maior cidade da Índia, com uma população de 1,1 milhão de pessoas. É governada pela Corporação Municipal de Jodhpur (JMC), que é responsável pelo saneamento, enquanto o Departamento de Engenharia de Saúde Pública do Rajastão (PHED) é o responsável pelo abastecimento de água. A cidade possui um antigo sistema de esgoto que cobre cerca de 70% da área da cidade, embora sua capacidade de tratamento seja bem menor. Cerca de 65% das residências melhoraram os sanitários. A cidade não cobra uma tarifa separada para o esgoto; em vez disso, cerca de 30% das taxas d'água cobradas pelo PHED são transferidas para a JMC para saneamento, embora esse dinheiro não seja discriminado dentro da JMC. A JMC tem apenas cinco funcionários para saneamento e empreiteiros para todos os trabalhos de construção e manutenção; não tem um sistema de gestão de ativos de capital.

MECANISMOS FINANCEIROS UTILIZADOS NESTA CIDADE

Para as despesas de capital em infraestrutura de saneamento (principalmente esgotos e estações de tratamento), a JMC depende de subsídios do governo nacional e estadual, que são em média cerca de US$ 5 milhões por ano.

Para as despesas operacionais em saneamento, a JMC tem uma receita anual (quase toda da sua participação nas tarifas de água da PHED) de US$ 800 mil, uma despesa de US$ 1,2 milhão e isso cobre o déficit de US$ 400 mil derivados de seus outros recursos financeiros internos (em última instância, do imposto local). A JMC está ciente de que sua despesa é muito baixa e deseja

dispender uma despesa-alvo, que calcula como 5% do valor de capital de seus ativos, de US$ 7 milhões. A política de saneamento do governo do estado do Rajastão incentiva as cidades a recuperarem o custo total das despesas operacionais por meio de tarifas e a gerarem receita vendendo as águas residuais tratadas para irrigação, mas a JMC ainda não conseguiu realizar nenhuma das duas coisas.

INOVAÇÕES USADAS OU PLANEJADAS NESTA CIDADE

A JMC tentou gerar receita com a venda de produtos de suas estações de tratamento de esgoto, principalmente águas residuais tratadas, biogás e compostagem, mas a receita foi insignificante. Os principais problemas foram que os produtos eram vistos pela JMC como não-econômicos em termos de custo de produção em relação ao seu valor de mercado, e a JMC experimentou uma forte resistência dos clientes decorrente da percepção de que os produtos dos órgãos do setor público deveriam ser gratuitos.

O JMC manifestou um forte interesse em tentar inovações no financiamento de saneamento para melhorar sua cobertura e sua qualidade de serviço.

MENSAGENS PARA DECISORES ESPECÍFICOS DESTA CIDADE

Melhorar a cobrança de tarifas da JMC para aumentar as suas receitas gerais.

Transferir autoridade para definir e cobrar tarifas de saneamento da PHED para a JMC.

Discriminar a contabilidade de saneamento no orçamento para que os decisores possam ver a imagem financeira real e tomar decisões com base nessa evidência.

Incentivar grandes instituições, como hospitais, hotéis, instituições de ensino, etc., a construírem as suas próprias estações de tratamento de águas residuais. Essas estações poderiam ser administradas por empreiteiros do setor privado que aplicariam conceitos de economia circular e venderiam os produtos.

NOME DA CIDADE DE ESTUDO: **Marraquexe, Região Marrakesh-Safi, Marrocos**

DADOS E CARACTERÍSTICAS DO PAÍS E DA CIDADE

O Marrocos tem uma população de 34 milhões de pessoas, das quais 60% vivem em áreas urbanas. Tem uma estrutura federativa com poderes governamentais crescentemente descentralizados do governo nacional para os governos regionais e locais. O saneamento é uma responsabilidade do governo local, enquanto o governo nacional estabelece políticas e diretrizes. A cobertura de saneamento urbano é de cerca de 90%. A política governamental em matéria de financiamento de saneamento é a de tanto as despesas de capital quanto as operacionais para o saneamento urbano devem ser financiadas pelos municípios por meio de tarifas. O conceito de economia circular de saneamento ainda é novo no Marrocos e pouquíssimo praticada em quaisquer dos programas governamentais: o foco principal destes ainda é a construção de saneamento por rede de esgoto e infraestrutura

Marraqueche é a segundo maior cidade do Marrocos, com uma população de 1,3 milhão de pessoas. O serviço do setor público Régie Autonome de Distribution d'Eau et d'Electricité de Marraqueche (RADEEMA) presta serviços de eletricidade, água e saneamento. A cidade tem um grande sistema de esgoto que atualmente cobre cerca de 90% das residências e ainda está sendo ampliado: a RADEEMA planeja atingir 100% de cobertura de saneamento por rede de esgoto até 2030. Os demais 10% das residências dispõem atualmente de saneamento no local. Cerca de 90% do esgoto é adequadamente tratado.

MECANISMOS FINANCEIROS UTILIZADOS NESTA CIDADE

Para as despesas de capital em infraestrutura de saneamento (principalmente esgotos e estações de tratamento), a RADEEMA depende principalmente de um subsídio cruzado da parte elétrica do serviço, incrementado por alguns empréstimos de bancos privados.

A RADEEMA cobre 59% de suas despesas operacionais em saneamento a partir da tarifa que cobra pelo saneamento, sendo o saldo financiado por um subsídio cruzado da parte elétrica do serviço.

INOVAÇÕES USADAS OU PLANEJADAS NESTA CIDADE

A principal característica incomum do RADEEMA é que o lado da eletricidade de seus negócios, que é rentável, subsidia a parte do saneamento, que não é.

O RADEEMA gera cerca de 10% da receita total de seus clientes de saneamento por meio da venda de águas residuais tratadas para campos de golfe.

A RADEEMA está aberta a sugestões de inovações no financiamento de saneamento, que possam ajudar a tornar o seu serviço de saneamento autofinanciado.

MENSAGENS PARA DECISORES ESPECÍFICOS DESTA CIDADE

Revisar a política tarifária e aumentar a tarifa real de saneamento.

Aumentar a receita da RADEEMA nas vendas de outros produtos além da água. Encontrar novos clientes (além dos campos de golfe) para as águas residuais tratadas.

Discriminar a contabilidade de saneamento no orçamento da RADEEMA para que os decisores possam ver a imagem financeira real e tomar decisões com base nessa evidência. Então, decidir continuar a política atual de saneamento cruzado da eletricidade ou encontrar fluxos de receita alternativos para o saneamento.

A RADEEMA poderia contratar o negócio de venda de água, biogás e compostagem das estações de tratamento de esgoto municipais para um empresário do setor privado que poderia operá-lo de forma mais eficaz do que o RADEEMA.

NOME DA CIDADE DE ESTUDO: **Nairóbi, município de Nairóbi, Quênia**

DADOS E CARACTERÍSTICAS DO PAÍS E DA CIDADE

O Quênia tem uma população de 49 milhões de pessoas, das quais de 25 a 30% vivem em áreas urbanas. O Quênia tem um sistema de governança descentralizada com poderes de governança e mandato constitucional compartilhado entre o governo nacional e os governos dos municípios. O saneamento é nominalmente uma responsabilidade do município, enquanto diversos ministérios do governo estabelecem políticas, diretrizes e regulamentos. A cobertura de saneamento urbano é de cerca de 20% com rede de esgoto e cerca de 50% com saneamento no local, mas nenhum deles é classificado pela JMP como segura; os serviços de saneamento falharam em acompanhar o rápido crescimento das populações urbanas. A política do governo em matéria de financiamento de saneamento é a de que a despesa de capital para o saneamento urbano venha em parte dos subsídios do governo nacional financiados com base na receita fiscal e em parte das tarifas, enquanto as despesas operacionais devem ser totalmente financiadas por meio de tarifas – o governo reconhece que as tarifas atualmente são muito baixas para alcançar isso. O conceito de economia circular de saneamento é reconhecido no Quênia, embora haja poucos exemplos dele em operação.

Nairóbi é a capital e maior cidade do Quênia com uma população em rápido crescimento de 3,9 milhões de pessoas. O Conselho de Serviços de Água de Athi (AWSB) é o detentor dos ativos, enquanto a Companhia Municipal de Água e Esgoto de Nairóbi (NCWSC) é o prestador de serviços, embora existam sobreposições e confusão quanto aos seus papéis. A cidade tem um sistema de esgoto bastante extenso que atende cerca de 45% das residências com a tarifa de saneamento estabelecida em 75% da tarifa de água. Quase todas as outras residências usam o saneamento no local, exclusivo ou compartilhado, com poços drenados pelo setor privado em pequena escala. O plano até 2030 é expandir o esgoto canalizado, mas há pouco dinheiro alocado ou em perspectiva para isso.

MECANISMOS FINANCEIROS UTILIZADOS NESTA CIDADE

Para as despesas de capital em água e saneamento, a AWSB e a NCWSC discutem sobre a propriedade e a responsabilidade e pouco progresso tem sido alcançado: pretende-se que o financiamento provenha de uma combinação de subsídios governamentais nacionais e empréstimos privados, a serem reembolsados pelas receitas tarifárias. Os orçamentos de saneamento são pequenos, não estão claramente discriminados e distribuídos entre o governo do município, a NCWSC e a AWSB.

A receita anual da NCWSC proveniente das tarifas combinadas de água e saneamento é de cerca de US$ 70 milhões, o que deve cobrir suas despesas operacionais.

INOVAÇÕES USADAS OU PLANEJADAS NESTA CIDADE

A NCWSC, com suporte técnico do Banco Mundial e um subsídio da GPOBA, obteve um empréstimo privado de US$ 6 milhões para despesas de saneamento em 2016.

Vários empresários de pequeno porte e projetos iniciaram atividades de economia circular.

A NCWSC manifestou interesse em experimentar inovações no financiamento de saneamento.

MENSAGENS PARA DECISORES ESPECÍFICOS DESTA CIDADE

Esclarecer os papéis das diversas agências responsáveis pelo saneamento e resolver os conflitos institucionais entre elas.

Aplicar regulamentos.

Discriminar a contabilidade de saneamento nos orçamentos da AWSB e da NCWSC para que os decisores possam ver a imagem financeira real e tomar decisões com base nessa evidência.

Reconhecer que expandir o esgoto canalizado para toda a população é economicamente inviável e, em vez disso, empregar conceitos de planejamento de saneamento que incluam a cidade inteira para se concentrar na melhoria dos serviços de saneamento no local e em recipientes coletores.

Desenvolver e ampliar o mandato do Fundo Conjunto da Água no Quênia para também financiar o saneamento.

ANEXO 2: LISTA DE PESSOAS CONSULTADAS PARA ESTE TRABALHO

Jamie Butterworth, Circularity Capital
Dominique Carrie, Social Finance
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INCREMENTO DE LOS FLUJOS FINANCIEROS PARA EL SANEAMIENTO URBANO

INFORME DEL CONSEJO MUNDIAL DEL AGUA

CONSEJO MUNDIAL DEL AGUA

CONSEJO
MUNDIAL
DEL AGUA

El Consejo Mundial del Agua es una plataforma internacional multi-actor, fundadora y coorganizadora del Foro Mundial del Agua. La misión des Consejo es detonar la acción en temas críticos del agua a todos los niveles, incluyendo el más alto nivel de toma de decisiones, a través de la participación de la gente en el debate y desafiando el pensamiento convencional. Con sede en Marsella, Francia, y creado en 1996, el Consejo Mundial del Agua reúne a más de 300 organizaciones miembros de más de 50 países diferentes.
www.worldwatercouncil.org

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Nuestro objetivo de creación del Consejo Mundial del Agua ha sido posicionar el tema del agua como elemento central de las prioridades políticas más apremiantes de nuestro planeta. La principal preocupación del Consejo es la seguridad hídrica a nivel mundial, y la infraestructura que suministra agua potable y saneamiento debe ser una prioridad. Sin los cuales, las sociedades no pueden crecer y los países no pueden desarrollarse. Uno de cada cinco niños menores de cinco años muere prematuramente cada año a causa de enfermedades relacionadas con el agua, y casi un tercio de la población mundial carece de un saneamiento adecuado. Una realidad alarmante teniendo en cuenta que ya ha transcurrido casi una cuarta parte del siglo XXI.

Estos hechos se ven agravados al saber que la meta sobre saneamiento de los Objetivos de Desarrollo del Milenio, cuya finalidad era reducir en un 50% la población mundial sin servicios de saneamiento, estuvo lejos de alcanzarse. Actualmente, los Objetivos de Desarrollo Sostenible están dirigidos a lograr una cobertura completa, que es aún más ambiciosa. Como señala la publicación, en los próximos 12 años los servicios de saneamiento tendrán que llegar a más de 3,000 millones de personas en zonas urbanas y a un total de 5,500 millones. Por consiguiente, se tendrá que seguir manteniendo este gasto para cubrir hasta un monto de $45,000 millones de dólares anuales por concepto de costos sólo en las zonas urbanas, lo cual representa cinco veces más de lo que se invierte actualmente.

Tampoco vamos a conseguirlo si continuamos trabajando como de costumbre. Si bien esto representa una cantidad sustancial para nuestros ya sobrecargados fondos públicos, no debemos permitir que debilite nuestros esfuerzos. En cambio, debemos ser más inteligientes en nuestra inversión, tanto de dinero como de voluntad política, para garantizar que el saneamiento sea financiado de manera suficiente e inteligente.

Si queremos ofrecer una respuesta convincente a estos problemas, es necesario replantearse a fondo cómo llevar a cabo el saneamiento, y las conclusiones del presente informe ofrecen muchas soluciones prometedoras. En este sentido, las recomendaciones en materia de políticas ofrecen respuestas preventivas a las tendencias que sabemos continuarán desarrollándose en los próximos años.

Ya me he referido anteriormente a las tres “I”, tres pilares esenciales sobre los cuales se constituye una política hídrica eficaz –instituciones, infraestructura e inversión– , y el presente informe explica en detalle cómo los tres tienen una función que desempeñar. Las instituciones deben unirse para promover economías circulares de los recursos de aguas residuales tratadas y facilitar los flujos financieros a través de instrumentos de financiación nuevos y existentes. La infraestructura puede reducir los costos al reemplazar el saneamiento de alcantarillado tradicional por soluciones localizadas. La inversión debe incrementarse mediante una mejor gobernanza e incentivando el desempeño de los proveedores de servicios. La gestión del agua, y del saneamiento en particular, debe ser un tema central en los debates políticos mundiales, ya que los enfoques integrados son la única garantía para un futuro sostenible. El saneamiento es a su vez una cuestión medioambiental, social y económica, y el saneamiento eficaz tiene efectos positivos en la vida y en los medios de subsistencia de millones de personas en todo el mundo.

Les invito a consultar estas recomendaciones de política y a unirse al debate para el cambio.

Benedito BRAGA
Presidente
Consejo Mundial del Agua

Al iniciar su primer proyecto sobre mecanismos financieros innovadores para el saneamiento urbano, el Consejo Mundial del Agua ha preparado un estudio analítico basado en ocho ciudades de diferentes continentes que aceptaron participar en el programa. El Consejo Mundial del Agua hace un reconocimiento a la contribución voluntaria de estas ocho ciudades y agradece su compromiso con la mejora de los servicios de saneamiento.

Este proyecto ha permitido evaluar la capacidad potencial de estas ciudades para cumplir con uno de los requisitos básicos para alcanzar el Objetivo de Desarrollo Sostenible 6, sin olvidar las otras dos áreas prioritarias –la suficiente adquisición de conocimientos y tecnologías adaptadas, y la gobernanza relacionada con la gestión de las aguas residuales urbanas– que también son necesarias para la consecución del ODS 6.
El proyecto también contribuye a la comprensión de los principios básicos sobre mecanismos financieros innovadores para prestar un mejor apoyo al desarrollo del sector del saneamiento, así como para identificar los mensajes que deben captar la atención de los actores, especialmente de los tomadores de decisiones, los profesionales, los donantes y la sociedad civil.

Para el Consejo Mundial del Agua y sus asociados, la presentación de los resultados del proyecto durante el VIII Foro Mundial del Agua celebrado en Brasilia (Brasil) brindará la oportunidad de considerar la posibilidad de hacer extensivo el análisis a un mayor número de ciudades. Este análisis podría comenzar ya en 2019 con vistas a compartir los respectivos resultados en el IX Foro Mundial del Agua en Dakar (Senegal).
Este esfuerzo será liderado por el Consejo Mundial del Agua en estrecha coordinación con las instituciones y organizaciones internacionales que participan en el proyecto.

Hachmi KENNOU
Presidente del Grupo de Trabajo del Consejo Mundial del Agua “Ciudades: en el corazón del crecimiento”
Consejo Mundial del Agua

AGRADECIMIENTOS

El presente programa de trabajo ha sido diseñado y dirigido por el grupo de trabajo de ciudades del Consejo Mundial del Agua bajo la dirección de Hachmi Kennou. Teresa Liguori es la Responsable de Proyecto de este programa de trabajo y fue la encargada de dirigir y gestionar a todos los consultores. Tom Soo, entonces Director Ejecutivo del Consejo Mundial del Agua, colaboró con notables consejos estratégicos.

Este informe ha sido redactado por Jon Lane, consultor coordinador del Consejo Mundial del Agua de este programa de trabajo. Cualquier error, omisión u opinión subjetivos son suyos.

Los consultores nacionales que llevaron a cabo el estudio individual de cada ciudad fueron: Abdelaziz Enasri, Diego Fernandez, Vikki Ferrer, John Gathenya, Murty Jonnalagadda, Neil Macleod, Cesar Seara, y Moustapha Sene.

El Consejo Mundial del Agua y el autor agradecen a los siguientes compañeros del sector, encargados de revisar los borradores de este informe: Guy Hutton (UNICEF), Dennis Mwanza (Fundación Gates), Maimuna Nalubega (Banco Africano de Desarrollo), Lesley Pories (Water.org), Sophie Trémolet (Banco Mundial), y Chris Zurbrügg (EAWAG).

El Consejo Mundial del Agua y el autor agradecen a los numerosos miembros del sector que facilitaron información, material publicado o no, opiniones y consejos; todos ellos incluidos en el Anexo 2. Entre ellos, Sophie Trémolet del Banco Mundial ha sido especialmente generosa al compartir tanto el trabajo publicado como el no publicado y los datos sobre la financiación del saneamiento, en los que se ha basado ampliamente este informe.

El Consejo Mundial del Agua quiere que este trabajo sea abierto, colaborativo y que reconozca plenamente las contribuciones y la propiedad intelectual de terceros. De hecho, el Consejo, a raíz de su privilegiada posición como creador y organizador del Foro Mundial del Agua, quiere poner sus canales de defensa y comunicación a disposición de otros compañeros y socios para divulgar sus mensajes sobre este tema.

RESUMEN EJECUTIVO

El análisis de las tendencias actuales e ideas innovadoras genera una visión optimista de cara al año 2030. En este sentido, el saneamiento urbano será una herramienta para el progreso, no un problema del que preocuparse.

INTRODUCCIÓN

El saneamiento fue uno de los sectores con peores resultados monitoreado por los Objetivos de Desarrollo del Milenio. Ahora la meta de los Objetivos de Desarrollo Sostenible es significativamente más ambiciosa con respecto a los planteados por la ODM por dos razones. En primer lugar, tiene como objetivo ofrecer el saneamiento para todos, en vez de reducir a la mitad el número de personas sin estos servicios. En segundo lugar, pretende conseguir un saneamiento gestionado de manera segura (el uso de instalaciones mejoradas que no se compartan con otros hogares y donde los excrementos se eliminen in situ o se transporten y traten externamente de forma segura) en vez de proporcionar únicamente un saneamiento básico (el uso de instalaciones mejoradas que no se compartan con otros hogares). Lograr los ODS requerirá un enorme esfuerzo, tanto operativo como financiero. El Consejo Mundial del Agua ofrece este informe, junto con ocho casos prácticos adicionales de ciudades, como contribución a ese esfuerzo global colectivo.

Si bien el Consejo reconoce que el saneamiento rural sigue siendo importante, concentra su atención en el saneamiento urbano porque estos servicios deben llegar a más de tres mil millones de personas en los próximos 12 años. Los desafíos técnicos son más complicados, los costes más altos, y la economía y los beneficios sociales vinculados a su éxito mucho mayores. Por tales motivos, este informe se centra en el saneamiento urbano.

El informe sigue una secuencia lógica: primero plantea cómo podría ser el saneamiento urbano para 2030, después examina cómo se financiaría el saneamiento, y posteriormente identifica qué pueden hacer los dirigentes para incrementar los flujos financieros.

¿CÓMO PODRÍA SER EL SANEAMIENTO URBANO EN 2030?

El análisis de las tendencias actuales e ideas innovadoras genera una visión optimista de cara al año 2030. En este sentido, el saneamiento urbano será una herramienta para el progreso, no un problema del que preocuparse.

La justificación económica y empresarial para mejorar el saneamiento será bien comprendida. El saneamiento urbano será un sector de servicios, no de infraestructura. La reutilización segura y económicamente productiva de los excrementos humanos como recurso será una parte integral de este sector. Los servicios con alcantarillado, in situ y basados en contenedores coexistirán. Las funciones de los gobiernos, los municipios, el sector privado y la sociedad civil reflejarán los puntos fuertes de cada uno de ellos. Seguirán el concepto de saneamiento inclusivo en toda la ciudad, en el que todas las organizaciones relacionadas con estos servicios en una ciudad concreta se reunirán y acordarán cómo atender mejor a todos los ciudadanos.

Las funciones de los gobiernos, los municipios, el sector privado y la sociedad civil (...) seguirán el concepto de saneamiento inclusivo en toda la ciudad, en el que todas las organizaciones relacionadas con estos servicios en una ciudad concreta se reunirán y acordarán cómo atender mejor a todos los ciudadanos.

¿CÓMO SE FINANCIARÍA ESTE SANEAMIENTO URBANO?

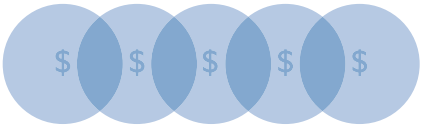
Una financiación óptima que utilice las estrategias actuales requeriría aproximadamente 45 mil millones de dólares al año en saneamiento urbano, cinco veces más que el nivel de gasto actual. Esta perspectiva puede parecer desalentadora, pero hay dos formas principales de lograrlo. La primera consistiría en reducir la cifra original de 45 mil millones al año mediante un cambio estratégico que pase de estar centrado en el saneamiento con alcantarillado a unos servicios in situ y basados en contenedores, cuyo coste se reduce a la mitad del primero. La segunda es hacer que los proveedores de servicios (ya sean servicios públicos municipales, empresas del sector privado u ONG, grandes o pequeñas) sean financieramente viables y estables al reducir sus gastos y/o aumentar sus ingresos. Este informe propone varias ideas para lograrlo. La más importante para reducir el gasto es, con diferencia, la propuesta anterior de sustituir el saneamiento con alcantarillado por otro in situ y basado en contenedores. Las ideas más significativas para aumentar los ingresos son que los reguladores modifiquen las tarifas, sobre todo para que las personas con más poder adquisitivo subvencionen de manera cruzada a las personas con menos recursos. Asimismo, se propone que los gobiernos nacionales reconozcan y cuantifiquen el valor monetario de los beneficios sociales y económicos del saneamiento para así pagar dicha cantidad a los proveedores de servicios.

Si los proveedores de servicios son financieramente viables y estables, pueden atraer nueva financiación. La fuente de esa financiación no serán los gobiernos y donantes que ya están sobreexplotados, sino las sumas de dinero sin precedentes que ahorrarán las personas de todo el mundo. Esas personas, junto con sus asesores financieros e intermediarios, siempre buscan empresas en las que invertir su dinero. Cuando confíen en la posibilidad de un negocio centrado en las empresas de saneamiento, invertirán su capital. De esta manera, la financiación necesaria para lograr los ODS de saneamiento pasará de ser un problema para los donantes de subvenciones a convertirse en una oportunidad de mercado para los inversores.

El elemento crítico de este esquema es cómo hacer llegar el dinero de los inversores a las empresas de saneamiento. Por consiguiente, el presente informe propone varias ideas innovadoras con el fin de permitir un mayor flujo financiero. Una posible vía consistiría en instrumentos financieros específicos, mientras que otra serían los mecanismos financieros. De esta última, la propuesta con mayor impacto potencial serían los mecanismos financieros de múltiples partes interesadas que permitan a muchos inversores diferentes dar soporte a varias empresas diferentes simultáneamente a través de una plataforma única con sistemas comunes de control e información. Este informe debe su título de “servicio de financiación del saneamiento” a dicha plataforma. Estos mecanismos podrían tomar diferentes formas legales y crearse a nivel nacional, regional o incluso global. Otros sectores empresariales tienen plataformas similares, pero para el caso que nos ocupa, serían conceptos desconocidos que requieren pioneros decididos.

Estas innovaciones financieras contarán con el respaldo de tres elementos principales de colaboración: medición de los resultados de los servicios de saneamiento; capitalización de los beneficios sociales de la mejora de estos servicios; y generación de confianza entre todas las partes interesadas.

45 Mil millones
al año en saneamiento urbano



5 veces más que el nivel actual de gasto

¿QUÉ PUEDEN HACER AHORA LOS DIRIGENTES PARA AUMENTAR LOS FLUJOS FINANCIEROS?

Estas innovaciones financieras tendrán éxito únicamente si los dirigentes las permiten. El presente informe, por tanto, alienta a todos ellos: principalmente a políticos nacionales y de forma secundaria a los municipales, reguladores, empresarios, banqueros, inversores así como, a la comunidad de desarrollo internacional. Estas son algunas de las acciones importantes para estos grupos:

- Establecer organismos estatutarios independientes para fijar tarifas y regulaciones.
- Definir claramente las funciones de las diversas instituciones y entidades, para crear confianza entre los inversores y que de esta forma apoyen a los proveedores de servicios de saneamiento.
- Introducir y hacer cumplir las normas y regulaciones nacionales y locales relativos a la calidad y venta de los productos elaborados a partir de excrementos humanos tratados, para así alentar el auge de actividades basadas en la economía circular.
- Reasignar los fondos de las subvenciones de las costosas instalaciones con alcantarillado y plantas de tratamiento a sistemas descentralizados mucho más baratos, la gestión de lodos fecales e infraestructuras para el saneamiento basado en contenedores.
- Alentar a los bancos e inversores comerciales a entrar en el sector mediante una reducción de riesgos y costes para ellos.
- Reconocer la aportación del saneamiento a la salud pública y el medio ambiente mediante la contribución financiera a los gastos operativos de los proveedores de servicios.
- Activar y alentar a los mercados de productos de saneamiento, con la creación de demanda de fertilizantes, energía y otros productos generados por negocios de economía circular de saneamiento.
- Considerar el saneamiento en los países en vías de desarrollo como un nuevo sector empresarial en el que tener la ventaja de ser el primero en actuar.
- Desarrollar e invertir en negocios presentes a lo largo de la cadena de valor de saneamiento.
- Alentar a los municipios y a los inversores comerciales a colaborar y coinvertir, a fin de aumentar la escala.

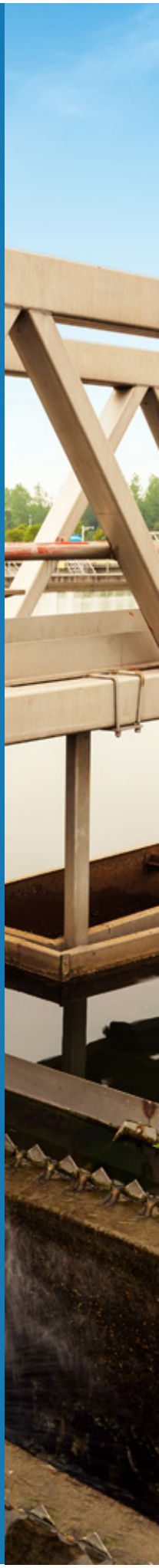
CONCLUSIÓN

De toda esta complejidad y especificaciones surgen tres mensajes fundamentales para todas las partes interesadas en el saneamiento urbano. Estos son:

- Ahorrar enormes cantidades de dinero desplazando el énfasis del saneamiento con alcantarillado a una versión in situ basada en contenedores.
- Aumentar los flujos financieros mediante el uso de una gama de instrumentos y mecanismos de financiación tanto existentes como nuevos.
- Atraer capital al sector mediante la mejora de las condiciones de gobernabilidad y el desarrollo de los proveedores de servicios.

Si las personas con poder, buena voluntad y visión se unen con decisión en esta causa, pueden atraer el aumento de la inversión necesaria para lograr los ODS de saneamiento y ayudar a crear ciudades en las que las personas sanas y felices puedan vivir de forma sostenible.

INTRODUCCIÓN AL PROGRAMA DE TRABAJO DEL CONSEJO MUNDIAL DEL AGUA SOBRE LA FINANCIACIÓN DEL SANEAMIENTO



DEFINICIÓN DE SANEAMIENTO A EFECTOS DE ESTE PROGRAMA DE TRABAJO

En este programa de trabajo, el saneamiento se define como la gestión, tratamiento y reutilización de excrementos humanos. Las aguas grises (aguas residuales de cocinas, baños, etc.) a menudo se procesan junto con los excrementos humanos, al igual que los desechos sólidos compostables. Por esta razón, y en función del contexto local, los desechos sólidos de aguas grises y compostables también se incluyen en este programa. El drenaje de aguas pluviales está asociado al alcantarillado en algunas ciudades, pero no está incluido en este programa de trabajo.

El programa de trabajo trata sobre la financiación del saneamiento, no sobre el servicio en general: únicamente estudia lo necesario sobre su funcionamiento para realizar un análisis informado sobre su financiación.

RAZONES PARA DESARROLLAR ESTE PROGRAMA DE TRABAJO

Desde que se establecieron los Objetivos de Desarrollo del Milenio (ODM) en el año 2000, se han realizado esfuerzos mundiales concertados para mejorar el acceso sostenible al agua potable y al saneamiento básico. El objetivo de los ODM en materia de agua se logró, pero el objetivo de saneamiento no: un tercio de la población mundial sigue sin disponer de un servicio básico. Ahora que los Objetivos de Desarrollo Sostenible han sustituido a los ODM, la definición de un saneamiento adecuado se ha vuelto más estricta, especialmente con el concepto de “saneamiento gestionado de forma segura”, por lo que las cifras parecen incluso peores [1].

A pesar de que los beneficios económicos y sanitarios que implica el acceso al saneamiento han sido ampliamente investigados y reconocidos, este tema suele tener una prioridad muy baja entre los políticos y dirigentes nacionales.
En comparación con muchos otros sectores de desarrollo, este sigue siendo un tema muy especializado y de menor importancia para donantes y financiadores en condiciones favorables, mucho menos para los inversores comerciales.

A pesar de que el número absoluto de personas en las zonas rurales que carecen de acceso a un saneamiento adecuado sigue siendo más elevado que en los núcleos urbanos, el rápido crecimiento de la población en ciudades y la migración están agravando la situación en los núcleos más poblados. Las estadísticas para las ciudades ocultan enormes disparidades entre ricos y pobres. El saneamiento en estas ubicaciones es técnicamente más difícil y más costoso que el rural. Los costes sanitarios, económicos y sociales de un servicio inadecuado son más elevados.

Tradicionalmente, se ha considerado como un complemento del agua, consistente en alcantarillas y plantas de tratamiento de aguas residuales: esta solución es conveniente para quienes tienen la suerte de permitírselo, pero cuesta mucho dinero y requiere mucha agua. Existen soluciones adecuadas más baratas, pero están mal explicadas o entendidas. Por tanto, puesto que el saneamiento se percibe como costoso y difícil, muchas ciudades de todo el mundo han hecho muy poco al respecto. Han sido los propios residentes los que han tenido que mejorar este servicio, a menudo de manera ad hoc y sin seguir las regulaciones.

Por todas estas razones, el Consejo Mundial del Agua ha puesto en marcha este programa de trabajo con el fin de identificar y publicitar mecanismos financieros, especialmente innovadores, que podrían ayudar a ampliar y acelerar los servicios de saneamiento urbano en todo el mundo.

1 Las definiciones autorizadas de todos los términos, como el saneamiento básico, adecuado y gestionado de forma segura, se encuentran en el sitio web del Programa Conjunto de Control www.washdata.org. El mayor impacto en la financiación del saneamiento es que el gestionado de forma segura requiere una eliminación o reutilización adecuada de todos los excrementos humanos.

Por todas estas razones, el Consejo Mundial del Agua ha puesto en marcha este programa de trabajo con el fin de identificar y publicitar mecanismos financieros, especialmente innovadores, que podrían ayudar a ampliar y acelerar los servicios de saneamiento urbano en todo el mundo.

CONTENIDO DE ESTE PROGRAMA DE TRABAJO

El programa de trabajo contiene dos elementos principales: los casos prácticos de las ocho ciudades desarrollados por los consultores nacionales y un análisis general realizado por el consultor coordinador.

Las ciudades fueron seleccionadas por el Consejo Mundial del Agua a través de sus redes profesionales, teniendo en cuenta su expreso interés en este trabajo, así como en su disposición para probar mecanismos de financiación innovadores. Dichas ciudades se encuentran en África, Asia y América del Sur, y varían en población, riqueza, estructuras políticas, cobertura de saneamiento, tecnologías y proveedores de servicios. Los casos prácticos ilustran los éxitos, desafíos y futuras aspiraciones relacionados con la financiación del saneamiento. Algunas de ellas ya han comenzado a innovar, pero eso no fue determinante a la hora de seleccionarlas para este estudio. Las ciudades son: Baguio (Filipinas), Blumenau (Brasil), Bogotá (Colombia), Dakar (Senegal), eThekwini (Durban, Sudáfrica), Jodhpur (India), Marrakech (Marruecos), Nairobi, (Kenia).

Cada consultor nacional ha seguido un marco analítico coherente que comprende una breve historia del país y de la ciudad estudiada, información detallada sobre la financiación del saneamiento en la ciudad objeto de estudio y su análisis. Cada uno de ellos ha trabajado en estrecha colaboración con la autoridad responsable de los servicios de esa ciudad, ha recabado datos de dicha autoridad y de otras organizaciones pertinentes. El resultado de este trabajo es un conjunto de ocho casos prácticos, publicados por el Consejo Mundial del Agua, los cuales se pueden leer individualmente o en conjunto a la vez que este informe. El trabajo del consultor coordinador se basa en el conocimiento personal, el estudio, y el buen trabajo ya realizado por otras personas en materia de financiación del saneamiento. También se basa en ejemplos, opiniones e información de los casos prácticos de las ocho ciudades. El presente informe es el resultado de dicho trabajo.

OBJETIVO Y ESTRUCTURA DE ESTE INFORME

Este informe no es un documento académico, sino una introducción descriptiva del tema de la financiación del saneamiento urbano. Su objetivo es promover un mayor flujo financiero para el saneamiento con fin de lograr una visión positiva del sector para 2030. En él se describe y analiza el tema, generando tanto implicaciones como mensajes políticos orientados a los dirigentes y el Consejo Mundial del Agua con el objetivo de generar acciones relevantes por parte de ellos, además de alentar a que otras personas lleven a cabo un análisis más exhaustivo sobre las necesidades, mecanismos y fuentes de financiación.

El informe sigue una secuencia lógica: primero se prevé cómo serán los servicios de saneamiento urbano en 2030; a continuación, se analiza cómo se financiarían esos servicios, y finalmente se identifican las decisiones que se deben tomar ahora y quién debe tomarlas para aumentar esos flujos financieros.

La sección final sobre las decisiones que se deben tomar de manera inminente, se está resumiendo en un breve folleto, para que así las personas con un mayor nivel de autoridad puedan leerlo rápidamente. Este folleto debe contener todo lo que necesitan saber para tomar decisiones, mientras que sus empleados y compañeros pueden encargarse de estudiar los materiales más detallados en su nombre.

Este informe combina material genérico obtenido mediante la consulta personal, las entrevistas a expertos y el estudio de publicaciones; además incluye las lecciones específicas que se desprenden de los ocho casos prácticos de las ciudades. Estas lecciones se incorporan al texto principal, mientras que los casos prácticos individuales se resumen brevemente en los Anexos.

SIGUIENTES PASOS EN ESTE TRABAJO

Este programa de trabajo será constante para el Consejo Mundial del Agua. Se han planificado varias sesiones y actividades en el 8° Foro Mundial del Agua que se celebrará en Brasilia, donde se presentará este informe. Después del Foro, el Consejo continuará con diversos flujos de trabajo, incluido el apoyo a las ocho ciudades objeto de estudio para ser los primeros en adoptar y defender este tema. Asimismo, trabajará globalmente junto con otras partes involucradas con el fin de ayudar a promover los mecanismos financieros innovadores descritos en este informe.

I. ¿CÓMO PODRÍA SER EL SANEAMIENTO URBANO EN 2030?

Para los profesionales que ya han trabajado en este campo durante 20 o 30 años, realizar una proyección para dentro de otros 12 años no es futurología especulativa, sino una predicción informada basada en las tendencias actuales e ideas futuras. Esa es la base de esta sección del informe. El tono subyacente es, sin lugar a dudas, positivo y optimista: la visión de que se puede conseguir un saneamiento urbano gestionado y financiado adecuadamente para el año 2030, al tiempo que examina cómo puede justificarse dicho optimismo.

1.1 CONTEXTO POLÍTICO Y DEMOGRÁFICO

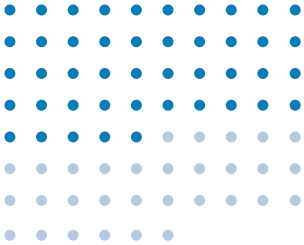
Según las estadísticas y proyecciones de ONU DAES, en la actualidad hay 7,6 mil millones de personas en el mundo, de las cuales 3,1 mil millones viven en núcleos urbanos de las regiones menos desarrolladas. En el año 2030 la población mundial habrá aumentado en mil millones, y la mayoría vivirá en esos mismos núcleos. Esto equivale a mil millones más de personas que alimentar y proveer de servicios de saneamiento.

Los Objetivos de Desarrollo Sostenible (ODS) establecen de forma comprensible objetivos más rigurosos que los Objetivos de Desarrollo del Milenio (ODM). Específicamente en materia de saneamiento urbano, los datos del Programa Conjunto de Control de la ONU muestran que en 2015 el 83% de la población urbana del mundo tenía un servicio mejorado (esta era la definición de los ODM: instalaciones diseñadas para separar los excrementos del contacto humano de forma higiénica), pero sólo el 43% disponía de saneamiento gestionado de forma segura (esta es la definición del ODS: instalaciones mejoradas, no compartidas con otros hogares, donde los excrementos producidos deben tratarse y eliminarse in situ, almacenarse temporalmente y luego vaciarse y transportarse para someterlos a un tratamiento externo, o transportarse a través de una alcantarilla con aguas residuales y luego tratarse en otras instalaciones). Eso significa que el 40% de la población urbana mundial tenía instalaciones mejoradas compartidas con otros hogares, o instalaciones mejoradas en las cuales los excrementos no eran tratados adecuadamente.

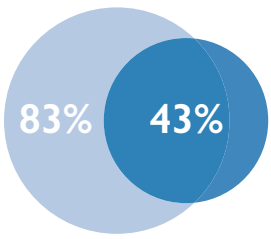
Esas cifras principales, por amplio margen que incluyan, esconden grandes disparidades entre ricos y pobres. Los núcleos urbanos son diversos en términos de condiciones socioeconómicas, patrones de asentamiento, infraestructura y servicios. Los vecindarios ricos a menudo están muy bien atendidos, mientras que las áreas pobres (especialmente los poblados de chabolas) están mucho peor. Esta situación de inequidad supone un problema político y demográfico importante.

Con el fin de alcanzar los ODS en materia de saneamiento, en 2030 habrá que atender hasta a 3.200 millones de personas en núcleos urbanos y a 2.100 millones más en zonas rurales para lograr un saneamiento gestionado de forma segura y, a su vez, se deberán tratar los excrementos de las 8.600 millones de personas en el mundo.

En 2030 los dirigentes mundiales lucharán por encontrar un equilibrio entre la mejora de la calidad de vida de miles de millones de personas, en constante aumento, y la conservación de la estabilidad y la salud del entorno natural del que dependen ellas y todas las demás especies. Estos dirigentes deberán tomar medidas históricas y sin precedentes para lograr mantener dicho equilibrio. Los profesionales del sector de saneamiento pueden ayudarles convirtiendo los excrementos humanos en un recurso en lugar de un desecho, y ofreciendo

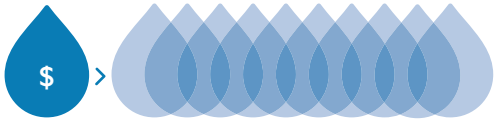


7.6 Mil millones
de personas en el mundo
3.1 Mil millones
viven en áreas urbanas en regiones menos desarrolladas.



En 2015 el **83%** de la población urbana del mundo tenía saneamiento mejorado pero solo el **43%** disponía de saneamiento gestionado de forma segura.
**Conjunto de Monitoreo de la ONU*

el saneamiento urbano como una herramienta para el progreso en lugar de otro problema más del que preocuparse. Esto se puede hacer revisando las formas tradicionales en las que se trabaja, así como aplicando algunas ideas nuevas sobre el servicio y su financiación.



Las cifras típicas reflejan que **1 dólar** invertido en agua y saneamiento rinde en el orden de **5-10 dólares** de beneficios económicos.

1.2 JUSTIFICACIÓN ECONÓMICA Y EMPRESARIAL DE UN SANEAMIENTO MEJORADO

La justificación económica y empresarial son expresiones similares, pero hacen referencia a diferentes conceptos. La justificación económica de un saneamiento mejorado demuestra que el mismo beneficia a la economía nacional o local, mientras que justificación empresarial indica que las empresas pueden dirigir negocios rentables que trabajan para mejorarlo. Ya en 2018 ambos están claramente establecidos, tal y como se describe a continuación. Dadas las bases de sus cálculos y las tendencias actuales, para el año 2030 ambos aspectos se habrán fortalecido.

Aspecto económico

Esencialmente aborda la pregunta de por qué los políticos deberían preocuparse por el saneamiento urbano en general y por el saneamiento universal gestionado de forma segura en particular. Se crea un aspecto económico mediante la cuantificación de los beneficios debido a su mejora.

Varios estudios han demostrado los buenos rendimientos económicos que se obtienen al invertir en agua y saneamiento mejorados. En general, su formato ha consistido en calcular sólo los beneficios económicos más directamente relacionados. Es decir, el ahorro de tiempo relacionado con un mejor acceso a instalaciones de ambos servicios, la ganancia de tiempo productivo debido al menor tiempo perdido debido a enfermedades, los costes ahorrados por los pacientes y el sector sanitario debido a menos tratamientos de enfermedades diarreicas, y el valor de la prevención de fallecimientos. La autoridad reconocida en estos análisis económicos es Guy Hutton, quien originalmente trabajó para la OMS y más tarde formó parte de un equipo que lleva a cabo la Iniciativa Economía del Saneamiento (ESI, por sus siglas en inglés) del Programa de Agua y Saneamiento (WSP, por sus siglas en inglés) del Banco Mundial. Los resultados de la OMS y de la ESI se enmarcan típicamente a nivel mundial, regional o nacional, en términos del beneficio (análisis de costes de invertir en saneamiento) o en términos del PIB perdido por un saneamiento deficiente. Las cifras típicas reflejan que 1 dólar invertido en agua y saneamiento obtiene rendimientos en el orden de hasta 5-10 dólares de beneficios económicos, y que un servicio deficiente cuesta a los países en torno al 2-6% de su PIB. Estos son números enormemente significativos. Si bien esos estudios anteriores no proporcionaron análisis rurales y ur-

banos por separado, el reciente documento de Hutton para el Copenhagen Consensus Center, sobre los beneficios y costes del agua y el saneamiento, proporciona el desglose específico para el entorno urbano, basado en los números y gastos de 2015. Proporciona una relación beneficio/coste de entre 2,5 y 3, en función de los supuestos económicos utilizados.

A pesar de la solidez de estos análisis, en general, es posible que subestimen los argumentos políticos en lo que respecta al saneamiento, puesto que no cuantifican los beneficios que están menos relacionados de forma directa, como aquellos para el medioambiente, el sentimiento de seguridad, la conveniencia, la salud y el bienestar de las personas y, en última instancia, el desarrollo económico nacional. El aspecto político puede incluso reconocer su impacto en el turismo, el comercio internacional, la inversión económica internacional, la estabilidad política, la reducción de la migración y el desplazamiento de personas.

El análisis anterior de cuantificación de los beneficios es, en terminología económica, monetizar las externalidades del saneamiento mejorado. Éste será un aspecto fundamental de las futuras soluciones financieras, y se comenta más detalladamente a continuación, en la sección 2.6.

Justificación empresarial

Aborda la cuestión de por qué los empresarios deberían estar interesados en trabajar en el saneamiento urbano. En los países de renta alta ya existen muchas empresas de todos los tamaños con negocios prósperos en este campo; sus accionistas y gerentes conocen muy bien la justificación empresarial de trabajar en este servicio urbano. En cuanto a los países con ingresos medios y bajos, el panorama es más variable. Sin duda, muchas empresas se ganan la vida con este negocio, pero tienden a ser pequeños empresarios o empresas familiares que a menudo operan en la economía informal, en lugar de grandes empresas que operen a escala de ciudades completas. Por ejemplo, de las ocho ciudades objeto de estudio, sólo una, Blumenau, tiene una empresa privada que gestiona el saneamiento de toda la ciudad.

Durante casi 20 años, desde que el tema fue originalmente impulsado por el gobierno de Suiza, varias agencias de desarrollo han trabajado en estudiar, promulgar y abogar por que las empresas se involucren en el saneamiento urbano. Este movimiento se ha visto reforzado recientemente por la atención prestada al cambio climático, al medioambiente y al concepto de economía circular, porque esas consideraciones están haciendo que las empresas de este sector sean inherentemente más rentables de lo que solían ser.

Una de las agencias que promueve más activamente la justificación empresarial para el saneamiento urbano es la Toilet Board Coalition (TBC), una organización de afiliación que promueve las contribuciones que los empresarios y las empresas del sector privado pueden hacer en los países en vías de desarrollo. La TBC estima que los recursos procedentes del inodoro (el nuevo nombre que la TBC ha acuñado para lo que antes se conocía como excrementos o desechos humanos) ascienden a 3,8 billones de litros anuales a nivel mundial, con un valor económico de muchos miles de millones de dólares. La TBC y otros partidarios están alentando a los empresarios a ver este tema en los países en vías de desarrollo como un nuevo sector empresarial en el que tener la ventaja de ser el primero en actuar. Consideran que los empresarios pueden desarrollar negocios a lo largo de la cadena de valor de saneamiento, para así atraer a diferentes inversores.

Con el fin de fortalecer la justificación empresarial, los inversores buscan factores que mitiguen los riesgos y costes que les supone. Además de las características específicas del negocio en sí, estos factores podrían incluir: un marco político claro para este sector; una definición clara de las funciones de las diferentes organizaciones gubernamentales y del sector privado; legislación y regulación que se aplica en los tribunales; un municipio estable y comprometido, preferiblemente dispuesto a coinvertir junto con inversores comerciales. Estos factores de gobernabilidad son muy importantes a la hora de crear la justificación empresarial. Las necesidades de los inversores se mencionan de nuevo en la sección 2.6 de a continuación.

1.3 SANEAMIENTO INCLUSIVO PARA TODA LA CIUDAD

En 2018 éste es un concepto emergente [2]; de cara a 2030 debería ser la norma. El principio básico es el sentido común, que todas las organizaciones relacionadas con el saneamiento de una ciudad concreta se unan y acuerden la mejor manera de atender a sus ciudadanos. Parece sencillo, pero todavía no se ha generalizado: por ejemplo, de las ocho ciudades objeto de estudio, sólo eThekwini y Dakar realmente lo han entendido y adoptado hasta la fecha. Es esencialmente un concepto de gobernabilidad que combina marcos de planificación, funciones institucionales acordadas, legislación y regulación. Cada ciudad es única, pero hay determinados principios subyacentes que se aplican a todas ellas:

- Cooperar para ofrecer servicios de saneamiento en toda la ciudad. Incorporar esta actividad en la gobernabilidad urbana en su totalidad; establecer funciones y responsabilidades claras que utilicen las fortalezas de los distintos tipos de organizaciones; expresar y crear demanda a través de la sociedad civil; colaborar para trazar, planificar, diseñar e implementar servicios de saneamiento.
- Abrazar la diversidad. Promover una variedad de conceptos de gobernabilidad, marcos de planificación, proveedores de servicios, soluciones técnicas y mecanismos financieros a fin de atender a todo el mundo; evitar imponer una solución para toda la ciudad.
- Cumplir con el derecho humano al saneamiento. Abordar la inequidad; llegar a las personas más vulnerables y marginadas; centrarse en asentamientos precarios; garantizar la asequibilidad para las personas más pobres y establecer las políticas tarifarias en consecuencia.
- Reconocer que el saneamiento contribuye a una economía urbana próspera. Integrar este sector en la planificación urbana; utilizar conceptos de economía circular para aumentar la recuperación y

2 Este concepto ha sido creado por un grupo de organizaciones formado, entre otros, por el Banco Mundial, la Fundación Gates, las universidades de Emory y Leeds, y WaterAid.

la reutilización de recursos; vincular el saneamiento mejorado con el progreso en otros sectores de desarrollo urbano y social.

• Lograr una gestión segura a lo largo de toda la cadena de servicios. Permitir diversas soluciones y estrategias; promover el tratamiento descentralizado frente a los sistemas centralizados; seleccionar y utilizar las mejores tecnologías en cada fase de la cadena de servicios.

Ninguna de estas ideas es extraña o difícil de entender. El esfuerzo reside en aplicarlas. Las personas, especialmente los dirigentes y los legisladores, deben cambiar su forma de trabajar. Aquellos que anteriormente ostentaban todo el poder, por lo general los líderes municipales, deben tener la dignidad y la visión para darse cuenta de que pueden compartir ese poder con terceros sin menospreciarse a sí mismos. Las otras partes interesadas deben reconocer este hecho y apoyar el cambio.

Varios actores externos están tratando de estimular a los líderes municipales para que adopten un saneamiento inclusivo para toda la ciudad. Un método poco habitual es otorgar premios. Por ejemplo, el Sanitation Challenge for Ghana (Desafío de Saneamiento para Ghana) es un mecanismo iniciado por el Departamento de Desarrollo Internacional del Reino Unido destinado a estimular el interés entre los municipios, para premiar las mejores estrategias en materia de gestión de residuos líquidos. El desafío ha generado gran interés entre los municipios de todo el país y recientemente se ha extendido al sector privado y a las ONG asociadas. El gobierno de Ghana está apoyando muy activamente el trabajo de los municipios revisando los acuerdos y normas de gobernabilidad. Todo el proceso ha ayudado a los municipios a pensar de forma creativa, a trabajar con terceros en asociaciones inclusivas y a diseñar e implementar estrategias sostenibles en materia de gestión de desechos líquidos que permiten prestar servicios en toda la ciudad.

1.4 SANEAMIENTO COMO PARTE DEL SECTOR DE SERVICIOS

Desde que se realizaron los programas municipales pioneros del siglo XIX, el saneamiento generalmente se ha clasificado como un sector de infraestructuras. A raíz de ello, se empezó a vincular más a la ingeniería civil, a grandes proyectos de capital que necesitan importantes cantidades de dinero, a la planificación centralizada, activos fijos y resultados rígidos. Los planificadores e ingenieros han dominado el sector. Mientras tanto, el servicio inadecuado se suele catalogar como un problema de salud pública, ya que la carga de resolverlo únicamente recae sobre el gobierno y los donantes interesados. Los residentes se han clasificado como receptores o beneficiarios, ejerciendo principalmente funciones pasivas.

Las telecomunicaciones también solían clasificarse como un sector de infraestructuras, basado en activos fijos de líneas fijas. Sin embargo, esto ha cambiado completamente en la actualidad gracias a todas las tecnologías flexibles, modelos de negocio y distintos medios de comunicación a disposición de los usuarios, convirtiéndolo en parte del sector servicios, atrayendo de este modo a un gran número de inversores y proveedores de servicios. Lo mismo ocurre con el saneamiento: con la proliferación de ideas nuevas (modelos comerciales, opciones de servicio, soluciones tecnológicas, etc.) a lo largo de la cadena de valor y mediante un nuevo enfoque en los residentes como clientes, las percepciones establecidas ya han empezado a cambiar. En 2030 esta actividad ya no debería clasificarse como infraestructura, sino como sector de servicios.

Una relación de servicio requiere clientes y proveedores de servicios. En este caso, los clientes son personas generalmente clasificadas como residentes porque este servicio está principalmente relacionado con el hogar. Los proveedores de servicios son todas las organizaciones, tanto del sector público como del privado, que brindan servicios a esos residentes. Entre ellos se incluyen, por ejemplo, educadores que explican los beneficios de un saneamiento mejorado, albañiles que construyen inodoros y pozos, contratistas que vacían pozos, empresarios que suministran y mantienen baños a base de contenedores,

grupos comunitarios o compañías que construyen y gestionan baños compartidos y servicios públicos, aseos, empresas de servicios públicos que construyen redes de alcantarillado y plantas de tratamiento de aguas residuales, compañías especializadas que transforman recursos procedentes del inodoro en productos básicos como agua, combustible, abonos o productos químicos. Son empresas de todo tipo y tamaños con una característica común: todas ellas se ganan la vida satisfaciendo las necesidades de saneamiento de sus clientes. Entre dichos proveedores de servicios, uno de ellos, generalmente el municipio o la empresa de servicios públicos, es el último responsable de la prestación de este servicio y de coordinar a los otros proveedores de servicios.

1.5 ECONOMÍA CIRCULAR DE SANEAMIENTO

En 2018, la economía circular de saneamiento es un concepto [3] relativamente nuevo. Se trata de una aplicación específica del concepto general de economía circular en la que los residuos de una organización pueden ser los inputs de otra. Durante décadas se han aplicado a este sector conceptos de economía circular a pequeña escala, como la reutilización de recursos y la generación de productos útiles a partir de desechos; casi todas las ciudades seleccionadas como objeto de estudio para este programa de trabajo cuentan con ejemplos a pequeña escala. Ahora estos conceptos se están teniendo en cuenta a escala de toda la cadena de servicios. Al mismo tiempo, cambiar nombres como “excrementos humanos” o “residuos” por “recursos procedentes del inodoro” es un avance simbólico que nos recuerda que es posible dejar de lado nuestras ideas preconcebidas y mirar hacia el futuro. Los recursos sanitarios tienen valor enérgico (para combustible gaseoso y de biomasa), valor nutritivo (para fertilizantes y piensos), valor orgánico (para almacenamiento de carbono) y valor hidrológico (para aplicaciones no potables). En 2030 todos los servicios de saneamiento urbano deberían formar parte de una economía circular. Los recursos procedentes del inodoro se almacenarán, transportarán y transformarán cuidadosamente en productos que pueden usarse como input para otros procesos industriales y agrícolas.

Esta economía circular de saneamiento se ha basado en principios asociados con el saneamiento ecológico y sostenible. Ambos conceptos se han utilizado durante muchos años, pero han tenido dificultades para convertirse en prácticas convencionales aceptadas. La economía circular tendrá un atractivo más amplio y llevará las ideas de esos conceptos a una escala y aceptación mucho mayores. Muchas agencias y analistas ahora consideran esta economía circular como una gran impulsora de la innovación en el sector.

La economía circular de saneamiento no es una tecnología, sino

3 Ha sido especialmente defendido por la Toilet Board Coalition (TBC), que se ha introducido en la sección 1.2 anterior.

un concepto. Su principio de generar valor a partir de los recursos procedentes del inodoro reutilizados puede aplicarse a muchas tecnologías, estructuras institucionales, organizaciones y escalas diferentes. Algunas de sus características y beneficios son [4]:

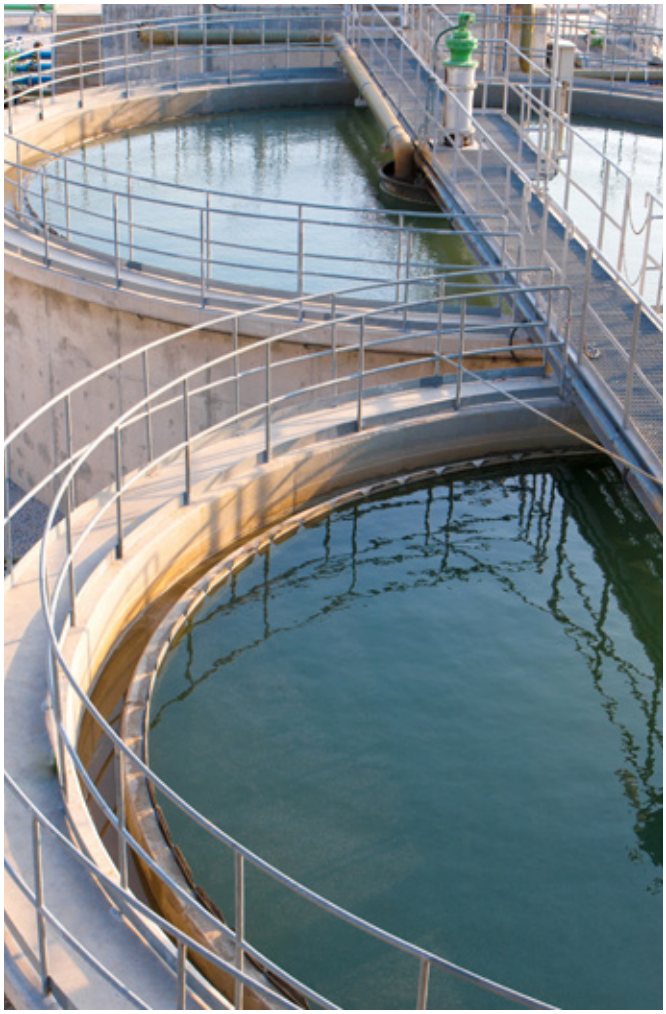
- La protección del medio ambiente y el uso eficiente y/o la protección de los recursos no se consideran un obstáculo económico, sino oportunidades económicas. La motivación para participar de este tipo de economía no es la simpatía o el deseo de querer sentirse bien, sino más bien un interés comercial y una oportunidad económica y de empleo.
- Las actividades de economía circular son más efectivas cuando se realizan en colaboración con empresarios, grandes empresas, empresas de servicios públicos y municipios, y no entre empresarios que actúan individualmente. Esto debería animar a las empresas de servicios públicos tradicionalmente centralizadas a aplicar la economía circular en lugar de ignorarla u oponerse a ella.
- Los modelos comerciales de saneamiento circular pueden ser rentables a nivel de ciudad si se fomentan mediante la regulación adecuada de los productos (por ejemplo, calidad de agua reutilizada, fertilizantes para cultivos alimentarios, alimentación a redes eléctricas, combustible sólido).
- Los modelos comerciales de economía circular también pueden volverse rentables a escala más local, como una sola fábrica, hospital, universidad o urbanización residencial.
- La economía circular de saneamiento puede tratar conjuntamente los recursos procedentes del inodoro con otros biológicos (como los residuos alimenticios de fábricas o restaurantes y otros residuos sólidos compostables) que, de otro modo, se desperdician. Ese tratamiento conjunto aumenta los volúmenes de productos y puede mejorar la rentabilidad del proceso.
- El concepto de economía circular puede aplicarse al saneamiento con alcantarillado (por ejemplo, en la gestión de plantas de tratamiento de aguas residuales), aunque tiende a ser más adecuado para tecnologías descentralizadas como el servicio in situ y basado en contenedores en el que los recursos procedentes del inodoro no se diluyen con agua y, por tanto, son más fáciles de procesar.
- La recuperación de recursos implica automáticamente el tratamiento adecuado de las aguas residuales o lodos fecales. Por ejemplo, generar biogás conlleva la digestión anaeróbica, un proceso de tratamiento de lodo que sigue al tratamiento de aguas residuales, las cuales deben ser tratadas para la irrigación agrícola. Para utilizar lodo como fertilizante en tierras agrícolas, este debe ser previamente tratado. Por consiguiente, la utilización de estos productos finales requerirá un mayor tratamiento de aguas residuales y lodos fecales.

Los procesos de economía circular de saneamiento a nivel de ciudad ya son habituales en los países desarrollados, especialmente en Europa, pero todavía no lo son en los países en vías de desarrollo: por ejemplo, de las ocho ciudades seleccionadas como objeto de estudio, solo eThekwini ha empezado a aplicar conceptos de economía circular a escala. La mayoría de las actividades de economía circular normalmente se han desarrollado a menor escala: Jodhpur es un buen ejemplo de una ciudad que lo intentó a una escala demasiado pequeña como para ser rentable. Los modelos económicos de la TBC sugieren que estas actividades deberían ser rentables a nivel de ciudad o, en el peor de los casos, deberían necesitar una subvención mucho más baja del gobierno que la que reciben los sistemas de economía no circular.

En **2018**, la **Economía Circular en Saneamiento** es un concepto relativamente nuevo. Es una aplicación específica en la cual el desperdicio de una organización puede ser un aporte para otra organización.

4 Esta lista se basa en el trabajo de la TBC.

1.6 TECNOLOGÍAS



Marrakech is lucky enough to be able to fund 2/3 of its capital expenditure on sanitation by cross-subsidy from its electricity operations.

A menos que se inventen tecnologías imprevistas de forma muy rápida, de cara al año 2030 las tres tecnologías básicas disponibles para esta actividad seguirán siendo las actuales: con alcantarillado, in situ y basado en contenedores. Algunas ciudades tienen previsto disponer de una cobertura del 100% mediante una sola tecnología (normalmente con alcantarillado), pero este objetivo es muy difícil en países con ingresos medios o bajos. Baguio y Nairobi son ejemplos típicos de ciudades con planes poco realistas y sin suficientes fondos para conseguirlo. Otras ciudades utilizarán una combinación de las tres: Dakar es un caso interesante en el que la visión a largo plazo del gobierno es 100% con alcantarillado, pero es consciente de que no es asequible, por lo que fomenta el servicio in situ a medio plazo. No existe una norma absoluta sobre qué tecnologías es mejor utilizar: lo que importa es elegir la combinación técnica adecuada para atender a las personas de dicha ciudad en particular de forma sostenible y asequible. Bajo el concepto de saneamiento inclusivo en toda la ciudad, lo tres modelos coexistirán e interactuarán de forma bien planificada, por ejemplo, transfiriendo los recursos procedentes del inodoro de inodoros in situ y de contenedores a plantas de tratamiento de aguas residuales diseñadas adecuadamente. Las decisiones políticas sobre la tecnología generalmente se basarán en la economía, la demografía, la topografía y la historia.

Saneamiento con alcantarillado

Describe una red de alcantarillas subterráneas con planificación centralizada que va desde las casas hasta las plantas de tratamiento de aguas residuales, a lo largo de las cuales los recursos procedentes del inodoro se transportan con agua. Este sistema es aparentemente el mejor valorado en todo el mundo, principalmente porque el usuario puede descargar y olvidarse; es decir, no requiere manipular el inodoro, ni inte-

des que sean lo suficientemente ricas como para permitírselo y cuenten con las alcantarillas adecuadas para suministrar, recolectar y tratar agua. En los núcleos urbanos de los países menos desarrollados podría proporcionar la infraestructura básica para los sistemas de la ciudad en los que se integrarán otras tecnologías, y tenderá a ser la tecnología dominante en los centros urbanos. La infraestructura de tuberías simplificada y más asequible también se puede utilizar para la eliminación de aguas grises y aguas pluviales.

Saneamiento in situ con gestión de lodos fecales (GLF)

El saneamiento in situ describe un sistema en el que el inodoro y la contención de los recursos procedentes del inodoro (generalmente un pozo o fosa séptica) se encuentran dentro del hogar del propietario. Cualquier desbordamiento de líquido del contenedor in situ penetra en el suelo o bien se conecta a una red de alcantarillado. En algunas tecnologías, especialmente en los inodoros de dos depósitos y el más reciente Inodoro Reinventado (Reinvented Toilet[5]), el tratamiento de los recursos procedentes del inodoro también se realiza in situ y los residentes pueden ser, de hecho, sus propios proveedores de servicios.

El principal problema técnico que existe con el saneamiento in situ es que requiere realizar uno o más agujeros en el suelo y, por tanto, puede instalarse únicamente en locales con espacios exteriores, como jardines. (En ocasiones, pueden cavarse pozos en espacios interiores, pero ello requiere una aceptación cultural y el vaciado resulta muy incómodo). En los edificios con varios inquilinos, como por ejemplo bloques de pisos, se requieren sistemas de mini-alcantarillado en el interior que conducen a una fosa séptica comunitaria u otra instalación de tratamiento al aire libre. Las propiedades y los vecindarios que reciben servicios in situ también necesitan sistemas separados para la eliminación de aguas grises y pluviales.

Los residentes han utilizado el saneamiento in situ durante muchos años y sigue siendo la tecnología más utilizada en muchas metrópolis importantes, incluida hasta hace poco Tokio, la ciudad más grande del mundo. Los principales desarrollos tecnológicos desde ahora y hasta 2030 se realizarán en el transporte y tratamiento de los recursos procedentes del inodoro (lodo fecal) que se eliminarán de las instalaciones in situ. Esta actividad se denomina gestión de lodos fecales (GLF) y se está convirtiendo en un sector servicios especializado. La calidad del tratamiento está mejorando y muchas empresas de GLF ya han demostrado que pueden ser rentables y viables mediante la aplicación de los principios de la economía circular. De las ciudades seleccionadas como objeto de estudio, Dakar cuenta con los sistemas más extensos y mejor planificados in situ y GLF y, en particular, ha sido pionera en los aspectos de gobernabilidad de la GLF.

La mejor fuente de información detallada sobre la GLF son las conferencias internacionales en curso sobre la misma con sus publicaciones de apoyo.

Saneamiento basado en contenedores (SBC)

En 2018 el saneamiento basado en contenedores (SBC) es un concepto nuevo dentro del sector de saneamiento convencional en los países en vías de desarrollo, aunque los mercados especializados (vehículos y barcos) de países ricos han utilizado ideas similares durante décadas. En 2030 el SBC podría estar muy extendido. Es técnicamente diferente del modelo con alcantarillado o in situ porque la unidad del inodoro en sí es un activo móvil que pertenece al proveedor del servicio, no al hogar. Incorpora un contenedor sellado higiénicamente que el proveedor del servicio retira del hogar con una frecuencia acordada, a quien el residente le paga una tarifa, generalmente semanal o mensual. Los recursos procedentes del inodoro se transportan a una instalación propiedad de ese proveedor de servicios o a una planta de tratamiento del

5 El Inodoro Reinventado, un concepto intensamente promovido por la Fundación Gates, es una tecnología modular y transformadora que tiene como objetivo destruir todos los patógenos in situ y recuperar recursos valiosos, operar sin conexiones de alcantarillado, agua o electricidad y tener un coste menor de 0,05 dólares por usuario al día en un modelo de negocio sostenible. Varias versiones se encuentran actualmente en la etapa de prototipo.

municipio para su tratamiento. En cualquier caso, la venta de productos constituye una parte importante del concepto, por lo que se integra con aún más facilidad en el concepto de economía circular que las opciones con alcantarillado o in situ. Por su naturaleza, es un servicio descentralizado y flexible con costes de pérdidas mínimos en bienes de capital, por lo que uno o varios proveedores de servicios pueden revisarlo, mejorarlo o ampliarlo indefinidamente. El SBC permite a los residentes utilizar el saneamiento ecológico sin necesidad de administrar los recursos procedentes del inodoro, así como gestionar grandes volúmenes de este recursos procedentes del inodoro, por lo que es adecuado para baños compartidos y públicos.

Una gran ventaja del SBC es que el inodoro puede instalarse en cualquier parte de la casa, por lo que no es necesario que el residente disponga de un espacio exterior para ello. Esto es especialmente beneficioso para las personas que viven en núcleos urbanos densamente poblados. Por otro lado, el SBC tiene un posible problema de reputación: la gente podría asociarlo con la ya desaparecida práctica de la recolección de excrementos. El sistema, actualmente en desuso, requería personal para recolectar excrementos frescos de las nada higiénicas letrinas de los hogares, y se reconoció que era una profesión humillante. Los defensores del SBC tienen la intención de explicar claramente que el SBC contemporáneo no tiene nada que ver con la recolección de excrementos en lo que a seguridad y riesgo sanitario del personal se refiere. El SBC tiene otros inconvenientes: requiere contenedores más grandes para aquellos residentes que utilizan agua para la limpieza anal, genera tráfico adicional de camiones, asociado a la contaminación del aire, y debe garantizar que el servicio de vaciado de contenedores sea completamente fiable.

En la actualidad, los proveedores de servicios de SBC son pequeñas empresas emprendedoras o, en el caso de Manila, una empresa de servicio público para toda la ciudad. En esta última empresa es solo un plan piloto, pero si tuviese éxito podría indicar el camino a seguir para el SBC, ya que una empresa de servicio público puede generar economías de escala que para los emprendedores podrían ser muy difícil de alcanzar.

Baños públicos y compartidos

Las tres tecnologías principales se han descrito anteriormente en el contexto de los servicios de saneamiento para hogares y locales comerciales. Sin embargo, para las personas que viven en lugares muy concurridos en determinados países, algunas políticas nacionales seguirán permitiendo la prestación de servicios mediante baños públicos o compartidos. Estos inodoros se encuentran generalmente en bloques con instalaciones de lavado y otros servicios, ya sea conectados a alcantarillas o con sus propias fosas sépticas de gran tamaño.

En 2030, la calidad de los baños públicos o compartidos debería mejorarse significativamente, ya que las buenas prácticas en la gestión de inodoros se habrán extendido. En la actualidad, los municipios ya venden o alquilan muchos bloques de baños públicos o compartidos a las ONG o empresas del sector privado. Por ejemplo, en Jodhpur los encargados de gestionar los inodoros públicos de forma rentable son concesionarios del sector privado. Con respecto al tratamiento de materiales procedentes del inodoro, los pocos baños públicos o compartidos que dispongan de suficiente espacio tendrán su propia instalación de tratamiento in situ. Sin embargo, la mayoría no dispondrá de ello, por lo que será necesario transportar los residuos procedentes del inodoro a través de la red de alcantarillado o vehículo para ser tratados.

Los siguientes cuadros resumen dos estudios recientes (2017) sobre el SBC.

ESTUDIO PARA EVALUAR EL POTENCIAL DEL SBC, POR EL BANCO MUNDIAL

Combina una visión general del SBC y el análisis detallado de cuatro compañías. Generalmente es partidario del SBC como parte de un enfoque de saneamiento inclusivo para toda la ciudad. Algunos puntos importantes que presenta son:

- El SBC general podría ser más rentable a largo plazo que el modelo con alcantarillado o in situ, aunque el Banco Mundial aún no considera que se hayan realizado suficientes investigaciones como para adoptar una postura rotunda al respecto.
- La mayoría de los proveedores de servicios de SBC ofrecen servicios de calidad a sus clientes y reciben muy pocas quejas.
- Actualmente es difícil evaluar la asequibilidad relativa del SBC para los clientes porque los proveedores de servicios generalmente establecen sus tarifas para que coincidan con las de alcantarillado existentes (generalmente con grandes subvenciones del gobierno).
- Las cuatro empresas están avanzando hacia una mayor rentabilidad. Definitivamente lo conseguirán si amplían su escala de operaciones. Los obstáculos para aumentar esta escala son: la regulación incierta de los productos; el bajo apoyo de los municipios; y la falta de subvención por parte del gobierno (a diferencia de otros tipos de saneamiento).

PUBLICACIÓN: EL MUNDO ESTÁ ANSIOSO POR TENER ALCANTARILLAS, POR WSUP

Esta publicación analiza los factores de éxito de las empresas de SBC y presenta una propuesta para llevarlo a escala, basada principalmente en el ejemplo de Clean Team en Kumasi, Ghana. Algunos puntos importantes del documento son:

- El SBC, en teoría, es rentable, pero resulta difícil llevarlo a la práctica. Entre los factores económicos más importantes se encuentran el coste de capital del contenedor y la frecuencia de las recolecciones semanales. La empresa debe tener un margen de beneficio bruto de al menos un 50% para considerarse un negocio sostenible, lo que generalmente equivale a cobrar unos 8 dólares por hogar al mes, un precio probablemente demasiado alto para los hogares más pobres.
- El SBC es un trabajo centrado en el cliente. El servicio debe ser fiable e higiénico. De forma realista, solo puede atraer a aproximadamente un 20% de la población total de una ciudad.
- Es más probable que el futuro del SBC consista en asociaciones entre un emprendedor y el sector público que entre empresas independientes de emprendedores. Por tanto, el SBC puede ser un elemento integral de un programa de saneamiento inclusivo para toda la ciudad.
- El requisito de gasto de capital para un servicio de SBC es mucho más bajo que para la opción con alcantarillado. El coste del tratamiento es un elemento importante y puede ser bajo si se integra la planificación del servicio SBC en el tratamiento de aguas residuales y la gestión de lodos fecales para la ciudad en general.

2. ¿CÓMO SE FINANCIARÍA ESTE SANEAMIENTO URBANO?

2.1. QUIÉN NECESITARÁ FINANCIACIÓN Y PARA QUÉ

El primer paso a la hora de analizar los mecanismos financieros apropiados es identificar a las personas y organizaciones que necesitarán financiación y para qué. Esto puede resultar confuso, especialmente para aquellos profesionales que no se dedican a las finanzas. Varios analistas y comentaristas tienen diferentes puntos de vista y definiciones con respecto a la financiación del saneamiento. A continuación se incluye una lista de las principales personas y organizaciones que necesitan financiación.

En función de su poder adquisitivo, algunos residentes no pueden afrontar este gasto económico, por lo que necesitan subvenciones. Otros pueden afrontarlo pero no en un único pago, por lo que necesitan préstamos.

Los ciudadanos o propietarios de viviendas

Los ciudadanos o propietarios de viviendas necesitan financiación para construir sus propios baños, así como conexiones de alcantarillado o almacenamiento in situ, tales como fosas sépticas o pozos; algunas ciudades incluso construyen sus redes de alcantarillado por barrios. Las inversiones de capital de estos ciudadanos constituyen un porcentaje muy elevado del coste total en saneamiento. Sin embargo, la condición dispersa de este gasto hace que inevitablemente no se mida bien y reciba mucha menos atención que la financiación municipal o de servicios públicos, descrita más adelante en esta lista. Además, las brechas existentes en el saneamiento urbano son extremadamente perjudiciales para la población urbana desfavorecida, al disponer de menos poder adquisitivo para financiar su propio servicio. En función de su poder adquisitivo, algunos residentes no pueden afrontar este gasto económico, por lo que necesitan subvenciones. Otros pueden afrontarlo pero no en un único pago, por lo que necesitan préstamos.

Idealmente, y por norma general, cuando se proveen adecuadamente los servicios de saneamiento, los propietarios o inquilinos pueden pagar las tarifas completas a su proveedor de servicios. Estos proveedores pueden ser: un proveedor de servicios de vaciado para la opción in situ pagado una vez cada pocos años (lo cual puede resultar muy costoso para la gente con pocos recursos); un servicio público que cobra servicios de alcantarillado como recargo en la factura de agua; un proveedor de servicios basado en contenedores, pagado mensual o semanalmente; o un operador de baños públicos pagado por visita. Sin embargo, en función de su nivel económico, algunos residentes necesitarán ayuda continua para hacer frente a estas tarifas. Por ejemplo, tanto en Bogotá como en eThekwini, se proporciona un servicio básico gratuito a los usuarios en el marco de una política gubernamental.

La brecha en el **saneamiento urbano** es abrumadora para los pobres urbanos, que tienen menos capacidad para financiar su propio saneamiento.

MANTENER COSTES ASEQUIBLES PARA PROPIETARIOS EN SITUACIÓN DE POBREZA Y VULNERABILIDAD

Los ciudadanos más pobres y vulnerables pueden requerir medidas especiales (es decir, subvenciones directas o indirectas) que les ayuden a la hora de aportar el capital para los gastos operativos del servicio. El 60% de los gobiernos que respondieron al informe GLAAS de 2017 tiene programas de accesibilidad financiera, aunque lamentablemente la mitad de estos no se utilizan habitualmente. Estos programas incluyen:

- Subvenciones públicas a los proveedores para que ofrezcan servicios gratuitos, tarifas reducidas o descuentos para alcantarillado y/o vaciado de pozos destinados a grupos específicos de la población.
- Vincular directamente la tarifa de saneamiento al bloqueo de las estructuras tarifarias del agua, con un primer bloque altamente subvencionado para cubrir las necesidades básicas.
- Tarifas de conexión gratuitas o reducidas para grupos específicos de la población.
- Subvenciones públicas a instituciones microfinancieras que concedan préstamos a los residentes con ingresos bajos, con poca o ninguna garantía, y con planes de pago que se adapten a sus circunstancias.
- Varios tipos de planes de pago y fondos de préstamos rotatorios.Estos conceptos se analizan en varios apartados de este informe.

Proveedores de servicios locales: contratistas de gestión de lodos fecales y empresas de saneamiento basado en contenedores

Se trata de contratistas que vacían las fosas sépticas de los residentes, los inodoros o baños en contenedores, y transportan los residuos procedentes del inodoro (excrementos, lodos fecales, residuos sépticos) a plantas de tratamiento que son operadas por ellos mismos o por una empresa de servicio público/municipal.

Este tipo de proveedores necesita financiación para cubrir las inversiones destinadas a comprar baños y contenedores, vaciado de pozos y vehículos de transporte, representando normalmente sus principales activos. También pueden necesitar financiación para poder construir o comprar las plantas de tratamiento que elaboran productos comercializables.

En función del marco económico y regulador en el que operan, la escala de sus operaciones, distancias de las rutas, congestión del tráfico e infraestructura de tratamiento en la que operan, estas empresas pueden ser o no rentables. Por tanto, es posible que también necesiten financiación en forma de subvención o préstamo para su trabajo operativo.

Proveedores de servicios municipales: empresas de servicio público o municipales

Son entidades de gran tamaño que trabajan el saneamiento a escala urbana. Pueden ser departamentos dentro de los municipios o empresas de servicios públicos independientes; estas últimas pueden ser corporaciones del sector público o concesiones del sector privado.

Necesitan financiación para poder construir redes de alcantarillado y plantas de tratamiento de aguas residuales, siendo estos sus principales activos. En comparación con todas las otras actividades enumeradas, estas tienden a ser, con diferencia, las partidas de capital que mayor cantidad de dinero necesitan, además de atraer una mayor atención y controversia política. Un ejemplo muy citado es Dar es Salaam, donde supuestamente el 99% del presupuesto destinado a saneamiento se invirtió en el coste de capital de un sistema con alcantarillado para el 10% de la población [6].

El sitio web **IBNET** indica que **43%** de los servicios públicos monitoreados en países de **ingresos medios y bajos** no son rentables solo en sus gastos operacionales.

También necesitan financiación para el fondo de maniobra destinado a la conservación de capital y la rehabilitación de estos grandes activos. También pueden necesitar fondos para el capital circulante destinado a su trabajo operativo (que a su vez incluye el coste de obtener un préstamo para sus inversiones).

En función de la capacidad de pago de sus clientes y del marco político y regulador en el que operan, estas entidades pueden ser o no rentables. Por ejemplo, el sitio web de la Red Internacional de Comparaciones para Empresas de Agua y Saneamiento (IBNET, por sus siglas en inglés) indica que el 43% de las empresas de servicios públicos controladas en países con ingresos medios y bajos no son rentables cuando se consideran solamente sus gastos operativos, dejando a un lado sus gastos de capital. De las ciudades seleccionadas como objeto de estudio, las empresas de servicios públicos en Bogotá y eThekwini son rentables si se considera el gasto operativo, mientras que las de Jodhpur y Nairobi no lo son. En Baguio, el capital y los gastos operativos no se contabilizan por separado y, en general, el municipio debe recibir el 40% de sus ingresos en forma de subvenciones del gobierno nacional.

6 El material de investigación para este caso fue elaborado por Sophie Trémolet para WaterAid.

Otros

En el sector hay muchos otros actores, tales como educadores de higiene del sector público u ONG, promotores de saneamiento en general, excavadores de pozos y constructores de fosas sépticas, fabricantes y proveedores de hardware, operadores de baños comunitarios o compartidos y especialistas en las diversas partes de la cadena de suministro. Sus necesidades financieras son similares a las de los principales actores descritos anteriormente o comparativamente pequeñas, por lo que no se repiten aquí.

2.2 CUÁNTO DINERO NECESITARÁN

Varias organizaciones han estudiado los requisitos financieros mundiales, regionales y nacionales a nivel hídrico y de saneamiento, generalmente expresados en términos de la financiación necesaria para alcanzar los Objetivos de Desarrollo Sostenible. De estas organizaciones, la autoridad más citada es el Programa de Agua y Saneamiento y el documento del Banco Mundial de 2016 escrito por Guy Hutton y Mili Varughese titulado “The Costs of Meeting the 2030 Sustainable Development Goal Targets on Drinking Water, Sanitation, and Hygiene” (Los costes de alcanzar Objetivos de Desarrollo Sostenible de 2030 en agua potable, saneamiento e higiene). Los autores destacan que sus cifras se basan en suposiciones generales, por lo que cada dato puede tener un amplio margen de variación, pero por lo general se reconocen como los mejores disponibles. Estiman que, para alcanzar la meta de los ODS de un saneamiento gestionado de forma segura para todo el mundo, se requieren aproximadamente 45 mil millones de dólares al año a nivel urbano [7]. Esta cifra incluye gastos de capital, conservación de capital para nuevas infraestructuras y gastos operativos, pero excluye el mantenimiento de la infraestructura

7 Estiman un rango de 25 a 70 mil millones de dólares dependiendo de las suposiciones planteadas. El factor más importante es el equilibrio entre el saneamiento in situ (más barato) y con alcantarillado (más caro).

365 Días

$45 Mil millones

Hutton y Varughese estiman que, para alcanzar la meta de los **ODS** de un saneamiento responsablemente administrado para todos, se requieren aproximadamente **45 mil millones de dólares al año** a nivel urbano. Esta cifra incluye gastos de capital, capital de mantenimiento para nueva infraestructura y gastos operativos.

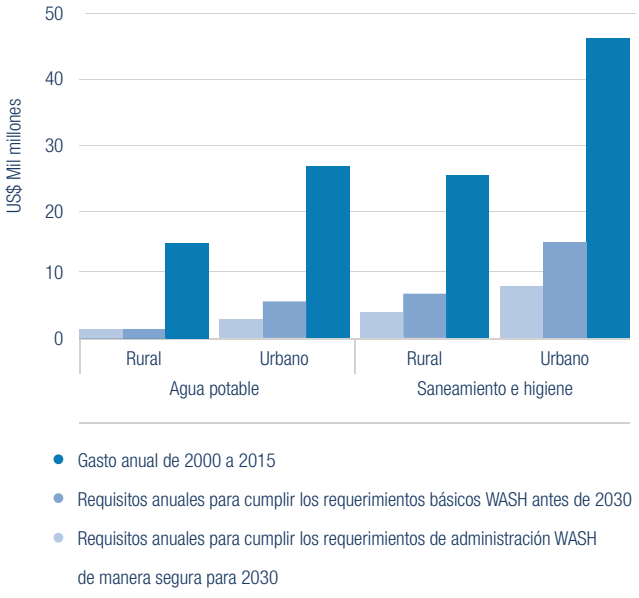


Fig 1 Diagrama elaborado a partir de los datos de Hutton y Varughese por Sophie Trémolet, del Banco Mundial.

ya existente. Estas cifras son muy elevadas y algo abstractas, ya que los autores no abordan la cuestión de quién tiene que reunir y destinar este dinero. Sí lo hacen las personas y organizaciones enumeradas en la sección 2.1.

Al poner las cifras de Hutton y Varughese en contexto para indicar la tarea que tenemos por delante, este requisito de financiación futura para el saneamiento es aproximadamente el doble del requisito correspondiente al agua potable y aproximadamente cinco veces mayor que las inversiones realizadas durante el período de los ODM. En cambio, el informe GLAAS de 2017 señala que el gasto actual en saneamiento es aproximadamente un 25% menor que el del agua, y que el 87% de los países que respondieron a la encuesta GLAAS informaron de que disponían de una financiación insuficiente para alcanzar sus objetivos nacionales de saneamiento urbano.

Los requisitos se muestran en el gráfico de la página anterior, elaborado a partir de los datos de Hutton y Varughese por Sophie Trémolet, del Banco Mundial.

De la cifra principal de 45 mil millones de dólares, aproximadamente dos tercios están destinados a gestionar de forma segura los desechos procedentes del inodoro, y aproximadamente un tercio a proporcionar el nivel básico de servicios a los residentes. Por tanto, la inserción de la importante pero aparentemente inocua frase "gestionada de forma segura" en la redacción de los ODS triplica el coste del saneamiento en comparación con la era de los ODM, durante la cual se descuidó este aspecto. Por otro lado, las cifras mundiales ocultan importantes discrepancias regionales y nacionales: por ejemplo, las necesidades de financiación son mayores en el África Subsahariana. Del mismo modo, en el ámbito nacional los países más pobres necesitan destinar, en comparación con los países más ricos, un mayor porcentaje del PIB para saneamiento.

PROGRAMA TRACKFIN DE LA ONU-AGUA GLAAS

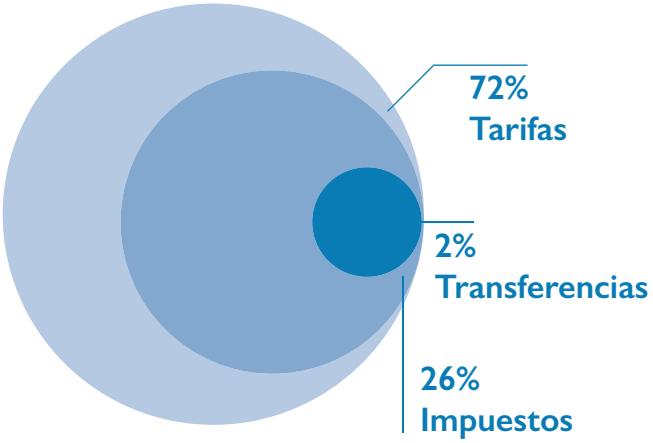
Este programa propone una metodología estándar para controlar los flujos financieros en el sector del agua y saneamiento que se utilizará para futuros informes del Análisis Mundial y la Evaluación del Agua Potable y el Saneamiento (GLAAS, por sus siglas en inglés). Se recomienda encarecidamente a todos los actores del sector que también la adopten con el fin de mejorar la coherencia y la comparabilidad de los datos.

La metodología aborda cuatro preguntas básicas:

1. ¿Cuál es el gasto total en todo el sector?
2. ¿Cómo se distribuyen los fondos entre los diferentes servicios WASH (agua, saneamiento e higiene) y los gastos, tales como gastos de capital, gastos de operación y mantenimiento, y coste de capital?
3. ¿Quién paga por los servicios WASH?
4. ¿Qué entidades representan los principales canales de financiación para los servicios WASH y cuál es su respectivo porcentaje del gasto total?

El programa está compuesto por un conjunto completo de clasificaciones codificadas que cubren los usos y proveedores de servicios y las unidades y tipos de financiación. Su resultado principal son las cuentas nacionales WASH para cada país. A continuación, la metodología vincula la información de las cuentas WASH a las cuestiones políticas más importantes.

Varias organizaciones trabajan actualmente para generar estimaciones actualizadas y más matizadas de diversos aspectos de los costes del saneamiento urbano y para controlar el gasto dentro del mismo. Entre ellas el Banco Mundial, el programa de la ONU-Agua GLAAS, TrackFin y el proyecto Climate and Costs in Urban Sanitation (Clima y costes en el saneamiento urbano), implementado por la Universidad de Leeds. Durante 2018 y 2019 generarán datos desglosados más precisos que serán bien recibidos, aunque parece poco probable que la aritmética básica a la que se refiere este informe cambien de manera significativa.



El informe **GLAAS 2017** indica que, en los **25 países** que respondieron a esta encuesta, un promedio del 72% de los fondos de agua, saneamiento e higiene provienen de tarifas o aranceles, 26% de impuestos y 2% de transferencias.

2.3 DE DÓNDE PROVENDRÁ ESTE DINERO

En última instancia, únicamente habrá tres fuentes para obtener el dinero necesario, tanto para el gasto de capital como para el operativo. Generalmente son conocidas como "las tres T":

- Tarifas: pagadas por los clientes a los proveedores de servicios que incluyen a los ciudadanos y a las empresas que reciben este tipo de servicios o compran productos generados a partir de los recursos procedentes del inodoro.
- Tasas: impuestos recaudados por los gobiernos locales o nacionales y otorgados a los residentes o a los proveedores de servicios en este sector.
- Transferencias: subvenciones de otras fuentes, como donantes internacionales, fundaciones, ONG, transferencias de particulares ofrecidas a los ciudadanos o a los proveedores de estos servicios.

En cuanto a las contribuciones relativas a estas tres fuentes, el informe GLAAS de 2017 indica que, en los 25 países que respondieron a esta parte de la encuesta, una media del 72% de la financiación destinada al agua, saneamiento e higiene procede de las tarifas, el 26% de las tasas y el 2% de las transferencias [8]. Con algunas excepciones notables, como China, la mayoría de los países tienen un crecimiento económico lento y unas finanzas públicas disponibles para el saneamiento extremadamente limitadas. Por tanto, en el futuro, debido a las tendencias actuales de la financiación internacional para el desarrollo y la debilidad general de muchas economías nacionales, el porcentaje de las tarifas probablemente aumentará: los casos de Baguio, Marrakech y Nairobi son un buen ejemplo de ello.

Cualquier otro recurso económico destinado al saneamiento será un préstamo que se deberá reembolsar. Este tipo de financiación normalmente se destina a gastos de capital y sólo en contadas ocasiones (nunca en las ocho ciudades seleccio-

8 Estos porcentajes son nacionales, no urbanos, y cubren el agua, el saneamiento y la higiene, pero no hay una razón inherente para suponer que los porcentajes destinados al saneamiento urbano serían muy diferentes.

nadas como objeto de estudio) para gastos operativos. Se subdivide en varias categorías:

- Préstamos con condiciones favorables: préstamos con tipos de interés por debajo del mercado, por lo general con largos períodos de amortización y períodos de gracia, obtenidos del sector de financiación del desarrollo como, por ejemplo, bancos multilaterales de desarrollo, bancos nacionales de desarrollo o donantes.
- Préstamos comerciales: préstamos con tipos de interés de mercado, obtenidos del sector de financiación comercial, como bancos o mercado de bonos, con o sin mecanismos de garantía de crédito respaldados por gobiernos o donantes.
- Microfinanciación: pequeños préstamos ofrecidos a personas con ingresos bajos (a menudo personas que de otro modo estarían excluidas del sector bancario formal) con poca o ninguna garantía y programas de reembolso especialmente diseñados. Este servicio de préstamos especializado lo pueden ofrecer instituciones microfinancieras especializadas, bancos u ONG.

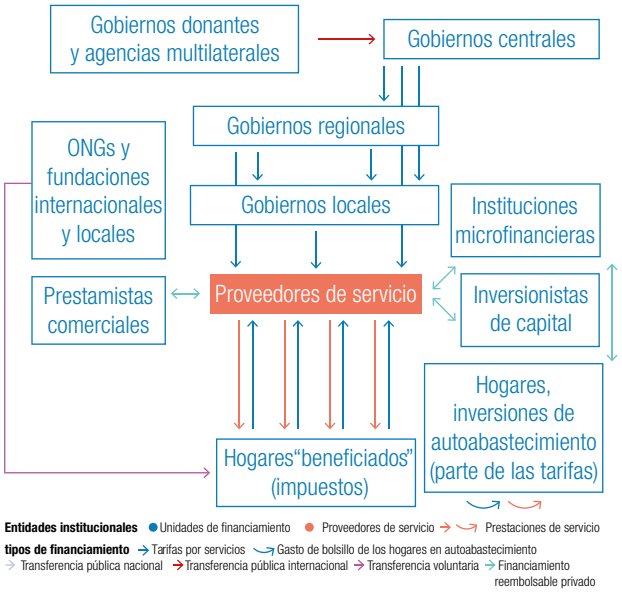


Fig 2: Trackfin, determinación de los flujos financieros para la provision del servicio WASH

Los préstamos financieros pueden ser útiles para cerrar brechas financieras a corto plazo o para financiar grandes sumas por adelantado, pero, en última instancia, todo tiene que ser reembolsado, a través de tarifas, tasas o transferencias.

Las numerosas combinaciones de fuentes de fondos, tipos de destinatarios, capital y gastos operativos, donaciones y préstamos, pueden delinear un panorama complicado. Esta complejidad en sí misma supone un obstáculo para aumentar la financiación, debido a que ni los beneficiarios ni los financiadores entienden bien cómo y dónde fluye el dinero. Para comprender esta compleja estructura, TrackFin ha desarrollado un diagrama estándar de flujos financieros.

El documento del Banco Mundial elaborado por Amanda Goksu y otros trata este tema con bastante detalle y destaca la importancia de entender todos los flujos financieros con el fin de decidir políticas e inversiones.

Comprender el panorama financiero para una ciudad entera se relaciona bien con el concepto de saneamiento inclusivo para toda una ciudad, descrito en la sección 1.3. Las estrategias de financiación para las distintas partes de la cadena de suministro de servicios en una ciudad deben crear un conjunto coherente.

En general, los analistas del sector coinciden en que es muy poco probable que las subvenciones procedentes de las tarifas, tasas y transferencias se multipliquen por cinco según lo requerido en la sección 2.2, así como que las entidades crediticias existentes incrementen significativamente sus asignaciones de préstamos al saneamiento. Esto tiene dos interpretaciones: que las empresas de saneamiento deben ser más viables para invertir, tema abordado en la sección 2.4; y que los nuevos inversores deben sentirse atraídos por el sector, uno de los temas abordados en la sección 2.5.

2.4 ANÁLISIS FINANCIERO GENÉRICO DE UN PROVEEDOR DE SERVICIOS DE SANEAMIENTO

Identificadas las organizaciones que necesitan financiación, la cantidad y las posibles fuentes de esta, la presente sección se centra en el análisis financiero de un proveedor de servicios de saneamiento. Se trata de un análisis genérico que podría aplicarse, con pequeñas variaciones, a un pequeño empresario, una gran empresa, una empresa de servicio público independiente o una parte de un ente municipal: todas ellos son empresas.

El punto clave consiste en que, si una empresa tiene éxito financiero, atraerá a los inversores. La generación de energía solar es un ejemplo actual de un sector de servicios sociales y beneficiosos para el medioambiente en el que las empresas con éxito atraen una importante inversión comercial, y no existe una razón intrínseca por la que las empresas de saneamiento no puedan hacer lo mismo. Si una empresa tiene o no ánimo de lucro, o incluso si combina ambas fórmulas, sin importar cómo define sus criterios para el éxito financiero hay algunas medidas fundamentales que puede tomar para tener más éxito financiero, tal y como se explica a continuación.

GASTOS Y CÓMO REDUCIRLOS

Cualquier empresa de saneamiento tiene dos tipos de gastos: de capital y operativos [9]. Con el fin de mejorar su viabilidad financiera, la empresa debe tratar de reducir ambos. A continuación se detallan algunas sugerencias para hacerlo:

Reducir los gastos de capital

La forma más sencilla de reducir el gasto de capital es trasladar el énfasis de la planificación futura del saneamiento con alcantarillado al método in situ y al que está basado en contenedores. Aunque este último es un concepto nuevo con pocos datos históricos disponibles, el saneamiento in situ tiene gastos bien documentados. Por ejemplo, Hutton y Varughese tabulan los costes de capital unitarios para el alcantarillado con tratamiento y para el servicio in situ con GLF para 160 países. Si bien no tabulan los costes de capital unitarios a nivel mundial, la Fig 3.4 implica una relación de coste medio de 2:1 entre estas dos tecnologías. Este estudio ha calculado una relación ponderada del coste promedio por habitantes urbanos sin servicio a nivel mundial, que también es de 2:1 (ver recuadro para la metodología). La opción de alcantarillado con tratamiento cuesta el doble por persona que la opción in situ con GLF. Cambiar planes futuros de sistemas con alcantarillado a in situ puede reducir a la mitad el gasto de capital necesario.

Los datos actuales indican que el gasto de capital del SBC sería comparable al saneamiento in situ, es decir, aproximadamente la mitad que el de alcantarillado, aunque también deberían tenerse en cuenta los costes adicionales de eliminación de aguas grises y pluviales.

Además de ese punto principal, a continuación se describen formas de reducir los gastos de capital de la empresa:

- Al construir sistemas con alcantarillado, adoptar las investigaciones más modernas sobre optimización de flujos de tuberías, redes y procesos de tratamiento.
- Pedir a los residentes que inviertan más en su propia infraestructura dentro de sus propias propiedades, y en ocasiones, como en el vecindario o las alcantarillas comunes del Proyecto Piloto Vecinal Orangi en América del Sur, fuera de sus propiedades.
- Producir un mayor número de unidades a escala industrial para lograr ahorros en costes unitarios.

9 La guía del programa TrackFin (Tabla 12) ha sido útil para la clasificación estándar de gastos de cualquier empresa.

MÉTODO PARA CALCULAR LOS GASTOS RELATIVOS AL SANEAMIENTO URBANO CON ALCANTARILLADO E IN SITU

Primero, para cada país:

- Utilizar el Anexo 4 del informe JMP de 2017 para calcular la cantidad de población urbana sin saneamiento básico: son las personas que actualmente necesitan un servicio completo con alcantarillado o in situ con gestión segura de los excrementos.
- Usar la Tabla E1 de Hutton y Varughese para conocer el coste incremental del saneamiento externo por persona (i) para sistemas de alcantarillado con tratamiento y (ii) para sistemas in situ (fosas sépticas) con tratamiento. Es necesario tener en cuenta que el precio externo es el coste para el proveedor del servicio, p. ej. una empresa de servicios públicos, independiente del coste in situ asumido por el residente.
- Multiplicar el número de personas que necesitan el servicio por los dos costes por persona para obtener los gastos de capital totales para todas las personas que recibirán servicios con cualquiera de las dos tecnologías.
- Dividir la cifra de alcantarillado entre la cifra in situ para obtener la proporción de ambos gastos.

Después, para las personas sin servicio a nivel mundial:

- Tabular los dos costes de capital totales para los 59 países en los que cada uno tiene al menos un millón de personas que necesitan el servicio. (Entre ellos, tienen el 96% de las personas del mundo que necesitan servicio).
- Sumar los dos totales y dividir entre la cantidad total de personas de esos 59 países que necesitan el servicio.
- Esto da los dos costes por persona, como una media global ponderada.
- Dividir la cifra de alcantarillado por la cifra in situ para obtener la relación ponderada global de ambos costes.

Reducir los gastos operativos

Éstas son algunas formas de reducir el gasto operativo de la empresa:

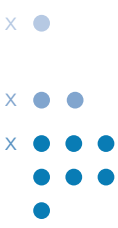
- Emplear mejor la Tecnología de la Información. Las tarifas, por ejemplo, pueden pagarse con dinero móvil. Una centralita de llamadas o una línea directa acopladas a una plataforma de mercado puede mejorar el flujo de comunicaciones entre los clientes y los proveedores de servicios, tales como vaciadores de fosas, mejorando la competencia y disminuyendo el precio al cliente. El seguimiento y gestión de vehículos puede reducir el coste del transporte de los recursos procedentes de inodoros. El control de flujo y proceso puede optimizar la gestión de la entrada de lodos fecales en las plantas de tratamiento de aguas residuales y reducir los gastos en general.
- En los sistemas con alcantarillado, optimizar el rendimiento del flujo y reducir los costes de bombeo, que suelen constituir un elevado porcentaje de los gastos operativos.
- En los sistemas in situ, reducir los costes de vaciado de pozos y transporte, que suelen representar una proporción elevada del gasto total.
- Utilizar marcos regulatorios y de licencias claros para conceder las mismas a dos o tres operadores de Gestión de Lodos Fecales dentro de una ciudad, consiguiendo así economías de escala [10] mientras se mantiene la competencia.
- Reducir el coste de los préstamos mejorando la calificación crediticia de la empresa, o incluso persuadiendo al gobierno nacional para que tome prestado y devuelva el dinero en nombre de la empresa, tal y como sucede en el caso de Dakar.

Incrementar las tarifas de los residentes y clientes comerciales

Éste es el ámbito con más posibilidades de mejora: después de todo, así es como se financian las empresas de saneamiento en los países ricos. En muchos países en vías de desarrollo, las tarifas actuales son muy bajas y/o no se recaudan, por lo que aumentarlas y cobrarlas es una forma obvia de mejorar la solidez financiera de la empresa. El caso práctico de Bogotá es un claro ejemplo; en 1996, el alcalde aumentó notablemente las tarifas y con ello la posición financiera de las empresas del sector público. Muchos estudios demuestran que las personas pueden y están dispuestas a pagar más por un mejor servicio. Sin embargo, la política de tarifas representa un tema complejo y con mucha carga emocional. Un ejemplo muy citado es el hecho de que a los políticos les guste mantener las tarifas bajas para conseguir el apoyo popular. El caso práctico de Baguio es un ejemplo de esta reticencia de los políticos, combinado con un sistema tarifario poco habitual en el que la tasa de alcantarillado se calcula por inodoro, en lugar de por casa o volumen de agua. Una forma de resolver ese dilema para los políticos es delegar la fijación de tarifas a un regulador independiente que pueda hacerlo de manera realista. Pero incluso los reguladores pueden ser reacios a imponer sus decisiones: por ejemplo, más de la mitad de las empresas de servicios públicos urbanos que participaron en la revisión GLAAS de 2011/12 declararon que las tarifas no se revisaban con regularidad o se revisaban, pero no se aumentaban.

INGRESOS Y CÓMO AUMENTARLOS

Cualquier empresa de saneamiento tiene únicamente tres vías de ingresos posibles: (i) tarifa sobre servicios prestados y/o las ventas de productos; (ii) subvenciones; (iii) e inversión de capital. Para mejorar su viabilidad financiera, la empresa debe intentar aumentar algunas o todas.



Actual tarifa de saneamiento pagada por personas conectadas al sistema de alcantarillado Para cubrir la depreciación de los activos de capital, debería **duplicarse**. Para cubrir también los costos de los nuevos activos y costo de las finanzas, tendría que aumentar **siete veces**

10 Un buen ejemplo de esto es la Blue Water Company en la ciudad de Leh, India.

En los países ricos, las tarifas de saneamiento suelen ser más elevadas que las del agua, ya que los proveedores de servicios y los reguladores han analizado los costes reales de los servicios y han acordado igualar las tarifas a los gastos.

En los países más pobres, generalmente ocurre lo contrario, y las tarifas para el saneamiento son mucho más bajas que las del agua. Por ejemplo, muchas empresas de servicios públicos que ofrecen servicios de agua y saneamiento cobran una tarifa por el agua según el contador y no tienen una tarifa o un recargo prorrateado para el saneamiento. Si la tarifa del agua es baja, la de saneamiento también lo es. Sin embargo, si ambos elementos están separados, las dos tarifas se pueden establecer por separado como tasas viables que cubran los dos gastos respectivos de la empresa de servicios públicos. Los casos prácticos de Bogotá y eThekwini constituyen ejemplos de esta separación.

Los responsables de fijar las tarifas deben decidir qué gastos se cubrirán, por ejemplo, los operativos; depreciación de activos de capital; coste de nuevos activos de capital; gastos financieros; una ganancia para el proveedor del servicio, etc. Esta decisión supone una gran diferencia en dichas tarifas. El estudio de tarifas de saneamiento de Uganda encargado por la Corporación Nacional de Agua y Saneamiento en 2015 es un claro ejemplo. La tarifa actual, pagada por personas conectadas al sistema con alcantarillado, solo cubría los gastos operativos del proveedor de servicios de saneamiento. A fin de compensar la depreciación de los activos de capital, debería duplicarse. Para cubrir también los costes de los nuevos activos de capital y el de las finanzas (pero no una ganancia para el proveedor de servicios) la tarifa tendría que aumentar siete veces. En la mayoría de países, esto último es política y económicamente irrealista, mientras que el primero sería un nivel razonable al que aspirar. No obstante, en la actualidad, incluso ese nivel está lejos de ser alcanzado: solo el 39% de los países que respondieron a la encuesta GLAAS de 2017 indicó que sus tarifas cubren más del 80% de los gastos operativos. De las ciudades objeto de estudio, solo Blumenau, Bogotá y eThekwini alcanzan ese punto de referencia.

Al aumentar los precios en general, existe el riesgo de que las personas más pobres no puedan pagar tarifas más altas. El regulador o la empresa pueden diseñar mecanismos internos de subvenciones cruzadas para ellos: las empresas de servicios públicos de todo el mundo lo han estado haciendo durante décadas, y las tecnologías modernas de la información permiten que sea más fácil. Existen muchos mecanismos de este tipo, entre los que se incluyen los precios progresivos, los descuentos según recursos o los precios por propiedad. Cualquiera que sea el mecanismo elegido, el principio subyacente de las subvenciones cruzadas es que los ingresos totales de la empresa a partir de las tarifas no cambian, solo la balanza de pagos para sus diversos clientes.

Una política tarifaria equitativa lograría un equilibrio entre cubrir los gastos operativos de las personas que ya disponen de servicios y permitir que las que no disponen de ellos tengan acceso (casi siempre, los más desfavorecidos). Eso implica fijar las tarifas teniendo en cuenta el objetivo social subyacente, cobrando más a las personas más ricas y menos a las más pobres.

El análisis anterior se aplica principalmente a clientes conectados al saneamiento con alcantarillado. Los clientes con sistemas in situ o mediante contenedores pagan tarifas por operación o por período de tiempo, y estas son más difíciles de regular. Sin embargo, muchos de los mismos principios para la regulación y reforma tarifaria siguen vigentes: por ejemplo, los contratistas de vaciado de fosas sépticas generalmente obtienen ganancias de sus clientes más ricos, por lo que se necesita una regulación minuciosa y fijación de tarifas que garanticen que estas empresas también atiendan a los clientes más pobres.

Incrementar los ingresos obtenidos a través de la venta de productos

Ganar dinero vendiendo los productos finales de los procesos de tratamiento de excrementos es un concepto relativamente nuevo. Sólo unas pocas empresas de servicios públicos lo han estado haciendo, especialmente en Europa: por ejemplo, GENeco en Bristol, Reino Unido, es un ejemplo impresionante de una empresa del sector privado que gestiona la planta de tratamiento de aguas residuales de una ciudad y genera ingresos por cada sustancia que sale de las instalaciones. Los recursos procedentes de inodoro contienen nutrientes y valor calórico, por lo que se pueden procesar para generar varios productos comercialmente viables, especialmente agua, fertilizantes, biogás, combustible sólido y productos químicos. Hay mercados abiertos a esos productos. Por supuesto, el precio debe ser el adecuado para el mercado en concreto, y eso podría significar que el proveedor (la empresa de saneamiento) no recibirá grandes ingresos de ellos, pero creará un flujo de ingresos que aumentará los que proceden de las tarifas a sus clientes.

Puesto que este es un concepto nuevo, las ventas de estos productos pueden verse obstaculizadas por el estigma social o la regulación. Desde hace algunos años, la Public Utility Board of Singapore (Junta de Servicios Públicos de Singapur) ha producido agua potable de calidad derivada de sus plantas de tratamiento de aguas residuales con la marca “NEWater”. Se necesitaron varios años para superar el sentimiento de aversión del público de beber agua de alcantarillado tratada, cuando en realidad esta práctica se lleva ejerciendo desde hace mucho tiempo en muchas ciudades. De manera similar, el cultivo de alimentos fertilizados con productos derivados de excrementos humanos no está permitido en algunos países, mientras que en otros incluso se han utilizado excrementos humanos frescos como fertilizantes durante siglos. La regulación tiende a reflejar las percepciones públicas y culturales

Recibir mayores subvenciones

Las decisiones al respecto las toma el gobierno nacional o regional, o bien la agencia donante que otorga las subvenciones, en lugar de la misma empresa. Los gobiernos suelen ser más propensos a otorgar subvenciones para gastos de capital que para gastos operativos.

Con respecto a las subvenciones destinadas a los gastos de capital, por un lado, el caso práctico de Bogotá constituye un ejemplo de un gobierno nacional que considera que es su deber proporcionar ayudas financieras para este fin. Por otro lado, el caso práctico de Jodhpur da un ejemplo de las consecuencias involuntarias de estas subvenciones. El gobierno de India invierte enormes sumas en gastos de capital para saneamiento. En consecuencia, el proveedor del servicio, Jodhpur Municipal Corporation, tiene pocos incentivos para aumentar sus tarifas a los clientes y es financieramente dependiente del gobierno nacional de forma íntegra y, por lo tanto, vulnerable a cualquier cambio futuro en la política nacional.

En cuanto a las subvenciones para gastos operativos, éstas se otorgan unas veces directamente a la empresa y otras a los residentes para ayudarles a pagar las tarifas (ver el recuadro en la sección 2.1 anterior).

Aumentar las inversiones de capital

La inversión de capital es el mecanismo habitual con el que las empresas de todos los países y sectores empresariales recaudan dinero para financiar sus operaciones. Una empresa de saneamiento compite por el dinero del inversor con muchas otras empresas. A continuación, se muestran algunas maneras de aumentar sus posibilidades de éxito:

- Preparar modelos de negocio claros y comprensibles que detallen su trabajo, sus requisitos y perspectivas financieras, y que expliquen a los posibles inversores el equilibrio entre los

riesgos que están asumiendo y los rendimientos que pueden prever.

- Demostrar una buena comprensión y compromiso con los residentes, que son clientes de la empresa.
- Ofrecer una coinversión por parte del municipio, ya que esto demuestra a los posibles inversores que el municipio tiene una participación directa en el éxito de la empresa.
- Demostrar que el regulador y el municipio cuentan con un buen historial en hacer cumplir las regulaciones, los estatutos, las tarifas, etc., ya que esto hace que el posible inversor se sienta más seguro.
- Explicar el efecto positivo de invertir en saneamiento en la economía local y en la salud personal y de la comunidad. Esto será de especial interés para la categoría de inversores conocidos como inversores de impacto, que buscan rendimientos tanto sociales como financieros de sus inversiones.

Como indica la lista, varias de estas sugerencias requieren una estrecha colaboración entre la empresa y el municipio donde opera. En algunas ciudades, esto requerirá un cambio significativo de mentalidad por parte de los líderes municipales.

PASOS SIGUIENTES EN CASO DE QUE ESTAS MEDIDAS SEAN INSUFICIENTES

Incluso después de tomar todas las medidas anteriores, algunos proveedores de servicios de saneamiento, públicos o privados, aún no serán financieramente viables. El siguiente paso es que el gobierno nacional, reconociendo que el saneamiento es una actividad que genera ganancias sociales, aporte a la empresa dinero que corresponda al valor de dichas ganancias. De las ciudades estudiadas, Bogotá recibe dinero del gobierno nacional, que reconoce los beneficios sociales de este sector (no utiliza esas palabras exactas para describirlo). Nunca se insiste lo suficiente en este punto: el impacto social y económico positivo en la sociedad en su conjunto no ayuda a la empresa que presta el servicio, a menos que ese impacto se traduzca en un beneficio financiero positivo. Por ejemplo, una de las conclusiones principales de la Semana Mundial del Agua de 2017 fue que las actividades de recuperación y reutilización de recursos (es decir, economía circular) son económicamente viables, pero necesitan internalizar los beneficios sociales para serlo. Este es el mismo mensaje que el Banco Mundial, entre otros, está transmitiendo.

Comúnmente denominados subvenciones, estos pagos del gobierno a la empresa son medidas financieras legítimas que reconocen el saneamiento como un bien público y como una inversión que aumentará el PIB nacional y, por lo tanto, la base tributaria y reducirá los costes sanitarios del gobierno.

La palabra subvención parece suscitar muchas críticas y, sin embargo, describe uno de los deberes fundamentales de los gobiernos durante milenios: satisfacer las necesidades de sus ciudadanos. Una fuente de la crispación es la percepción de que estas subvenciones benefician a una entidad con ánimo de lucro y constituye un apoyo gubernamental injusto; esta percepción puede reducirse mediante la concesión de subvenciones directamente a los residentes o etiquetándolas de forma transparente como pagos por ganancias sociales (también referidas como bienes públicos o de mérito). Otra fuente de controversia es la preocupación por evitar favorecer a individuos: irónicamente, muchos gobiernos que están dispues-

tos a subvencionar el tratamiento externo asignando grandes sumas para construir redes de alcantarillado con plantas de tratamiento centralizadas que favorecen a algunas comunidades sobre otras, se niegan a financiar (algo mucho más barato) el tratamiento in situ por el motivo espurio de que favorece a personas individuales.

Históricamente, el sector de saneamiento ha tendido a ser marginado en comparación con otros sectores en materia de pagos gubernamentales por ganancias sociales. Esto se debe a dos razones principales. La primera es que no se ha presentado como un tema políticamente atractivo. La segunda es que los costes económicos y sociales de un saneamiento deficiente han sido subestimados y no se explican lo suficientemente bien con demasiada frecuencia. Ahora varias organizaciones globales generan mejores datos y mensajes más claros para este trabajo de defensa, lo que debería conducir a mayores pagos de este tipo en el futuro.

En resumen, si una empresa ha hecho todo lo posible por reducir sus gastos y aumentar sus ingresos, pero sigue sin ser financieramente viable, es legítimo y sensato que el gobierno le pague una cantidad que represente de forma transparente el valor de su trabajo de cara a la sociedad como conjunto. Esos pagos deberían asegurar la viabilidad financiera de la empresa.

2.5 ALGUNAS IDEAS DE FINANCIACIÓN INNOVADORAS

Parte del propósito de este programa de trabajo ha sido el de examinar si ya se han producido innovaciones en la financiación del saneamiento que funcionen [11]. La conclusión general es que se han discutido o propuesto muchas ideas financieras innovadoras relevantes para este sector pero, lamentablemente, pocas se han implementado. Sin embargo, dada la difícil situación financiera descrita en las secciones anteriores de este informe y el corto período de tiempo hasta 2030, los líderes financieros y de saneamiento deben seguir adelante y aplicar estas innovaciones ahora. Los tres tipos de innovaciones se centran en: financiadores, instrumentos financieros y mecanismos financieros. Los elementos individuales se han incluido aquí en función de una combinación de su trayectoria, utilidad futura y potencial para ofrecer beneficios a escala. Cada idea solo se describe brevemente. Varias organizaciones y sitios web, como el de WSUP/IRC/Trémolet www.publicfinanceforwash.com, ofrecen más detalles sobre ellos.

El siguiente apartado 2.6 contiene algunas herramientas conceptuales y elementos básicos para apoyarlos a todos.

NUEVOS FINANCIADORES

En varias secciones anteriores de este informe se ha mencionado que los financiadores tradicionales (gobiernos nacionales y donantes) disponen de fondos limitados para invertir en saneamiento. Éste es sólo un síntoma de un cambio global importante que se ha producido en las últimas décadas, acelerado por la crisis financiera de 2007/2008, en el que los gobiernos disponen de menos dinero o voluntad de invertir, mientras que personas individuales tienen más riqueza que nunca antes en la historia. Estas personas se pueden convertir en los nuevos financiadores del saneamiento urbano en los países en vías de desarrollo.

11 Se debe tener en cuenta que no todas las innovaciones tienen que ser completamente nuevas: la innovación podría provenir de la utilización de un enfoque determinado en un sector en el que no se había aplicado con anterioridad.

Las personas del mundo como conjunto están ahorrando sumas de dinero sin precedentes, cifradas en billones de dólares, y continúa ahorrando más cada año. Gran parte de ese ahorro se produce en los mismos países que tienen las mayores necesidades de financiación del saneamiento; por ejemplo, se estima que los fondos de pensiones en los países en vías de desarrollo tienen más de un billón de dólares bajo su gestión. Las personas e instituciones a las que confían este dinero, como empresas familiares, gestores de inversiones, fondos de pensiones, compañías de seguros y los fondos soberanos (indirectamente), están constantemente explorando los mercados financieros nacionales y globales en busca de nuevas oportunidades de inversión. Invertir, incluso una pequeña fracción de esos ahorros, daría un gran impulso a los flujos financieros dirigidos al saneamiento urbano. Sin embargo, estos potenciales agentes financiadores actualmente no invierten mucho en esta actividad porque no pueden comprender o reducir el riesgo, no saben identificar un instrumento financiero adecuado a través del cual invertir, y todos prefieren hacerlo en diferentes niveles, plazos y divisas.

Por lo tanto, las empresas de saneamiento deben sentar las bases para comunicar sus propuestas de inversión a estos nuevos posibles financiadores. A las empresas les resulta difícil ponerse en contacto con ellos directamente, pero en su lugar, pueden comunicarse a través de intermediarios, grupos comerciales, asociaciones profesionales, medios especializados, etc. A nivel mundial, existen varios intermediarios que han expresado un especial interés en el saneamiento urbano, por ejemplo, la Global Impact Investors Network, Circularity Capital y Social Finance Ltd. A nivel nacional, los intermediarios podrían incluir fondos de pensiones, bancos y grupos de inversores.

INSTRUMENTOS DE FINANCIACIÓN INNOVADORES

Subvenciones cruzadas

Las subvenciones cruzadas ya son bastante comunes en las políticas de tarifas de saneamiento a nivel mundial. Permiten que las personas con poder adquisitivo alto ayuden a financiar el saneamiento de los más desfavorecidos. Pueden ser transferencias internas dentro del concepto de la tarifa por el servicio en sí, o transferencias de la tarifa del agua o incluso, como en el caso de Marrakech, de la electricidad. Un impuesto de saneamiento empleado de manera rutinaria en Burkina Faso y que se probó en Lusaka, es un recargo en la tarifa del agua destinado a inversiones de saneamiento in situ, y está dirigido a que las personas con domiciliación bancaria de su factura del agua paguen por aquellas que dependen de este tipo de saneamiento.

Por su naturaleza, las subvenciones cruzadas se pueden gestionar de forma más efectiva dentro de un enfoque inclusivo de toda la ciudad que mediante los proveedores de servicios que trabajan de forma aislada.

Inversión de impacto

Un inversor de impacto es un inversor que busca beneficios económicos y sociales. El rendimiento económico deseado por el inversor podría darse de acuerdo a los tipos de mercado o por debajo de los mismos, siendo esta última posibilidad, por supuesto, más conveniente para la entidad participada. El rendimiento social deseado por el inversor debe poder medirse con indicadores de impacto adecuados y el saneamiento cuenta exactamente esa misma calidad de indicadores, tal y como se menciona a continuación en la sección 2.6. Los inversores de impacto cuentan con enormes cantidades de dinero a su disposición y, según su organización de afiliados, la Global Impact Investors Network, desean contribuir a los ODS, pero que no disponen de oportunidades de inversión.

Cuando un inversor de impacto identifica una posible inversión, el primer obstáculo suele ser financiero. Éste suele ser el momento en que muchas inversiones con modelos comerciales no probados fallan porque sus tasas de rendimiento interno (TRI) se consideran demasiado bajas para que un inversor de este tipo llegue al siguiente paso. Generalmente, esas tasas

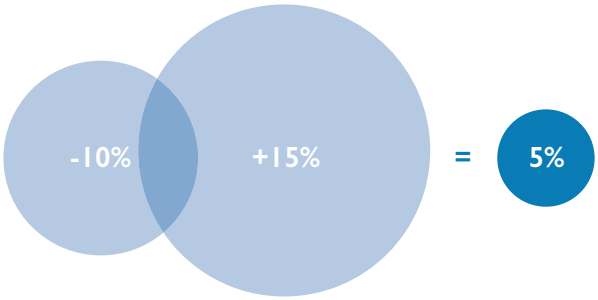
son ligeramente negativas, denominadas la "zona azul" por la Presidencia del Grupo CDC [12]. Muchos proveedores de servicios de saneamiento, como los contratistas del modelo mediante contenedores, son entidades participadas que operan precisamente en esta región financiera. De cara al inversor, la TRI puede mejorarse mediante una reducción de la tasa de descuento aplicada a los ingresos futuros o con los fondos de un donante para cubrir la pérdida, lo que permite convertir una inversión con una TRI general ligeramente negativa a una positiva para el inversor de impacto [13]. Este último escenario es un ejemplo de financiación combinada.

Financiación combinada

La financiación combinada consiste en el uso estratégico de las finanzas públicas para catalizar la financiación comercial, en un ámbito en el que ésta no hubiese entrado previamente o en una escala que no hubiera alcanzado anteriormente. La financiación combinada abarca una gama de instrumentos y procesos en los que el dinero público y comercial se puede invertir al mismo tiempo con objetivos diferentes pero complementarios. A modo de demostración con una aritmética simple: si una empresa de saneamiento opera con una pérdida de, por ejemplo, el 10%, un financiador público puede otorgarle una subvención del 15% que permitiría a un inversor comercial invertir en ella y obtener un rendimiento del 5%. Se trata de una situación beneficiosa para todos: el inversor comercial se ve beneficiado por un menor riesgo y/o un aumento del rendimiento de su inversión y el financiador público puede ampliar el impacto de su financiación; en este ejemplo, solo necesita otorgar una subvención del 15% del valor del trabajo de la empresa en lugar del 100% de la misma. Los dos flujos financieros se combinan para lograr el resultado general deseado.

El Banco Mundial promueve la financiación combinada que respalda a empresas solventes (definidas como aquellas que al menos recuperan sus costes operativos) y reduce los riesgos financieros relativos a su actividad y, por lo tanto, ayuda a disminuir las tasas de interés que obtienen de los bancos comerciales.

Algunas organizaciones hablan sobre el crowding en las finanzas del sector privado (es decir, comercial), lo que significa más o menos lo mismo que la financiación combinada. Por ejemplo, el documento de trabajo del G20 sobre el crowding en la financiación del sector privado establece los principios que deben seguir los Bancos de Desarrollo Multilaterales. Estos incluyen la creación de un entorno favorable a la inversión, la expansión y estandarización de la mejora del crédito, la fusión de la financiación en condiciones favorables y la financiación comercial. La premisa fundamental del documento es la misma que la de la financiación combinada: atraer la financiación comercial y así aumentar la contribución del sector público, porque este último es insuficiente para alcanzar los ODS. Mientras tanto, la OCDE y la Global Impact Investors Network han señalado que actualmente hay muy pocos inversores comerciales que inviertan dinero mediante financiación combinada, por lo que la OCDE está tratando de alentarlos a través del establecimiento de principios de financiación combinada.



Esto es beneficioso para todos: el inversor comercial se beneficia de un menor riesgo y/o mejores rendimientos de su inversión y el financiador público puede magnificar el impacto de su financiación; en este ejemplo, sólo necesita un subsidio del 15% del valor del trabajo en lugar del 100%. Los dos flujos se combinan para lograr el resultado general deseado.

12 Development Finance Institution del gobierno de Reino Unido, anteriormente conocida como Commonwealth Development Corporation

13 La organización Social Finance denomina a este concepto un Fondo de Oportunidades Perdidas, porque aún no se ha utilizado a escala

WATER CREDIT

Un ejemplo de financiamiento combinado exitoso es el programa Water Credit de Water.org. Un apoyo institucional calculado en aproximadamente 20 millones de dólares para instituciones de microfinanciación ha facilitado que 600 millones de dólares de capital comercial fluyan en forma de préstamo a residentes y hogares para implementar mejoras hídricas y de saneamiento como la construcción de baños. Hasta la fecha, más del 90% de los prestatarios son mujeres, sus tasas de reembolso están muy por encima del 90%, y las instituciones financieras están incorporando en gran medida estos productos crediticios en sus carteras de préstamos convencionales. Water.org está utilizando esta experiencia positiva para ampliar su trabajo en el asesoramiento y capacitación de más instituciones financieras para participar en este sector de préstamos.

Mejora del crédito para reducir los perfiles de riesgo/rendimiento, p. ej. capital catalítico para primeras pérdidas

Ésta es una forma concreta de financiación combinada en la que un financiador invierte dinero en una empresa y se sitúa voluntariamente al final de la lista de para recibir el reembolso. Esto permite que otros financiadores inviertan dinero con una expectativa más fiable de recuperar sus inversiones. La Agencia de los Estados Unidos para el Desarrollo Internacional (USAID, por sus siglas en inglés), por ejemplo, opera una Autoridad de Crédito para el Desarrollo (DCA, por sus siglas en inglés) que garantizará cubrir el primer porcentaje estipulado (a menudo en torno al 15%) de pérdidas para una inversión determinada. En esa situación, el inversor comercial no corre el riesgo de perder dinero hasta que el 16% de los prestatarios no hayan devuelto el préstamo. Esta reducción del riesgo puede convencer a los posibles inversores escépticos a que inviertan.

Ayuda en función de los resultados

La ayuda en función de los resultados (Output-based aid, OBA, por sus siglas en inglés) es un tipo de financiación ya establecido por los gobiernos y los financiadores internacionales de desarrollo que se ha vuelto más importante en los últimos años a medida que las partes interesadas en el desarrollo han tratado de hacer que la ayuda sea más eficiente. La OBA vincula el lanzamiento de fondos de subvenciones públicas al logro de resultados claramente especificados que respalden un mejor acceso a los servicios básicos. Funciona sobre una base de reembolso: el proveedor del servicio invierte su propio dinero y, cuando se completa el proyecto o programa de trabajo, se realiza una evaluación para determinar si se han alcanzado los resultados acordados. Si lo han hecho, generalmente alrededor del 50-70% del coste del proyecto se reembolsa al proveedor del servicio. La OBA se ha convertido gradualmente en una forma importante de financiar el acceso a los servicios básicos, aunque el proveedor del servicio todavía tiene que encontrar el efectivo por adelantado para financiar su trabajo antes de que se le reembolse. La evidencia de los proyectos existentes

sugiere que la OBA podría mejorar la focalización y la eficiencia de la entrega de las subvenciones.

Financiación de contingencia, BIS y BID

La financiación de contingencia es similar al financiamiento de ayuda en función de los resultados (OBA). Un donante público o filantrópico desea utilizar fondos para lograr un cierto beneficio social. En lugar de invertir ese dinero por adelantado en una empresa que trata de alcanzar ese objetivo, este donante no hace nada inicialmente. Otro financiero, en este caso un inversor comercial, presta el dinero a la empresa. Luego, el donante solo paga dinero si realmente se produce la ganancia, es decir, su pago depende del resultado que se logre. Se lo conoce como un financiador de resultados.

Hay varias maneras de estructurar la financiación de contingencia. Una idea que cada vez cobra más relevancia es la de un Bono de Impacto Social (BIS) o la de un Bono de Impacto en el Desarrollo (BID). Esta breve descripción de un BID se basa en una presentación reciente de Jeremy Keele, del Sorenson Impact Centre, titulada Beyond Development Aid ('Más allá de la ayuda al desarrollo') y que expuso en la Conferencia WASTE:

- Hay cuatro partes involucradas en un BID. Un inversor invierte dinero a través de un intermediario en un proveedor de servicios. Este último ofrece servicios a una población objetivo. Si dichos servicios consiguen alcanzar un resultado acordado y medible, un financiador de resultados paga al intermediario por ese éxito y este último utiliza ese dinero para reembolsar al inversor original su capital más intereses.
- Un BID necesita un plazo razonable, un resultado significativo y medible, condiciones legales y políticas apropiadas, y evidencia de éxito, utilizando métricas estándar que las cuatro partes pueden acordar usar.
- Algunos problemas con los BIDs son las largas negociaciones, los elevados costes de transacción, los datos insuficientes y las métricas que son difíciles de acordar.
- Hasta la fecha, más de 55 BIDs han recaudado aproximadamente 180 millones de dólares, pero ninguno de ellos se aplica todavía al ámbito del saneamiento.

Una crítica de los BIS y BID es que no recaudan más dinero para un programa de trabajo, solo proporcionan una forma de movilizar el dinero por adelantado: en última instancia, el financiador de resultados paga por el trabajo de todos modos, como si hubiera dado una subvención al proveedor del servicio. Este análisis pasa por alto algunos aspectos. Uno de ellos, que si el trabajo no da el resultado deseado, el financiador del resultados no paga nada y el inversor corre con la pérdida. El otro es que la presión ejercida por el inversor sobre la capacidad de gestión financiera del proveedor de servicios aumenta la probabilidad de que el trabajo tenga éxito. Por lo tanto, la misma cantidad total de dinero invertida por el financiador de los resultados en los programas de saneamiento dará como resultado un mayor éxito en general que en un sistema convencional en el que otorga subvenciones tanto a programas que tienen éxito como a otros que no.

Financiación mediante el aumento de impuestos

La financiación mediante el aumento de impuestos es una herramienta financiera del sector público en la que un organismo del gobierno local, como un municipio, toma un préstamo de un banco comercial para financiar una mejora específica de la infraestructura pública, utilizando los aumentos futuros en los ingresos fiscales locales para pagarlo. La lógica subyacente es que la mejora de la infraestructura, por ejemplo, el saneamiento mejorado, aumentará la conveniencia de vivir en su área y, por lo tanto, el valor de las propiedades y el impuesto pagado por los propietarios al municipio. Este instrumento se empleó por primera vez en los Estados Unidos

en la década de 1950, pero aún no se ha utilizado mucho en otros países. Este estudio no ha encontrado un ejemplo de su uso para el saneamiento, pero está incluido en esta lista porque podría ser un instrumento útil.

MECANISMOS DE FINANCIACIÓN INNOVADORES

Financiación comunitaria

Este término se refiere principalmente a planes de ahorro establecidos por personas pobres que viven en áreas urbanas, con el fin de que mejoren sus condiciones de vida con la inclusión del saneamiento. Si los reguladores nacionales reconocen estos esquemas y los integran en el mercado comercial, se pueden movilizar otras financiaciones comerciales para aumentar la comunitaria. Éste es un mecanismo especialmente valioso porque puede acortar la distancia entre los hogares que gastan su propio dinero en saneamiento y los servicios públicos que obtienen financiación externa para mejorar el servicio de los residentes.

Fondo de garantía

Se trata de un fondo creado por un financiero público o filantrópico para suscribir empresas para arrendar o comprar bienes de capital. Un ejemplo en el sector de saneamiento proviene de la ciudad de estudio de Dakar, donde la Fundación Gates proporcionó un fondo de garantía a un banco privado a través del Gobierno para permitir que las empresas del sector privado solicitaran dinero en términos comerciales para comprar camiones para vaciar las fosas sépticas. La garantía es una protección segura para el banco en caso de incumplimiento por parte de los prestatarios. Este mecanismo tiene la ventaja, desde el punto de vista del financiero, de que si el prestatario no incumple, no se efectúan intervenciones en la garantía y, por lo tanto, el financiero sólo tiene que correr con los costes administrativos de su instalación. La ventaja para las empresas es que pueden acceder a préstamos a los que de otro modo no accederían debido a su baja calificación crediticia o falta de garantías: en el caso del fondo de garantía de Dakar, la tasa de interés suele ser del 7,5% en lugar del 11 o 12%, y sólo el 8% de los préstamos no están funcionando completamente.

Donantes de subvenciones o préstamos relacionados con el clima, incluido el Fondo Verde del Clima

El sector del agua y del saneamiento ha sido lento y poco imaginativo a la hora de intentar atraer a fondos relacionados con el sector climático. No existe un enfoque intelectual consistente. Algunas organizaciones líderes, como The Toilet Board Coalition, hacen hincapié en los aspectos positivo y promueven el papel que este sector puede tener en la mitigación del cambio climático. Por su parte, otros actores como la Red de Soluciones para un Desarrollo Sostenible, una iniciativa global de la ONU presidida por Jeffrey Sachs, enfatizan el aspecto negativo y sugieren añadir un 25% a los costes de las inversiones de capital de Hutton y Varughese, como el gasto adicional de adaptación al cambio climático.

Por otro lado, el Fondo Verde del Clima, el fondo más grande que invierte en la adaptación o mitigación del cambio climático, solo ha realizado una inversión en agua o saneamiento hasta la fecha: para el suministro de agua urbana en Fiji. Aparentemente, el motivo no es que el Fondo Verde del Clima se oponga a las inversiones en saneamiento, sino que ninguna entidad de saneamiento en la que se pudiera invertir ha presentado una propuesta suficientemente sólida. Existen dificultades técnicas, por ejemplo, para verificar las mejoras climáticas debido al carácter disperso de ciertas actividades, como el saneamiento de los hogares. Pero otros sectores, como el sector de las estufas o la energía solar sin conexión a la red, abordan estos problemas más vehementemente que el sector del saneamiento. El Fondo Verde del Clima y otros

financiadores relacionados con el clima podrían representar un gran potencial en futuros mecanismos de financiación para los programas de saneamiento urbano.

Servicios de financiación del saneamiento

"Servicio de financiación del saneamiento" es el nombre que este estudio le otorga a un mecanismo de múltiples partes interesadas, el cual permite a diferentes financiadores de donaciones y préstamos realizar nuevas inversiones en muchas empresas diferentes simultáneamente. Es una plataforma única y eficiente. Por un lado, permite a los inversores presentar sus propuestas a muchos posibles inversores de forma simultánea. Por otro lado, les ofrece una gran cantidad de propuestas de inversión en las que pueden utilizar su dinero en los plazos, niveles de riesgo y divisas que prefieran.

Este tipo de mecanismo aborda muchos de los obstáculos que se han descrito en secciones anteriores de este informe. Puede utilizar varios de los instrumentos innovadores descritos previamente, como la inversión de impacto, las financiación combinada y la financiación de contingencia. Se podría establecer un servicio de financiación del saneamiento en un país, en una región o incluso a nivel mundial, para prestar servicios a un tipo de tecnología o a todas ellas, para contratistas del sector privado o servicios municipales. Las diferentes instalaciones de financiación podrían ser independientes o estar vinculadas.

Varias organizaciones han reconocido la necesidad de mecanismos o plataformas de este tipo. La institución Dutch Water Financing Facility tiene elementos similares. La Red de Soluciones para un Desarrollo Sostenible ha concluido que el sector de WASH necesita un mecanismo de financiación mancomunado exclusivo. El Banco Mundial propone un marco conceptual que combina tres elementos: finanzas públicas mejor planificadas y asignadas; proveedores de servicios que ofrezcan un mayor rendimiento; e inversores comerciales atraídos por las finanzas públicas. El Banco Africano de Desarrollo y la Fundación Bill y Melinda Gates están estableciendo el *Africa Urban Sanitation Investment Fund* (Fondo de Inversión en Saneamiento Urbano de África, AUSIF, por sus siglas en inglés), [14] que tendrá varias características similares a un servicio de financiación del saneamiento, en particular el financiamiento mancomunado y la gama de ideas de inversión. Las conclusiones generales de la World Water Week de 2017 hacen referencia a modelos comerciales innovadores y a mecanismos de financiación que atraigan todas las fuentes de financiación disponibles, también a la necesidad de simplicidad en el diseño de estructuras financieras para mitigar la incertidumbre el alto riesgo percibidos, el uso de innovaciones en asociaciones y el diseño de modelos de negocio que conviertan proyectos económicamente beneficiosos en financiables. Los servicios de financiación del saneamiento casan perfectamente con todas estas directrices y conceptos estratégicos.

Todavía no existe un servicio de financiación del saneamiento, pero un equipo multisectorial de pensadores, convocado por Arthur Wood de Total Impact Advisers, con el apoyo de un grupo de donantes con visión de futuro, está diseñando un mecanismo de financiación genérico aplicable a la gestión regional de los recursos hídricos o al saneamiento. Este trabajo se remonta a 2009, cuando un equipo similar dirigido por Wood diseñó un Servicio Mundial de Financiación del Saneamiento. La idea no avanzó más allá de la etapa de planificación: los financiadores eran reacios a pagar por crear una plataforma global con sistemas de control complejos, diseñados por una empresa de consultores de gestión líder. Su concepto estaba adelantado a su tiempo a los ojos del sector bancario y financiero, que no

14 El AUSIF movilizará fondos adicionales de una serie de donantes, incluidos socios tradicionales de desarrollo, el sector privado y los gobiernos para aumentar el acceso al saneamiento innovador en los núcleos urbanos. Esto: (i) apoyará el desarrollo institucional y los programas de mejora de la capacidad; (ii) proporcionará incentivos para un mayor enfoque hacia la prestación de servicios de saneamiento urbano sostenible; (iii) aumentará la atención hacia una mayor adopción de enfoques y tecnologías innovadores; y, (iv) apoyará la gestión del conocimiento para un mayor impacto.

estaba dispuesto a apoyar modelos de financiación colaborativa, y tal vez sus diseñadores no lo explicaron con suficiente claridad en el sector de saneamiento. Sin embargo, la idea nunca se abandonó y se describió en un documento escrito por Wood y Hutton en 2013 para UNESCAP, que se basó en el trabajo de diseño anterior; el documento utilizó el saneamiento en Asia como caso práctico, pero era aplicable en todo el mundo. Ese concepto fue el punto de partida para el trabajo actual de Wood. El diseño de la instalación genérica, actualmente en fase de desarrollo, se resume en el cuadro adjunto, tal como se aplica al saneamiento.

Las condiciones para el éxito de un servicio de financiación son ahora significativamente diferentes a las de 2009. El diseño se ha suavizado y reducido para que no cree otro intermediario que compita con las partes interesadas existentes, sino que sea más bien una plataforma que ayude a las partes interesadas a colaborar. Esta plataforma tecnológica ahora existe y está en uso en otros sectores, como la vivienda y la salud, al igual que un sistema de control estándar y fiable para medir los resultados. Ese sistema de control ha evolucionado de un modelo global descendente a uno local que mide y monetiza los resultados de actividades específicas. Todavía es un concepto desconocido para el sector del saneamiento, pero las organizaciones de otros sectores [15] podrían compartir sus experiencias y dar consejos sobre cómo comenzar y superar los inevitables problemas iniciales.

Los servicios de financiación del saneamiento son innovadores porque presentan la necesidad de financiación para lograr los ODS como una oportunidad de mercado para los inversores, en lugar de un problema para los donantes de subvenciones. Los servicios de financiación del saneamiento tienen la flexibilidad, el alcance y la profunda visión de hacer una contribución importante para financiar el saneamiento urbano de cara al año 2030.

15 Por ejemplo la plataforma Greater Cincinnati Foundation's Collective Impact, o el National Affordable Housing Trust, ambos en Estados Unidos.

LAS PRINCIPALES CARACTERÍSTICAS DE UN SERVICIO DE FINANCIACIÓN DEL SANEAMIENTO

Un servicio de financiación del saneamiento es una asociación sin ánimo de lucro, legalmente registrada, cuyos miembros pueden ser organizaciones con fin de lucro o sin él (muchos sistemas legales en todo el mundo ahora permiten estos tipos de asociaciones híbridas o mutuas). Sus miembros interesados incluirían:

- Proveedores de servicios de saneamiento de todo tipo
- Un intermediario social para supervisar el trabajo de saneamiento
- Un intermediario financiero para establecer los acuerdos de inversión
- Inversores de todo tipo
- Su estructura de gobierno la deciden estos miembros interesados.

Muchos flujos financieros diferentes pueden canalizarse a través de este tipo de servicio en forma acuerdos contractuales individuales diseñados por las partes interesadas (por ejemplo, con los tipos de instrumentos financieros innovadores descritos anteriormente). Los resultados de los servicios de saneamiento se notifican a través del servicio, mediante el uso de un conjunto común de indicadores acordados. El servicio puede simplificar las estructuras financieras para reducir el riesgo y la incertidumbre y los costes de transacción, lograr economías de escala y mejorar la eficiencia y el impacto de las inversiones actuales y futuras y, por lo tanto, aumentar significativamente los flujos financieros para el saneamiento.

2.6 ALGUNAS HERRAMIENTAS PARA MEJORAR Y HABILITAR ESTAS INNOVACIONES

A continuación se enumeran algunas herramientas conceptuales y componentes básicos que sirven de apoyo a los mecanismos e instrumentos de financiación innovadores descritos en la sección 2.5 anterior y que pueden mejorar el atractivo del saneamiento para nuevos inversores.

Medición de resultados

Se necesitan indicadores estándar para medir los resultados del trabajo de saneamiento. Pueden ser tangibles o intangibles, conductuales o financieros, internos o externos al trabajo en sí. Sus características principales son que todas las partes interesadas puedan medirlos, reconocerlos y confiar en ellos: esta confianza mutua es especialmente importante si los indicadores se utilizan para juzgar el progreso contractual y, por lo tanto, los pagos. A continuación se muestran algunos ejemplos relevantes de cómo diseñar indicadores y medir los resultados:

- Los indicadores oficiales de progreso hacia los ODS de saneamiento son ideados y controlados por el Programa de Control Conjunto de la OMS/UNICEF (JMP) bajo los auspicios de ONU-Agua. El sitio web de JMP proporciona detalles completos sobre ellos, incluido el trabajo que se está realizando actualmente para desarrollar indicadores para los aspectos de los ODS que no estaban presentes en los ODM.
- El Índice de Progreso Social ha sido diseñado por el Imperativo de Progreso Social para medir objetivamente el bienestar y la calidad de vida de una población. Genera un índice de un solo número que se puede tabular y analizar, tal como es el caso del PIB. Su objetivo es recordar a todo el mundo que los indicadores económicos no son los únicos que importan. Puede tener demasiadas variables confusas como para utilizarlas como una medida de los resultados de saneamiento, pero podría tener un papel valioso junto con los indicadores de salud y el PIB.
- La organización Integrity Action ha desarrollado una metodología para el control en tiempo real que puede aplicarse a muchos tipos de actividades e indicadores, incluido el saneamiento mejorado. Es una metodología de código abierto en la que se anima a todos a contribuir al proceso de control. En este modelo, este tipo de proceso es tan importante como los propios indicadores.
- Al igual que la mitigación de los equivalentes de CO_2 es una medida del impacto de los proyectos climáticos, este enfoque podría traducirse en el sector del saneamiento con una medida comparable (por ejemplo, la mitigación de unidades de flujo de excrementos no gestionadas). Este estudio aún no ha identificado ninguna organización que esté trabajando actualmente en esta idea.

Un ejemplo reciente de un instrumento financiero innovador proporciona una buena muestra en la elaboración de indicadores. En 2014, el estado de Utah, Estados Unidos, emitió un Bono de Impacto Social a un inversor para mejorar el aprendizaje preescolar; el indicador de resultado acordado fue la reducción en el porcentaje de niños que necesitaban educación especial en la próxima etapa de su educación. El inversor invirtió su dinero en el proveedor de servicios. Al final del período del proyecto, el financiador de resultados declaró que se había alcanzado el indicador de resultado y pagó al inversionista su capital más intereses. Más tarde quedó claro que el logro fue extraordinariamente elevado (reducción del 99% en comparación con una disminución normal del 10-20%) y la inversión financiera inusualmente baja (aproximadamente la mitad de la cantidad normal) y, por lo tanto, que el indicador probablemente era defectuoso y no debería haber sido utilizado en el contrato.

Monetización de factores externos

Este concepto es muy importante para el éxito de muchos de los nuevos mecanismos de financiación. Implica simplemente calcular un valor financiero para los beneficios que tradicionalmente se consideran fuera de la aritmética financiera, como los impactos ambientales, sanitarios o sociales. Varias organizaciones están trabajando en el desarrollo de herramientas que todos puedan usar para monetizar estos factores externos. El saneamiento sería un candidato para este enfoque puesto que los beneficios de un servicio mejorado, especialmente en la salud pública, limpieza ambiental y ganancia de tiempo productivo, son sustanciales, [16] pero históricamente no se han expresado en términos monetarios. Algunos ejemplos relevantes son:

- La Organización Internacional de Normalización, reconociendo el alto nivel de interés y actividad en este tema, actualmente está desarrollando la certificación ISO 14008 sobre "valoración monetaria de los impactos ambientales y los aspectos ambientales relacionados". La norma proporcionará a las organizaciones un marco común que incluye métodos establecidos y términos comunes en el campo de las valoraciones monetarias. Considera los indicadores ambientales, no los sociales, pero su metodología y lenguaje también pueden ser útiles para estos últimos.
- La Contabilidad de Costes Naturales es una metodología establecida para evaluar el impacto de una intervención en unidades físicas y luego convertirlas en valor monetario. Se podría utilizar en el campo del saneamiento.
- La Gold Standard Foundation es un organismo de normas y certificación que desarrolla metodologías para medir los resultados de las actividades de desarrollo. Su trabajo original se centró en los resultados relacionados con el clima y, posteriormente, lo ha ampliado para incluir resultados relacionados con los ODS bajo el título general de Gold Standard for the Global Goals. Gold Standard puede certificar proyectos o sus impactos. La fundación ha desarrollado recientemente Certificados de Beneficios de Agua que representan un volumen de agua suministrada, tratada o conservada, y también la Certificación de ADALY para cuantificar los beneficios sanitarios de una menor contaminación del aire (por ejemplo, mediante fogones mejorados). Tanto los Certificados de Beneficios de Agua como las Certificaciones de ADALY se han diseñado para que los compren donantes, filántropos e inversores sociales, aunque todavía no son instrumentos negociables, como los créditos de carbono. La Fundación está dispuesta a asesorar a otras organizaciones sobre cómo desarrollar la certificación ADALY para cuantificar los beneficios sanitarios, y potencialmente económicos, del saneamiento. Esto podría convertirse en la forma estándar reconocida de monetizar los factores externos del saneamiento.

Infundir confianza

La confianza es en sí misma una herramienta para el progreso financiero. Muchos analistas hacen hincapié en que la buena gestión pública atrae la inversión porque ayuda a los recién llegados a confiar en los proveedores de servicios y en los gobiernos. Es más probable que los inversores entren en un país o mercado concreto si pueden ver que los contratos se respetan en los tribunales. Una tecnología de la información fiable es esencial para recopilar datos objetivos claros para medir resultados que todas las partes puedan creer. Por ejemplo, los beneficios externos monetizados descritos anteriormente todavía no se han convertido en productos comercializables porque los profesionales financieros aún no se han implicado para lograrlo. En caso de que lo hagan, necesitarán poder medir resultados auditables para que el mercado tenga confianza en la compra y venta de los instrumentos.

16 Total Impact Advisors los estima en cientos de miles de millones de dólares.

3. ¿QUÉ PUEDEN HACER AHORA LOS DIRIGENTES PARA INCREMENTAR LOS FLUJOS FINANCIEROS?

ALGERIA
TRIPOLITANIA
LIBYA
EGYPT
SAHARA
DESERT
MAURITANIA
TROPIC OF CANCER
NIGERIA
CHAD
SUDAN
GULF OF GUINEA
South Eastern
Atlantic Basin
ANGOLA
NAMIBIA
BOTSWANA
ZIMBABWE
SOUTH AFRICA
Cape Town
Walvis Ridge

3.1 DIRIGENTES Y CÓMO INFLUIR EN ELLOS

Este informe tiene como objetivo influir en las decisiones tomadas por varios grupos de personas y organizaciones relacionadas con el saneamiento urbano:

- Los políticos nacionales (y, en menor medida, los regionales) definen políticas y deciden la legislación; por consiguiente, son el público objetivo principal de este programa de trabajo.
- Los líderes municipales toman decisiones importantes, deciden si implementar las políticas establecidas por los políticos nacionales y regionales y cómo implementarlas. Son el público objetivo secundario de este programa de trabajo.
- Los reguladores nacionales, emprendedores, banqueros, inversores y la comunidad de desarrollo internacional también son responsables de la toma de decisiones en este tema. Todos ellos son público objetivo de este programa de trabajo.
- Los residentes deciden sus propias necesidades y prioridades para su saneamiento, pero el Consejo Mundial del Agua no tiene un canal directo de comunicación con ellos. Por lo tanto, son sólo un grupo objetivo indirecto para este programa de trabajo.

Todos estos públicos objetivo quieren crear ciudades saludables, felices y habitables. El saneamiento puede ser un elemento importante para alcanzar ese objetivo. Compite por recursos financieros contra muchos otros sectores de desarrollo económico y social. Los políticos, los líderes municipales y otras partes interesadas, pueden conseguir más gastando menos si hacen uso de las últimas ideas sobre financiación para el saneamiento. Esto requiere un cambio de mentalidad, tal y como se ha explicado en las secciones anteriores de este informe, especialmente para favorecer las tecnologías menos costosas, poner un valor financiero a las mejoras creadas por este asunto y atraer a nuevos inversores a este sector.

El Consejo Mundial del Agua anima a todos los lectores de este informe a que se sientan dueños de las ideas que hay en él y se comprometan a transmitir este relevante mensaje al público objetivo adecuado. Los líderes políticos de las ocho ciudades objeto de estudio tienen una función especial, dado que ellos mismos mostraron interés en este tema. Ésta es la razón por la que el Consejo Mundial del Agua optó por estudiar sus ciudades. El Consejo trabajará en estrecha colaboración con ellos para tomar decisiones sobre sus propias ciudades, y luego los apoyará para persuadir a otros políticos de su mismo nivel para que también tomen decisiones parecidas.

TÉCNICAS PARA INFLUIR SOBRE LOS DIRIGENTES

A continuación se indican algunas técnicas para influir sobre este público meta, especialmente sobre los políticos:

- Comprender sus objetivos y prioridades. Prepararse para explicarles cómo sus ideas pueden ayudarles a alcanzar sus objetivos. Por ejemplo, los políticos pueden pensar que una determinada política es técnicamente buena, pero no entender los aspectos políticos que podrían hacerla poco atractiva. Por lo tanto, se debe considerar las ventajas de adoptar una determinada política, y explicar dichos beneficios al dirigente.
- Las relaciones importan. Preguntar a una persona bien relacionada que esté dispuesta a dedicar tiempo y esfuerzo a la iniciativa para ser el principal defensor de dicha iniciativa. Apoyar a esa persona para que se comunique verbalmente con los dirigentes.
- Usar documentos escritos sólo con el objetivo de respaldar la comunicación verbal. Muchos dirigentes están sobrecargados de trabajo y no tienen tiempo para leer los documentos que justifiquen esa iniciativa. Las relaciones, las actitudes y la confianza son más importantes.
- Usar evidencias basadas en ejemplos locales en lugar ejemplos de otros lugares. Por supuesto, esto puede resultar difícil cuando se introducen ideas nuevas de las que no hay ejemplos locales.
- Garantizar que las personas influyentes se muestren favorables normalmente. Tratar de asegurar que no haya un político importante, a quien un dirigente pueda dirigirse para pedir su aprobación, que se oponga a las ideas presentadas.
- Controlar y hacer un seguimiento de los compromisos asumidos por el responsable elegido.

3.2 MENSAJES PARA LOS DIRIGENTES

Los principales mensajes para los diversos grupos de dirigentes se han desarrollado y descrito en las secciones 1 y 2 del informe, por lo que esta sección es solo un resumen de ellos para que puedan ser localizados con mayor rapidez. Se subdividen en listas para los distintos públicos objetivo. No todos los elementos de una lista en particular se aplicarán a cada uno de los dirigentes o a cada ciudad.

Mensajes para los políticos nacionales

- Establecer organismos reglamentarios independientes que fijen tarifas y normas.
- Definir claramente las funciones de las diversas instituciones y entidades, con el fin de inspirar confianza a los inversores para apoyar a los proveedores de servicios de saneamiento.
- Legislar que los proveedores de servicios que suministran agua y saneamiento deben mantener separadas las finanzas de ambas actividades.
- Introducir normas y regulaciones nacionales relativas a la calidad y venta de los productos elaborados a partir de los recursos tratados procedentes de inodoros, para fomentar el desarrollo de conceptos y actividades de economía circular.
- Adoptar medidas firmes en la planificación y financiación de la infraestructura necesaria. El sector privado y la inversión de las ONG por sí solas no pueden conseguir un saneamiento adecuado, por muy bien intencionado que sea.
- A fin de eliminar el retraso histórico de los servicios de saneamiento, otorgar subvenciones y hacer que sea asequible tanto para el proveedor del servicio como para los clientes. Si esto no se produce, la erradicación de cualquier retraso llevará demasiado tiempo y tendrá impactos económicos adversos que superarán el coste de no garantizar un servicio adecuado y seguro.
- Reasignar los fondos de las subvenciones de las costosas instalaciones con alcantarillado y plantas de tratamiento, a sistemas descentralizados mucho más baratos, la gestión de lodos fecales, e infraestructuras para el saneamiento basado en contenedores.
- Reconocer la contribución del saneamiento en la salud pública y el medio ambiente mediante la contribución financiera a los gastos operativos de los proveedores de servicios.
- Alentar a los bancos e inversores comerciales a entrar en el sector mediante una reducción de riesgos y costes para ellos, por ejemplo, la aplicación de contratos tal y como se han etablecido, regulación activa, garantías de ingresos mínimos y otras formas de financiación combinada.
- Celebrar foros de inversores para atraer nuevos inversores a este sector.

Mensajes para los líderes municipales

- Adoptar un enfoque de saneamiento inclusivo para toda la ciudad.
- Evitar los planes poco realistas, como conseguir un 80% de alcantarillado en una ciudad que actualmente sólo tenga aproximadamente un 10%.
- Probar el saneamiento basado en contenedores para atender a los clientes en las partes adecuadas de la zona donde se está proporcionando el servicio.
- Adjudicar contratos a empresarios para el sistema in situ o basado en contenedores que cubra áreas geográficas lo suficientemente grandes como para ser financieramente viables.
- Colaborar activamente con el gobierno u organismo regulador para revisar las tarifas e implementar las revisiones propuestas en los informes.
- Mantener un buen flujo de liquidez y de recaudación fiscal que inspiren confianza a las entidades crediticias respecto a la capacidad del municipio para pagar los préstamos.
- Introducir normas y regulaciones locales para la calidad y venta de los productos elaborados a partir de los recursos tratados procedentes de inodoros, para fomentar el desarrollo de conceptos y

actividades de economía circular, siempre que no entren en conflicto con las normas nacionales en virtud de la reglamentación nacional.
• Hacer cumplir todas las regulaciones y estatutos.
• Celebrar foros de inversores para atraer nuevos inversores locales a este sector.• Coinvertir en nuevas empresas junto a inversores comerciales.
• Alentar a los mercados de productos de saneamiento a ser clientes de fertilizantes, energía y otros productos generados por las empresas de economía circular de este sector.

Mensajes para los reguladores

• Establecer bases de datos de proveedores de servicios de saneamiento, incluida su información financiera, su solvencia, etc.
• Permitir que los proveedores de servicios que suministran agua y saneamiento mantengan separadas las finanzas de ambas operaciones.
• Revisar regularmente las tarifas e implementar las revisiones propuestas en los informes.
• Reconocer el saneamiento basado en contenedores como una alternativa válida al sistema con alcantarillado o in situ.
• Hacer cumplir las normas y regulaciones nacionales relativos a la calidad y venta de los productos elaborados a partir de los recursos tratados procedentes de inodoros

Mensajes para los emprendedores

• Considerar el saneamiento en los países en vías de desarrollo como un nuevo sector empresarial en el que tener la ventaja de ser el primero en actuar.
• Desarrollar negocios por toda la cadena de valor añadido del saneamiento, para atraer a inversores diferentes.
• Buscar colaborar y coinvertir con municipios y servicios públicos, para aprovechar las economías de escala.
• Demostrar que se tiene una mentalidad comercial junto a una sólida estructura de gobierno, con el fin de atraer más financiación de los bancos e inversores.

Mensajes para los banqueros

• Tener la ventaja de ser los primeros en participar en el saneamiento ahora, antes de que lo hagan otros bancos.
• Persuadir a sus inversores y clientes de que este sector es ahora financiable.
• Enseñar a sus posibles prestatarios (por ejemplo, empresas de saneamiento) a preparar programas para obtener inversión.
• Tomar la iniciativa en aplicar los instrumentos financieros establecidos (por ejemplo, fondos de inversión mancomunados, bonos municipales y corporativos) y nuevos mecanismos (por ejemplo, servicios de financiación) para el saneamiento.

Mensajes para inversores nacionales e internacionales

• Invertir en saneamiento en países en vías de desarrollo combina ganancias financieras y sociales.
• Tener la ventaja de ser los primeros en invertir ahora, antes de que lo hagan otros.
• Invertir a lo largo de la cadena de valor añadido del saneamiento.
• Participar en la creación de nuevos mecanismos, como los servicios de financiación del saneamiento.

Mensajes para la comunidad internacional de desarrollo

• Reasignar donaciones y préstamos de las costosas plantas de saneamiento y de tratamiento del alcantarillado a sistemas descentralizados mucho más baratos, como la gestión de lodos feca

les y las infraestructuras para el modelo basado en contenedores.

- Cambiar los fondos de gastos fragmentados a aportaciones en soluciones sistemáticas para lograr resultados.
- Alentar a los bancos e inversores comerciales a entrar en el sector mediante una reducción de riesgos y costes para ellos, por ejemplo, ofreciendo garantías o capital para primeras pérdidas.
- Apoyar la creación de nuevos mecanismos, como los servicios de financiación del saneamiento.
- Organizar y apoyar visitas de estudio para los dirigentes a lugares específicos, por ejemplo, empresas de sistemas basadas en contenedores.
- Adoptar estrategias de financiación combinadas para atraer financiación comercial.
- Celebrar foros de inversores para atraer nuevos inversores a este sector.

CONCLUSIONES FINALES PARA TODOS LOS DIRIGENTES

- Ahorrar dinero implementando servicios de saneamiento urbano más rentables.
- Aumentar los flujos financieros utilizando toda la gama de instrumentos y mecanismos de financiación, tanto existentes como nuevos.
- Atraer dinero nuevo al sector mejorando la gobernabilidad y el rendimiento del sector.
- Alcanzar el ODS de saneamiento urbano para 2030 siendo positivos y resolutivos.

ANEXO I: RESÚMENES DE LOS CASOS PRÁCTICOS DE LAS CIUDADES

Este anexo solo ofrece un resumen muy breve de cada caso práctico. Todos ellos, que normalmente tienen unas 50 páginas, están siendo publicados individualmente por el Consejo Mundial del Agua.

NOMBRE DE LA CIUDAD OBJETO DE ESTUDIO **Baguio, Región Administrativa de La Cordillera, Filipinas**

DATOS Y CARACTERÍSTICAS DEL PAÍS Y CIUDAD

Filipinas tiene una población de 103 millones de personas, el 45% de las cuales vive en áreas urbanas. Es una república unitaria con varias jerarquías de gobierno: nacional, provincial y municipal. El saneamiento es una responsabilidad de la ciudad/municipio. El gobierno nacional tiene muchas agencias y departamentos con funciones confusas y superpuestas en políticas de saneamiento, regulación y finanzas. La cobertura del saneamiento urbano es aproximadamente del 78%. El gobierno no tiene una política única y clara sobre su financiación. En la práctica, el gasto de capital y el gasto operativo para el servicio urbano se contabilizan conjuntamente, con fondos procedentes de varias líneas presupuestarias diferentes en el gobierno nacional, financiadas con ingresos tributarios y de las ciudades/municipios, también financiados principalmente con los ingresos fiscales locales. La recaudación de tarifas para saneamiento fuera del área metropolitana de Manila no es coherente. El concepto de economía circular de saneamiento aún no es muy conocido en Filipinas, aunque algunos de sus principios se utilizan principalmente en la gestión de residuos sólidos.

Baguio es la ciudad número 25 en la lista de las más urbanizadas de Filipinas con una población de 0.35 millones de personas. Es una ciudad compacta con alta densidad de población, conocida principalmente por los sectores del turismo y servicios. Está regida por el gobierno de la ciudad, cuya Oficina de Medio Ambiente tiene una División de Gestión de Aguas Residuales, Agua y Aire Ambiental (WAMD-CEPMO, por sus siglas en inglés), que es responsable del saneamiento, mientras que el Distrito de Agua de Baguio (BWD, por sus siglas en inglés) es responsable del suministro de agua. La ciudad tiene un sistema con alcantarillado pequeño que cubre tan solo el centro de la ciudad, sus líneas principales y la planta de tratamiento de aguas residuales fueron completamente financiadas por el Gobierno de Japón. Cerca del 67% de los hogares tienen servicios de saneamiento in situ (casi todas fosas sépticas), mientras que el 28% son atendidos por el sistema con alcantarillado y aproximadamente el 5% por fosas sépticas comunitarias. La ciudad cobra una tarifa de saneamiento sólo a los hogares conectados al sistema con alcantarillado y se calcula por inodoro, no por metro cúbico de agua utilizada.

MECANISMOS FINANCIEROS UTILIZADOS EN ESTA CIUDAD

Para el gobierno de la ciudad, tanto el gasto de capital como el operativo se agrupan como una única línea presupuestaria. El gobierno de la ciudad considera el saneamiento como un servicio básico que se debe proporcionar, por lo que su gasto en esta partida de casi un millón de dólares supera con creces los ingresos obtenidos de las tarifas que se aproximan a los 300.000 dólares. De este déficit, obtiene alrededor del 60% de sus ingresos generales y aproximadamente el 40% en subvenciones del gobierno nacional. La ciudad no pide préstamos bajo ningún concepto.

Para la gran mayoría de los residentes, el saneamiento se autofinancia por completo, tanto el gasto de capital -principalmente la construcción de la fosa séptica-, como el operativo -la limpieza de lodo-. Esta última la realizan contratistas con una regulación insuficiente que cobran precios establecidos por las condiciones del mercado; sólo una pequeña fracción del lodo fecal llega a la planta de tratamiento de aguas residuales.

INNOVACIONES UTILIZADAS O PLANEADAS EN ESTA CIUDAD

Baguio no está innovando actualmente en la financiación de este sector. Tiene algunas características inusuales, por ejemplo, cobrar tarifas por inodoro en vez de por metro cúbico de agua, pero no hay pruebas de que esto se haya hecho para innovar, y quiere prescindir de ellas. Tiene una aspiración de planificación para proporcionar alcantarillado universal de cara al 2035, pero no hay un plan financiero asociado que sea significativo.

El gobierno de la ciudad y el alcalde han mostrado un gran interés en probar innovaciones en la financiación con el fin de mejorar la calidad del servicio.

El concepto de economía circular no resulta familiar con ese nombre, pero WAMD-CEPMO ha probado algunas actividades a pequeña escala, como la venta de lodo tratado como abono.

MENSAJES PARA LOS DIRIGENTES ESPECÍFICOS DE ESTA CIUDAD

Coordinar la planificación entre BWD para agua y WAMD-CEPMO para saneamiento.

Diferenciar la contabilidad de saneamiento en el presupuesto de WAMD-CEPMO y subdividirla en gastos operativos y de capital para que los dirigentes puedan ver el panorama financiero real y tomar decisiones basadas en dichas pruebas.

Planear el uso de un enfoque inclusivo para toda la ciudad que conceda la misma importancia al sistema in situ y al alcantarillado a través del agua. Reconocer que el alcantarillado universal a través del agua no será asequible y, en cambio, permitir que WAMD-CEPMO se haga cargo de la planificación financiera para el modelo in situ y el alcantarillado a través del agua.

Revisar la base de cálculo y el mecanismo de recaudación de tarifas y por servicios sépticos, para cubrir completamente los gastos operativos de WAMD-CEPMO.

Reconocer los recursos procedentes del inodoro como un recurso valioso y no como un residuo que se debe eliminar. Alentar a los empresarios privados a participar en este trabajo de economía circular. Aumentar los ingresos de WAMD-CEPMO a partir de las ventas de productos.

NOMBRE DE LA CIUDAD OBJETO DE ESTUDIO: **Blumenau, Estado de Santa Catarina, Brasil**

DATOS Y CARACTERÍSTICAS DEL PAÍS Y CIUDAD

Brasil tiene una población de 207 millones de personas, el 85% de las cuales vive en áreas urbanas. Brasil tiene una estructura federal con poderes gubernamentales compartidos entre el gobierno nacional y los estatales. En materia de agua y saneamiento, el gobierno nacional es responsable de las políticas y orientación, mientras que las corporaciones municipales son responsables de la prestación del servicio, excepto en las áreas metropolitanas donde esta resulta de acuerdos entre empresas estatales y municipales de agua y saneamiento. Además de eso, acuerdos similares permiten a las corporaciones estatales proporcionar servicios de agua y saneamiento a varios municipios de los estados. Recientemente, algunas de esas corporaciones municipales han comenzado a contratar concesionarios del sector privado para ofrecer dichos servicios urbanos. Según los datos de 2015, aproximadamente el 40% de la cobertura de saneamiento se gestiona con seguridad (es decir, a través de alcantarillado) y el 50% básica (es decir, in situ). La política del gobierno consiste en que el gasto de capital en agua y saneamiento se deben financiar principalmente a partir de tarifas o préstamos, aumentado por un pequeño porcentaje en subvenciones del gobierno nacional financiadas con los ingresos tributarios. El gasto operativo lo deben financiar los municipios a través de tarifas. El concepto de economía circular es familiar en la gestión de los residuos sólidos, pero es nuevo en materia de saneamiento: existen pocos ejemplos de su aplicación en todo el país.

Blumenau es la 78ª ciudad más grande de Brasil con una población de 0,35 millones de personas. Es una ciudad comparativamente próspera en un estado próspero (Santa Catarina) aunque su cobertura de saneamiento va muy por detrás de su estatus económico. La corporación municipal de agua y saneamiento, Serviço Autônomo Municipal de Água e Esgoto (SAMAE), es responsable de prestar el servicio, y en 2010 contrató el saneamiento a una empresa del sector privado, firmando un contrato de 45 años. La ciudad tiene un antiguo sistema con alcantarillado que cubre una pequeña área en el centro de la ciudad. Cerca del 92% de los hogares tienen un sistema mejorado, de los cuales solo el 27% recibe servicios con alcantarillado y el resto in situ.

MECANISMOS FINANCIEROS UTILIZADOS EN ESTA CIUDAD

Para los gastos de capital en infraestructura de saneamiento (principalmente alcantarillas y plantas de tratamiento), el concesionario depende de los préstamos de los bancos comerciales; existen dudas considerables sobre si eso será asequible.

Para los gastos operativos, el concesionario recupera el coste total a través de tarifas. Los clientes pagan tarifas de saneamiento y agua separadas, de las cuales la primera es ligeramente más alta que la segunda. Ambas se basan en el consumo volumétrico de agua, con un elemento de comprobación de los medios económicos que ofrece tarifas más bajas para los más desfavorecidos. La tasa de recaudación de tarifas se acerca al 89%.

INNOVACIONES UTILIZADAS O PLANEADAS EN ESTA CIUDAD

El contrato de SAMAE con una concesionaria del sector privado es en sí mismo bastante innovador en el contexto brasileño.

SAMAE y la concesionaria han mostrado interés en probar innovaciones en la financiación del saneamiento a fin de mejorar tanto la cobertura como la calidad del servicio.

MENSAJES PARA LOS DIRIGENTES ESPECÍFICOS DE ESTA CIUDAD

Aclarar la propiedad de los activos, el régimen regulador y los objetivos a largo plazo para los servicios de saneamiento.

Reconocer que esta actividad tiene un impacto social muy positivo y obtener beneficios económicos de ese impacto, por ejemplo, reduciendo los impuestos del proveedor del servicio.

Mejorar la recaudación de tarifas.

Cambiar los planes futuros de la expansión del sistema con alcantarillado, que probablemente será inasequible, a la mejora de los servicios con el modelo in situ.

Integrar conceptos de economía circular en los servicios de saneamiento con alcantarillado e in situ, a fin de reutilizar recursos y generar ingresos adicionales para el concesionario.

NOMBRE DE LA CIUDAD OBJETO DE ESTUDIO: **Bogotá, Distrito Capital, Colombia**

DATOS Y CARACTERÍSTICAS DEL PAÍS Y CIUDAD

Colombia tiene una población de 49 millones de personas, el 77% de las cuales vive en áreas urbanas. Tiene una estructura constitucional unitaria con tres niveles de gobierno (nacional, departamental, local) cada uno con sus propios mandatos y poderes. En materia de saneamiento, el gobierno nacional establece políticas y los gobiernos locales (en áreas urbanas: los municipios) prestan los servicios. Se dice que la cobertura de saneamiento urbano se sitúa en torno al 93%. La política del gobierno sobre la financiación es que tanto los gastos de capital como los operativos deben ser financiados por los municipios a través de tarifas. Estas deben reconocer el derecho humano al saneamiento, por lo que los servicios básicos son gratuitos para el residente y el gobierno nacional puede pagar al municipio una subvención adicional recurrente para cubrir ese coste. El gobierno nacional tiene la intención de promover el concepto de la economía circular, pero aún no ha incentivado su fomento, por lo que hay muy pocos ejemplos de ello en funcionamiento.

Bogotá es la capital de Colombia con una población de 8,1 millones de personas. Está gobernada por un Concejo Municipal liderado por un alcalde elegido directamente. El proveedor del servicio de agua y saneamiento es la Empresa de Acueducto, Alcantarillado y Aseo de Bogotá (EAB), es propiedad del municipio. La ciudad tiene un extenso sistema con alcantarillado que cubre aproximadamente el 96% de los hogares. Sin embargo, solo el 16% del alcantarillado se gestiona de forma segura, y el resto se descarga directamente en un río. Por lo tanto, la cifra de cobertura se redujo drásticamente con el cambio de las estadísticas de los ODM a las de los ODS.

MECANISMOS FINANCIEROS UTILIZADOS EN ESTA CIUDAD

La EAB cobra tarifas separadas por agua y saneamiento; tienen casi el mismo coste por metro cúbico. Las cuentas del servicio de agua y de saneamiento están separadas y se auditan también por separado. Las tarifas aumentaron significativamente a finales de la década de 1990 debido al fuerte liderazgo del alcalde.
En cuanto a los gastos de capital en su infraestructura de saneamiento regular, la EAB obtiene todos los fondos directamente de las tarifas o de los préstamos comerciales reembolsados de las tarifas. La EAB tiene una buena calificación crediticia y, por lo tanto, paga tipos de interés bajos sobre estos préstamos. En el caso concreto de la construcción de nuevas plantas de tratamiento de aguas residuales para mejorar la calidad del agua del río, el gobierno nacional contribuye con alrededor del 40% del coste en reconocimiento de la mejora ambiental.

Por lo que respecta a los gastos operativos, la EAB tiene un presupuesto anual de aproximadamente 140 millones de dólares, que se financia en un 95% con las tarifas y en un 5% con subvenciones gubernamentales para cubrir el suministro gratuito de saneamiento básico.

INNOVACIONES UTILIZADAS O PLANEADAS EN ESTA CIUDAD

La principal innovación financiera es una subvención cruzada transparente a nivel nacional que se logra mediante el cobro de diferentes tarifas a las personas que viven en casas de diferentes valores: por lo tanto, los valores de las propiedades se utilizan como un indicador de la riqueza de los residentes.

La ciudad de Medellín (la segunda ciudad más grande de Colombia) ha sido pionera en el pago de tarifas mediante tarjetas inteligentes, que son más cómodas para los clientes y más eficientes para el proveedor del servicio. Bogotá está considerando adoptar este sistema.

La EAB está abierta a probar innovaciones en la financiación del saneamiento para mejorar su calidad de servicio y rendimiento financiero.

MENSAJES PARA LOS DIRIGENTES ESPECÍFICOS DE ESTA CIUDAD

El saneamiento universal con alcantarillado ya se ha logrado, por lo que se debe hacer hincapié en el tratamiento y la reutilización de los recursos procedentes del inodoro. La EAB podría generar ingresos por la venta de productos de sus plantas de tratamiento de aguas residuales, específicamente fertilizantes, biodiesel, productos químicos y biomasa para alimentación. Todos ellos entran dentro del concepto de la economía circular de saneamiento. Los recursos procedentes del inodoro deben ser considerados como una fuente de nutrientes y energía de las plantas y no como un residuo que se debe eliminar.

La EAB podría firmar contratos con empresas del sector privado para partes concretas de sus operaciones, por ejemplo, dirigir plantas de tratamiento de aguas residuales, lectura de contadores, centros de llamadas.

NOMBRE DE LA CIUDAD OBJETO DE ESTUDIO: **Dakar, Región de Dakar, Senegal**

DATOS Y CARACTERÍSTICAS DEL PAÍS Y CIUDAD

Senegal tiene una población de 15 millones de personas, el 44% de las cuales vive en áreas urbanas. Tiene una estructura unitaria con poderes gubernamentales compartidos entre los gobiernos nacionales y regionales. En materia de saneamiento, el gobierno nacional rige, establece políticas y regulaciones y también implementa programas de trabajo a través de organismos del sector público que, en lo que respecta al saneamiento urbano, se realizan a través de la Office National de l'Assainissement du Sénégal (Oficina Nacional de Saneamiento en Senegal) (ONAS). La cobertura de saneamiento urbano se estima entre el 62% y 82% dependiendo de las definiciones. La política del gobierno sobre la financiación del saneamiento es que los gastos de capital para el servicio urbano provengan principalmente de préstamos concesionarios y comerciales, mientras que los gastos operativos deben financiarse a través de tarifas. El concepto de economía circular de saneamiento se reconoce oficialmente en Senegal, pero se practica muy poco hasta la fecha.

Dakar es la capital y la ciudad más grande de Senegal con una población de 3,3 millones de personas. El gobierno municipal no tiene participación en este sector, que es responsabilidad de la ONAS. La ciudad tiene un pequeño sistema con alcantarillado que cubre el centro histórico. Cerca del 78% de los hogares tienen saneamiento mejorado; de estos, dos tercios tienen un sistema in situ y sólo un tercio con alcantarillado. La ONAS pone tanto énfasis en el modelo in situ como en el que utiliza alcantarillado, y sus planes futuros para Dakar cubren ambos.

MECANISMOS FINANCIEROS UTILIZADOS EN ESTA CIUDAD

La ONAS no mantiene cuentas separadas para Dakar, solo por su trabajo general: las cifras de Dakar se pueden obtener estimando que la ciudad representa el 80% del trabajo de la ONAS y, por tanto, su dinero.

Para los gastos de capital en infraestructura de saneamiento, la ONAS depende de préstamos concesionarios y comerciales.

La ONAS cobra una tarifa que se calcula como un porcentaje de la del agua. Para el gasto operativo, la ONAS recupera el 73% del coste de esa tarifa y el 27% restante lo obtiene de las subvenciones del gobierno nacional para compensar el déficit.

INNOVACIONES UTILIZADAS O PLANEADAS EN ESTA CIUDAD

La ONAS, con el apoyo de la Fundación Gates, ha innovado considerablemente en la gestión de lodos fecales a través del programa PSFSM. La Oficina Nacional concede licencias y regula a los contratistas de vaciado de pozos y también alquila las plantas de tratamiento de lodos fecales a un contratista. Estos cambios han mejorado significativamente el rendimiento financiero del servicio.

Dentro del programa PSFSM, la ONAS ha establecido un fondo de garantía para permitir que los contratistas de vaciado de pozos obtengan préstamos bancarios para comprar sus equipos. Esta garantía ha permitido a los bancos comerciales reducir sus tasas de interés del 12% al 7,5%. Cerca del 8% de los préstamos no están siendo reembolsados correctamente por los contratistas, de modo que la asociación comercial de contratistas está tratando de reducir esta cifra.

La ONAS está mejorando las plantas de tratamiento de lodos fecales para generar productos comerciales, especialmente agua tratada, fertilizantes y energía. A escala de toda la ciudad, está supondría una importante innovación hacia la economía circular.

La ONAS ha mostrado interés en fomentar la innovación en la financiación del saneamiento con el fin de mejorar su cobertura y la calidad del servicio.

MENSAJES PARA LOS DIRIGENTES ESPECÍFICOS DE ESTA CIUDAD

Continuar según lo programado, con un enfoque inclusivo para toda la ciudad, que conceda la misma importancia al saneamiento in situ como con alcantarillado.

Aumentar las tarifas para cubrir completamente los gastos operativos.

Aumentar los ingresos de las ventas de productos.

Continuar contratando más servicios a los operadores del sector privado, para aumentar la eficiencia y la sostenibilidad financiera.

Mejorar el entorno legal y normativo para alentar a los inversores comerciales.

NOMBRE DE LA CIUDAD OBJETO DE ESTUDIO: **eThekwini (Durban), Provincia de KwaZulu Natal, Sudáfrica**

DATOS Y CARACTERÍSTICAS DEL PAÍS Y CIUDAD

Sudáfrica tiene una población de 55 millones de personas, el 65% de las cuales vive en áreas urbanas. Tiene una estructura constitucional unitaria con tres esferas de gobierno (nacional, provincial, local), cada una con sus propios mandatarios y poderes. En materia de saneamiento, el gobierno nacional establece políticas y los gobiernos locales (en áreas urbanas: los municipios) prestan los servicios. La cobertura de saneamiento urbano se sitúa en torno al 76%. La legislación, normas y funciones institucionales se exponen en detalle. La política del gobierno sobre la financiación del saneamiento consiste en que los gastos de capital para el saneamiento urbano provengan principalmente de subvenciones calculadas con precisión del gobierno nacional, financiadas con los ingresos fiscales, mientras que los gastos operativos deben ser financiados por los municipios a través de tarifas. Éstas deben reconocer los beneficios de salud pública del saneamiento, por lo que los servicios básicos son gratuitos para el residente y el gobierno nacional le paga al municipio una subvención adicional recurrente para cubrir ese coste. El concepto de economía circular de saneamiento se comprende bien en Sudáfrica y hay algunos ejemplos en funcionamiento.

El municipio de eThekwini (también conocido como Durban) es la tercera ciudad más grande de Sudáfrica con una población de 3,7 millones de personas. Está gobernado por el Consejo Municipal eThekwini. El proveedor del servicio de agua y saneamiento es eThekwini Water and Sanitation (EWS), propiedad del municipio. La ciudad tiene un extenso sistema con alcantarillado que cubre aproximadamente el 50% de los hogares, mientras que otro 26% recibe servicios mejorados in situ. EWS utiliza un enfoque inclusivo para toda la ciudad con el fin de gestionar todo tipo de servicios de saneamiento, y sus planes futuros incluyen los modelos con alcantarillado e in situ.

EWS es una entidad excepcionalmente bien administrada. Muchos otros municipios de Sudáfrica tienen un rendimiento peor que EWS en términos de cobro de tarifas, uso de subvenciones de capital, gestión de activos y relaciones con los clientes.

MECANISMOS FINANCIEROS UTILIZADOS EN ESTA CIUDAD

Para los gastos de capital en infraestructura, EWS obtiene aproximadamente la mitad de los fondos de las subvenciones del gobierno nacional y cerca de la mitad de los préstamos comerciales, reembolsados de los ingresos operativos. EWS tiene una buena calificación crediticia y paga tipos de interés bajos por estos préstamos.

Para los gastos operativos, EWS tiene un presupuesto anual de alrededor de 140 millones de dólares, que se financia en un 84% con las tarifas y en un 16% con subvenciones gubernamentales.

EWS recauda tarifas por separado para agua y saneamiento; la tasa de cobro de tarifas es del 100%. Las cuentas del servicio de agua y de saneamiento están delimitadas y auditadas por separado de las otras cuentas municipales.

INNOVACIONES UTILIZADAS O PLANEADAS EN ESTA CIUDAD

EWS ha sido pionera en muchas políticas en Sudáfrica y adopta un enfoque de gerencia abierta a la innovación. Está dispuesta a probar innovaciones en la financiación para mejorar su calidad de servicio y rendimiento financiero.

EWS ha comenzado a generar ingresos por la venta de productos de sus plantas de tratamiento de aguas residuales, específicamente fertilizantes, biodiesel, productos químicos y biomasa para alimentación. Todos ellos entran dentro del concepto de la economía circular de saneamiento.

EWS firma contratos con empresas del sector privado para segmentos concretos de sus operaciones, por ejemplo, dirección de plantas de tratamiento de aguas residuales, lectura de medidores, centros de llamadas, vaciado de inodoros.

MENSAJES PARA LOS DIRIGENTES ESPECÍFICOS DE ESTA CIUDAD

La elección de la tecnología determina la asequibilidad de la opción tanto para los servicios públicos como para los clientes. En cualquier análisis económico, los factores externos deberían incluirse al determinar la asequibilidad de un servicio público.

El modelo con alcantarillado universal no sería asequible en este caso, o, de hecho, en la mayoría de las ciudades de los países en vías de desarrollo, y no es práctico en los suburbios pobres y densos.

Los desarrollos en la tecnología in situ y basada en contenedores tienen el potencial de hacer que los sistemas con alcantarillado sean redundantes en el medio plazo, con una sobreinversión resultante fija en esa infraestructura.

Las tarifas deben diseñarse para reconocer el derecho humano al saneamiento y ser asequibles para los más desfavorecidos. Esto implica una subvención cruzada interna manifiesta de los ricos a los pobres.

Reconocer los recursos procedentes del inodoro como una fuente de nutrientes de plantas, productos químicos y energía; no como un deshecho que se debe eliminar.

NOMBRE DE LA CIUDAD OBJETO DE ESTUDIO: **Jodhpur, Estado del Rajastán, India**

DATOS Y CARACTERÍSTICAS DEL PAÍS Y CIUDAD

India tiene una población de 1.311 millones de personas, de las cuales el 33% vive en áreas urbanas. El 18% de la población urbana vive en suburbios marginales. India tiene una estructura federal con poderes gubernamentales compartidos entre el gobierno nacional, el gobierno estatal y los municipios. El saneamiento es nominalmente una responsabilidad del estado, y el gobierno nacional es muy activo en la formulación de políticas, orientación e implementación de algunos programas patrocinados centralmente, concretamente la Swachh Bharat Mission, la Atal Mission for Rejuvenation and Urban Transformation y la Smart Cities Mission. En las áreas urbanas, la cobertura de saneamiento mejorada se sitúa en torno al 65% y cerca del 21% tiene acceso a instalaciones compartidas. Aproximadamente sólo el 32% de los inodoros están conectados a sistemas con alcantarillado y, en el mejor de los casos, solo se procesa alrededor del 30% del lodo fecal. La política del gobierno sobre la financiación del saneamiento es que los gastos de capital para el saneamiento urbano provengan principalmente de subvenciones del gobierno nacional y los gobiernos estatales, financiadas con los ingresos fiscales, mientras que los gastos operativos deben ser financiados por los municipios a través de tarifas. De media, las tarifas en toda la India recaudan sólo alrededor del 30-40% de los gastos operativos de agua e incluso menos para el saneamiento. El concepto de la economía circular de saneamiento es todavía nuevo en India y apenas se practica en ninguno de los programas gubernamentales: su foco principal sigue siendo la construcción de infraestructura.

Jodhpur es la 45ª ciudad más grande de la India con una población de 1,1 millones de personas. Está gobernado por la Jodhpur Municipal Corporation (JMC), que tiene la responsabilidad de saneamiento, mientras que el Rajasthan Public Health Engineering Department (PHED) es responsable del suministro de agua. La ciudad tiene un antiguo sistema con alcantarillado que cubre aproximadamente el 70% del área de la ciudad, aunque su capacidad de tratamiento es mucho menor. Alrededor del 65% de los hogares tienen inodoros mejorados. La ciudad no cobra una tarifa por separado para el alcantarillado; en cambio, aproximadamente el 30% de los cargos de agua recaudados por el PHED se transfieren al JMC para fines de saneamiento, aunque ese dinero no está separado dentro del JMC. El JMC sólo dispone de 5 empleados dedicados al saneamiento, más contratistas para todo el trabajo de construcción y mantenimiento; no tiene un sistema para la gestión de activos de capital.

MECANISMOS FINANCIEROS UTILIZADOS EN ESTA CIUDAD

Para los gastos de capital en infraestructura de saneamiento (principalmente alcantarillado y plantas de tratamiento), el JMC depende de las subvenciones del gobierno nacional y estatal, con una media aproximada de 5 millones de dólares al año.

Para los gastos operativos, el JMC tiene un ingreso anual (casi todos de su participación en las tarifas de agua del PHED) de 0,8 millones de dólares, un gasto de 1,2 millones y cubre el déficit de 0,4 millones de sus otros recursos financieros internos (en última instancia, el impuesto local). El JMC es consciente de que su gasto es muy bajo y desea fijar un gasto meta, que se sitúa en el 5%

del valor del capital de sus activos, de 7 millones de dólares. La política de saneamiento estatal del gobierno del Rajastán alienta a las ciudades a recuperar el coste total de los gastos operativos a través de tarifas y a generar ingresos mediante la venta de aguas residuales tratadas para el riego, pero el JMC aún no ha podido hacerlo.

INNOVACIONES UTILIZADAS O PLANEADAS EN ESTA CIUDAD

El JMC ha intentado generar ingresos vendiendo los productos de sus plantas de tratamiento de aguas residuales, específicamente aguas residuales tratadas, biogás y compost, pero los ingresos fueron insignificantes. Los principales problemas consistieron en que el JMC consideró que los productos eran antieconómicos en términos del coste de producción frente a su valor de mercado, y a que la corporación experimentó una fuerte resistencia de los clientes derivada de la percepción de que los productos de las organizaciones del sector público deberían ser gratuitos.

El JMC ha mostrado un gran interés en probar innovaciones en la financiación del saneamiento a fin de mejorar su cobertura y la calidad del servicio.

MENSAJES PARA LOS DIRIGENTES ESPECÍFICOS DE ESTA CIUDAD

Mejorar la recaudación de impuestos del JMC para aumentar sus ingresos generales.

Transferir autoridad para establecer y cobrar las tarifas de saneamiento del PHED al JMC.

Separa la contabilidad del saneamiento del presupuesto del JMC para que los dirigentes puedan ver el panorama financiero real y tomar decisiones basadas en dichas pruebas.

Incentivar a las grandes instituciones como hospitales, hoteles, instituciones educativas, etc. a construir sus propias plantas de tratamiento de aguas residuales, que podrían ser dirigidas por contratistas del sector privado que aplicarían conceptos de economía circular y posteriormente venderían los productos.

NOMBRE DE LA CIUDAD OBJETO DE ESTUDI: **Marrakech, región de Marrakech-Safi, Marruecos**

DATOS Y CARACTERÍSTICAS DEL PAÍS Y CIUDAD

Marruecos tiene una población de 34 millones de personas, el 60% de las cuales vive en áreas urbanas. Tiene una estructura federal con poderes gubernamentales cada vez más descentralizados del gobierno nacional hacia los regionales y locales. El saneamiento es una responsabilidad del gobierno local, mientras que el gobierno nacional es el encargado de establecer políticas y orientación. La cobertura de saneamiento urbano se sitúa en torno al 90%. La política del gobierno sobre la financiación del saneamiento es que los gastos de capital y operativos para el saneamiento urbano deben ser financiados por los municipios a través de tarifas. El concepto de la economía circular de saneamiento todavía es nuevo en Marruecos y apenas se practica en ninguno de los programas gubernamentales: su foco principal sigue siendo la construcción de infraestructura de saneamiento con alcantarillado.

Marrakech es la segunda ciudad más grande de Marruecos con una población de 1,3 millones de personas. La empresa del sector público Régie Autonome de Distribution d'Eau et d'Electricité de Marrakech (RADEEMA) suministra servicios de electricidad, agua y saneamiento. La ciudad tiene un gran sistema con alcantarillado que actualmente cubre alrededor del 90% de los hogares y aún se está ampliando: RADEEMA planea alcanzar una cobertura con alcantarillado del 100% para 2030. El otro 10% de los hogares cuenta actualmente con servicios in situ. Aproximadamente el 90% de las aguas residuales se trata adecuadamente.

MECANISMOS FINANCIEROS UTILIZADOS EN ESTA CIUDAD

Para los gastos de capital en infraestructura de saneamiento (principalmente alcantarillado y plantas de tratamiento), RADEEMA depende principalmente de una subvención cruzada de la parte eléctrica de la empresa, que aumenta mediante algunos préstamos de bancos comerciales.

RADEEMA cubre el 59% de sus gastos operativos mediante la tarifa que cobra por dicho saneamiento, y el resto es financiado con una subvención cruzada de la parte eléctrica de la empresa.

INNOVACIONES UTILIZADAS O PLANEADAS EN ESTA CIUDAD

La principal peculiaridad de RADEEMA es que la sección de la electricidad de su negocio, que es rentable, subvenciona la parte de saneamiento, que no lo es.

RADEEMA genera aproximadamente el 10% de los ingresos totales de sus clientes de saneamiento a través de la venta de aguas residuales tratadas a campos de golf.

RADEEMA está abierto a sugerencias de innovaciones en la financiación que podrían ayudar a que su servicio se autofinanciara.

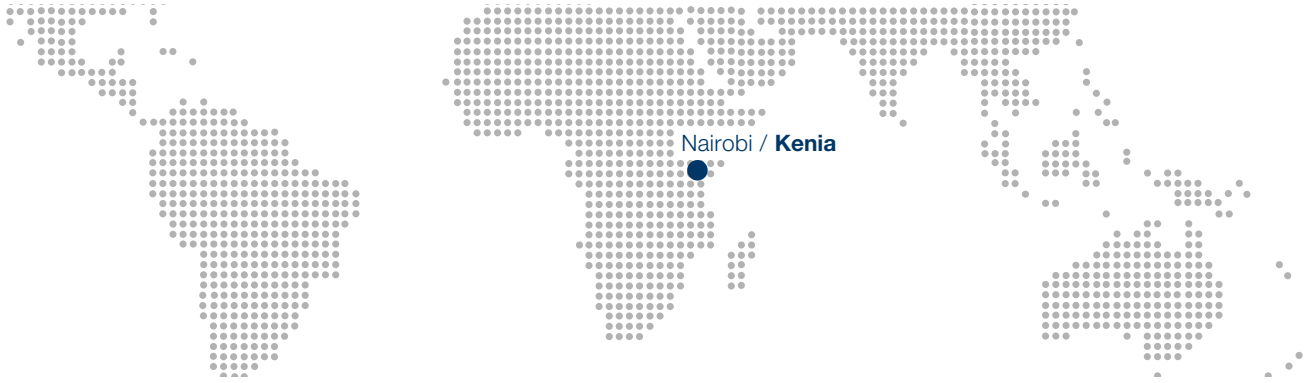
MENSAJES PARA LOS DIRIGENTES ESPECÍFICOS DE ESTA CIUDAD

Revisar la política de tarifas e incrementar la tarifa de saneamiento real.

Aumentar los ingresos de RADEEMA procedentes de la venta de productos que no sean agua. Encontrar nuevos clientes (que no sean campos de golf) para las aguas residuales tratadas.

Separar la contabilidad del saneamiento del presupuesto de RADEEMA para que los dirigentes puedan ver el panorama financiero real y tomar decisiones basadas en dichas pruebas. Luego, decidir si se continúa con la política actual de subvención cruzada o si se buscan fuentes alternativas de ingresos para este.

RADEEMA podría contratar el negocio de venta de agua, biogás y compost de las plantas municipales de tratamiento de aguas residuales a un empresario del sector privado que podría operarlo de manera más efectiva que RADEEMA.



NOMBRE DE LA CIUDAD OBJETO DE ESTUDIO: **Nairobi, Condado de Nairobi, Kenia**

DATOS Y CARACTERÍSTICAS DEL PAÍS Y CIUDAD

Kenia tiene una población de 49 millones de personas, el 25-30% de las cuales vive en áreas urbanas. Su sistema de gobernabilidad es descentralizado, y los poderes y mandato constitucional se comparten entre el gobierno nacional y los condados. El saneamiento es nominalmente una responsabilidad de este último, mientras que varios ministerios distintos del gobierno nacional establecen políticas, orientación y normas. La cobertura de saneamiento urbano se sitúa en torno al 20% con alcantarillado y 50% in situ, pero el JMP no los clasifica como de gestión segura; los servicios no consiguen responder al rápido crecimiento de las poblaciones urbanas. La política del gobierno sobre la financiación es que los gastos de capital para saneamiento urbano provengan en parte de subvenciones del gobierno nacional financiadas con ingresos fiscales y en parte de tarifas, mientras que los operativos deben financiarse completamente a través de tarifas; el gobierno reconoce que estos últimos son actualmente demasiado bajos como para alcanzar este objetivo. El concepto de la economía circular de saneamiento se reconoce en Kenia, aunque hay pocos ejemplos de que funcione.

Nairobi es la capital y la ciudad más grande de Kenia, con una población en rápido crecimiento de 3,9 millones de personas. La Athi Water Services Board (AWSB) es el titular del activo, mientras que la Nairobi City Water and Sewerage Company, (NCWSC) propiedad del gobierno del Condado es el proveedor del servicio, aunque existen superposiciones y confusión sobre sus funciones. La ciudad tiene un sistema con alcantarillado bastante extenso que atiende a cerca del 45% de los hogares con una tarifa de saneamiento establecida en el 75% de la tarifa del agua. Casi todos los demás hogares utilizan el sistema in situ, de uso individual o compartido, con vaciado de pozos mediante el sector privado de pequeña escala. El plan de cara a 2030 es ampliar el alcantarillado a base de agua, pero hay muy poco dinero asignado o en perspectiva para esto.

MECANISMOS FINANCIEROS UTILIZADOS EN ESTA CIUDAD

En materia de gastos de capital en agua y saneamiento, la AWSB y la NCWSC discuten sobre la propiedad y la responsabilidad, y se logran pocos avances: se pretende que la financiación proceda de una combinación de subvenciones del gobierno nacional y préstamos comerciales, que se pagarán con los ingresos por tarifas. Los presupuestos son pequeños, no están claramente delimitados y se distribuyen entre el gobierno del condado, la NCWSC y la AWSB.

Los ingresos anuales de la NCWSC procedentes de las tarifas combinadas de agua y saneamiento son de aproximadamente 70 millones de dólares, y deberían cubrir sus gastos operativos.

INNOVACIONES UTILIZADAS O PLANEADAS EN ESTA CIUDAD

La NCWSC, con el apoyo técnico del Banco Mundial y una subvención de GPOBA, obtuvo un préstamo comercial de 6 millones de dólares para gastos de capital en 2016.

Varios pequeños empresarios y proyectos han comenzado actividades de economía circular.

La NCWSC ha mostrado interés en probar innovaciones en la financiación del saneamiento.

MENSAJES PARA LOS DIRIGENTES ESPECÍFICOS DE ESTA CIUDAD

Aclarar las funciones de las diferentes agencias responsables del saneamiento y resolver los conflictos institucionales entre ellos.

Hacer cumplir las normas.

Separar la contabilidad del saneamiento de los presupuestos de la AWSB y la NCWSC para que los dirigentes puedan ver el panorama financiero real y tomar decisiones basadas en dichas pruebas.

Reconocer que no es asequible ampliar el alcantarillado a base de agua a toda la población y, en su lugar, utilizar los conceptos de planificación inclusiva para toda la ciudad para concentrarse en mejorar los servicios de saneamiento in situ y basado en contenedores.

Desarrollar y ampliar el mandato del Kenya Pooled Water Fund para financiar también el saneamiento.

ANEXO 2: LISTA DE PERSONAS CONSULTADAS PARA ESTE TRABAJO

Jamie Butterworth, Circularity Capital
Dominique Carrie, Social Finance
Dan Corry, New Philanthropy Capital
Barbara Evans, University of Leeds
Cheryl Hicks and Sandy Rodger, the Toilet Board Coalition
Guy Hutton, UNICEF
Dale Jacobson, American Society of Civil Engineers - Environmental & Water Resources Institute
Neil Jeffery, Water and Sanitation for the Urban Poor
Nabeela Khan, the CDC Group
Bernardo Lazo, the Gold Standard Foundation
Amanda Marlin, Sanitation and Water for All
Alex Money, Oxford University
Dennis Mwanza, Bill and Melinda Gates Foundation
Maimuna Nalubega and colleagues, African Development Bank
Lesley Pories and Heather Arney, Water.org
Manas Rath and colleagues, Bremen Overseas Research and Development Agency
Mohammed Saddiq, GENeco
Barbara Kazimbaye Senkwe and colleagues, Water, Sanitation and Hygiene Finance project
Tony Slatyer, Government of Australia
Simon Szreter, Cambridge University
Sophie Trémolet, World Bank
Arthur Wood, Total Impact Advisors
Christian Zurbrügg, Swiss Federal Institute of Aquatic Science and Technology

ANEXO 3: SELECCIÓN DE BIBLIOGRAFÍA ESTUDIADA PARA ESTE TRABAJO

Estas publicaciones contienen colectivamente análisis e información más detallados sobre muchos aspectos de la financiación del saneamiento de los que podrían caber en este breve informe. Muchos de ellos se refieren el uno al otro. La mayoría se publicaron recientemente, lo que refleja el creciente interés actual en este tema.

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Work programme

Increasing Financial Flows for Urban Sanitation

Case study

Marrakech, Morocco

Prepared by:

Abdelaziz Enasri

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I. Background

I.1. Political and constitutional context

Over the last few years the Kingdom of Morocco has seen drastic changes, particularly in political and institutional areas: the new Constitution of 2011 introduced institutional changes relating to the management of public utilities with a view to wider decentralization. Local public services managed by communes (municipalities) include drinking water, electricity, collection and treatment of wastewater, sewerage, solid waste, public lighting, public transport, road signalling and parking, ambulance services, slaughter houses and funeral homes. Municipalities are also responsible for local economic development and for a range of functions related to hygiene, health and the environment, as well as social and cultural services.

The Constitution of 2011 reinforced the role of communes and regions and created an environment to speed up decentralization. It introduced two essential principles: free administration of territorial authorities and subsidiarity; the latter implies that the central government will only intervene in cases where projects vital for citizens could not be carried out by regions and municipalities.

The process of transferring responsibilities from the central level to regional and local levels was implemented through a legal and institutional framework that transferred resources for decentralization. Implementation was introduced by revising the Law of Territorial Authorities into three laws: law on regions, law on prefectures and law on communes. The revision constitutes a breakthrough towards a legally decentralized system of government.

I.2. Demographic, economic and social evolution

According to the 2014 census, the population of the Kingdom of Morocco was 33.8 million, an average annual increase of 1.25 per cent since the previous census in 2004. The rate of population growth is not high since the growth rate declined from 2.61 per cent between 1971 and 1982 to 1.25 per cent between 2004 and 2014 (Table 1).

Table 1. Population of Morocco 1960–2014

Year of census	Population	% annual average growth
1960	11,626,470	-
1971	15,379,259	2.58
1982	20,419,555	2.61
1994	26,073,717	2.06
2004	29,891,708	1.38
2014	33,848,242	1.25

According to estimates by the Economic Advisory Committee, the Moroccan population is now 34.9 million, an increase of 3.1 per cent compared to the census of 2014; the average annual increase is 1.03%, confirming the trend between 2004 and 2014.

Disaggregating the population by sex shows a slight dominance of females in the Moroccan population in 2014 (Figure 1).

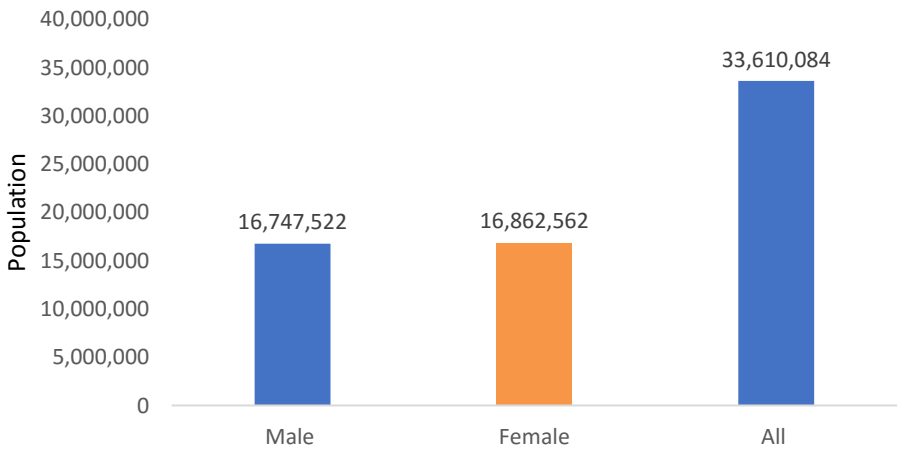


Figure 1. Population in Morocco by gender 2014

The demographic split between urban and rural areas shows a very strong structural variation; the percentage of the population living in

urban areas is 60.4 per cent and the percentage living in rural areas is 39.6 per cent. The number of inhabitants in urban areas has increased on average by 5 per cent between every census since 1994. The population of rural areas decreased from 70.8 per cent to 39.6 per cent between 1960 and 2014 (Figure 2) and led to a structural transformation in local public services, particularly urban public transport, drinking water and sanitation.

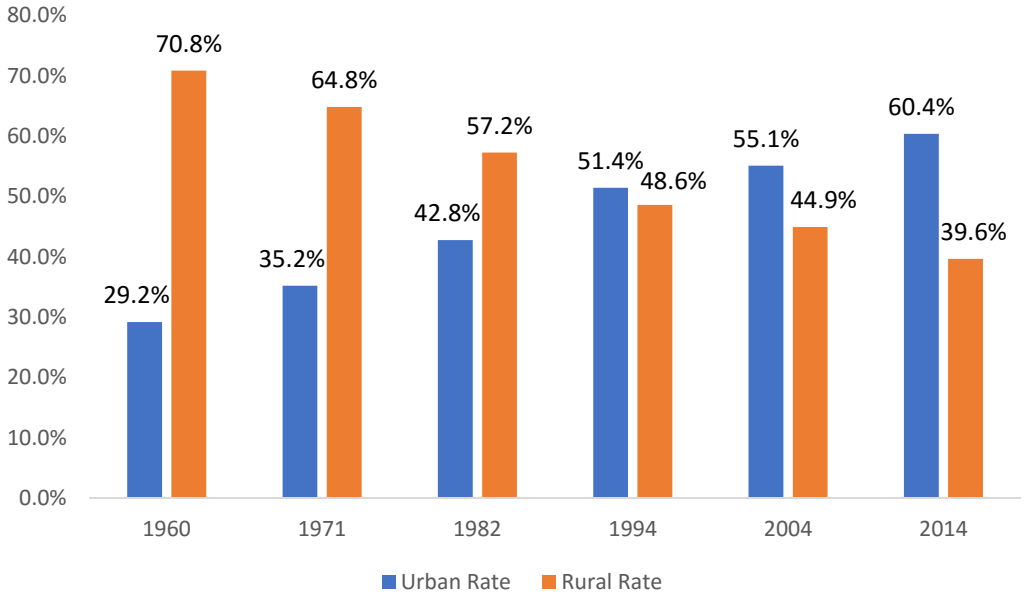


Figure 2. Urbanization in Morocco 1960–2014

In 2016, the gross domestic product (GDP) of the Kingdom of Morocco reached Moroccan dirham (MAD)914 billion (USD91 billion). The economy of the country is becoming more and more diversified; the agricultural sector now represents only 12 per cent of GDP

against over 30 per cent in the 1990s. The evolution of the Moroccan economy is due to the emergence of new sectors, notably the car industry, aeronautics and services (Figure 3).

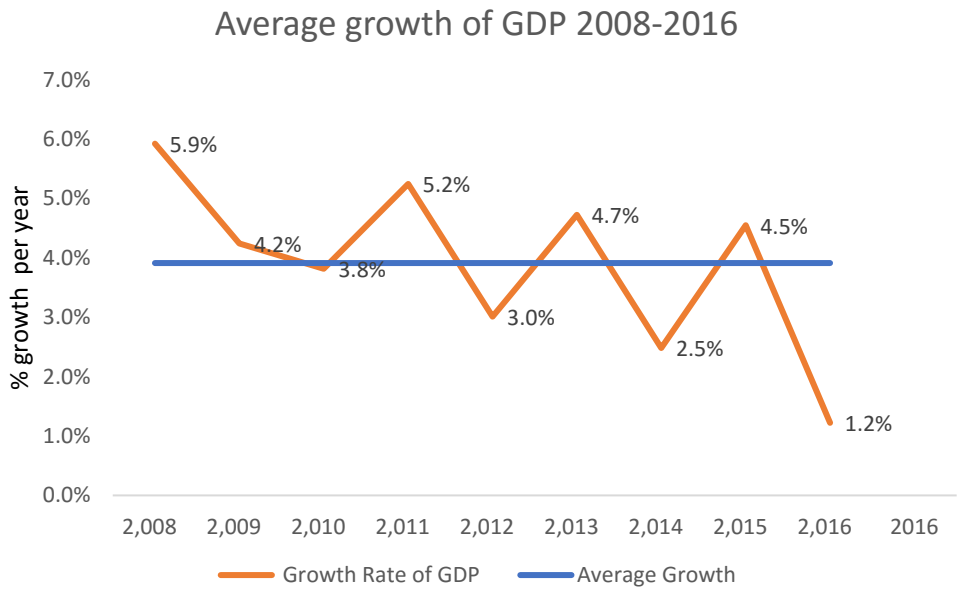


Figure 3. Gross domestic product (GDP) in Morocco 2007–2016

Like other countries, Morocco faces the scourge of youth unemployment. At the end of 2016, the national unemployment rate was 9.4 per cent and the urban unemployment rate was 13.9 per cent. The unemployment rate in rural areas is estimated to be 4.2 per cent. For young people aged from 15 to 24 years, unemployment is particularly high in towns, where the rate reached 41 per cent in 2016.

I.3. Water supply and wastewater treatment

The 2014 census brought to light data concerning access to drinking water and sanitation (Table 2):

- 73 per cent of the population has access to the public distribution network of drinking water, 91 per cent in urban areas and 37.8 per cent in rural areas.
- In rural areas, access to sanitation is relatively poor compared to access to water. The rate of connectivity to sanitation in urban areas is 88.2 per cent and 2.9 per cent in rural areas, an overall national rate of 58.9 per cent.

Table 2. Urban and rural access to water and sanitation

Access to public networks	Urban (%)	Rural (%)	Total (%)
Water	91.3	37.8	73
Sanitation	88.2	2.9	58.9

Table 3. Disposal of wastewater

Disposal of wastewater	National (%)	Urban (%)	Rural (%)
Public sewerage network	58.9	88.2	2.9
Septic tank	23.2	9.6	49.2
Other	17.9	2.2	47.9

The public sewerage network is the main method of disposing of wastewater, used by 58.9 per cent of the Moroccan population (Table 3). Septic tanks are the second most common method of wastewater disposal, with 23.2 per cent. Septic tanks predominate in rural

areas; 88.2 per cent of the urban population has access to the public sewerage network for disposal of wastewater compared to 2.9 per cent in rural areas.

Institutionally, the management of sanitation is the responsibility of municipalities (communes) in accordance with the law on communes (113-14 enacted July 7 2015 section II article 83). This article specifies that municipalities should manage sanitation, wastewater treatment and water treatment plants. The management methods recommended by the law are:

- Direct management — municipal control or control supervised by municipalities
- Delegated management — entrusting the management of public services for treatment of wastewater and the development and management of water treatment plants to private entities (concessionaires)
- Management by local development societies — these are limited liability companies with at least 34 per cent municipal ownership.

Morocco specifies that, according to the needs of each municipality, operators are to manage at least two activities: drinking water and sanitation. In some situations, notably in large urban centres, operators manage electricity, drinking water and sanitation.

There are three categories of urban sanitation service providers in Morocco:

- Autonomous state-owned companies such as Regie Autonome de Distribution d'Eau et d'Electricité de Marrakech (RADEEMA) in Marrakech, Regie Autonome de Distribution d'eau et d'electricite de Fès (RADEEDF) in Fès, etc.
- Private concessionnaires. Lydec, subsidiary company of Suez Environnement, REDAL subsidiary company of Veolia Environnement
- National public company. Office National de l'Electricité et de l'Eau Potable (ONEE), which operates mainly in rural zones and small townships.

The first two categories of operator manage sanitation operations and investment in large urban centres. According to official data provided by the Directorate of State-owned Company and Conceded Services (DRSC), the population served by networks managed by big state-owned companies and contract holders increased by 80 per cent between 2001 and 2015.

Currently these operators serve 44 per cent of the national population and 73 per cent of the urban population (Table 4).
Table 4. Management of water, sanitation and electricity services by state-owned companies in Morocco

	Served population	Management method	Services managed		
			Sanitation	Drinking water	Electricity
Grand Casablanca	4,078,633	Private concessionaire	Yes	Yes	Yes
Rabat-Salé-Temara	2,183,940	Private concessionaire	Yes	Yes	Yes
Fès	1,191,661	Municipal utility	Yes	Yes	Yes
Tanger	1,064,633	Private concessionaire	Yes	Yes	Yes
Marrakech	932,135	Municipal utility	Yes	Yes	Yes
Grand Agadir	879,892	Municipal utility	Yes	Yes	No
Meknès	710,395	Municipal utility	Yes	Yes	Yes
Tétouan	658,592	Private concessionaire	Yes	Yes	Yes
El Jadida	620,317	Municipal utility	Yes	Yes	Yes
Oujda	511,400	Municipal utility	Yes	Yes	No
Kénitra	469,300	Municipal utility	Yes	Yes	Yes
Safi	311,600	Municipal utility	Yes	Yes	Yes
Larache	260,077	Municipal utility	Yes	Yes	Yes
ChYesa	275,970	Municipal utility	Yes	Yes	No
Tadla-Beni-Mellal	196,572	Municipal utility	Yes	Yes	No
Taza	149,362	Municipal utility	Yes	Yes	No
Total	14,494,479				

Access to sanitation in urban areas was one of the biggest challenges Morocco faced. In fact, it was more important to connect people to the sanitation network than to the drinking water network: the population connected to the drinking water network grew from 9.7 million to 14.8 million, a 52.6 per cent increase between 2001 and 2015 whereas the population connected to the sanitation network increased from 7.5 million in 2001 to 13.5 million, an 80 per cent increase (Figure 4).

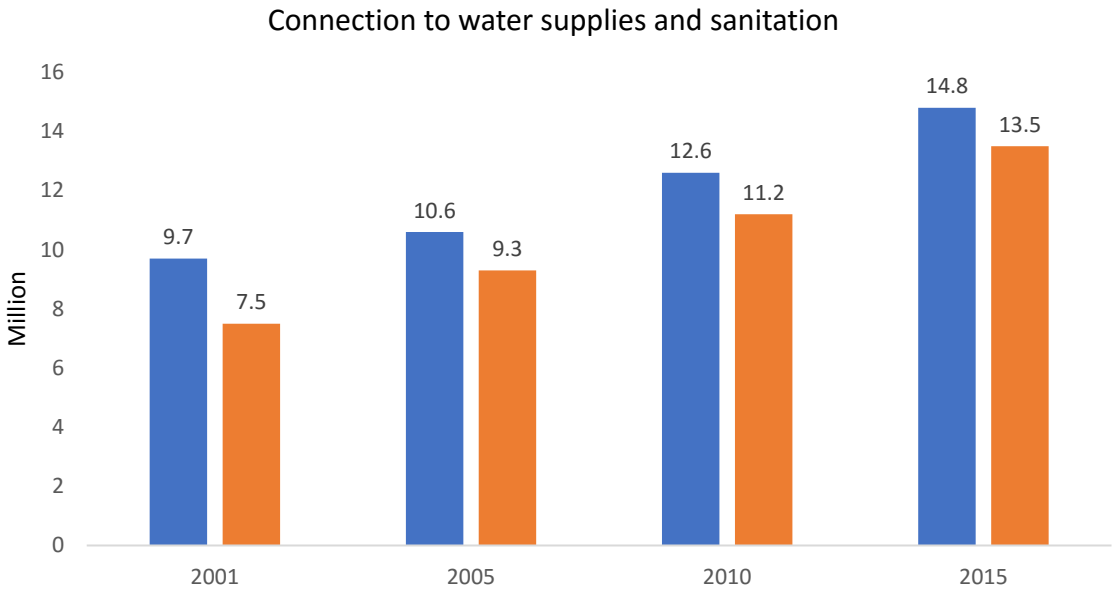


Figure 4. Population (million) connected to sanitation and drinking water networks 2001–2015

With 13.5 million users, the population connected to sanitation networks was 92.6 per cent in 2015 compared to 75 per cent in 2001, while the population connected to the drinking water network grew from 82 per cent to 97.8 per cent (Figure 5).

The two levels of connection are very important even though they only relate to 73 per cent of the population in urban zones.

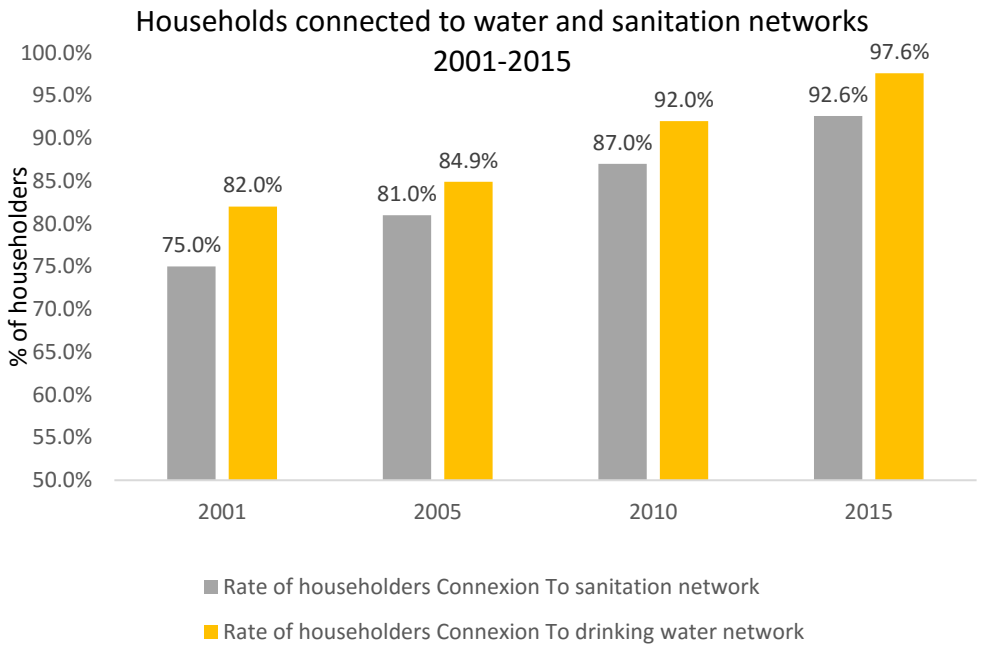


Figure 5. Households (%) connected to drinking water and sanitation networks

With regard to the cost, achieving connections to the sanitation network required an investment of MAD20.4 billion (USD2 billion) over the last ten years, or an average of MAD2 billion a year, compared to only MAD850 million a year on average over the period 2001 to 2005. Over the period 2001 to 2015, investments in sanitation totalled MAD24.6 billion (Figure 6).

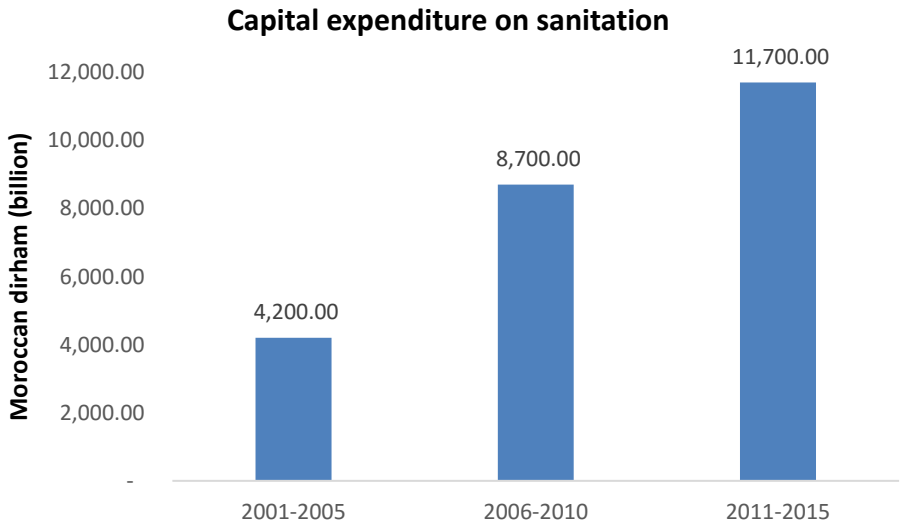


Figure 6. Capital expenditure (Moroccan dirham) on the sanitation network 2001–2015

Thanks to these investments and policies implemented by authorities at national and local levels, treatment of wastewater saw a significant improvement between 2001 and 2015. Before 2005 there was a lack of basic facilities for treatment and purification: each year out of 500 million cubic metres (m^3) wastewater, barely 10 per cent underwent adequate treatment. This situation incurred costs of MAD15 billion just to remedy the environmental damage from pollution.

State policy, to be implemented mainly by municipal utilities, concessionaires and the ONEE, recommended prioritizing projects for treating wastewater and reducing pollution of the natural environment (water and sea) by eliminating untreated liquid waste. This policy has paid off; 63 per cent of wastewater currently undergoes adequate treatment.

Municipal utilities and concessionaires installed a significant number of treatment and pre-treatment works to implement the national policy and protect the population against health and epidemiological risks (Table 5).

Table 5. Wastewater treatment facilities implemented 2001–2015

Work	Number	Throughput a year (m^3)
Treatment works	19	232 million
Pre-treatment works	6	973 million
Maritime emissaries	5	

At the end of 2015, the wastewater amounted to 510 million m^3, of which 410 million m^3 was discharged into the sea and 100 million m^3 into rivers and lakes (Table 6). The rate of treatment and pre-treatment was 63 per cent, 70 per cent of which was wastewater discharged into rivers and lakes and 61 per cent discharged into the sea.

Table 6. Treated and untreated urban wastewater discharged 2015

	Treated or pre-treated (million m^3)	Part discharged without treatment (million m^3)	Wastewater discharged (million m^3)	Rate of treatment (%)
To the sea	250	160	410	61%
To the water environment	70	30	100	70%
Total	320	190	510	63%

As for rural areas and small towns—where municipal authorities and concessionaires are absent—the treatment and distribution of drinking water is the responsibility of the national public operator ONEE. The ONEE manages sanitation in more than 100 townships, serving a population of 4.3 million inhabitants (Table 7).

Table 7. Sanitation managed by ONEE 2015

	2015
Number of townships (communes)	100
Number of treatment works	81
Beneficiary population	4,300,000
Treatment capacity (m^3/day)	332,000
Treatment rate %	67

In terms of national coordination, sanitation management is the responsibility of two entities:

- The Ministry of Interior controls and coordinates the activities of municipal utilities and concessionaire (approved) services. It is in charge of controlling, monitoring and regulating sanitation (Decree n°2-64-394 of September 29, 1964). This mission is realized under the Directorate des Régies et Services Concédés (DRSC). The main responsibilities are:
    - Developing state strategic policies for sanitation and wastewater;
    - Directing and coordinating local operators; assisting communes in decisions concerning management of public services (drinking water, sanitation and electricity);
    - Participating (DRSC) in studies and directing large projects at a national or sectoral level; and
    - Controlling and following up (DRSC) on the quality of services and fixing rates.
- The Ministry of Water through the national public operator ONEE. The ONEE coordinates sanitation and drinking water services in rural areas and small towns—where municipal services and concessionaires are absent. ONEE manages sanitation in more than 100 townships, serving a population of 4.3 million inhabitants.

II. MARRAKECH

The city of Marrakech was chosen as a case study as it is one of the biggest cities in the Kingdom of Morocco, demographically and economically. With a population of 1.32 million it is the second largest urban centre in the kingdom after Casablanca. Since the census of 2004, the population of the city has grown by 24 per cent, that is an annual increase of 2.4 per cent, compared to population growth of 1.3 per cent nationally. It must be noted that the city of Casablanca, the biggest agglomeration in the kingdom, saw its population grow by only 14 per cent. The city of Marrakech experienced significant growth between 2004 and 2014 (Table 8).

Table 8. Population growth in Morocco and the city of Marrakech 2004 and 2014

	2004	2014	Variation %
Marrakech	1,063,415	1,323,005	24
Kingdom of Morocco	29,891,708	33,848,242	13
Share Marrakech/national	3.6%	3.9%	0.004

The city covers an area of 230 km^2, with a density of 5,739 inhabitants per km^2. Marrakech is one of the most densely populated cities in Morocco. In comparison, the city of Casablanca, which is the most populated city and which accounts for most of the national wealth

with 30 per cent of national GDP, has a density of 4,253 inhabitants per km^2. The population density in Marrakech is 35 per cent higher than that of Casablanca (table 9).

Table 9. Population of major cities in Morocco

	Male	Female	Total
Casablanca	1,647,986	1,695,656	3,343,642
Marrakech	654,865	668,140	1,323,005
Fès	567,132	578,956	1,146,088
Tanger	540,280	519,981	1,060,261
Salé	483,382	490,036	973,418
Rabat	277,348	295,369	572,717

The city of Marrakech is the most important urban area in the Marrakech-Safi Region, accounting for 69 per cent of the region's urban population and 29 per cent of the overall population of the region (Table 10). The fact that the city is the most important urban centre in the region has led to an influx of the rural population in search of jobs and better living conditions.

Table 10. Population of Marrakech and the Marrakech-Safi Region

	Indicator
Marrakech	1,323,005
Region-Marrakech-Safi	4,504,767
Urban population of Marrakech-Safi Region	1,928,525
Share Marrakech/Marrakech-Safi Region	29%
Share Marrakech/urban population of Marrakech-Safi Region	69%

Marrakech is the hub of the Marrakech-Safi region and is the city in fifth place in terms of income and income per head: the GDP per capita in 2015 was USD1,930.31 compared to USD4,527.91 for Casablanca (Table 11). The difference can be accounted for by the poor diversification of the city's economy which is principally based on tourism, trade and the craft industry.

Table 11. Gross domestic product in Moroccan regions

Region	GDP 2015 (million USD)	Population 2014	GDP/person (USD)
Casablanca-Settat	30,911.00	6,826,773	4,527.91
Rabat-Salé-Kénitra	15,543.80	4,552,585	3,414.28
Tanger Tétouan Al Hoceima	9,800.70	3,540,012	2,768.55
Fès Meknès	8,761.00	4,216,957	2,077.56
Marrakech Safe	8,695.60	4,504,767	1,930.31

The city of Marrakech has low unemployment compared with other urban agglomerations (Table 12).

Table 12. Unemployment in Morocco and Moroccan cities

	Unemployment rate (%)
Morocco	16.2
Marrakech	15 9
Casablanca	18 9
Fès	19 6
Rabat-Salé	16 9

The city of Marrakech is known for attracting large events and international conferences. In 2016, the United Nations Climate Change Conference (COP22) was held in Marrakech.

III. MARRAKECH SANITATION

At the end of 2016 the area of Marrakech mostly served by Regie Autonome de Distribution d'Eau et d'Electricite de Marrakech (RADEEMA) had 968,263 inhabitants, an increase of 9 per cent between 2011 and 2016 (Figure 7). The area comprises both urban and rural districts. The urban districts are the most important with 98.2 per cent of the population.

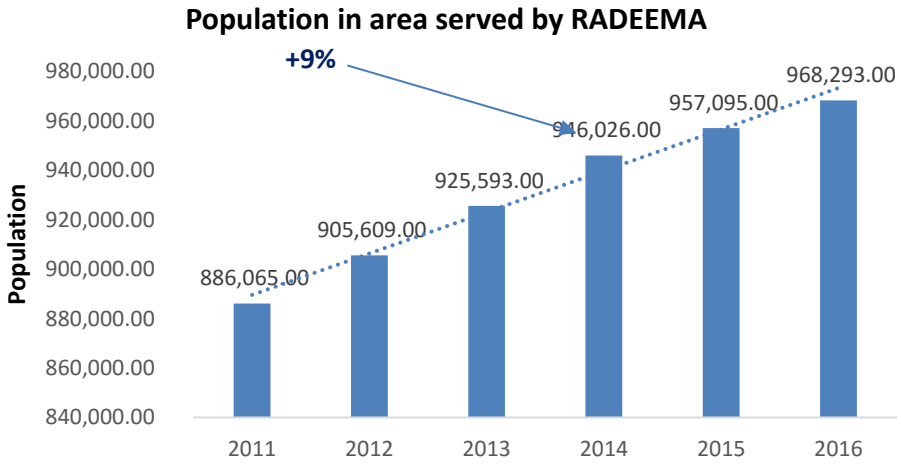


Figure 7. Population in the area covered by Regie Autonome de Distribution d'Eau et d'Electricité de Marrakech (RADEEMA) operations 2011–2016

According to the 2014 census, the population of the city of Marrakech (most of which is covered by RADEEMA) had access to the following (Table 13):

Table 13. Access to sanitation in Marrakech and nationally 2014

Sanitation type	Population of province of Marrakech (%)	National level (%)
Public sewerage network	75.8	58.9
Septic tank	17.5	23.2
Other	6.7	17.9

The public sewerage network managed by RADEEMA, or ONEE in some parts of the Marrakech prefecture, shows that 75.8 per cent of the population has access to a public network. Of the 1.323 million inhabitants of the province, the number of inhabitants with access to a public network is 968,293 in the urban area of the City of Marrakech managed by RADEEMA whereas, 17.5 per cent of the province's population flushes wastewater mainly into unregulated septic tanks. Septic tanks are mostly used in rural townships not managed by RADEEMA.

III.1. Rate of connection and length of network

In the city of Marrakech, the population served by the sanitation network (connected to the network) was 93.4 per cent in 2016 compared to 86 per cent in 2006, an 8 per cent increase overall (Figure 8).

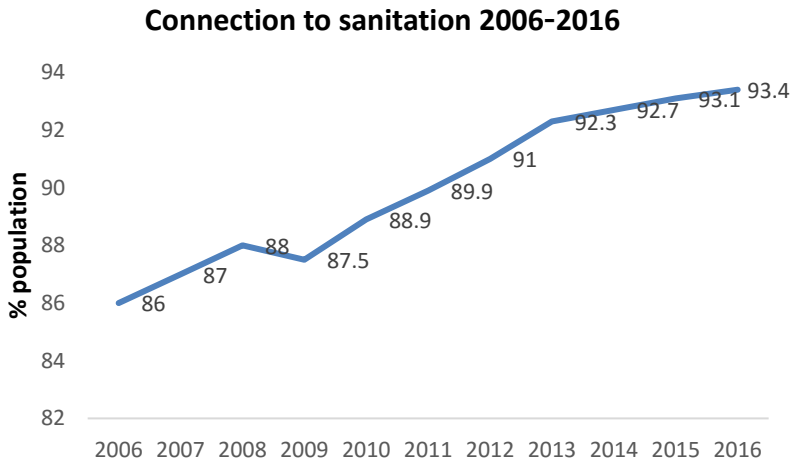


Figure 8. Population served by the sanitation network in Marrakech 2006–2016

The improvement in the service rate was accompanied by an expansion of the sanitation network, which grew from 1,635 km in 2007 to 2,778 km in 2016, a 70 per cent increase. Urban development and the significant growth of the population explain the increase of the length of the sanitation network (Figure 9).

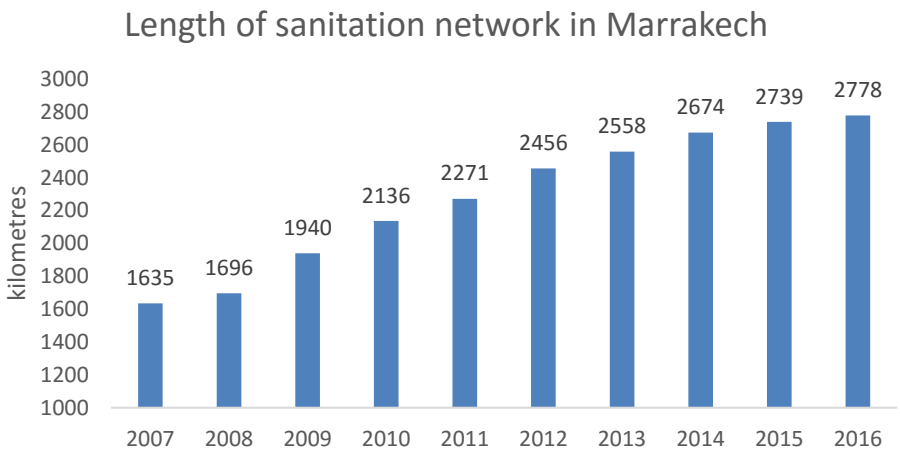


Figure 9. Length of the sanitation network (km) in Marrakech 2007–2016

III.2. Treatment of wastewater

Since 2009 wastewater has been treated in the wastewater treatment plant, one of the most important investments in the life of RADEEMA:

- In 2009: the first stage of purification, consisting of primary treatment of wastewater (screening, degreasing and primary settling) and processing of primary sludge (gravitational thickening, digestion dehydration) was brought into service;
- In 2011: the second stage of purification, consisting of secondary treatment of wastewater (biological treatment with activated sludge, secondary decantation and, according to the need, treatment by filtering through sand, disinfection in ultra-violet light and chlorine) and a second processing with activated sludge (gravitational thickening, digestion dehydration), was brought into service.

Collection and transportation of wastewater is by gravity. However, some zones are equipped with lifting or pumping stations. The sewerage network in Marrakech works in three modes:

- Pseudo-separated system: runoff from roads and impermeable areas is separated from wastewater. This mode is adopted in the zone of M'hamid and in some housing estates in the Targa zone.

- Separated system: separation of wastewater from rainwater. This mode is adopted in the industrial zone of Sidi Ghanem, the tourist zone of Agdal and the Kasbah Resort.
- Combined system: this mode is adopted in the rest of the city.

RADEEMA treats on average 90 per cent of wastewater discharged into the public network (Figure 10). The median volume (2011–2016) treated at primary level is 39.1 million cubic meters. Water treated currently represents 94 per cent of station throughput. The available capacity is 6 per cent for an untreated volume of 10 per cent.

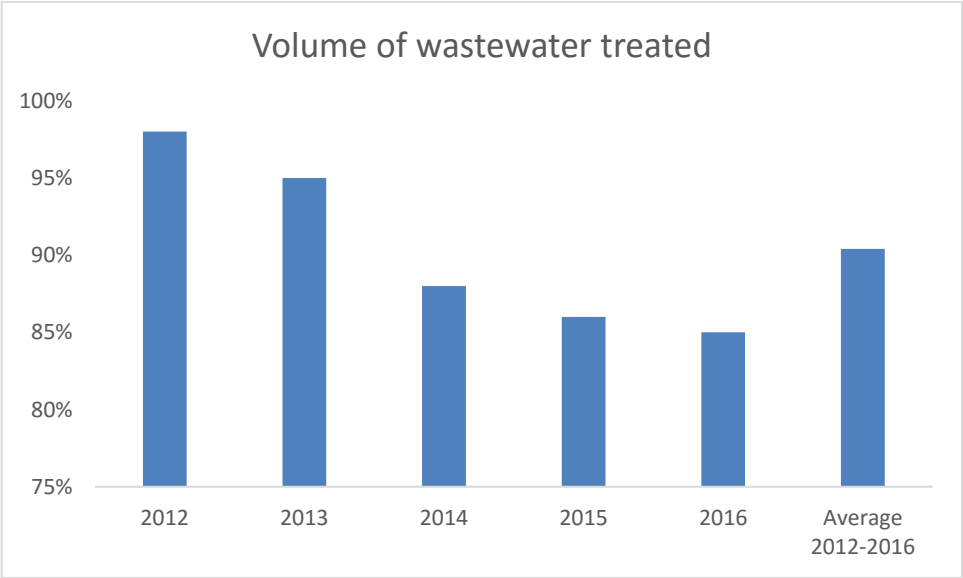


Figure 10. Volume treated 2012–2016

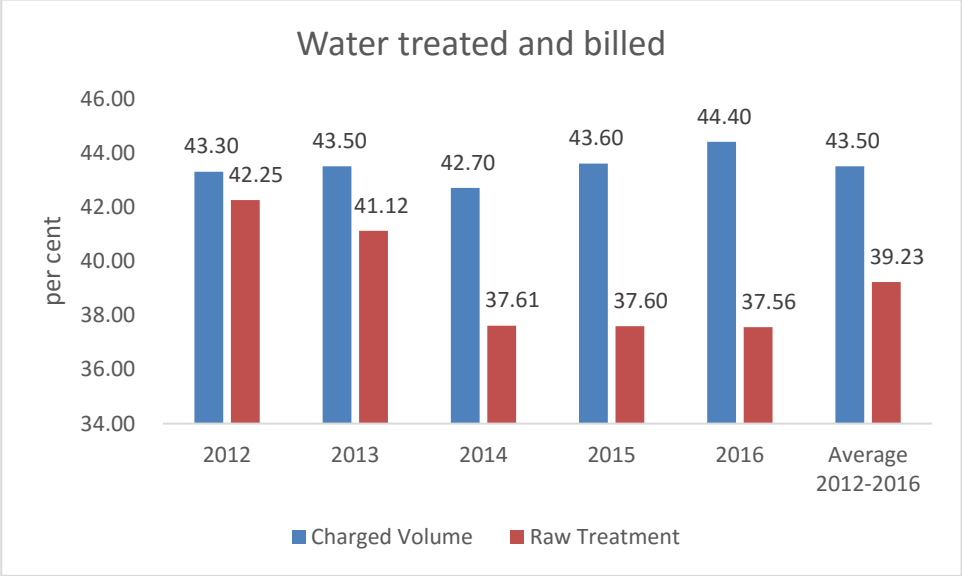


Figure 11. Volume of water billed and volume treated at primary level by RADEEMA 2012–2016 (%)

Over the period 2011–2016 the water treated at secondary level represented on average 90 per cent of the raw water received by the purification station (Figure 11).

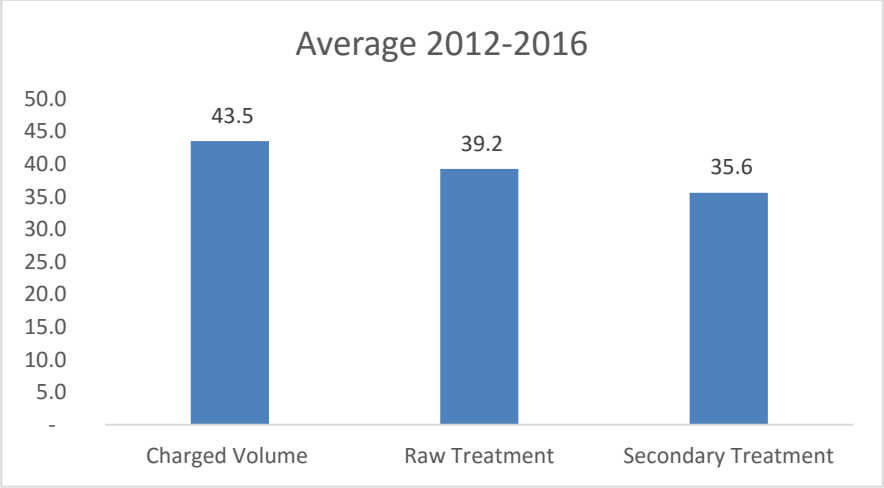


Figure 12. Volume of water billed, primary and secondary treated 2012–2016

The volume of wastewater receiving secondary treatment compared to the volume receiving primary treatment increased between 2012 and 2016; secondary treatment was 95.5 per cent in 2016 against 82.4 per cent in 2012, a 13.1 per cent increase (Figure 13).

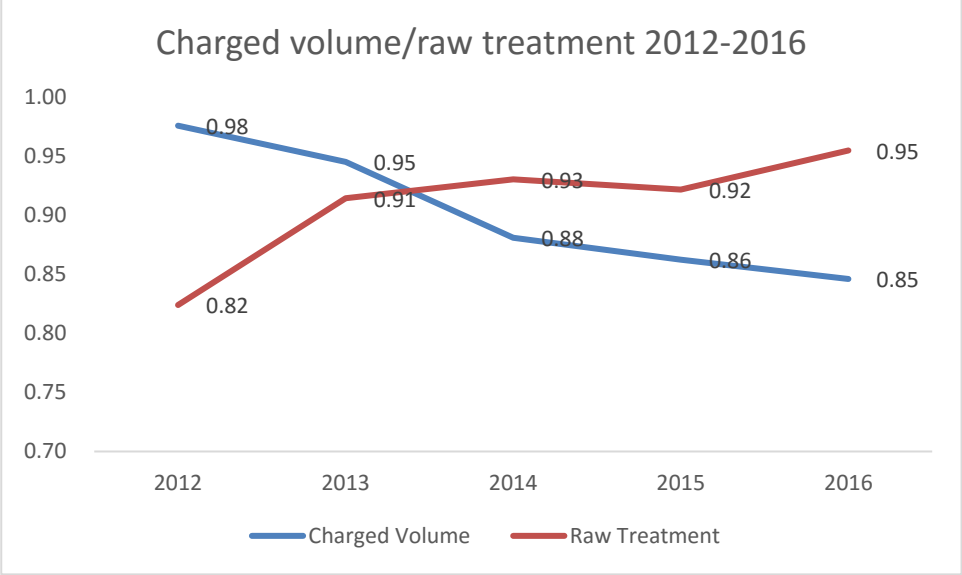


Figure 13. Ratio of treated/discharged water and secondary treated/gross volume 2012–2016

RADEEMA also treats some wastewater at tertiary level in order to re-use it for irrigating golf courses. In 2012, the percentage of water treated at tertiary level was 19 per cent compared to 10 per cent at secondary level (Figure 14) and the average volume was 5.21 million cubic metres. Water to be re-used is distributed through pipes (between 250 cm and 1100 cm in diameter) stretching over about 80 km and five pumping stations ranging from 800 kW to 2,500 kW in capacity.

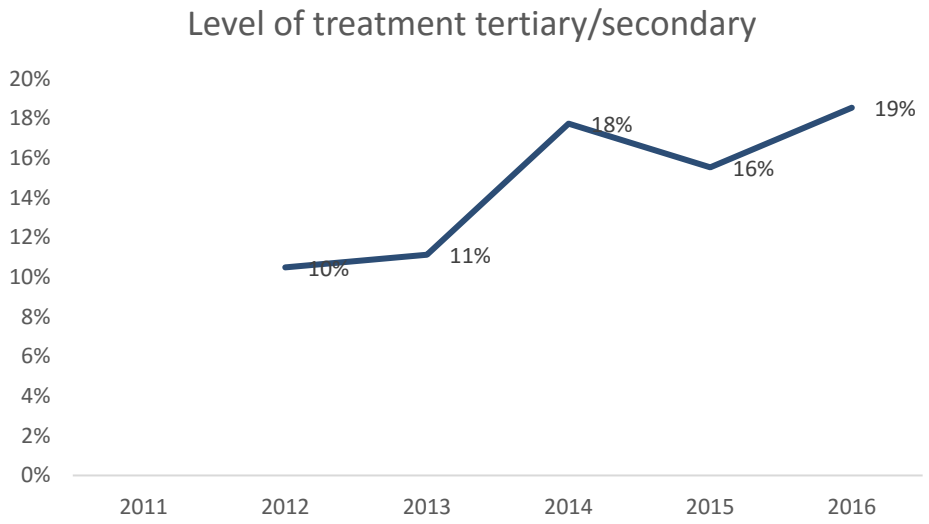


Figure 14. Percentage of tertiary/secondary treated water

In comparison with cities of the same size (nearly 1 million inhabitants), Fez, where sanitation is managed in a similar way to in Marrakech, and Tangier, where sanitation is managed by a private operator:

- The level of connection to the public sewerage network is higher in the other two cities, compared with Marrakech
- The volume of wastewater treated is much larger in Marrakech compared with the other two cities (Figure 15). The rate of wastewater treatment is the highest in Morocco, which makes the city of Marrakech a reference in this respect.

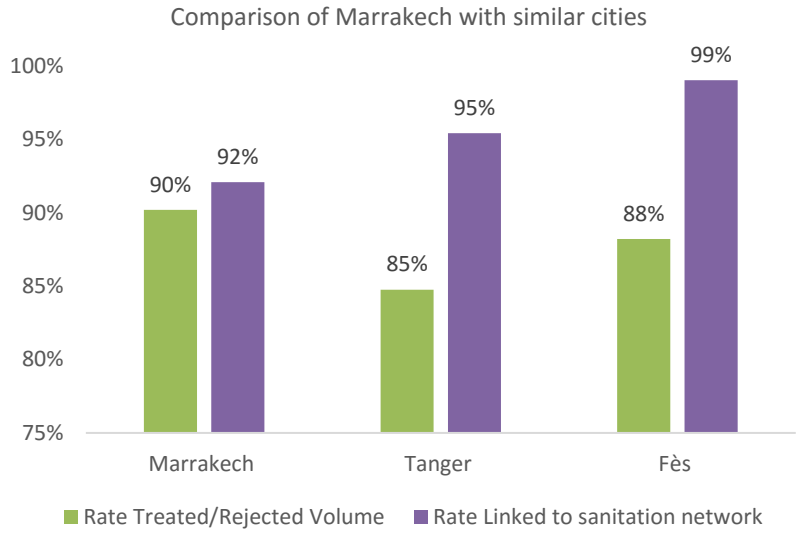


Figure 15. Treated volume/collected volume and coverage rate in Marrakech, Tangier and Fez

III.3. Investment in sanitation

An investment of MAD2.7 billion (USD270 million) resulted in improvements in the connection rate to the sewerage network, the extension of the network, and improvements in the quantity and quality of treated water. An investment of MAD1.5 billion was made in just three years (2009, 2010 and 2011) representing 56 per cent of investment over the last ten years (Figure 16). In addition to the amount invested in the Sewage Treatment Plant (STP), the amount invested over the three-year period was for the wastewater re-use project (tertiary treatment).

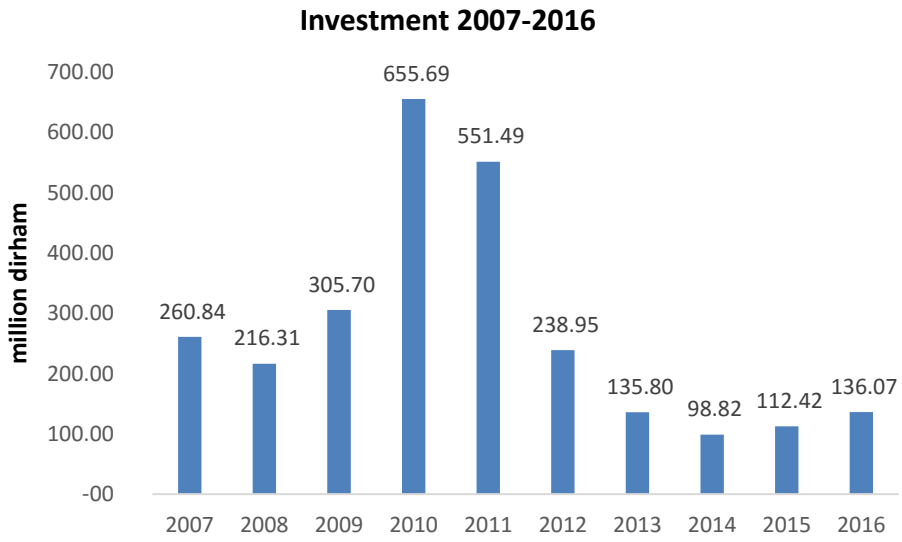


Figure 16. Investment of 2.7 billion dirham 2007-2016 in sanitation in Marrakech

In the last ten years, investment by municipal utilities and concessionaires was MAD20.4 billion (USD2 billion). Investment by RADEEMA represented 13.2 per cent of total investment. The population connected to the RADEEMA network is only 7 per cent of the national population served domestically by municipal utilities and concessionaires (Figure 17).

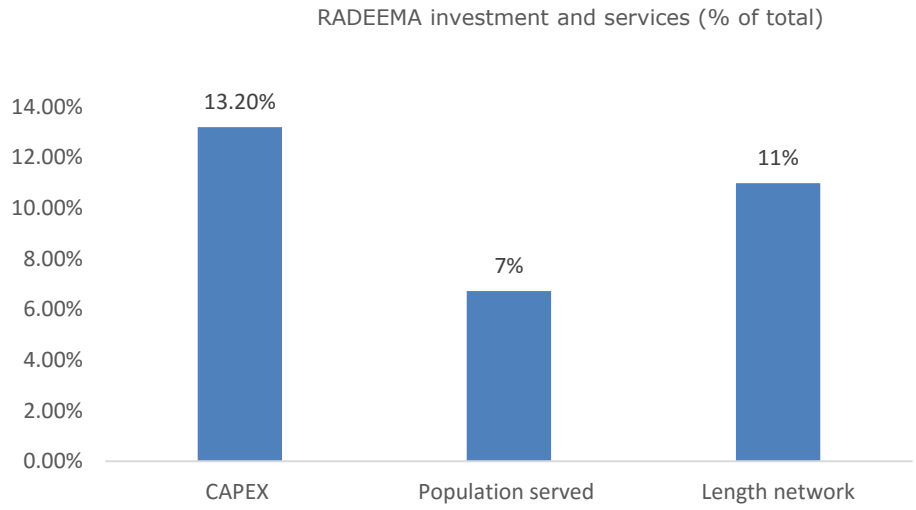


Figure 17. Capital expenditure by RADEEMA (% of total investment)

III.4. Perspectives

The wastewater treatment plant of Marrakech receives an average of 110,000 m^3 wastewater a day, which represents 94 per cent of its throughput capacity. The current capacity of 118,000 m^3/day will be surpassed in 2018.

Future investments planned as part of the contract between the State and RADEEMA amount to MAD668.2 million 2017–2019 (Table 14)

Table 14. Investments planned 2017–2019

	Investment planned 2017–2019 (MAD million)	Structures %
Extension of STP throughput	223,956.00	33.5
Construction of a solar drying unit for STP	106,931.00	16.0
Strengthening and extension of network (collectors)	109,826.00	16.4
Improvement of the distribution network	136,927,.0	20.5
Other	90,585.00	13.6
Total: Wastewater treatment	668,225.00	100

The plan to extend STP throughput is a priority. The plan aims to meet the wastewater treatment needs of the city of Marrakech by 2030, thereby achieving Morocco's commitments to sustainable development and protection of the environment. For the cost of MAD224 million. RADEEMA anticipates a rate of (primary) raw treatment of 98 per cent by the end of 2019. The objective of 100 per cent treatment seems easily attainable by 2030.

Strengthening and extending the distribution network is the second priority for RADEEMA, whose aim is to link 94.3 per cent of the population to the network. The overall goal of the project is to connect nearly 100 per cent of the population by 2030.

According to the RADEEMA economic and financial model, sanitation investments 2017–2030 will reach MAD1.4 billion (USD140 million) (Table 15). The investment required for the extension of the STP will amount to 20 per cent of the total investment.

Table 15. RADEEMA investment planned 2017–2030

	Investment envisaged 2017–2030 (dirham)	%
Infrastructure	622,092	43
Distribution	565,145	39
Household connections	51,652	4
Finance costs	200,000	14
Total	1,438,889	100

IV. Financing sanitation in the city of Marrakech

According to the data presented in the previous section, the types of treatment in urban Marrakech are (calculated on the basis of a population of 968,293):

- Population connected to the sanitation network with a level of treatment consistent with the norm (primary level): Estimated rate = Served Population * Level of treatment in percentage = 95%*93.4%*968,293
- Population connected to the network and without access to treatment (93.4%-88.7%) *968,293 =4.7
- Population without access to the sanitation network (1-93.4%) *968,293

Table 16. Access to wastewater treatment in Marrakech

	Population	Rate (%)
Households linked to public networks with good treatment of wastewater	859,166.38	88.7
Households linked to public networks without good treatment of wastewater	45,219.28	4.7
Households not linked to public networks	63,907.34	6.6
Total	968,293.00	100

Other types of treatment are not applicable in the study area:

- Septic tanks without regulated emptying services
- Other types of toilets on site without regulated emptying services
- Public community toilets not linked to the network
- No treatment
- Septic tanks with regulated emptying services
- Other types of toilets on site with regulated emptying services
- Community or shared public toilets linked to the network or regulated emptying services

Sanitation in the city of Marrakech is managed by RADEEMA using financing generated by all its activities (water, sanitation, electricity). For activities incurring deficits RADEEMA cross-subsidizes funding.

V. SOURCES OF FINANCING FOR SANITATION

As in any structure or authority, financing sanitation poses a problem at two levels:

- Financing essential, recurring operational expenses (i.e. maintenance, operations, repairs, etc.)
- Financing capital investment (i.e. equipment for homes, collection networks, installation of wastewater treatment facilities, etc.).

Evaluation and analysis of financing differs according to the type of expenses:

- Recurring expenses must be covered by revenues (rates paid by users, income from operations and income from services requested by clients) (Table 17).

Table 17. Recurring expenses 2007–2016

	Cumulative 2007-2016 (MAD)	%
Operating costs	1,044,091,454.2	42.4
Supplies and materials	543,410,204.2	22.1
External costs	66,736,345.1	2.7
Staff costs	429,494,414.8	17.4
Other operating costs	4,450,490.2	0.2

- Capital Investment expenses can be estimated in two ways:
  - Earnings from operations before depreciation and amortization (EBIT DA)
  - The capital invested with costs of financing (weighted average cost of capital WACC).

We will develop both approaches.

Table 18. Investments financed 2007–2016

	Cumulative 2007-2016	%
Infrastructure	1,865,650.2	68.8
Distribution	637,664.5	23.5
Household connections	32,055.3	1.2
Finance costs	176,731.4	6.5
Total	2,712,101.5	100

An analysis of RADEEMA's financial statements and activity reports identifies five main sources of financing:

- Resources generated directly by users (rates, charges, cash generated from operations, with or without participation, re-used water)
- RADEEMA resources, generated by other services managed by RADEEMA as part of all its activities
- External resources in the form of loans granted by national and international financing institutions
- External resources in the form of payments by commercial users (notably developers and golf courses)
- Public subsidies for investment mainly from the state (National Sanitation Programme and the National Initiative for Human Development).

Multi-utility (water, sanitation, electricity) activities are a model specific to Morocco. Budget surpluses from multiservice activities finance structural deficits in water treatment, thus contributing to the overall balance of the system. It is an innovative financing mechanism based on specific institutional circumstances.

The analysis of the sources of financing of treatment activities involves three stages:

- Stage 1: Analysis of recurrent costs
- Stage 2: Analysis of investment costs
- Stage 3: Calculation of Free Cash Flows. This will demonstrate a clear deficit in the realm of treatment and assess RADEEMA's own resources generated by the multi-utility activities used to cover it.

V.1. Covering recurrent costs from recurrent income

A system can work sustainably only if recurrent expenses are covered by users. The income generated from sanitation is about MAD1,972 billion (Table 19):

- Charges for consumption and fixed costs paid directly by the users account for 58.8 per cent
- Work with no financial contribution from customers generates 28.47 per cent

- Work with participation generates 9 per cent
- The sale of re-used water is still in the stage of preliminary development, barely clearing 3.77 per cent of RADEEMA recurrent costs.

Table 19. RADEEMA income 2007–2016

	Cumulative 2007-2016 (MAD)	%
Charges for consumption and basic salaries	1,159,874.57	58.80
Sale of re-used water	74,418.61	3.77
Other income (jobs without participation, etc.)	561,702.68	28.47
Income of repayable jobs	176,731.44	8.96
Total income	1,972,727.30	100.00

Consumption charges and fixed costs paid by users constitute the most significant income. The average increase in income was 2 per cent. The exceptional increase in income of 19 per cent in 2009 was due to an increase in the rates for treatment (the only tariff increase over this period). Over the last two years, growth in income has remained stable at 3 per cent.

The resources generated by consumers are used to finance recurring expenses, which have increased significantly since 2009. The development of the STP generated new operational costs of MAD62 million a year on average (USD6 million) and caused a drop in the working margin (earnings from operations before depreciation and amortization - EBITDA) available to cover amortization and new financial expenses. Debt servicing has decreased (Figure 18):

- The EBITDA went down by 57.5 per cent between 2007 and 2016 due to the additional operational costs caused by the creation of the STP
- The increase in depreciation expenses reduced EBIT, which became negative in 2011. In other words, RADEEMA does not generate sufficient working income to service its debt.

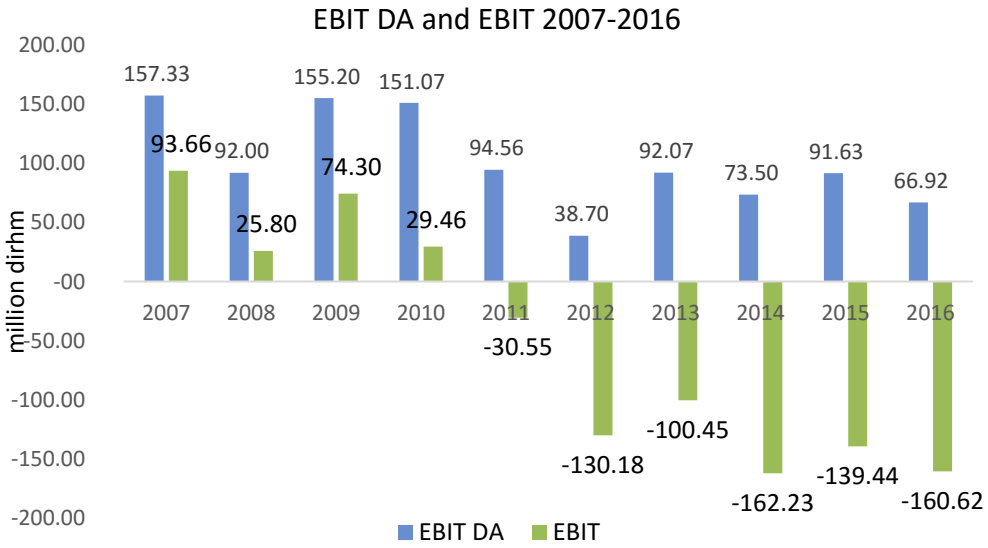


Figure 18. Earnings from operations before depreciation and amortization (EBITDA) and earnings from operations (EBIT) (million dirham)

V.2. Coverage of capital investment expenses: calculation of Free Cash Flows

An analysis of cash flows 2007–2016 shows that:

- Over the period 2007–2016, the city of Marrakech (through RADEEMA) invested 2.7 billion dirhams. A significant part of this was invested in building the STP to enable a satisfactory standard of treatment at primary and secondary levels.
- The capital financing structure improved in comparison with 2006. The decrease of EBITDA, as a result of the increase in operational expenses for maintenance of the STP, caused a loss of MAD459 million that brought equity capital for treatment down to MAD250 million (for an initial allocation of equity capital of MAD750 million), covering only 7 per cent of net investments:
    - At the end of 2016 customer investment grants covered 39 per cent of fixed assets (338% net increase over the period) excluding golf courses, the main consumers of re-used water (treatment level service sector)

- Subsidies granted by the state as part of the National Sanitation Programme (PNA) and the National Initiative for Human Development (INDH) totalled MAD312.9 million
- Over this period RADEEMA contracted MAD627.1 million in debt to finance treatment and repaid MAD416.5 million. The outstanding sum is MAD210 million
- The remaining deficit of MAD1.8 billion was re-financed with the surplus from services, that is 49 per cent.

Table 20. Financing 2006 and 2016

	Structure of financing 2006		Structure of financing 2016	
	Amount (MAD)	% fixed assets	Amount (MAD)	% fixed assets
Net fixed assets (I)	1,023,116.78	100	3,689,550.10	100
Total resources (II)	936,584.74	92	1,886,023.44	51
Equity capital	444,046.96	43	250,198.12	7
Combined deficit/surplus (EBIT-financial cost-taxes)	-266,005.16	-26	-459,854.00	-12
Capital (initial allocations)	710,052.12	69	710,052.12	19
Investment grants	420,601.25	41	1,425,253.62	39
Financial debt	71,936.53	7	210,571.70	6
Deficit (II)-(I) re-financed	86,532.04	8	1,803,526.66	49

V.3. Conclusions

Without income from services and the surpluses generated from supplying electricity to industrial users, it would be impossible for RADEEMA to cover operational costs and invest in wastewater treatment. Income (EBITDA) and sources of financing (equity capital, investment subsidies and debt) cover only 75 per cent of total expenses (recurrent expenses and investment expenses).

The calculation of free cash flows 2007–2016 (CF = EBITDA – CAPEX – theoretical taxes – variation BFR) shows that operating and investment expenses are not covered by the cash generated (Figure 19): a deficit (accumulation of free cash flows) of MAD2.008 billion was covered by debt, investment subsidies and internal subsidies between activities managed by RADEEMA:

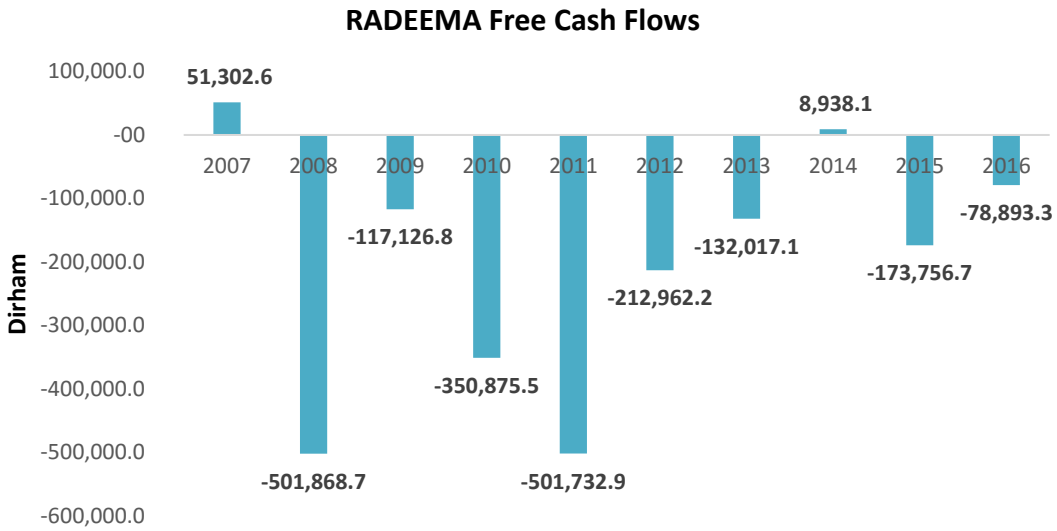


Figure 19. RADEEMA free cash flows 2007–2016

V.4. Free Cash Flows for Equity: global cover of costs by external sources and determination of the surplus from services

V.4.1. External loans

In terms of external resources, RADEEMA benefited from loans from financiers and commercial banks (Table 21):

- European Investment Bank (development bank), MAD340 million, a part of which was released before 2007
- A private consortium of commercial banks in Morocco, MAD330 million
- A loan from the Co-operative Bank of Marrakech, a mutual bank, of MAD50 million

Table 21. Structure of loans contracted by RADEEMA

MAD 'OOO	Duration	Outstanding	Refund at the end of 2016	Financial expenses end 2016	Financial expenses end 2016/global outstanding %
European Investment Bank	15 years	340,409.78	340,409.78	25,350.25	7.4
Total commercial local banks		480,000.00	98,214.29	127,874.07	26.6
Consortium of commercial local banks	15 years	330,000.00	68,750.00	101,288.20	30.7
Popular Bank Morocco	15 years	50,000.00	29,464.29	26,585.87	17.7

- RADEEMA was able to repay the entire European Investment Bank loan in foreign currency at a very low rate (2%). The interest paid by RADEEMA over 15 years was MAD25.4 million, that is 7.4 per cent of the loan.
- The interest from both local loans over the studied period is MAD127 8, that is 26.6 per cent of the amount borrowed.

V.4.2. Investment subsidies

Investment subsidies are made up of the contributions of customers (billable jobs), state subsidies and payments from RADEEMA golf course clients. Net investment subsidies (minus repayments) by RADEEMA for wastewater treatment were MAD1.464 billion (Table 22):

Table 22. RADEEMA investment subsidies 2007–2017

	Cumulative 2007-2017	Structure %
Contributions of customers (billable work)	690,026.65	47.1
Payments from golf courses	461,000.00	31.5
Total payments of investment, RADEEMA clients	1,151,026.65	78.6
Subsidies of investment of the State	312,869.56	21.4
• Of which INDH: National Initiative of Human Development	162,369,56	11.1
• Of which PNA: National Sanitation Programme	144,000.00	9.8
• Other subsidies of investment of the state	6,500.00	0.4
Subsidies of investment	1,463,896.21	100

Customers and golf courses contributed 78 per cent of RADEEMA's investment expenses.

State support from budget appropriations was MAD312.9 million, from:

- The National Initiative of Human Development (INDH): MAD162.4 million, mainly to support connections to wastewater treatment networks in disadvantaged districts of Marrakech
- The National Sanitation Programme (PNA) of wastewater treatment: MAD144 million.

The state subsidies through INDH and PNA are output-based aid (OBA). The support through these two mechanisms (in the form of donations that RADEEMA does not have to refund) is one important part of social programmes to connect disadvantaged populations.

Moreover, it must be noted that OBA can be used to compensate operators in return for setting affordable tariffs for low-income users.

V.4.3. Internal subsidies from services

To identify the amount of internal resources (surplus of equity capital needed to cover deficit), we analysed cash flows for equity:

Free Cash Flow to Equity = Free Cash Flow + Financial Products – Financial Expenses – Redemption Debts + New Debts +Augmentations / Reduction Appropriations of Investment

2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Sum 2007-2016

Initial Fixed assets	1 022 287,91											
		157	92	155	151	94	38	92		91		
EBIT DA		328	001	203	065	562	069	069	73 497	629	66 924	1 012 347
		260	216	305	655	551	238	135		112		
CAPEX		842	306	700	689	491	953	800	98 821	424	136 074	2 712 100
Theoretical		28		22								
Taxes		099	7 741	290	8 838	-00	-00	-00	-00	-00	-00	66 968
Variation		-182	369	-55	-162	44	12	88		152		
Working Capital		915	823	661	587	804	709	286	-34 262	962	9 743	242 902
	-1 022	51	-501	-117	-350	-501	-213	-132		-173		
Free Cash Flows	287,91	302	869	126	875	733	593	017	8 938	757	-78 893	-2 009 623
Annual		63	66	80	121	125	168	192	235	231		
Amortization		664	197	901	605	115	878	515	727	072	227 543	
					10	11		12				
Financial Income		5 835	9 197	9 610	521	373	7 882	836	9 149	2 979	3 086	82 468
						10	21	25		26		
Finance Costs		1 549	2 635	2 876	2 406	428	515	446	28 656	331	20 170	142 012
Debt			20	45	46	47	48	50		38		
Amortization		8 628	975	457	456	654	918	201	71 987	214	38 214	416 704
Increasing Debt		67	105	74		330		50				
"New Debt"		017	471	582		000		000				627 070
Investment		245	317	216		291	98	83		147		
Subsidiary		827	651	157	785	819	749	879	62 151	210		1 464 228
	444											
Initial Equity	719,00											
Free Cash Flows	-577	359	-93	134	-388	73	-177	-60		-88		
For Equity	568,91	804	160	890	431	377	395	949	-20 405	113	-134 191	-1 674 594

The cumulative FCFE resulted in a deficit 2007–2016 of MAD432.7 million, compensated by the surpluses provided by RADEEMA's electricity activities.

V.4.4. Free cash flows after servicing debt and integrating investment subsidies: case of sanitation

Table 23. Free cash flows after servicing debt and integrating investment subsidies

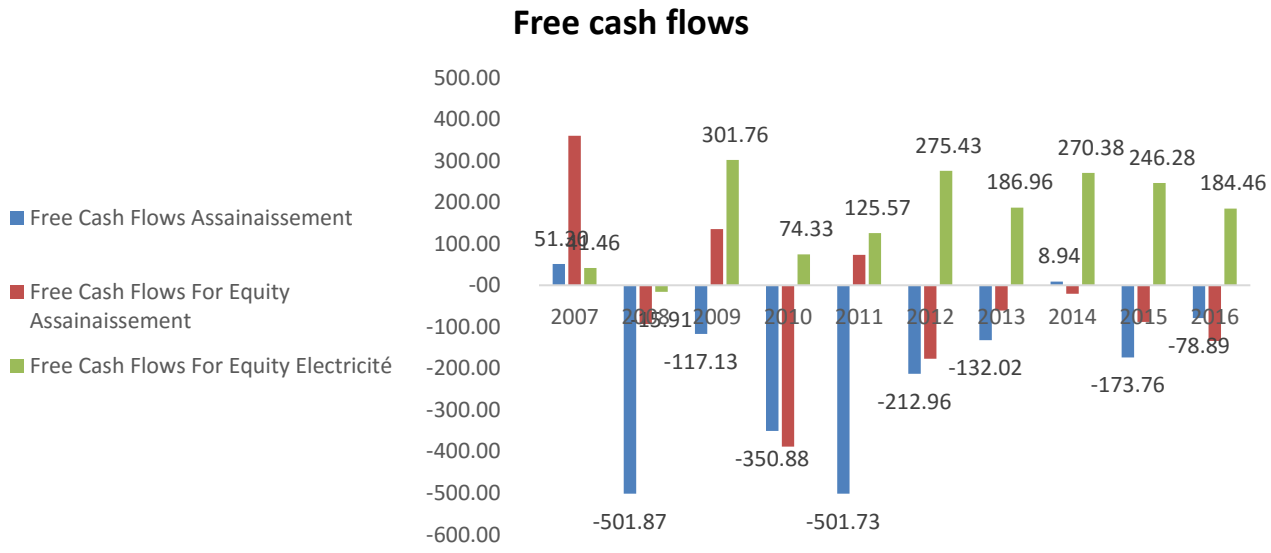


Figure 20. Free cash flows for sanitation, and sanitation and electricity equity

V.4.5. Free cash flows after servicing debt and integrating investment subsidies: RADEEMA (all activities)

Table 24. Free cash flows after servicing debt and integrating investment subsidies

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	Sum 2007-2016
Initial Fixed assets	555 444										
EBIT DA	165 150	231 893	287 874	336 509	320 654	310 030	270 890	324 350	332 744	349 351	2 929 445
CAPEX	98 075	143 243	136 015	236 440	93 022	82 773	60 879	50 422	66 871	49 387	1 017 127
Theortical Taxes	49 545	-00	68 995	83 282	75 849	71 466	56 916	72 003	72 187	78 078	628 321
Variation Working Capital	-1 072	141 679	-114 569	-52 760	67 750	-42 458	49 246	-12 588	-64 775	38 778	9 231
Free Cash Flows	-555 444	18 602	-53 029	197 433	69 547	84 033	198 249	103 849	214 513	258 461	183 108	1 274 766
Financial Income		3 854	6 310	7 495	5 464	2 778	881	29 404	32 394	8 185	7 783	104 548
Finance Costs		726	734	703	678	472	15 382	24 746	23 062	18 783	12 601	97 887
Debt Amortization									2 679	3 571	3 571	9 821
Increasing Debt "New Debt"								50 000				50 000
Investment Subsidiary		14 152	31 542	97 530		39 230	91 682	28 458	49 219	1 986	9 737	363 536
Security deposit		5 578	5 496	2 160	344	3 910	1 381	-717	11 372	10 805	12 052	52 381
Initial Equity	-9 304,00											
Free Cash Flows For Equity	-564 748	41 460	-10 415	303 915	74 677	129 479	276 811	186 248	281 757	257 083	196 508	1 172 775

It can be seen that the net deficits of the sanitation activity are fully offset by the surpluses of the electricity business. Multi-utility is a long-term financing option if the consolidation of all the sectors that compose it are balanced (Table 24).

V.4.6. Structure of future financing

As part of the sustainable development plan of Morocco (Circular Economy), the city of Marrakech plans to invest MAD1.438 billion 2017–2030 (Table 25). MAD668.2 billion will be invested 2017–2019; this amount has already been contracted with the state as part of the contract programme.

V.4.7. Projected investment

Table 25. Projected investment 2017–2030 (Moroccan dirhams)

	Envisaged investment 2017–2030	Envisaged investment 2017–2019	Envisaged investment 2020–2030
Infrastructure	622,092.00	466,637.00	155,455.00
Distribution	565,145.00	136,927.00	428,218.00
Household connections	51,652.00	19,661.00	31,991.00
Finance costs	200,000.00	45,000.00	155,000.00
Total	1,438,889.00	668,225.00	770,664.00

To ensure the financing of investments, RADEEMA intends to principally rely on its own income from services (particularly electricity). In the context of services, overall economic equilibrium is the only guarantor of the sustainability of this mode of financing.

Will RADEEMA be able to maintain this balance, in spite of the importance of investments?

To assess the capacity of RADEEMA to clear sufficient resources to provide all services, we compare the cost of capital invested to the profits generated by the fixed assets. The profitability will be measured by IRR (internal rate of return). The period of calculation will be limited to 2007-2019 (achievements + expectations of the contract programme).

The problem which arises is estimating the cost of equity capital brought by RADEEMA to support sanitation activities:

- The financial cost of equity capital is usually measured in terms of expected profitability obtained by adding a risk premium for RADEEMA to a risk-free rate. To calculate the risk premium, it is usual to use the risk premium of a similar listed company.

The only similar listed company in Morocco is Lydec, which is in charge of distributing electricity, drinking water and sanitation in the city of Casablanca

- To use only the book cost of equity, measured by 'ROE = Return On Equity', the profitability of equity capital can be defined by ROE 'Return On Equity' of electricity activities.

Given that RADEEMA is a government-owned firm which does not distribute dividends, we will use the second approach, which is the most suitable. The cost of equity capital will be calculated by:

Cost of the invested capital = (Equity capital / (Equity capital + indebtedness)) * ROE + (1-T) * (Cost of debt) / (Equity capital + indebtedness)

The period of analysis is 2007–2019, about which official data in terms of achievements, and in terms of predictions (2017–2019) are available:

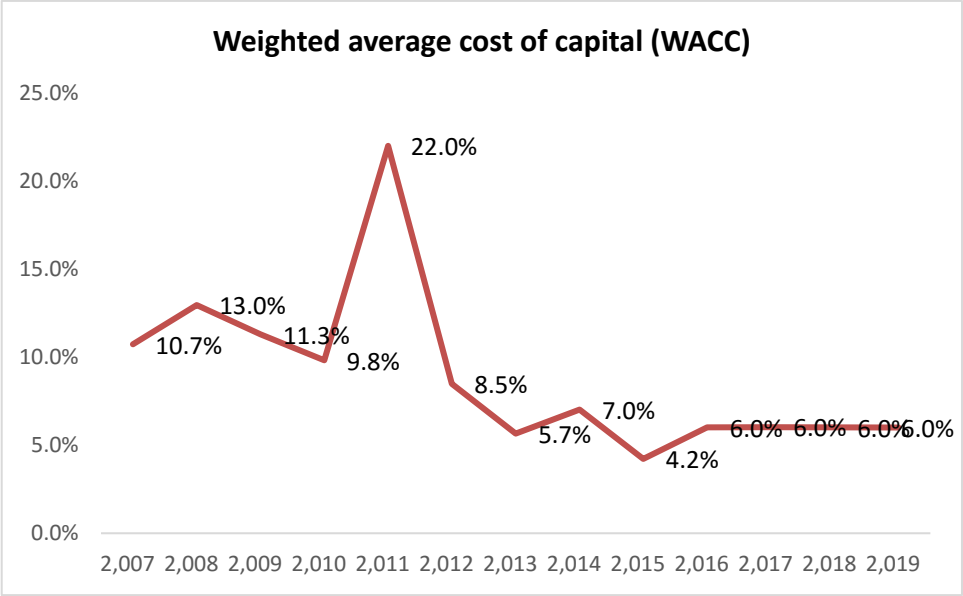


Figure 21. Cost of capital (weighted average cost of capital)

It is notable that, since 2013 when RADEEMA began financing investments through debt, the cost of capital fell from 20 per cent to 6 per cent (Figure 21). The cost is planned to be maintained at this level over the coming years. The IRR over the period 2007–2019 is 5.9 per cent, which proves that RADEEMA has the capacity to use electricity surpluses to fund the needs of sanitation.

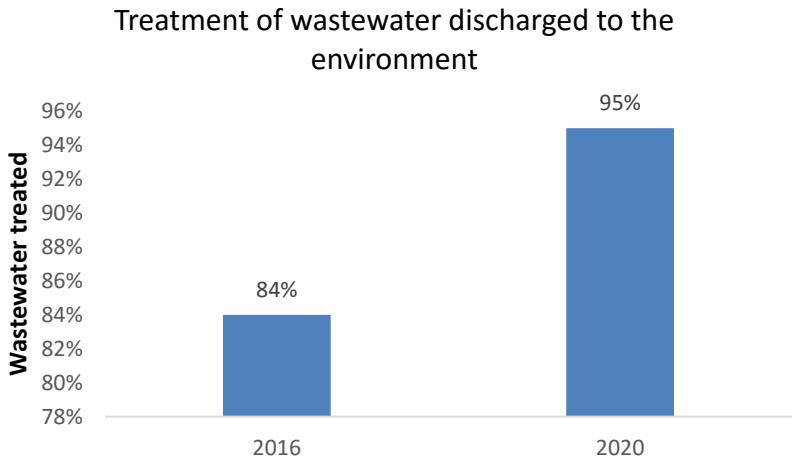
VI. Analysis and lines of thought

The study of Marrakech shows that the development of sanitation requires significant investment and involves recurrent costs to support the treatment of wastewater. This poses the biggest problem for the utility in the city of Marrakech (RADEEMA), and for cities and localities which, in addition to other investments, have to bear the additional costs of treatment; treatment objectives are quite ambitious and are fixed as part of the strategy of sustainable development.

To recap, strategic objectives are fixed at two levels:

- At the level of urban areas managed by municipal utilities and concessionaires. Objectives are part of the Objectif 2020 Plan, which prioritizes:
    - Connecting households to networks, particularly low-income families
    - Extending wastewater networks:
        - Creating 15 STPs, with a total capacity of 63 million m^3 a year
        - Extending six STPs, for a capacity of 54 million m^3 a year
        - Creating two pre-treatment plants, for a total capacity of 110 million m^3 a year
    - Improving the volume of re-used water, and the preservation of water resources
    - Sanitation and protection of aquatic and marine environments.

Figure 22. Evolution of wastewater treatment 2016–2020



VI.1. Areas managed by ONEE

For areas managed by the national operator ONEE, whose financing comes principally from the National Sanitation Programme and Purification of Wastewater (PNA), which was launched in 2005 jointly by the Department of Environment and the Ministry of the Interior, the objectives for 2020 and 2030 are to:

- Attain a rate of connection to the sewerage network in towns: of 75 per cent by 2016, 80 per cent by 2020 and 100 per cent by 2030
- Attain a volume of treated wastewater: of 50 per cent by 2016, 60 per cent by 2020 and 100 per cent by 2030
- Finance plans relating to rehabilitation and extension of the network, connection and strengthening the storm drainage system and creating STPs (primary, secondary or even tertiary treatment) to equip 330 cities and urban centres, reaching more than 10 million inhabitants.

To meet the objectives the total cost of investment is estimated at:

- MAD2.9 billion by 2020, which will be directly financed by municipal utilities and concessionaires
- MAD43 billion by 2020, financed by PNA, of which MAD21.5 billion is to be financed from the state budget and the remainder by operators, notably ONEE.

The question which arises is: will classical modes of financing (users, external subsidies—public or private) and recourse to backers and commercial banks be sufficient to face this huge financing need?

- Income from users will not be sufficient: indeed, current price setting has attained a saturation threshold and purchasing power is weak. Charges for consumption (according to volume and fixed costs) do not cover the operating expenses of

sanitation, which poses a structural problem for maintaining operators' balance sheets. Indeed, a system can work permanently only if at least recurrent expenses are covered by income and charges paid by users. The situation will deteriorate when future investment, the objectives of treatment and the high cost of sanitation generate additional costs for operators. In the case of RADEEMA, which we have analysed, incomes by invoiced m^3, will cover only 83 per cent of operational expenses (excluding costs of investment), given that RADEEMA plans to attain at least 100 per cent primary treatment (Figure 23).

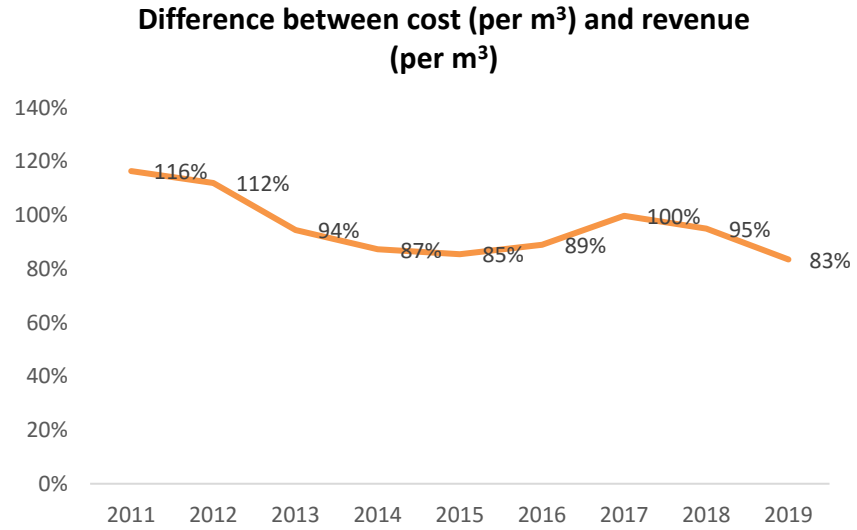


Figure 23. Gap between charges (per m^3) and costs (per m^3)

RADEEMA was able to improve the coverage of operating expenses 2015-2017, thanks mainly to the implementation of a cost control strategy, including of overhead costs. Users must pay more in order to cover recurrent expenses. Whether from RADEEMA or the other utilities distributing electricity, the operating deficit must be covered by internal cross-subsidy from surpluses provided by electricity services. The surplus of funds necessary to cover expenses differ from one year to another.

However, problems arise for municipal utilities which supply only potable water and sanitation (the most important case is that of greater Agadir). Electricity is managed by the national ONEE operator. Indeed, these municipal utilities cannot benefit from internal cross-subsidies to cover the deficit in sanitation (given that drinking water activities also require important investment and present a structural deficit).

Are there solutions to remedy this situation? As explained above, a system will work in the long-term only if operational expenses are borne by users of services. Currently two solutions can be envisaged:

- Implementing an appropriate tariff structure which will allow operators to cover recurrent costs with charges for consumption and fixed charges
- The state and communes find a system of subsidies which will cover costs from the outset.

- Own resources of operators: (Equity capital as part of cross-subsidies). Operators' own resources come from the margin earned from all activities (water, sanitation, electricity), or as part of a strategy to cover expenses (overheads). The Moroccan mode of financing, is one which we consider as innovative, in so far as electricity supply generates resources to cover the working deficit and a part of the investment cost. In Morocco there are problems of critical size and the lack of synergy between state companies, concessionaires and ONEE.
- Standardization and integration of operators in larger areas, at the scale of the region. Thought has been given to these issues for several years, particularly since the National Service of Drinking Water and the National Service of Electricity merged into the National Office for Electricity and Potable Water (ONEE). Morocco is experimenting with new models, based on public-private partnerships (PPPs), and reorganizing operations into regional companies with a clear separation between planning and financing. The new models for utility services could improve access to water, electricity and sanitation, while making the most of financial capacities.
- A feasibility study of the Souss-Massa region with the participation of all parties (State, ONEE, townships and autonomous state corporations) indicated that the preconditions for the success of regional all-purpose schemes are institutional reform to strengthen the capacities of municipal utilities for managing urban services and decentralization. With the help of the World Bank, Morocco is testing a programme to help communities to improve capacities in order to become regional operators.

- External income from investors: sanitation benefited from the support of investors and commercial banks in Morocco. However there has been a decrease in loans at concessional rates granted by international financial institutions which benefited operators. Loans granted by local banks are at higher rates of interest, thus limiting operators' ability to cover expenses.

Table 26. Loans to RADEEMA 2007–2026

MAD '000	Duration	Outstanding	Financial expenses	% outstanding	% financial expenses
European Investment Bank	15 years	340,409.78	25,350.25	41	12.29
Total commercial local banks	15 years	480,000.00	180,870.17	59	87.71
Total loans		820,409.78	206,220.42	100	100

Table 26 shows that loans from national banks represent 59 per cent of outstanding discounted bills financing sanitation and generate 87.7 per cent of interest expenses.

Loans from international backers leverage finance for investment and cover recurrent expenses to help operators. The development of guarantee instruments, in addition to the sovereign guarantee given by the state, may encourage investors to allocate more money to sanitation.

Loans from local banks are part of business between banks and operators. The rates applied by these banks are higher than those of investors because the banks do not demand a state guarantee. To compensate, the banks apply a risk premium which, in certain cases, can be up to 150–200 basis points (between 1.5% and 2%). All the local banks have promised to support the national sustainable development strategy by allocating funds to environmental plans. However, financial innovations allowing banks to offer instruments adapted to the needs of the sanitation sector have not yet been implemented. As part of the sustainable development strategy a partnership between operators and banks to provide access to less expensive financing should be encouraged.

- External resources provided by the state in form of OBA (Output-Based Aid): These state subsidies support investment in sanitation. In general, the subsidies are similar to OBA. The two main instruments the state has at its disposal to support sanitation are PNA and INDH (see above). INDH is a human development programme which only partly benefits sanitation. PNA is more specific to sanitation and is part of a long-term policy. The problem is that this programme is principally financed by the state budget from taxation.
- External resources provided by the state, as part of the strategy of sustainable development: The State of Morocco strategy for sustainable development commits to mobilizing resources to support key sectors, including sanitation. For example, the state dedicated MAD1.15 billion to planned actions, as part of its strategy of sustainable development for 2018. Sanitation and treatment of wastewater are to absorb MAD580 million, that is more than 50 per cent of the programme, proving the determination of the state to improve both access to sanitation and quality treatment. This amount will be allocated as follows:

    - MAD180 million to municipal utility companies for modernization, strengthening sewerage networks and STPs
    - ONEE will get MAD400 million to complete the same activities.

In conclusion, it is evident that, in comparison with other countries, Morocco's mechanism of financing through grouping three sectors—drinking water, sanitation and electricity—is the most important and the most innovative. This mode of financing should be preserved and extended to allow operators to attain a critical size in larger areas. This critical size, and only that, will allow investors to support sanitation.

The other specificity of the Moroccan case is the financial incentive provided by the state, through sectoral programmes, to support investment in local utilities, and particularly sanitation. These programmes have achieved a threshold of maturity and saturation and their functions now need to be updated and their capacities developed.

Work programme

Increasing Financial Flows for Urban Sanitation

Case study

Jodhpur, India

Prepared by:

Jonnalagadda V. Ramana Murty

Increasing Financial Flows for Sanitation – Case Study of Jodhpur City

Part A: Country and WSS Sector Background

About India: With about 1.2 billion people, India is the second most populated country in the world, after China. Out of this, 835 million people (69%) live in rural areas and 377 million (31%) live in urban areas. The decadal growth, between 2001 and 2011, was 17.64% for the entire population, while the same was 12.18% for rural population and 31.80% for urban population. There is significant variance in the decadal growth across the different states in India, ranging from 11% in Andhra Pradesh to 25% in Bihar. About 65.5 million people live in slums, which is nearly 18% of total urban population.

India is a federal government containing about 29 states and 7 Union Territories (directly under the control of the central government). The roles and responsibilities of the central government or Government of India (GoI) and the state governments is laid down in the Constitution of India. The 73rd and 74th amendments to the Constitution laid down roles and responsibilities of the local governments also. The three-tier Panchayati Raj Institutions (PRIs) at District, Block and Gram Panchayat/ village forms the basic rural local governance structure, while the Urban Local Bodies (ULBs) take care of urban local governance issues. Based on the population, the ULBs are divided into three types; Municipal Corporations (metros and town above 0.5 million people), Municipality (50,000 to 0.5 million) and Nagar Panchayat (5000-50,000). As the respective state governments are vested with powers to confer ULB status to a settlement, the population size for a given ULB type varies across states.

The number of districts, ULBs and villages in In India are as follow;

- 707 districts in India[1] (2016), up from 640 in 2011.
- 7,935 ULBs in 2011. Out of these there are about 53 million plus cities and about 465 cities with population more than 100,000[2]. About 2613 towns reported to have some portion of residents living in 'slums' (2011 census).
- 239,000 Gram Panchayats, further divided into about 640,930 villages[3] .

Water Supply Status in India: While the stated coverage with water supply is almost universal in India, there are a lot of issues with 'service delivery' aspects. A large majority of urban and rural settlements have drinking water supply that is; intermittent, unreliable, doubtful quality and are not connected to households. Data from Joint Monitoring Program (JMP), 2015 assessments, is presented below, in table-1, to indicate coverage.

Table-1: JMP Data for Drinking Water, 2015:

	Drinking water coverage estimates					
	Urban (%)		Rural (%)		Total (%)	
	1990	2015	1990	2015	1990	2015
Piped onto premises	47	54	6	16	16	28
Other improved source	42	43	58	77	55	66
Other unimproved	10	3	32	6	26	5
Surface water	1	0	4	1	3	1

As can be seen from the data, only about 6% Indian population do not have access to improved sources. However, there are a lot of issues with 'service delivery and sustainability' aspects. The following table-2 depicts the overall 'average' service levels in urban India[4].

[1] https://en.wikipedia.org/wiki/List_of_districts_in_India
[2] Website of Ministry of Urban Development, Government of India, www.moud.gov.in
[3] Website of Ministry of Panchayati Raj, Government of India- www.panchayat.gov.in
[4] Urban Water supply and sanitation in India, Indian Institute for Human Settlements, 2014

Table-2: Service level benchmarks for Urban Water Supply in India:

Sr. No	Indicator	Unit	Benchmark	Median	Average
1	Household connections	%	100	53	50.2
2	Per capita supply	LPCD	135	69	69.2
3	Metering of connections	%	100	0	13.3
4	Non revenue water	%	20	29	32.95
5	Continuity of supply	Hrs	24	2	3.1
6	Quality & treatment	%	100	94	81.7

- House connections is still a 'luxury' in many systems – only about 28% population experience house connection. The situation is relatively better in urban areas with about 54% population having house connections, but is still a far cry compared to international standards. The situation is worse in urban slums.
- A large majority of urban and rural settlements have drinking water supply that is; intermittent, unreliable, doubtful quality. 'None of the Indian towns have 24x7 water supply'[5].
- The Non-Revenue Water (due to leakages, unauthorized connections, billing and collection inefficiencies, etc.) is huge, estimated between 40-70% of the water distributed[6]
- As most systems are subsidized directly (grants from governments, budgets for staff costs, electricity subsides etc) and indirectly (high tariffs for commercial and industrial users, apportioning of funds from other municipal taxes etc), there is no focus on aspects like cots recovery nor even recovery of operational costs. 'Operations and maintenance cost recovery through user charges is hardly 30-40%'[7].
- With per capita annual water reserves dwindling fast, India is precited to become a 'water stressed country' in near future. while per capita renewable water resource availability in 1951 was 5,177 cubic meters (cu.m) per capita per year, this became 1,588 cu.m by 2010, placing the country well within the water-stressed category[8] (CWC, 2010). This problem would further be compounded by the possible impacts of climate change.

There is no such data available for rural water supply. Most of the rural water supplies are dependent on groundwater and hence, face seasonal variations, due to changes in groundwater availability. Most villages suffer from low to high levels of water scarcity in summer, as the groundwater depths fall and yield reduces.

Sanitation Status in India: This study defines sanitation as management, treatment and re-use of human excreta and waste water and hence, the analysis is also undertaken on the following basis: (i) access to improved toilets (human excreta) (ii) treatment of human excreta (iii) treatment of water, and (iv) re-use.

The practice of open defecation, being continued from centuries, is still a big behavior problem in India, despite several attempts by national and state governments. This seen as one of the impediments to development in terms of health, safety, economic loss and dignity of women. A World Bank study (World Bank, 2006) estimated that economic impact of inadequate sanitation is about 6.4% of the country's GDP in 2006.

Access to Improved Toilets: In 2010 (census 2011) about 53% of the total 1.2 billion people were estimated to be practicing open defecation- about 70% in rural areas and about 18% in urban areas. This made India the largest contributor to the number of people practicing open defecation globally. The new government at the center (led by Mr. Narendra Modi) made this a top government priority and efforts have been increased many fold since 2014. The aim of the GoI is eliminate the practice of open defecation by October 2019. The situation has improved since 2011 and is reflected in the three sets of data presented below.

(i) The first set is the JMP data, 2015, given below in table-3.

Table-3: JMP data for Sanitation coverage in India, 2015:

	Sanitation coverage estimates		
	Urban (%)	Rural (%)	Total (%)

[5] World Bank article, July 2011, - http://www.worldbank.org/en/news/feature/2011/09/22/urban-water-supply-india

[6] Same as above.
[7] Same as above
[8] Central Water Commission, GoI, 2010

	1990	2015	1990	2015	1990	2015
Improved facilities	49	63	6	28	17	40
Shared facilities	16	21	1	5	5	10
Other unimproved	6	6	2	6	3	6
Open defecation	29	10	91	61	75	44

(ii) The Ministry of Health and Family Welfare (MoH), GoI undertakes periodic National Family Health (NFH) surveys. The 4th NHF survey done in 2015-16 also captured access to improved water supply and sanitation facilities. The results are given below in table-3.

Table-4: 4th NFH Survey Results for WATSAN:

	Urban	Rural	Total
HHs with improved water supply	91.1	89.3	89.9
HHs with improved sanitation facilities	70.3	36.7	48.3

(iii) The Ministry of Urban Development (MoUD), GoI tracks the progress on achieving 'open defecation status' in the urban areas. According to latest data (April 2017) about 531 cities (out of the total 7,935 cities/ towns) achieved this status. In the same way, the Ministry of Drinking Water and Sanitation (MDWS) tracks achievements in rural areas at state level, district level and Gram Panchayat leve. According to the MDWS, the current situation of units that achieved ODF status is: 3 states (Kerala, Himachal Pradesh and Sikkim), 36 districts (5 in Rajasthan) and about 194,555 villages (30% of total villages in the country).

Treatment of Human Excreta: Not much regular information is available under this section, beyond some studies and estimates. The assumptions for addressing this issue are: (i) households are connected to sewer systems, which convey both human excreta and waste water to a decentralized/ centralized Sewer Treatment Plants (STPs), that treat sewage to either primary, secondary or tertial levels- of the total urban households, only about 32% are connected to sewer systems (census 2011), and (ii) in the absence of such systems, the toilets are at least connected to 'septic tanks', and the towns deploy vacuum suction cleaners to empty septic tanks and treat the excreta to some extent- about 38% of the urban households are connected to septic tanks (census 2011)

There are only 601 STPs in the entire country (it is not clear as to how many towns have these facilities) and out of this only 522 are working, with an installed capacity of about 18,833 MLD[9]. The total expected sewage generated is about 62,000 MLD[10]. Even assuming that all the plants are operating at full scale, the maximum sewage treatment is, at best, only about 30%. Thus, more than 70% of sewage generated in urban India is not treated. It should be noted that none of the Indian cities have 100% sewage connections, collection and treatment.

Re-use of Treated Water: There is no information available on this topic.

Policy Framework and Financing for Sanitation in India: Water supply and sanitation is a state/ local government subject in India and hence, theoretically, states ate responsible for making necessary policies. However, the national government has taken a lead in developing these sectors and guided the development through various policies, guidelines and Centrally Sponsored Schemes. These schemes are implemented on cost-sharing between central and state governments, with varying ratios for different schemes. The following are the current key policies/ programs for the sector in India.

[9] Inventory of STPs in India, Central Pollution Control Board, 2015

[10] http://www.indiaspend.com/cover-story/70-of-urban-indias-sewage-is-untreated-54844

Swacch Bharata Mission -SBM (Clean India Mission): This is one of the national flagship programs, under the CSS, that aims to make India ODF by 2019. This is a program and is also treated as policy across India. There are two streams – SBM- Gramin (rural) and SBM-Urban.

SBM- Gramin: This is aimed at making all rural areas ODF by October 2019. The main components of SBM-G are:

Component	Cost INR/(USD[11])	Central Share	State Share	LG/ Beneficiary share
IEC, start up and capacity building	Upto 8% of program cost	75%	25%	Nil
Revolving fund (for giving loans to build toilets)	Upto 5% of program cost	80%	20%	Nil
Individual household toilets	12,000 (185)	75%	25%	Nil
Community sanitation complexes	Actual amount required, to make village ODF	60%	30%	10%
Administrative charges	Upto 2% of program cost	75%	25%	Nil
Solid and liquid waste management	As required for a village	75%	25%	Nil. The LG is responsible for total maintenance, once built

World Bank Loan – SBM -G: GoI signed an agreement with the World Bank to support it's SBM-G through a loan of about USD 1.5 billion. This program is financed by the World Bank through its new Program for Results (P4R) instrument, under which disbursements are made to GoI after achieving agreed results that are verified by an independent verification agency. This loan is aimed at incentivizing achievement of ODF status at GP, district and state levels. 'Incentives' are provided to these governments based on % of achievement vis-a-vis baseline status. The key components of this support are;

Disbursement Linked Indicators	Description	Financial allocation (USD-millions)
DLI-1	Reduction in the prevalence of open defecation	730.12
DLI-2	Sustaining ODF status in villages	464.63
DLI-3	Increase in rural population with access to Solid and Liquid Waste Management	132.74
DLI-4	Operationalization of performance incentive grans	147.50
Program Management		025.00
Total		1500.00

Swacch Bharat Mission- Urban (SBM-Urban): This program was also launched by GoI, simultaneously along with the SBM-G. The main aims of this program are to eliminate open defecation practice and also eradicate 'manual scavenging[12]' from urban India. The main components and funding sources are given below.

The total outlay for this program is about INR 620,000 million (USD 9530 million). Out of this the GoI contribution is expected to be about INR 146,230 million (USD 2250 million) and states are expected to contribute about 25% of this (USD 526 million). The remaining amount is planned to be raised through other means like: LG funds, user fees, beneficiary share, private sector participation, land leveraging, corporate social responsibility and external assistance.

[11] For the purpose of this note, one USD is equal to INR 65.

[12] Manual scavenging refers to the age old inhuman practice where people (usually from lower caste) clean the pits of bucket latrines, manually. While this practice has been eradicated to a large extent, there are still pockets where this is continuing.

The main components of this program are:

- Covering 80% households practicing open defecation with household toilets
- Covering remaining 20% households practicing open defecation with 'community toilet blocks'
- Building 'public toilets' in all key places of the city for 'floating population', as required
- Design and execution of solid waste management facilities, as required
- Undertake IEC and awareness campaigns for behavior change
- Capacity building of LGs

Smart Cities Mission[13]: With a view to improve the overall standard of living in Urban India, GoI launched a new 'Smart Cities Mission', across the country, targeting large cities. The main objective of this mission is to promote cities that provide core infrastructure and give a decent quality of life to its citizens, a clean and sustainable environment and application of 'Smart' Solutions. Provision of improved and sustained water supply and sanitation (including sewage systems) is a core element of this mission. About 100 cities have been identified by GoI and they are expected to develop innovative proposals for funding, as required. The cities are also expected to form a Special Purpose Vehicle (SPV) for managing these activities and attract adequate PPP. These proposals are vetted by an expert team and only winning proposals get funding support. Thus far, since 2015, about 60 proposals have been found suitable and funds to the tune of INR 1,317,620 million (USD 20,271 million) have been sanctioned.

Atal Mission for Rejuvenation and Urban Transformation (AMRUT): AMRUT mission has been launched by GoI, in 2015, to provide basic amenities for all households living in urban areas, including household tap connection and sewerage/ septage network connection. The ATAL mission will focus on 500 cities with population more than 100,000 for a five-year period from 2015 to 2020.

Here, the onus is vested with state governments to identify needs, prioritize and develop state annual action plans for funding support from GoI. The GoI will provide 50% funds, while state and ULBs are expected to bear the remaining 50% funds. The funding ratio between GoI, state government and ULBs in the ratio of 50:30:20. The ratio between state and ULB may vary, as per state government decision.

Operations & Maintenance (O&M): While all these missions/ programs provide capital expenditure, the O&M is the responsibility of local governments. There are no clear O&M policies and ULBs (and PRIs also) are encouraged to levy 'user fees/ tariff' for the services that is sufficient for O&M. However, in reality most urban LGs charge very less (due to political compulsions) and do not recover much, that too for water supply only. World Bank estimates that indicate that the ULBs, on an average, do not collect more than 30-40% of O&M costs.

There is hardly any user fee/ tariff for sewer connections. This is usually collected indirectly as a part of water bill and/or property tax. There are no credible estimates of this collection as a percent of O& M costs. In addition, ULBs (and also rural LGs) use other 'devolution grants' they get from central governments and state governments.

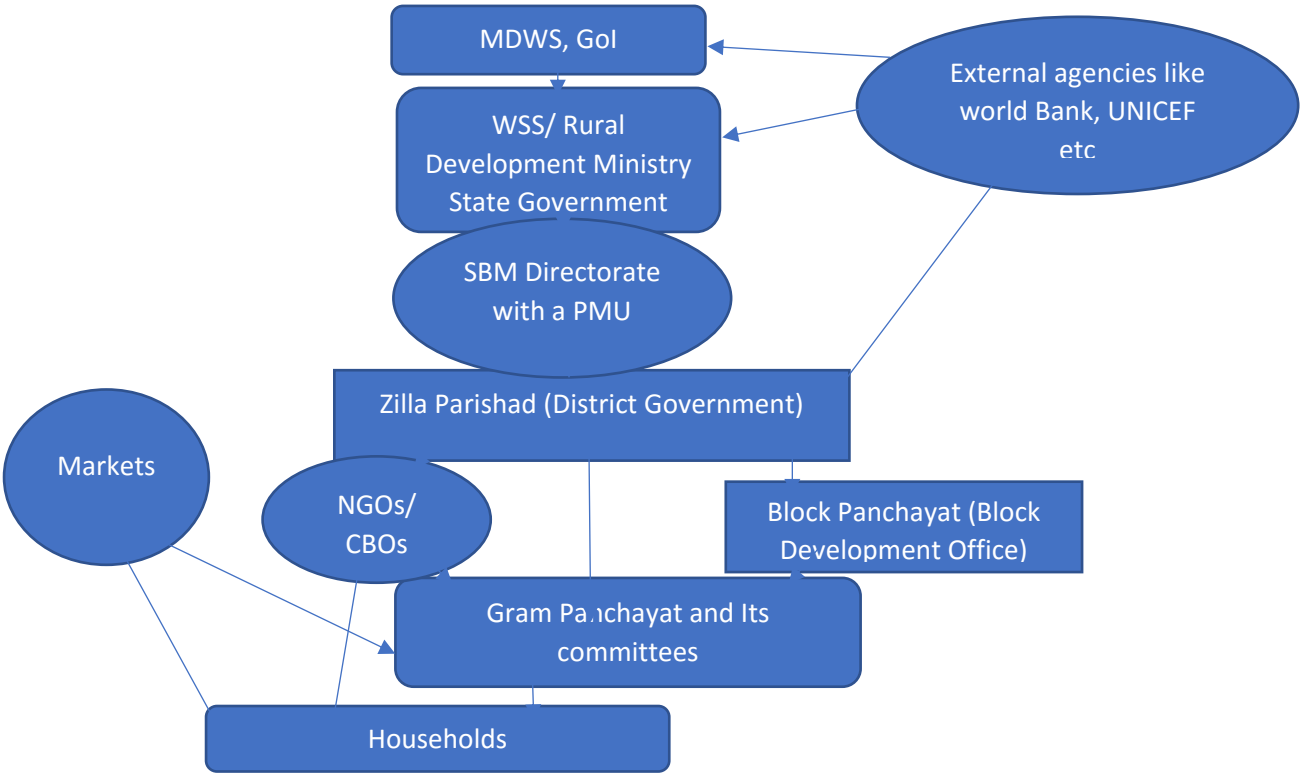
'Jodhpur' the city under this study prepared proposals for sewerage/ septage development projects to the tune of INR 10,800 million (USD 166 million).

Institutional Framework for Sanitation in India: While the elected national government is a powerful central government, each state is governed by an 'elected state government' and is responsible for social and economic development, including water supply and sanitation service delivery.

As explained earlier the local governments, PRIs for rural areas and ULBs for urban areas are responsible for water supply and sanitation provision and service delivery. However, several states also have central engineering agencies – Public Health Engineering Departments (PHEDs)- with expertise in design, execution and O&M of water supply and sewerage schemes. These PHEDs were established in early 70s, when engineering capacity was not available at local levels. Due to this, the actual institutional arrangements vary across states. The following is a broad framework for both rural and urban sanitation service delivery.

[13] Website of MoUD, GoI

Institutional Framework for Rural Sanitation



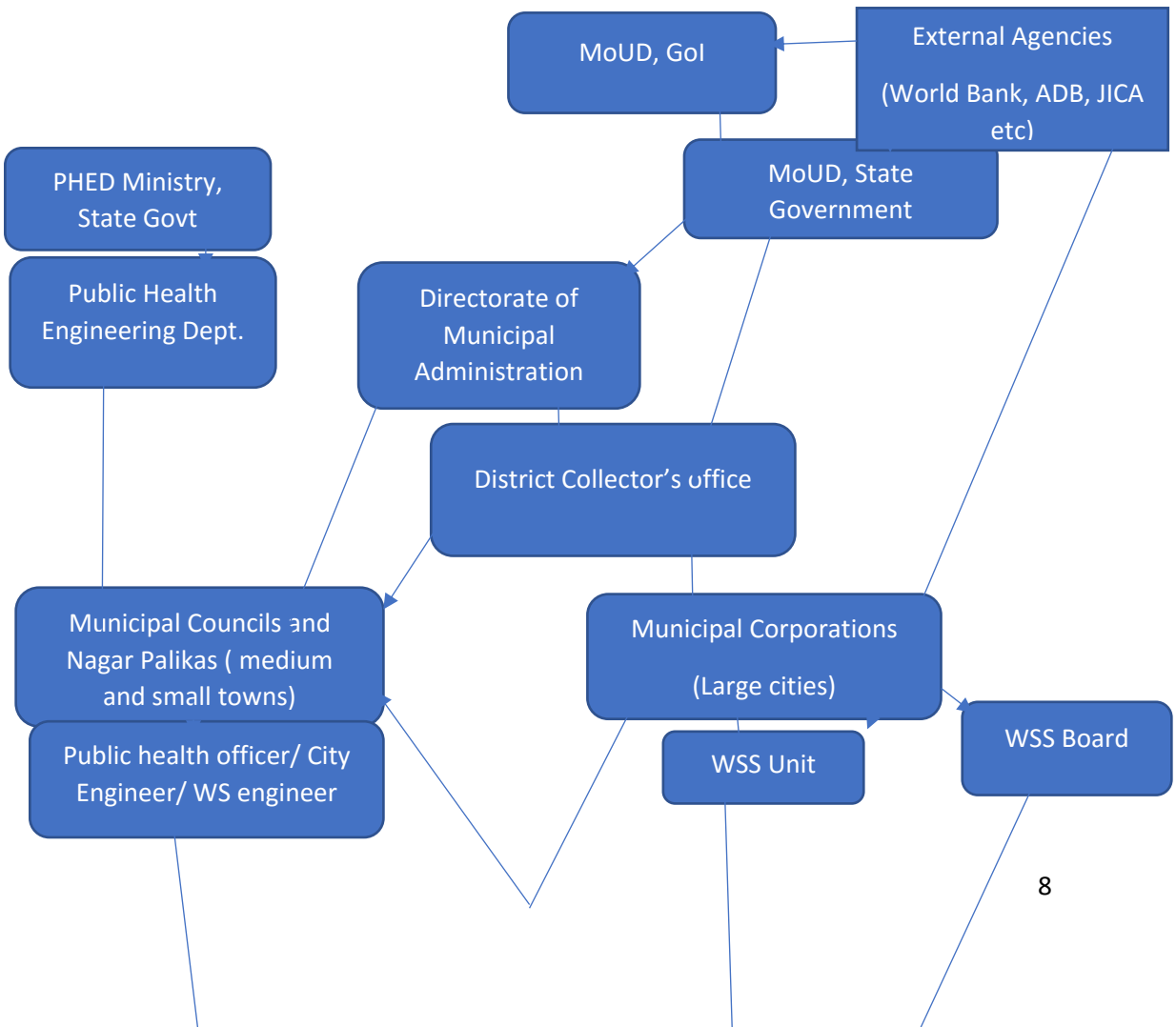
Roles and responsibility for implementing rural sanitation:

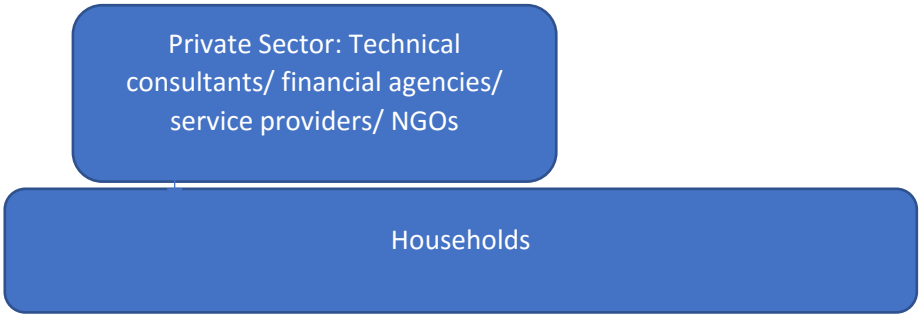
Institution	Role	Reporting to
MDWS, GoI	National goal setting, program design, funding, guidelines, monitoring, coordination with other ministries and externally aided projects	Report to parliament
State government (respective ministry/ ministries)	State/ regional goal setting, program design, co-funding, state specific guidelines, monitoring, coordination with other ministries, externally aided projects and corporates, hire services of NGOs, academic institutions for required support.	State assembly, MDWS
District Governments+ Block governments	Baseline surveys, annual action plans, capacity building, IEC activities, hire NGOs for local support, monitoring construction activities, transmission of subsidy/ incentives to households and accounting	Districts report to state Blocks report to districts
Gram Panchayats+ committees[14]	Motivate households, assist them in getting access to finances and materials, devise and implement	Report to Block governments

[14] While GPs are elected local governments for villages and have the responsibility of overseeing the implementation of sanitation activities, to make their village ODF, they also form subject committees for various subjects. In this case it is called 'Village Water and Sanitation Committee (VWSC).

	local regulations (for ex- fines for open defecation etc), coordinate with local government officers, local dispute resolution.	
NGOs/ CBOs	Usually hired for social mobilization activities, capacity building and technology advise, for specific periods, as required. They are also involved as third party verification of ODF status. Some Self-Help Groups (SHGs) led money for building toilets to their own members.	Report to district/ blocks as required.
Local Markets	Though a bit unrecognized in Indian context, the local markets play a big role in supplying materials (cement, bricks, sanitary pans, doors etc), masons and skilled/unskilled labor for construction of toilets.	To customers
Households	Build toilets, use and maintain them. While some households are eligible for government subsidy/ incentives, they may have to add some mote finances. Non-eligible household shave to fully finance their toilets.	
External Agencies	Provide technical assistance/ funding/ loans to GoI/ state governments. In some cases they also work with district governments to pilot and demonstrate innovations.	Department of External Affairs, GoI

Institutional Framework for Urban Sanitation:





Roles and responsibility for implementing urban sanitation:

Institution	Role	Reporting to
MoUD, GoI	National goal setting, program design, funding, guidelines, monitoring, coordination with other ministries and externally aided projects	Report to parliament
State government (MoUD ministry) + Directorate of Municipal Administration (DMA)	The MoUD in the state is responsible for all urban development activities. Most states have a full fledged DMA under the MoUD. The DMA usually looks after the activities of small and medium towns, as their capacity is weaker than Municipal Corporations. The key roles are: State/ regional goal setting, program design, co-funding, state specific guidelines, monitoring, coordination with other ministries, externally aided projects and other financial institutions/ funds	State assembly, MDWS
Ministry of PHED	Several states have strong PHEDs, established in 1970s with good engineering expertise. After devolution of functions (and funds), they function more as 'project managers' to ULBs- usually through state orders and sometimes by ULB invitation. Once planned infrastructure is built, the same is handed over to ULBs for regular service delivery and O&M.	Ministries
District Governments (District Collector's office)	The District collector's office is an overseeing agency for urban WSS issues. The city plans and budgets are vetted by this office and passed onto the higher tiers at state levels. Similar, they monitor progress and report to higher tiers. They do not play any direct role, like the ZPs in rural sanitation.	Districts report to state
Municipal Councils/ Nagar Palikas (Medium and small towns)	Baseline surveys, sewerage scheme planning with support from PHED/ consultants, prepare ODF plan, build and maintain community/ public toilets, levy and collect taxes/ user fees, spend funds received and maintain accounts. A typical Municipal Council/ Nagar Palika has some technical staff – city engineer, water supply engineer and a few assistants. In some cases, there might be a small WSS unit and take care of water supply aspects. These cities usually do not have sewerage systems.	Report to District collector/ DMA at state level.

	Sanitation (seen as – public toilets maintenance, street cleaning, drain cleaning, solid waste management etc) are under a Public Health Officer.	
Municipal Corporations (big/ large cities)	A municipal corporation is generally a town with more than 500,000 residents. In most cases, MCs have a full-fledged WSS unit taking care of water supply and sewerage aspects. The SWM is taken care by a separate unit – either SWM unit or public health unit. For some large metro cities, independent Water and Sewerage Boards[15] have been constituted to take care of WSS services, including infrastructure building. These units/ boards also perform all related functions: planning, design, execution, service delivery, tariff setting, billing and collection, citizen grievance redressal, regulations etc.	MoUD at state level.
Private Sector: Technical consultants, service providers, materials and labor, financial services, NGOs etc.	There are a variety of private sector players in the urban sanitation sector and play vital last mile connectivity roles. Some of the key ones are: -Consultants: design and project management services for households/ housing societies -Contractors: build public/ private infrastructure and sometimes, manage its O&M -Financial services: provide loans to households and builders. Some financial institutions provide loans to ULBs also, but usually under a state guarantee and routed through state -NGOs/ CBOs: community mobilization, service provision, advocacy etc- usually for slum residents and on critical citywide issues - Septic tank emptying: about 38% of urban India is connected to septic tanks and depend on local service providers for emptying their septic tanks. A few ULBs have their own services (through their departments) but in general, they also shortlist private service providers and fix a fee for the services.	To customers/ ULBs/ contract managers
Households	Unlike rural sanitation, which is highly funded (subsidy/ incentives) by government, most investments within houses are met by households. Government subsidy is usually limited to below-poverty families and slum residents. In slums, cities usually provide community toilets and do not support 'household toilets' due to legal aspects pertaining to land tenure.	
External Agencies	Provide technical assistance/ funding/ loans to GoI/ state governments.	Department of External Affairs, GoI

[15] Some examples of city based WSS boards are: Delhi Jal Board for Delhi city, Hyderabad Metropolitan Water Supply and Sewerage Board for Hyderabad city, Bangalore Water Supply and Sewage Board for Bangalore city.

	In some cases they also work with district governments to pilot and demonstrate innovations.	

Circular Economy: This concept is still new in India and is not practiced in any of the government programs. The main focus is still on infrastructure building.

Part B- Short background on Jodhpur

Jodhpur is the second largest city in the state of Rajasthan and is located in the lower middle of the Thar desert of Western Rajasthan. It is also known as gateway to Thar. Jodhpur with a population of about one million (2011 census), which is estimated to be about 1.1 million in 2016. The city is at a height of about 250-300 meters above mean sea level and is spread over 78.6 square kilometers.

Historically, founded in 1459 A.D by Rathore rulers, the city was known as Marwar. The city is famous for its forts and temples and is one of the international tourist destinations. The old city is around the fort of Mehrangarh. Jodupur is also called as 'Blue City' as almost all the houses based around the fort of Mehrangarh are painted in blue color. Polo has been the royal sport of Jodhpur since medieval times. Polo enthusiasts visit the city to participate in the various equestrian events that are held here. Jodhpur is also well known for its furniture industry, handicrafts, glass bangles, cutlery, carpets and marble goods. Jodhpur also boasts of a unique cuisine. The local eateries accord the tourists a delectable platter of local culinary delights.

Jodhpur is also a big education hub with several educational institutions like Indian Institute of Technology (IIT), All India Institute for Medical Sciences (AIIMS), National law College, National Institute for Fashion Technology etc having their presence in the city. Jodhpur with a population of about one million (2011 census), which is estimated to be about 1.1 million in 2016. There are about 53 cities that have a population of one million or more (census 2011) and Jodhpur stands at 45th position.

The city is governed by the Jodhpur Municipal Corporation (JMC) and functions as per mandate detailed under the Rajasthan Municipalities Act, 1959 (with subsequent amendments). The city is divided into 65 wards, each ward being represented by an elected 'councilor'. The Jodhpur Development Authority (JoDA) has been established in 2009, to develop and implement projects for the regional development. Some of the projects are; water supply augmentation, sewer systems, bridges, sports complex etc.

The MoUD, GoI, has been undertaking rating of cities in the country for sanitation (cleanliness ratings). In 2017, Jodhpur stood at a middle rank of 209 out of 434 cities rated. The city scored about 970 marks out of 2000 marks for this rating, almost half of the score of the best city in the country (Indore, 1808 marks out of 2000). It stood at a low rank of 337 out of the 476 cities rated in 2016. These surveys rate the cities on issues related to: municipal solid waste management, individual toilets, community/ public toilets, open defecation free status, capacity building, awareness campaigns etc.

Water supply: Water supply for the city comes from a long distance from Harike barrage at the confluence of Sutlej and Beas rivers, in Punjab and travels through the Indira Gandhi canal, which is about 650 kms long and feeds water to several cities, villages and fields in Rajasthan[16]. Currently, 219 MLD of filter water and 20 MLD raw water is supplied daily to the city population through 155728 water connections and 2410 PSPs. Gross per capita supply is 241 lpcd. Water supply in all sub zones is intermittent as water is supplied for 2-4 hours daily.
Annual O & M expenditure for the year 2010 INR 937 million (USD 14.4 Million)
Crores (excluding depreciation and debt services) and operating revenue was INR
275 million (USD 4.2 million), just about 30% of the operations cost[17].

Sewerage: The city has an old sewerage system, which has been upgraded from time to time. Currently a 1500 kms network of underground piped sewerage network covers about 70% of the city areas. While the total sewerage collection capacity is about 170 MLD, the current collection is about 132 MLD (78%). However, the treatment capacity is only about

[16] https://en.wikipedia.org/wiki/Indira_Gandhi_Canal

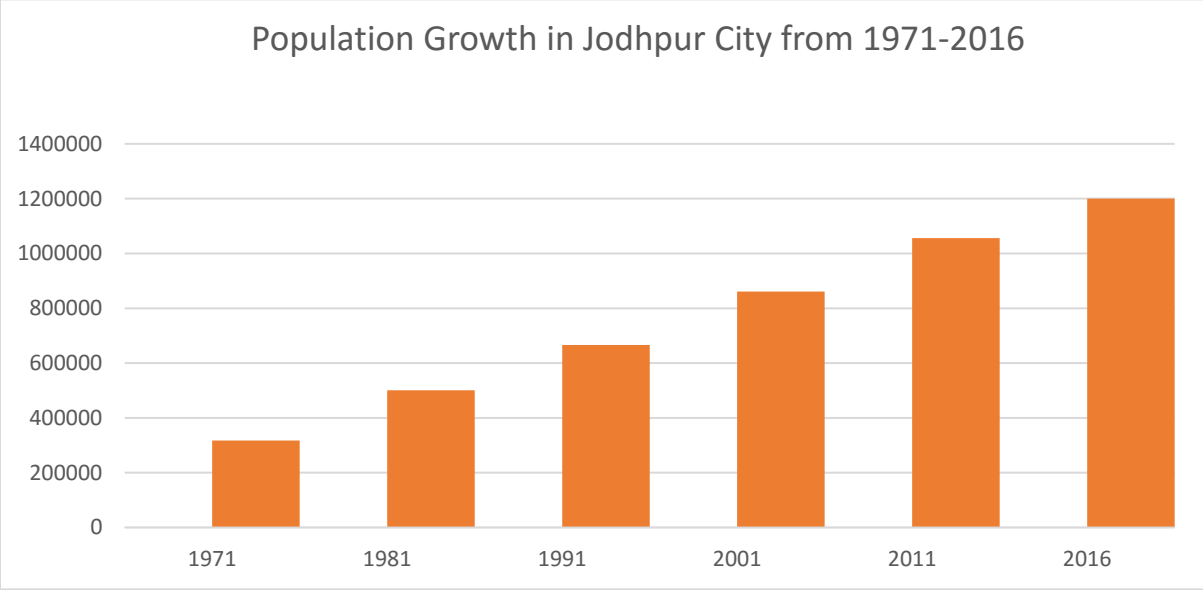
[17] As per details in the EOI floated for design and building of additional sewerage system by Municipal Corporation Jodhpur, 2011.

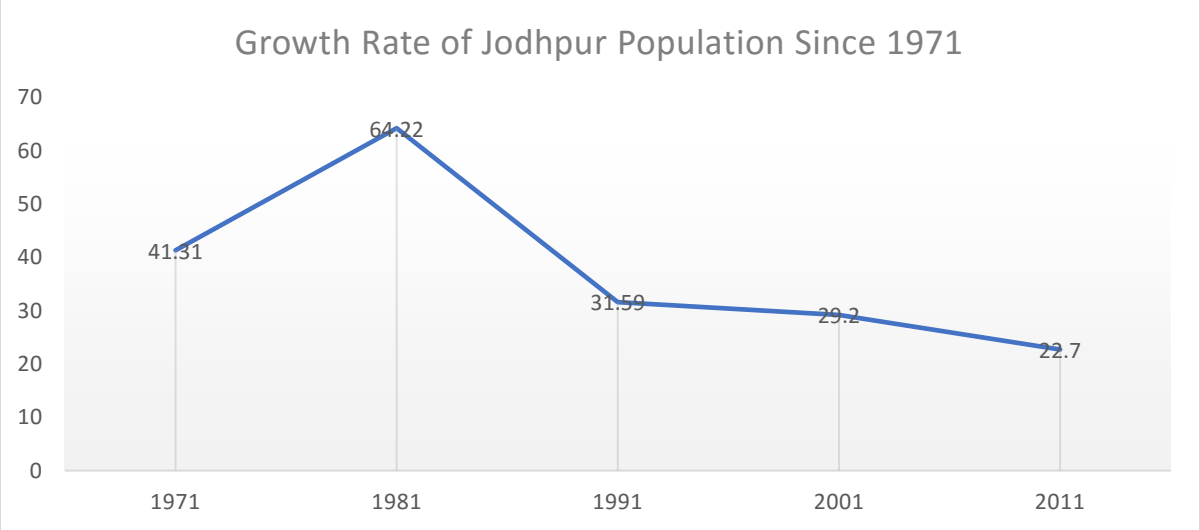
70 MLD (two plants of 50 and 20 MLD each), which is about 53% of the collection[18]. Currently, the city is not collecting any separate user fees for sewerage and about 30% of the water charges are apportioned to sewerage account (exact numbers to be verified).

The Government of Rajasthan (GoR) developed a Rajasthan State Sewerage and Waste Water Policy, in August 2016, to guide cities in managing sewerage and waste water. This policy encourages cities to recover 100% operational expenses and reuse treated waste water, to the extent possible. Details of this policy are given in Annex-1.

Part C- Detailed information about Jodhpur city

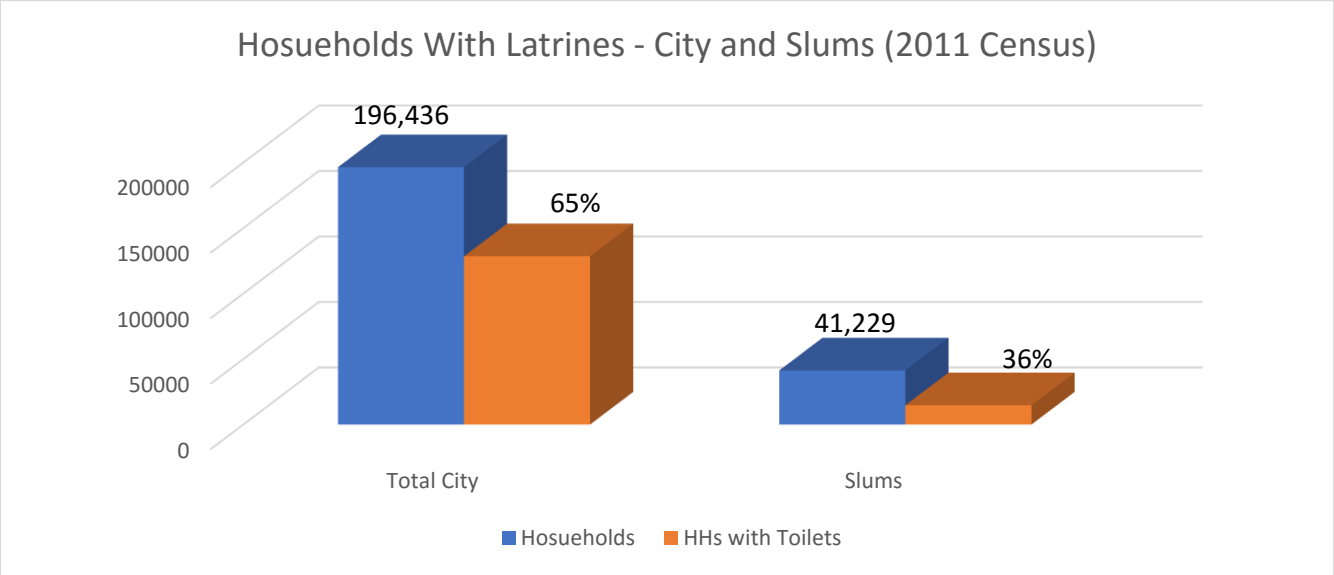
Population and Growth: Jodhpur city has about one million in 2011 and is now expected to be about 1.1 million (2016). The population grew more than three times since 1971, over a span of the last 40 years. The growth rate was high in 1971 (41.31%) and 1981 (64.22%) and stabilized to about 22% in 2011. There are about 243 slum pockets within the city and accounts for about 270,211 people i.e roughly 27% of the city's population. Details of population growth are given in charts below.





[18] Details from the same report as above.

Sanitation Arrangements: As per Census, 2011 data out of the total 196,436 households, about 128,432 households (65%) have access to improved latrine and about 48,021 (24%) have unimproved latrines. About 21% of total households (41,299) live in slums and only 36% of them have household latrines. The families without access to household latrines either depend on 'community sanitation complexes' or resort open defecation. Almost all the latrines have septic tanks. Details of household toilets in city and slums are represented in the chart below.



After the launch of SBM-Urban in 2014, the city has facilitated building (or in the process of building) household toilets for about 5825 households under the SBM-Urban program. The total cost of the 'twin-pit' toilet is estimated to be about INR 12,000/- (USD 185/-) and the GoI, GoR and Jodhpur Municipal Corporation (JMC) contribute 33% each, for the same. The individual household could add more money to this amount to build a better super structure.

According to the city officers, there are about 23 community sanitation complexes, each having 12 to 15 seats and a few bathrooms also. These are for the use of the households without access to individual toilets and most of them reside slums. In addition, JMC is building another 8 such community sanitation complexes. The JMC hired services of a local operator for the maintenance of these toilets and pay the contractor about INR 7500/- (USD 115/-) per month per unit. The total annual contract value is about INR 2.07 million (USD 31,850 mn).

As per Census, 2011 records there are about 187,421 properties[19] (152,709 domestic, 33,878 commercial and 925 others) in the city. In addition, there are about 5,288 industrial properties. JMC has a well-developed sewerage system and provides connections to about 120,000 (65%) of domestic, commercial and other properties. JMC has a sewerage network of about 1500 kms length, covering about 75% of city area. The expected sewerage generated in JMC area is about 100 MLD and the available functioning treatment capacity is about 70 MLD (2 STPs of about 50 MLD and 20 MLD capacity). In addition, a new STP of 50 MLD capacity is nearing completion and proposals for a new plant of 40 LPCD have been approved. Work is yet to start on this plant.

The JMC does not provide sewerage connections to industries and they have a separate network and also a separate Effluent Treatment Plant (ETP) of about 20 MLD capacity.

Institutions: The JMC is responsible for building and maintaining all the sewerage network, community sanitation complexes and also public sanitation facilities. The poor households get government assistance to build latrines in their homes, but they are responsible for their upkeep and maintenance. The general households, commercial and institutional establishments are responsible for providing latrines and other sanitation facilities within their properties and also maintain them.

[19] This number is estimated based on the electricity connections.

The PHED is responsible for providing and maintaining water supply system.

A small unit within the JMC, under the engineering department, is responsible for planning and maintenance of sewerage system. The unit has limited staff (4 engineers and 3 support staff). They outsource about 130 labor (2 each for the 65 wards) for regular sewage maintenance works. The O&M of the two functional STPs are also outsources to 'operators' through competitive bidding, for a period of five years. The maintenance of community sanitation complexes and public sanitation complexes is also outsourced to local operators. While the JMC pays a monthly fee for maintenance of the community sanitation complexes (located within slum areas), the contractor is expected to make money (pay and use) for the maintenance of public sanitation complexes (located in busy areas like markets, bus stands etc).

Financing Sanitation: This is divided into two parts viz financing infrastructure, and financing O&M.

Financing Infrastructure: JMC largely depends on grants made GoI and GoR for financing its sewerage infrastructure. Only in some cases the JMC has to make a matching contribution, which is funded through its regular income. The table below provides information on financing costs and sources for sewerage system in Jodhpur, from 2003.

Table- : Costs and Fund Sources for Sewerage System in Jodhpur

Scheme name/ year	Infrastructure built in Jodhpur			Total cost (INR/ USD Million)	City Share (INR/ USD Million)
	New STP (MLD)	Pipe lines (Kms)	Renovation of pipes / STP		
RUIDP (ADB funded) - 2003	20	400	-	INR 3100 (USD 48) -3000 mn for pipe lines and 100 min for STP	Nil
UIDSSMT (GoI funded) - 2012	50	125	-	INR 640 (USD 10) 340 mn for pipe lines and 300 mn for STP	10% (INR 64 mn/ USD 1 mn)
Chief Minister Budget program- ongoing	50 (90% of construction complete and could deployed by end 2017)	Nil	Nil	INR 300 mn (USD 4.6 mn)	Nil
New Proposal for state government. Yet to start	40	Nil	Nil	INR 500 mn (USD 7.8 mn)	Nil
AMRUT (GoI program)	Nil	Nil	Yes	INR 770 mn (USD 12 mn)	33% (INR 254 mn/ USD 0.4 mn)
Total	160			INR 5310mn (USD 82 mn)	INR 318 mn (USD 4.9 mn)

Financing household Latrines: As explained above, the JMC is facilitating construction of household latrines for poor families. Since, 2014 they have received about 8,524 applications out of which 5825 have been found to be eligible.

Detail	Cost/ unit (INR)	Total Units	Total cost (INR Mn)	Share of Different Govts (INR 000)		
				GoI	GoR	JMC
HH Latrine	12,000	5825	70	23.3	23.3	23.3

The total cost for this activity is about INR 70 million (USD 1.07 mn) and JMC's share for this is about INR 23.3 million (USD 0.36 mn).

The total share of sanitation in building of sanitation infrastructure of JMC, since 2003, is about INR 341 million (USD 5.25 million)

Financing O&M: The O&M costs are related to sewerage system maintenance and maintenance of community sanitation units. As explained above, JMC owns a sewerage system that has about 1500 kms of pipe lines and two functioning STP plants and 23 community sanitation complexes. The O&M costs for the same are given below in Table-xl

Table x- Actual Expenditure on of O&M Sanitation Services

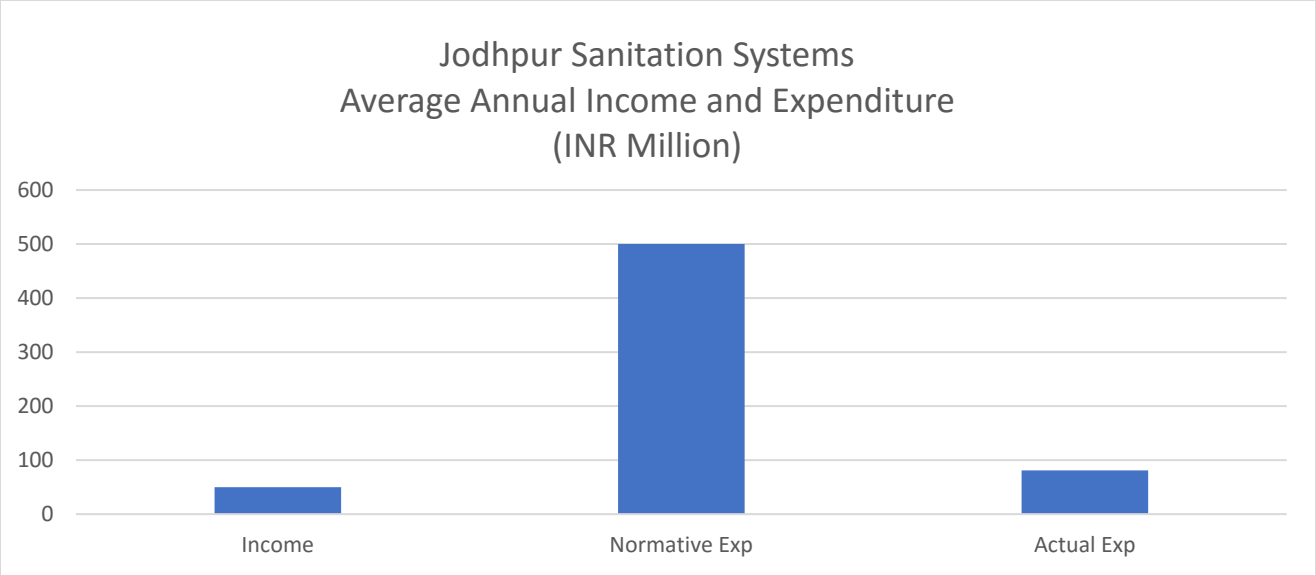
Sr.No	Detail	Annual cost (INR/ USD – million)
1	50 MLD-STP INR 1 million/month	12.00 (0.2)
2	20 MLD -STP INR 0.1 million/ month	1.2 (0.02)
3	Electricity for both STPs INR 1.0 million/month	12.00 (0.2)
4	Labor for pipes cleaning etc 130 nos (65 wardsx2) INR 1000/ ward/day	23.72 (0.37)
5	Machines for sewerage cleaning etc INR 2.5 mn/ month	30.00 (0.5)
	Sub-Total	78.92 say 79.00 (1.21)
5	O&M of community sanitation complexes INR 7,500/month/ unit	2.0 (0.03)
	Grand Total	81 (1.24)

Normative O&M costs: The city engineers estimate that the total asset value of the entire sewerage system is about INR 10,000 million (USD 154 mn). As per normative estimates the O&M costs for a sewerage system is about 5% of investment/ asset value. Considering this, the full-fledged O&M of the city sewerage system would need about INR 500 million (USD 7.7 mn) per annum. However, due to the severe financial constraints, the JMC team is doing with minimal O&M expenditure as shown above.

Income from Sanitation: The main income for managing sanitation comes from indirect sewerage user charges. There are no direct municipal taxes for sewerage. 33% of water user charges are to be apportioned to the sewerage head. In addition, the unit earns some money from new connections and sludge cleaning from septic tanks. The JMC sells the treated waste water to a vendor (selected through tendering), who in turn sells it to farmers nearby. The annual sale income is meagre at about INR 45 million (USD 0.7 mn). The average annual income over the last few years is shown below.

Sr. No	Source/ Details	Income INR million (USD mn)
1	Portion of water charges As per GoR rules, 33% of income from water charges are supposed to be transferred to sewerage account. However, the PHED which collects water charges, deducts some amount (like meter charges etc) and passes on 33% of the remaining amount	45 (USD 0.7 mn)
2	Income from sale of waste water	0.45 mn (USD 0.007 mn)
3	Others (connection charges, septic tank cleaning etc)	0.1 mn (USD 0.002 mn)
	Total	50 mn (USD 0.8 mn)

The total income, normative expenditure and actual expenditure is reflected in the graph below.



Circular Economy at City Level: Jodhpur city tried to recycle waste and earn income from the same, with partial success. The details are captured below;

- Gas from Waste: The JMC established gasification chambers at the biggest STP (50 MLD) in order to either bottle the gas and sell it as cooking gas and/or generate power from the gas for lighting purposes. No contractor came forward in the auction process to participate in either of these activities, as they found that these proposals were not cost effective. Hence, this activity did not move forward and the gas generated from the process is currently burnt.

- Recycling Waste Water: The JMC has been partially successful in recycling the treated waste water and sell the same to farmers. However, due to administrative and political economy reasons, the JMC is compelled to sell the waste water to the highest bidder in bulk, rather than selling it directly to farmers, the end customers. The highest bidding vendor offered a purchase value of INR 0.45 mn (USD 0.007 mn), while he sells the same to the end user at a very high price (almost 4 times more than the bid price). If the JMC were to directly sell the water to the end customers, they fear that the farmers would not pay any money, as it is seen as 'government property'.

- Composting Solid Waste: The JMC established a composting plant to recycle the organic solid waste into compost and sell to farmers/ retail users. However, this experiment also is not financially viable as the cost of production of compost is about INR 1.50 per KG and the selling price is lower than it. There are no takers for this compost and hence, the JMC is forced to sell at discounted prices.

Part D: Analysis

Current Sector Status: India's urban population grew at a rate of x% in the last two decades and now stands at 377 million people (79 million households). The urban sanitation sector has been a neglected sector for a long time, with no major policy and/or financial support to cities. Due to improvements in education levels, incomes and aspiration for a better lifestyle, the sanitation coverage increased, mainly owing self-financing of toilet construction. As of 2011, about 65% (Census 2011) to 70% (NHFS, 215) households in the country have access to toilets and another 21% use shared facilities and the remaining resort to open defecation. However, about 14 million households (18% of total households and about 65 million people) reside in slums spread across 2613 towns, and the access to household toilets in slums is much lower at 35%. The residents in slums mostly depend on shared facilities made available by local governments, in the form of 'community/ public' sanitation complexes. However, there was no major focus on transportation, treatment and safe disposal/ reuse of sludge and this was first recognized in the National Urban Sanitation Policy, designed by GoI in 2007. As per information available and best guestimates only about 30% of sewerage generated is being treated and only a portion of that waste water is being reused.

The situation in Jodhpur city is better than the national averages. Out of the 196,436 households 65% have access to improved latrine and about 24% have unimproved latrines. About 21% live in slums and only 36% of them have household latrines. Jodhpur fares very highly on account of sewerage connections, treatment and reuse of waste water, in comparison to national average. The 1500 km long sewerage network covers about 65% of properties (residential, institutional and commercial) and treats about 70% of sewage generated in the city. They are selling the aster water and earning a small revenue from it. The city also tried other means like converting the treated sludge into gas for selling and also converting the solid waste into manure for selling. But both efforts were not commercially viable and hence, were not successful.

Policy Environment: The policy making is usually led by central governments, as the same are embedded in centrally sponsored schemes (CSS), with cost sharing arrangements between central government, state governments and cities.

The National Urban Sanitation Policy (NUSP), 2007 was the first major policy in the sector and was reflected in the national schemes such as Jawaharlal Nehru Urban Renewal Mission (JNNURM) and Urban Integrated Development Scheme for Small and Medium Towns (UIDSSMT), both initiated in 2006. These schemes have been subsequently reshaped as the Smart Cities Mission and Atal Mission for Rejuvenation and Urban Transformation (AMRUT).

In addition, the GoI launched the Swacch Bharat Mission -Urban (SBM-U), in 2014, to make the cities and towns open defection free, by 2019. As of date, about 531 cities/ towns out of the total 7935 have been declared ODF. Some sections doubt these numbers and feel the data could have been fudged to show higher achievement.

Several states, including Rajasthan, have adopted these policies and programs and are actively working on the same. In addition, they have developed their own policies and programs also.

Rajasthan reflects a vibrant policy environment. The Rajasthan State Sewerage and Waste Water Policy, 2016 and the Rajasthan Urban Water Policy (draft), November 2015 are examples.

Financing Arrangements: Financing for urban sanitation, in Jodhpur city, is mainly through national and/or state led programs. The main ones in the past were the ADB funded program (2003) and GoI funded UIDSSMT (2012) which helped in creating a large part of the current infrastructure (sewerage network and STPs). The ongoing schemes are funded under the state's Chief Minister program and center's AMRUT program. The city had/has to contribute some share in UIDSSMT (10%) and AMRUT (33%), while they did not have to share any part in the other programs. All the funding under all the above programs was grant money to the city and not a loan. The ongoing SBM-U finances (grant) construction of household toilets for the poorer sections and this is a direct incentive to the individual households.

All the policies and projects mandate that the assets belong to the city (JMC) and that financing the O&M is their responsibility. While they adequate appropriate tariffs for the same, the state policy and practice limit levy of tariffs and recovery. As per the current policy/ practice there is no direct tariff on the sewerage services and is collected indirectly. About 33% of the water tariffs are to be apportioned to sanitation/ sewerage services and this depends on the 'effectiveness' of the drinking water providers, the PHED. Thus, the majority of the annual budgets come from PHED and the same is not sufficient for expected O&M. Thus, the JMC is undertaking sub-optimal maintenance, attending to only emergency maintenance/ repair works.

The JMC has been successful in earning some revenues from sale waste water, though the managers feel that they could have earned more, if not limited by the 'public organization' tag. The JMC also tried to convert the treated sludge into gas, but was not successful in 'selling the gas' for commercial exploitation due to technical and scale issues.

The team managing the entire sanitation comprises of about 5 people and are part of the JMC staff. Their salaries and allowances are taken care by JMC. All other activities like O&M of STP, cleaning of drains, operating septic tank cleaning vehicles etc have been outsourced to local contractors and this is a good arrangement to minimize permanent liability on accounts of the JMC.

The assets built/ owned are not properly registered and there is no scientific asset management and accounting system within JMC. They are seen as expenditure incurred and are accounted in that manner.

Institutional issues: Water supply and sanitation are managed by two different organizations. While the PHED is managing water supply, including infrastructure building, O&M, connections, billing and collections, all sanitation aspects including infrastructure building, connections and O&M are managed by a small unit within JMC.

It is universally accepted that the two functions are complimentary to each other and best undertaken by the same unit/ utility, the case is not so in JMC and almost all cities in Rajasthan, due to the state policy. The PHED is accountable to their head office and the sanitation unit within JMC is accountable to JMC.

The team managing the entire sanitation comprises of about 5 people and are part of the JMC staff. Their salaries and allowances are taken care by JMC. All other activities like O&M of STP, cleaning of drains, operating septic tank cleaning vehicles etc have been outsourced to local contractors and this is a good arrangement to minimize permanent liability on accounts of the JMC.

The sanitation unit within the JMC is not a ringfenced unit. The budget does not reflect the income (revenues and grants) and expenditure (staff, contracts, power expenses etc) at one place and are spread over different locations/ line items. In such a situation, it is difficult to understand the real financial situation.

Way Forward: The financial management of the sanitation system is entirely governed by the policies and practices of GoR and there is not much scope unless the system is changed. It is also tied to the overall efficiency and effectiveness of municipal financial management of JMC, which is not in a good condition.

Given, this overarching framework, there are not many options for improving the overall financial health of the sanitation system. The following options, most requiring state policy reforms, are suggested for further deliberations.

- Direct taxes for sanitation: Initiate direct tariffs for sewerage services, with due orientation and awareness building among the users. Currently, it is managed by indirect tariffs
- Ringfencing: Ringfence sanitation accounting in the municipal budgets. Provide estimates of actual required costs in the annual budgets and indicate how much is being actually allocated and spent. This would hopefully open the eyes of policy makers and start allocating more resources to O&M issues.
- More Municipal Subsides: Efforts should be made to allocate more resources for sanitation management, from other sources such as municipal taxes/ grants received by JMC. In order to achieve this, there is a need for an overall improvement in tax collection in JMC. Currently JMC is unbale to collect even 1% of the property tax and collects only INR 0.5 million out of the expected INR 82.6 million[20]. The collection of city development tax is also very low at less than 5% (INR 1.36 million out of expected INT 300 million)[21].
- Combined WATSAN Utility: Integrate operations of water supply and sewerage into one unit/ utility for operational and scale efficiencies. Currently, the water supply system is managed by the PHED and has a huge task force. Their budgets are not part of the JMC budget system. The state urban water supply policy, still envisages the PHED as the agency for building and managing water supply infrastructure and also run it and transfer to ULBs over a period of time. This could be re-assessed and steps could be taken to transfer all water supply systems to ULBs and integrate them with sanitation systems and rest the management with one single entity.
- Incentives: Encourage and incentivize large properties such as large housing societies, educational institutions, hospitals, hotels etc to establish their own decentralized facilities for treatment and reuse of waste water. Currently, three properties (two star hotels and AIIMS institute) practice this approach successfully. This would (i) reduce the load on municipal systems and enable optimization of operational costs, and (ii) improve the circular economy processes.

Annex-1

[20] As per JMC budget 2013-14 document.

[21] As per JMC budget 2013-14 document.

Rajasthan State Sewerage and Waste Water Policy, August 2016

The GoR developed its own sewerage and waste water policy in August, 2016. The main aim of the policy is to 'ensure improved health status of urban population, specially the poor and under privileged, through the provision of sustainable sanitation services and protection of environment'. The steps recommended for ensuring this aim are;

All local bodies will make city sanitation plan (CSP) for a period of 30 years considering future development and city development in line with city Master Plan to avoid any conflicts in developing the city in the future.

The cities which do not have a master plan may prepare a short-term plan of 5 years from the base year for immediate implementation and during this process then prepare a full-fledged CSP.

Treatment of wastewater shall be targeted towards producing an effluent fit for reuse in irrigation in accordance with WHO guidelines as a minimum requirement.

Central treatment plants shall be built to serve semi-urban areas, and collection of wastewater can be made initially through trucking until collection systems are justified. Specifications and minimum standards as stipulated by CPHEEO[22].

The reuse of treated wastewater in irrigation and industrial application shall be given the highest priority and shall be pursued with care.

The base tariff for treated waste water shall be 50% of drinking water supply tariff in case of industrial/commercial reuse and Rs. 3.00 per thousand litres increasing at the rate of 10% per annum, in case of agriculture/horticulture/fishery/landscape reuse.

The user fee and taxes shall be so set to cover atleast the O&M costs of sewerage systems for collecting, transporting, treating, disposal and reuse. At present sewerage charges are built into water bill, about 33% of water bill. This shall remain same. Other sources of revenue generation could include: connection fees/deposit, sale of treated water, sale of bio-gas, sale of fertilizes, sale of electricity etc, if generated.

Several sources for capital financing have been suggested. These include government grants, additional cess, ULB's own funds, loan from financial institutions etc.

PPP option is encouraged. GoI provides about 20% Viability Gap Funding (VGF) for feasible PPP projects. GoR shall match with this with another 20% VGF for sewerage projects in the state. The concession period for PPP projects could be as high as 30 years. GoR also commits other financial incentives for PPP projects viz- (i) land shall be given for STPs as per government rules on lease, (ii) 50% concession on VAT, (iii) exemption on excise and customs duty on certain condition, (iv) 50% exemption on electricity duty for seven years.

[22] Central Public health and Environmental Engineering Organization, Ministry of Urban Development, GoI.

Work programme

Increasing Financial Flows for Urban Sanitation

Case study

eThekwini,Durban, South Africa

Prepared by:

Neil Alastair Macleod

World Water Council Project: Increasing Financial Flows for Sanitation

1. Background information on South Africa

1.1 Social, political and economic data

South Africa has a population of 56 million people, with 65% living in urban areas and 35% in rural communities. 55% of the population live below the South African Poverty Datum of R1000 per month ($75 per month or $2.50 per day). The official unemployment rate is 27,7%. If one includes people who have stopped looking for work, this figure rises to 36.6%.

The current GDP growth rate is under 1% and two of the three major rating agencies have recently relegated South Africa's credit rating to junk status.

1.2 Constitutional structure

South Africa is a constitutional democracy, within a unitary structure, with three 'spheres' of government: national, provincial and local. The word 'tiers' is deliberately avoided as the Constitution clearly allocates functions to the various spheres of government which then work collaboratively to achieve the policies and objectives set by national government. All taxes are collected at the national level. Municipal property rates charges and tariffs for the provision of municipal services, including water and sanitation, are set at the Local government level. Each sphere of government has legislative and administrative powers for the functions delegated to it by the Constitution.

There are three categories of Local government in terms of the Constitution:

- Single tier Category A municipalities with exclusive executive and legislative authority in their area
- Two-tier local government in Category B and C municipalities, where a Category C municipality shares jurisdiction with a number of Category B municipalities

There are 8 Metropolitan (category A), 44 District (category C) and 204 Local (category B) municipalities, with the Local municipalities being located within district municipalities. The number of category B municipalities has declined from 230 in 1996 to 204 in 2017, as a result of the re-demarcation of municipal boundaries to create viable municipalities.

1.3 National water and sanitation data

Using data from the WHO/UNICEF Joint Monitoring Programme 2017 report[1], coverage for water and sanitation in South Africa, at the basic level or better, is as follows:

Sanitation; 73% national coverage, with 69% in rural areas and 76% in urban areas

Water ; 85% national coverage, with 63% in rural areas and 97% in urban areas

[1]Progress on drinking water, sanitation and hygiene: 2017 update and SDG baselines. Geneva: World Health Organization (WHO) and the United Nations Children's Fund (UNICEF), 2017

1.3 Institutional responsibility for sanitation provision

In South Africa, the national Department of Water and Sanitation is the custodian of South Africa's water resources and is primarily responsible for the formulation and implementation of policy for and the regulation of the water and sanitation sectors. Policy directives are issued in the form of regulations published in terms of the Water Services Act (Act 108 of 1997) and the National Water Act (Act 36 of 1998). The regulations published to date cover a wide range of issues, including minimum standards for the provision of services, the structure of tariffs and licensing procedures. Provincial government has no direct involvement in the provision of water and sanitation services.

The Water Services Act (Act 108 of 1997) introduced the concepts of Water Services Authority (WSA) and Water Services Provider (WSP). A WSA is any municipality that is allocated responsibility, by the Minister for Local Government, for ensuring access to water and sanitation services and a WSP is any juristic person who provides water and sanitation services to consumers. All metropolitan municipalities are WSA's but not all District and Local municipalities. Currently there are 147 municipal WSA's out of the total of 256 municipalities.

In effect this means that national government is responsible for ensuring an adequate supply of bulk water, for allocating the available water to various uses (including the environment) through the issuing of water use licenses and for ensuring the safe return of treated effluent to the environment through licenses which prescribe maximum effluent discharge parameters. Local governments that are WSA's are responsible for the provision of water and sanitation services within their municipal area. The role of Provincial Government is to provide support to municipalities that are not able to meet their Constitutional obligations.

1.4 National financing mechanisms for water and sanitation

South Africa was one of the first countries to introduce a rights based approach to the provision of water and sanitation services. Section 24 of the Constitution of the Republic of South Africa (Act 108 of 1996) states that 'everyone has the right to an environment that is not harmful to their health or well-being…. through measures that prevent pollution and ecological degradation' and Section 24 states that 'everyone has the right to have access to sufficient food and water'.

Any policy decision that is imposed by one sphere of government on another and that has financial implications, has to be accompanied by adequate fiscal transfers.

In 2000 the national government announced the introduction of a free basic services policy to ensure the provision of basic services to households that could not afford to pay for them. This was reinforced by the government White Paper on Basic Household Sanitation (2001) which stated that the poor should be given access to a free basic level of service.

Division of Revenue Act (Act 3 of 2017) currently allocates 9.1% of nationally raised revenue to local government for the provision of basic services. The budgeted total national expenditure for the 2017/18 fiscal year is ZAR1409.2 billion. In the current fiscal year, funding for the roll out of water and sanitation infrastructure in municipalities has been prioritised. The transfers to Local government are in the form of an Equitable Share which is intended to subsidise the monthly cost of providing basic services (water, sanitation, electricity and refuse collection) to poor families. A capital subsidy or conditional grant is also transferred to WSA's to subsidise the capital cost of providing basic infrastructure. The details are shown in the table below (with all values in ZAR millions, where ZAR 13.50 equals USD 1.

Table W1.20 Transfers to local government

R million	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
		Outcome		Revised estimate	Medium-term estimates		
Direct transfers	**82 595**	**87 570**	**98 338**	**103 255**	**112 524**	**121 470**	**130 477**
Equitable share and related[1]	**38 964**	**41 592**	**49 367**	**51 169**	**57 012**	**62 732**	**67 473**
Equitable share formula[2]	34 268	36 512	44 211	45 719	51 326	56 723	61 136
RSC levy replacement	3 930	4 146	4 337	4 567	4 795	5 073	5 357
Support for councillor remuneration and ward committees	766	935	819	883	891	936	981
General fuel levy sharing with metros	**9 613**	**10 190**	**10 659**	**11 224**	**11 785**	**12 469**	**13 167**
Conditional grants	**34 018**	**35 788**	**38 313**	**40 863**	**43 727**	**46 270**	**49 836**
Infrastructure	32 412	34 167	36 866	39 120	41 777	44 274	47 775
Capacity building and other	1 606	1 621	1 446	1 743	1 950	1 995	2 062
Indirect transfers	**5 945**	**8 250**	**10 370**	**7 824**	**7 338**	**7 596**	**8 015**
Infrastructure	5 705	7 998	10 119	7 740	7 235	7 480	7 893
Capacity building and other	240	252	251	84	103	115	122
Total	**88 541**	**95 820**	**108 708**	**111 079**	**119 862**	**129 066**	**138 491**

1. Excludes provisional allocations

2. Outcome and revised estimate figures for the equitable share reflect amounts transferred after funds have been withheld to offset underspending by municipalities on conditional grants. Roll-over funds are reflected in the year in which they were transferred

Source: National Treasury

The formula used to determine the allocation of the equitable share to each municipality is based primarily on 2011 census data for population and poverty, using a household income of R2300 per month (USD 170) to define a poor family. For the capital subsidy, the cost of providing a VIP toilet and the sanitation backlog, as determined through the 2011 census, is used to determine the allocation to each municipality.

This means if the census data is inaccurate, for example because of the movement of poor families between municipalities, or if the level of service provided by a municipality costs more than that determined by National Treasury, then the subsidy in terms of the Division of Revenue allocation is insufficient. This latter factor is particularly relevant in rural areas, where the density of development drives up construction costs, or in undulating terrain where access is more difficult than in flat terrain.

Table W1.22 below shows the allocation of the Equitable Share operating subsidy to the various basic services, with all values in ZAR millions:

Table W1.22 Amounts per basic service allocated through the local government equitable share, 2017/18

	Allocation per household below affordability threshold (R per month)			Total allocation per service (R million)
	Operations	Maintenance	Total	
Energy	68.52	7.61	76.13	8 725
Water	104.99	11.67	116.66	13 369
Sanitation	81.39	9.04	90.43	10 364
Refuse	68.23	7.58	75.81	8 688
Total basic services	**323.13**	**35.90**	**359.04**	**41 147**

Source: National Treasury

The capital subsidies for the 2017/18 fiscal year are shown in Table W1.23 below:

Table W1.23 Infrastructure grants to local government

R million	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19	2019/20
	Outcome			Revised estimate	Medium-term estimates		
Direct transfers	**32 412**	**34 167**	**36 866**	**39 120**	**41 777**	**44 274**	**47 775**
Municipal infrastructure	14 224	14 745	14 956	14 914	15 891	16 788	17 734
Water services infrastructure	1 129	1 051	2 305	2 845	3 329	3 559	3 757
Urban settlements development	9 077	10 285	10 554	10 839	11 382	11 956	12 631
Integrated national electrification programme	1 635	1 105	1 980	1 946	2 087	2 204	3 328
Public transport network	5 550	5 871	5 953	5 593	6 160	6 583	6 962
Neighbourhood development partnership	586	590	584	624	663	702	741
Integrated city development	40	255	251	267	292	309	326
Regional bulk infrastructure	–	–	–	1 850	1 865	2 060	2 175
Rural roads asset management systems	52	75	97	102	107	114	120
Municipal disaster recovery	118	190	186	140	–	–	–
Indirect transfers	**5 705**	**7 998**	**10 119**	**7 740**	**7 235**	**7 480**	**7 893**
Integrated national electrification programme	2 141	2 948	3 613	3 526	3 846	3 962	4 182
Neighbourhood development partnership	55	30	13	22	28	29	31
Regional bulk infrastructure	3 261	4 005	4 858	3 479	2 774	2 881	3 037
Water services infrastructure	247	732	659	362	587	608	642
Bucket eradication programme	–	282	975	350	–	–	–
Total	**38 117**	**42 165**	**46 985**	**46 859**	**49 012**	**51 755**	**55 668**

Source: National Treasury

National Treasury further breaks down the capital subsidy allocation by basic service as shown in Table W1.24 below:

Table W1.24 Municipal infrastructure grant allocations per sector

Municipal infrastructure grant (formula)	Component weights	Value of component 2017/18 (R millions)	Proportion of municipal infrastructure grant per sector
B-component	**75.0%**	**10 846**	**68.3%**
Water and sanitation	72.0%	7 809	49.1%
Roads	23.0%	2 495	15.7%
Other	5.0%	542	3.4%
P-component	**15.0%**	**2 169**	**13.7%**
Sports	33.3%	722	4.5%
E-component	**5.0%**	**723**	**4.6%**
N-component	**5.0%**	**723**	**4.6%**
Constant		**1 130**	**7.1%**
Ring-fenced funding for sport infrastructure		**300**	**1.9%**
Total		**15 891**	**100.0%**

Source: National Treasury

1.5 National policy on the definition of free basic sanitation services and tariff structures

In order to provide for fiscal transfers and to meet the Constitutional obligation to provide affordable basic water and sanitation services, the Department of Water and Sanitation has issued a number of regulations and policy statements since 1994.

The current situation may be summarised as follows:

Section 3 of the Water Services Act states that;

(1) Everyone has a right of access to a basic water supply and basic sanitation
(2) Every water services institution must take reasonable measure to realise these rights

A basic sanitation service is defined in the Compulsory National Standards, published in terms of the Water Services Act, as a system for disposing of human excreta, household waste water and refuse, which is acceptable and affordable to the users, safe, hygienic and easily accessible and which does not have an unacceptable impact on the environment.

Tariff structures for sanitation are defined by the Norms and Standards regulations published in terms of the Water Services Act as follows:

A WSA must consider the right of access to a basic water supply and the right of access to basic sanitation, when determining which water services tariffs are to be subsidised.

A tariff set by a WSA for the provision of sanitation services to a household must –

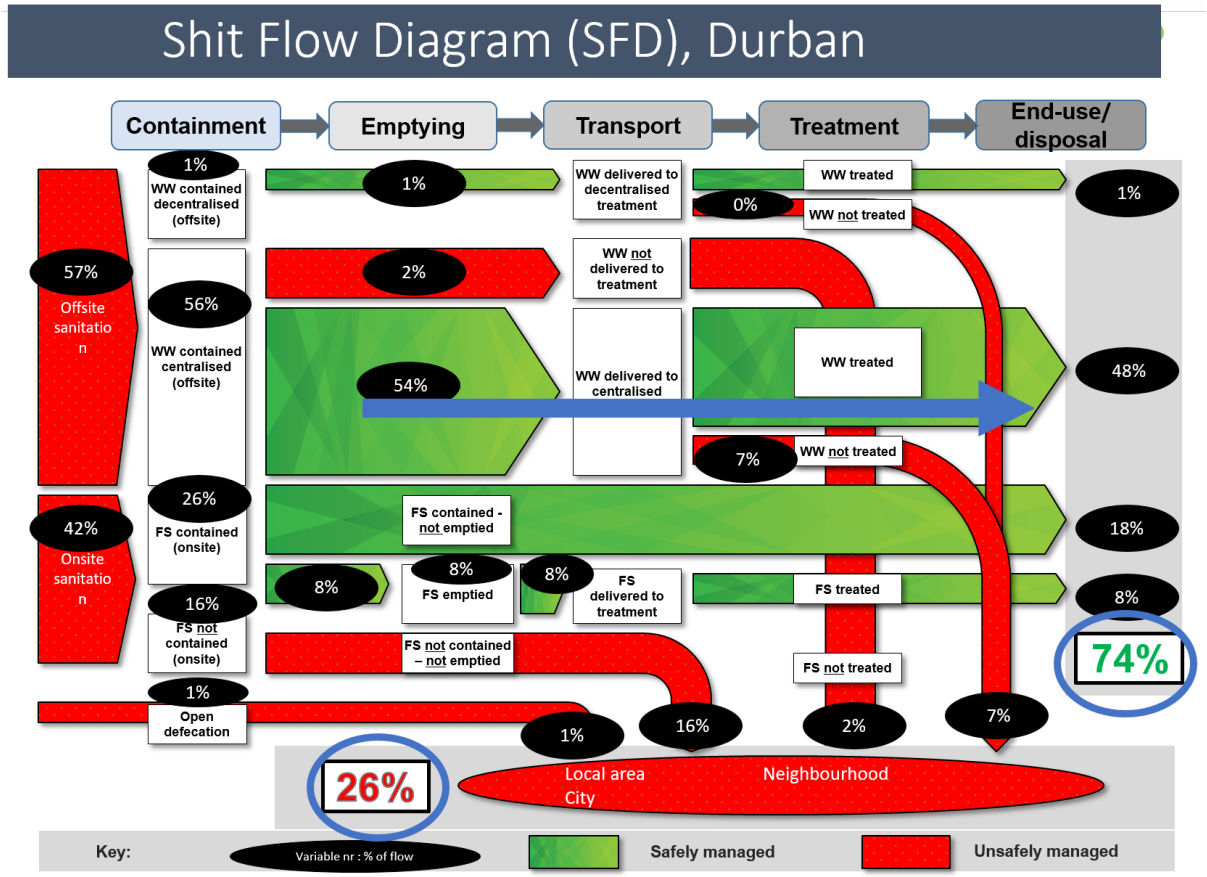
(a) Support the viability and sustainability of sanitation services to the poor
(b) Recognise the significant public health benefit of efficient and sustainable sanitation services and,
(c) Discourage usage practices that may degrade the natural environment

2. Background information on Durban (eThekwini municipality)

2.1 Social, political and economic data

The Durban metropolitan area (the eThekwini municipality) covers an area of 2555 km² and has a population of 3.7 million people, with an annual population growth of more than 1% per year over the past 10 years. It is the third largest municipality in South Africa after Johannesburg and Cape Town. There are 945910 households within the municipal area. 63% of the population is below the age of 35 years. In 2000 approximately 30% of the population

lived in rural and per-urban areas, with no access to municipal water and sanitation services. The situation has changed considerably since then, with 97% of all households having access to potable water and 83% of all households having access to a VIP, Urine Diverting Dry Toilet (UDDT), or a flush toilet.



52% of households have a disposable income of less than ZAR 1500 (USD 110) per month, after taxes and deductions. The eThekwini municipality has the second largest number of people living in poverty in South Africa.

The eThekwini region is the economic powerhouse of the province of KwaZulu-Natal and also makes a significant contribution to the South African economy[2]. It is a vital link between the regional economies of Pietermaritzburg (and onward to Johannesburg) and Richards Bay, and ranks as the second largest economic centre with the second most significant industrial region in South Africa.

[2] eThekwini municipality Integrated Development Plan 2017/18

EThekwini's share of national GDP in 2015 was 9.3% (ZAR279 billion in constant 2010 prices)

2.2 Differentiators that make eThekwini different

Currently the municipality has a long term credit rating of AA, which makes it possible to borrow from the market at competitive interest rates. This is comparable only to Cape Town and Johannesburg. Few South African municipalities are able to borrow on the capital markets and most rely heavily on government subsidies for both capital and operating expenditure.

Because of strict credit controls coupled with a benevolent policy of providing free basic services for poor families, the collection of billed revenue for the water and sanitation services has exceeded 100% since 2013. This is possible through the collection of previous years' outstanding revenue. The then Durban municipality was the first to introduce a rights based approach to the provision of basic services in 1997, by setting the tariff for the first 6m³ of water consumed each month, to zero. By catering for the basic needs of the poor it was then possible to take strong action against those who did not pay – by restricting daily consumption through a device known as a flow limiter installed in the connection of customers in arrears. This policy of a free basic service to poor families was extended to sanitation

in 2009, with the monthly usage charge for the sewerage service to domestic customers based on the water consumption.

The tribal areas within the municipal area are located on what is known as Ingonyama Trust land. Within these areas there is both a tribal authority and an elected councillor in each voting ward. Effectively the municipal bylaws are applied differently in these tribal authority areas and land tenure is informal in nature, with no title deeds, formally registered road reserves or servitudes covering services. Land is allocated by the local chief without any reference to a formal town planning scheme and houses are constructed without approved building plans. As a result, providing services in these areas is difficult, particularly when structures are built over existing infrastructure. These tribal areas and the lack of formal tenure are peculiar to particular municipalities, with a large part of the eThekwini municipal area being tribal authority land.

3. Detailed information on eThekwini Water and Sanitation

3.1 The nature of the Water Service Provider

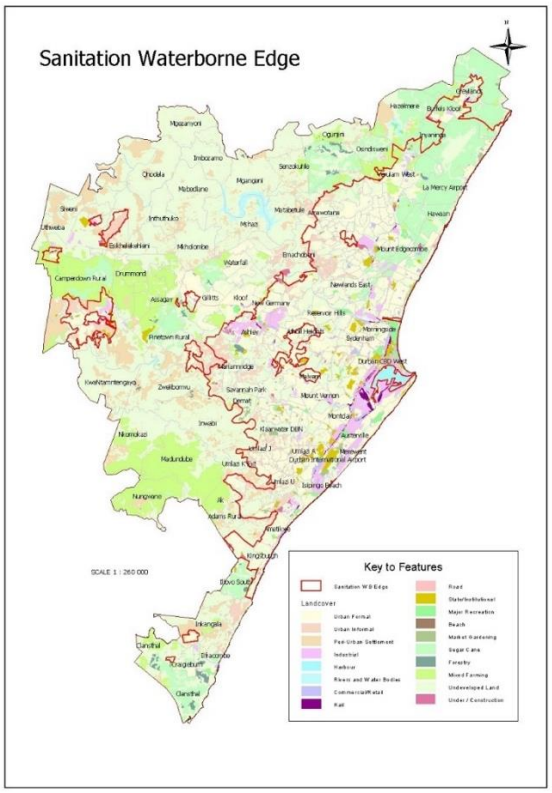
EThekwini Water and Sanitation is the WSP for the eThekwini municipality that covers greater Durban.

The accounts of both the water service and the sanitation service are ring fenced and audited separately from the other municipal accounts. This separation is to ensure that the tariffs correctly reflect the cost of providing each service and that any cross-subsidisation is transparent. It operates as a trading undertaking, providing water and sanitation services and recovering its operating costs from tariffs and the Equitable Share operating subsidy from national government.

The revenue budget for water in the 2017/18 financial year is ZAR 6.5 billion and for sanitation, ZAR 1.9 billion. The budget for the sanitation service is far lower than that for the water service because the piped sewer network is approximately half the length of the water distribution network. The unredeemed loans for the sanitation service are far lower than those of the water service, as a result of the relative average age of the assets in the two services. Most of the large sewage treatment works and associated network were constructed in the late 1960's and the associated loans have been fully redeemed.

As an aside, to provide a piped sewerage network to every domestic customer that is not connected to the grid would cost an estimated ZAR 65 billion (USD 4.8 billion). This cost includes the piped sewer network needed, additional sewage treatment plants and upsizing of the water network to meet the additional demand for water for toilet flushing. Research by the Water Research Commission of South Africa determined that toilet flushing accounts for 30% of in-house water consumption.

As a result EWS introduced the sanitation edge concept. In terms of this approach, all properties located in sufficiently dense developed areas can be affordably sewered and those in less densely developed areas beyond the sanitation edge can only be affordably serviced using off-grid sanitation options. The diagram below illustrates this concept, with all properties within the red lines serviced by a piped sewerage network:



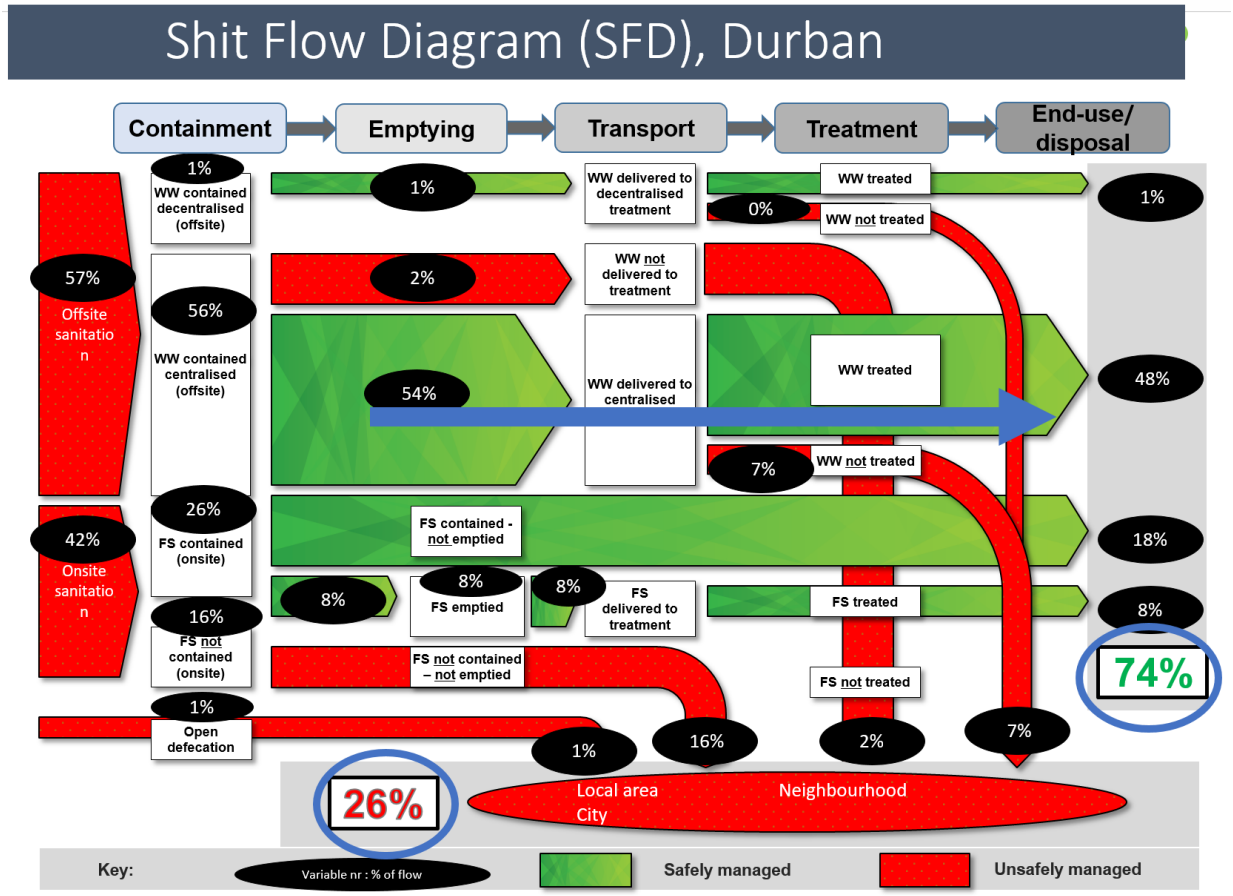
The provision of a basic water service to all residents began in 1996, at the formation of EWS as the metropolitan water services provider. In 2000 the responsibility for the sewerage network was transferred to EWS. However motivating for capital funding for sanitation in the early years proved to be extremely difficult until the cholera outbreak in rural communities in the eThekwini municipal area.

3.2 Sanitation service levels for domestic customers in eThekwini

Based on the latest household estimate of 945910 families and using the municipal average household size of 3.7 people per family, the service levels can be categorised as follows, using the most recent data available;

- Household connections to sewers with good wastewater treatment; 480000 households or 1.78 million people (50.5%)
- Household connections to sewers with no wastewater treatment or substandard wastewater treatment; 100000 households or 370 000 people with informal onsite sanitation with a mix living in urban and rural communities. (10.5%)
- Septic tanks with regulated emptying services; 104000 households or 385584 people (11%)
- Septic tanks with unregulated or no emptying services; nil
- Other on-site toilets with regulated emptying services; 85000 Urine Diverting Dry Toilets (UDDT's) and 35000 Ventilated Improved Pits (VIP's). This equates to 120000 households with an average of 6 people per household for rural and informal areas, which equates to a total of 720 000 people served.(12.5%)
- Other on-site toilets with unregulated or no emptying services; approximately 140000 which equates to around 500000 people (14.8%). This number changes daily with the inward migration of families
- Public, community or shared toilets with sewers or regulated emptying services; 1500 shared facilities (Community Ablution Blocks with 12 toilets per installation, with each installation serving a maximum of 75 families). These communal facilities are connected to the piped sewerage network.
- Public, community or shared toilets with unregulated or no emptying services; nil
- No sanitation, i.e. open defecation; less than 1% - see SFD below

The sanitation situation can best be illustrated by the following SFD for all sewage generated by both domestic and ICI customers:



3.2 Sanitation service levels for ICI customers in eThekwini

The breakdown of sanitation service levels for Industrial, commercial and Institutional customers (ICI) is as follows:

- Connections to sewers with good wastewater treatment; 93%
- Connections to sewers with no wastewater treatment or substandard wastewater treatment; 0%
- Septic tanks with regulated emptying services; 5%
- Septic tanks with unregulated or no emptying services; nil
- Other on-site toilets with regulated emptying services; 2%
- Other on-site toilets with unregulated or no emptying services; nil
- No sanitation, i.e. people must use other toilets or open defecation; nil

3.4 Historical trends in sanitation

- The increase in numbers or percentages of people served; 85000 Urine Diversion toilets built in the last 15 years for rural communities and 1500 Community Ablution Blocks for informal households in the last 8 years. This equates to approximately 1.3 million additional people served in this period.

- Changes in the types of sanitation services; In 2000, 1 million people did not have access to sanitation services. As the water and sanitation system has expanded, this has acted as a magnet to families living in communities without access to these services and has contributed to the rapid population growth in the municipal area. VIP toilets were inherited from other supply authorities when the new municipality was created. A policy decision was taken to move to constructing UDDT's for individual properties and community ablution blocks as a shared facility in dense shack areas where other sanitation options were impractical to construct or service.

- Changes in the quality of wastewater treatment; According to Durban's SFD 74% of all sewage effluent is safely managed. Annual Green Drop auditing program audits by the national regulator have also contributed to the improved treatment of wastewater.

- Changes in the regulation of emptying services; consolidated regulations and policies have been introduced since 2000 through the Sewage Disposal Bylaws and municipal Council policy decisions. These policies are available on the municipal web site in an 80 page document.

- Changes in people's perceptions about sanitation; Customer satisfaction surveys show an 80% satisfaction with the level of sanitation services that are provided. (UKZN Research). This has been the result of the creation of a dedicated customer management division, the publication of a Customer Charter and a Service Levels Standards document. In addition regular meetings are held with customers in Focus Groups and User Platforms, to improve customer relations. A toll free call centre operates 24 hours a day to attend to faults, with response times in terms of the service level standards set.

- Changes in the political importance of sanitation; the recently introduced national policy recognizes the importance of faecal Sludge management. There is now a dedicated national water and sanitation Ministry, whereas before water and environmental affairs were in one Ministry and sanitation was located in the Housing Ministry.

3.5 The plans to achieve 100% coverage with safely managed sanitation by 2030

There is a master plan in place to provide sanitation. However ongoing and increasing levels of inward migration create a moving target. Research and trials into innovative sanitation solutions, primarily through a research partnership with the Pollution Research Group at the University of KwaZulu-Natal have been in place for almost 10 years, where EWS contributes in excess of ZAR 2.5 million (USD 185 000) a year to fund post graduate applied research into sanitation related topics.

The plan recognizes that a phased and differentiated approach to the provision of sanitation services is needed. It also recognizes that flush toilets linked to conventional activated sludge treatment works are not sustainable and that the toilets of the future will not require flushing. Equally, with the advent of viable nutrient recovery at source, sewage treatment technology and sewerage network designs will change. Sewers will be smaller (because flows will reduce by up to 30% and will contain minimal solids) and nutrient removable at treatment works will no longer be needed. This will mean significant reductions in energy and overall treatment costs.

3.6 Financing of sanitation in eThekwini

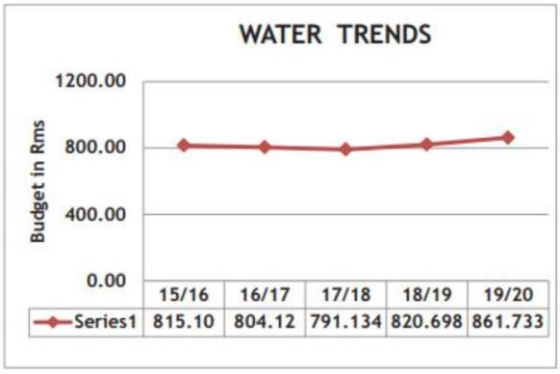
The main types of sanitation service provided across the municipal area are:

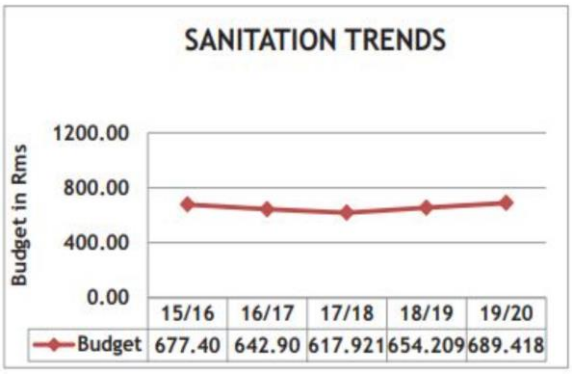
- waterborne sanitation linked to a piped network and convention sewage treatment
- UDDT's in rural and low development density communities, linked to an emptying and faecal sludge processing program. The UDDT's are emptied once every two years as a free basic service.
- Community Ablution Blocks providing toilet, shower and clothes washing facilities to dense shack areas. The CAB's are connected to the sewerage network.
- VIP toilets confined to rural communities added to the municipal area in 2000 (no longer constructed as a matter of policy). The VIP's are emptied once every five years as a free basic service.

The operating and capital costs are funded as follows:

EWS operates using a three year rolling expenditure forecast. The capital expenditure on water in the current financial year is ZAR 776 million and ZAR 605 million on sanitation. The graphs below show the actual and forecast capital expenditure for a 5 year period for water and sanitation. To meet part of the costs of providing access to basic services, the national government has transferred ZAR 371.4 million to cover their estimate of the costs to provide access to a basic water service and ZAR 414.3 million to fund access to a basic sanitation service. The remainder of the capital budget is funded from private sector bank loans

In order to fund the operating expenses to provide free basic services to poor families, the Equitable Share operating subsidy from national government in the current financial year is ZAR 786.5 million for water and ZAR 310.5 million for sanitation. This represents 12% of the water service operating budget and 16.3% of the sanitation service operating budget. The remainder to the operating costs are funded by tariffs paid by customers, with internal subsidies from higher volume users of services, to low volume users.





The source of funding for each service option is as follows:

Service level	Operating costs			Capital costs	
	Tariffs	ES subsidy	Internal cross subsidy	Bank loans	Government subsidy
Water- borne sewerage	√		√	√	√
UDDT's		√	√	√	√
CAB's		√	√	√	√
VIP's		√	√	-	-

EWS sanitation funding sources for operating and capital expenditure

The tariffs for the provision of a sanitation service to domestic customers with a sewer connection is based on a varying percentage of the water consumption. This recognizes that a higher percentage of the basic water consumption goes to sewer and as water consumption rises it is used mainly outside the dwelling and so does not enter the sewerage system. The structure of the tariff mirrors that of the water tariff and has been designed using Ramsay pricing theory which is intended to produce a welfare maximizing outcome.

Families who use a CAB, UDDT or VIP toilet are provided with access to the basic service at no charge. The cost of emptying a UDDT toilet every two years and a VIP toilet every five years is not charged to poor families.

The following is an extract from the report that introduced volumetric sewerage charges in 2010 for poor families connected to a piped waterborne sewerage network:

Flow volumes of sewage from the various development types was determined as follows;

- For domestic units in solely residential blocks which are 3 stories and above opportunities to use water for purposes other than where the resulting "waste water" is discharged to the sewerage system is considerably limited. Hence the fraction of water usage which is discharged to sewer can be fairly assessed as 90%.
- For non-domestic premises e.g. where the water usage is for business, commercial, mixed commercial/residential and industrial purposes, a fraction of water usage discharged to sewer can be similarly assessed as 90%.
- For single residential properties used solely for domestic purposes cognisance was taken of a Water Research Commission report - Water Consumption Levels in Selected South African Cities - WRC 1536/1/07 - dated November 2007. This was a large study using some 2,7 million water meter records across Johannesburg, Tshwane, Ekurhuleni, Cape Town and 151 cities and towns which, together with other research (by Tshwane Municipality and others) identified a sliding scale of the fraction of water discharged to sewer , the fraction decreasing as the volume of water usage increases. This study demonstrated that, as the volume of water usage increases, more and more water is used for purposes such as watering gardens, car washing etc. and other uses where the resulting “waste water“ is not discharged to the sewerage system.

Hence, by considering various iterations, a sliding scale of the fraction of water supply returned to the sewerage system for single residential units was developed such that the total volume now assessed as discharged to the sewer reticulation matched the volumes received at the sewage treatment works.

The resulting fractions of water consumption returned to sewer which reflect the water usage patterns applicable for eThekwini, are listed below:

- Single Residential properties

Water Consumption	Fraction of water to sewage
0 – 9 kl	95%
9 – 25 kl	75%
25 – 30 kl	75%
30 – 45 kl	65%
>45 kl	60%

i.e. A property which uses 32kl of water per month would be assessed as discharging the following volume of sewage:

Tariff Band m³/month	Water Consumption m³	Fraction of Water to Sewage	Sewage Volume m³
0 - 9	9	95%	8.55
9 – 25	16	75%	12.00
25 - 30	5	75%	3.75
30 - 45	2	65%	1.30
>45	0	60%	0.00

Total	32	kl	25.60	kl

- Residential Units in blocks 3 stories and above:

  Fraction of water returned to sewer = 90%

- Business, Commercial and Industrial properties

  Fraction of water returned to sewer = 90 %

Those premises which discharge a trade effluent (for which a separate charge is raised) will continue to be assessed on an individual basis.

The next challenge was to determine which families are poor and therefore qualify for the free basic service. Poor families do not pay for the first 8.55 m³ of sewage discharged to sewer. Research enabled EWS to determine that most families living in houses with a municipal property tax value of ZAR 250000 or less, were poor in terms of the national definition of poverty described above.

Provision is made in the policy for families living on properties with a higher value to apply for a relaxation. To do so requires a visit by a municipal social worker to the family and formal support by the ward councilor. Provision is also made in the policy for customers to reduce the percentage deemed to enter the sewer. Most often this is linked to properties which operate nurseries or very large irrigated gardens. Again a rigorous formal process, involving sub-metering on the property and a formal application, is involved.

4. Analysis

4.1 Major financing gaps and obstacles to urban sanitation in South Africa

Until recently the major obstacle to urban sanitation was a fixation on the part of politicians at all levels of government that flushing toilets were the only acceptable sanitation option. The recently published national sanitation policy document and pronouncements by the minister of Water and Sanitation that “it is not about flushing” have resulted in a more realistic and affordable approach.

However the co-ordination between the national Housing ministry (the ministry for Human Settlements) and the Ministry for Water and Sanitation is poor, resulting in houses for poor families being erected in areas where the bulk sanitation infrastructure is not able to cope with the additional sewage flows. No thought has been given to the funding for this infrastructure and so pollution of the environment results.

In the eThekwini municipality, the Spatial Development Plan and the Integrated Development Plan do not provide clear direction as to where development is to take place and how the provision of services is to be coordinated to reduce wasted or badly timed investments.

The Equitable Share operating subsidy is what is termed an unconditional grant. In terms of the Constitution, there has to be a sharing of revenue raised by the national fiscus, across the spheres of government. The national government cannot dictate how this money is spent by municipalities. As a result it is often redirected to fund initiatives unrelated to the provision of basic services. This is made worse by the fact that many of the local municipalities (the so-called category B municipalities) do not have any way of determining charges to individual customers for water consumption or sewage disposal. Meters are not installed and accounts are not raised, or if they are then credit control is poor. Revenue collection rates below 60% are not uncommon. This results in a dependency on national subsidies. By way of a contrast, the payment level for water and sanitation services in EWS has been at 100% since 2013.

Capital grants for the provision of infrastructure to serve poor families are regularly unspent in any financial year in the majority of municipalities. This is primarily because of a lack of professional skills in municipalities to design projects, prepare contract documents, issue tenders and then manage construction and the payment of contractors and consultants. Funds not spent in any year cannot be ‘rolled over’ to the following financial year and are lost.

Because few municipalities have strong balance sheets, most are unable to borrow on the capital market and are therefore wholly dependent on capital subsidies from national government to finance infrastructure projects.

Once projects have been constructed, poor asset management and a lack of adequately trained operators and maintenance staff has resulted in a scenario where assets are constructed, neglected or poorly maintained, abandoned and then recapitalized. Equally any sanitation solution that requires emptying of on-site storage at regular intervals, ceases to provide a service if the storage is not emptied and the family then returns to a situation of having no sanitation service.

Management of WSP's in South Africa is generally weak, with competent management in a minority of municipal entities. Many attempts have been made over the past 10 years to institute a management development programme for existing and aspiring WSP managers, but without success. As a result, asset management, revenue management and customer management are generally poor and this results in poor performance in all these areas. This has a knock on effect when it comes to raising capital.

4.2 Financial mechanisms to increase the flow of funds into sanitation

Improving management capabilities across the water and sanitation utilities would have a significant impact in the medium term on most municipality's ability to raise funds for both capital and operating expenditure. This would need to be coupled with the introduction of effective systems to manage revenue, customers and assets. The management contract option was used in Johannesburg from 2000 to 2005 to good effect and could be repeated in many other municipalities in the country. Where scale does not make this approach realistic, consideration could be given to using management contracts to manage a group of WSP's that are close geographically. Management contracts are viewed with less suspicion by trade unions, because they are relatively short term in nature and do not involved the transfer of assets to the private sector.

Having said this, a BOT contract to part finance, build and then operate a sewage treatment plant for 20 years to produce high quality water, was awarded by EWS to a private company with the support of the local trade unions. This option is again being considered in South Africa for services that are not directly customer facing.

4.3 Innovative and non-traditional funding instruments

In order to demonstrate the economic and financial benefits of sanitation, EWS has been party to a number of research initiatives. EWS and the WHO, co-funded research into the health benefits of sanitation (research by Renuka Lutchminarayan, 2007). In addition Pegram,et al, examined the direct medical costs of diarrhea and dysentery in South Africa and KwaZulu-Natal in particular (1998). A cholera outbreak in 2002 raised the importance of water and sanitation service spend as a contributor to improved public health and was a significant factor in influencing policy makers to increase funding for sewerage infrastructure.

Over the past 10 years innovations in the processing of faecal sludge to recover nutrients has been a focus area in EWS. Initially this was confined to the development of the LADEPA process which processes VIP toilet sludge into pathogen free, odourless, fertilizer pellets. The pit toilet sludge is loaded into a screw press which separates the garbage from the faecal matter and then the sludge is heated and dried on a conveyor belt system to produce the pellets. Currently the fertilizer is used by the municipal parks department, but the intention is to market and sell the product once safety standards and testing methodologies have been developed

In a second initiative a 200m long algal raceway pilot plant has been constructed at a regional sewage treatment plant in Kingsburgh, to grow specific algae strains which are harvested and which can be processed to produce biodiesel and a residual biomass. This technology is gaining ground internationally and appears to be most advanced in the USA. The major obstacles have been achieving a positive energy balance in the production process and a cost price that is competitive with oil based diesel.

Thirdly systems to process urine to recover phosphorous and nitrogen at scale from the urine diverting toilets and multi-storey buildings are being refined and taken to scale. Private fertilizer companies have expressed interest in purchasing these products, but production volumes will have to be increased to make it a viable proposition.

Fourthly a partnership between EWS and a company called Biocycle to process faecal sludge from UDDT's using black soldier fly larvae, has been initiated. The facility has been constructed and plant optimization trials are underway. A market exists for the protein rich larvae and the organic biomass, as a constituent of animal food. The ultimate objective is to certify these products as fit for human use.

These concepts fall into the circular economy for sanitation thinking and in the medium term have realistic and meaningful revenue implications.

4.4 Changes in national policy needed to facilitate an increased flow of funds into sanitation

Credit management is an issue in South Africa generally as the political support for taking action against those making illegal connections or those who do not pay for water consumed, is rare. While official policy documents, particularly from national Treasury, require municipal service providers to collect all revenue due to them, in reality politically driven opposition to any action to ensure payment for services is commonplace. This opposition takes the form of community protests or public meetings where officials are criticized for credit management activities even though they comply with approved policies.

What is needed is a form of social compact which makes illegal connections and non- payment for excessive usage socially unacceptable. If municipalities are able to increase cash flows it has the benefits of improved revenue, a stronger balance sheet and in time an improved ability to raise capital through bank loans.

Similarly, a policy to encourage affordable sanitation technologies has recently been announced by government, but this has not yet filtered down to the municipal level.

4.5 The likelihood of increased financial flows into sanitation

With the worsening economic situation in South Africa, increased subsidies from national government are unlikely. If management of public sector utilities can be improved then cash flows will improve through increased billing and collection rates. It will still take a number of years before an adequate track record is created to give banks comfort that loans will be repaid. The financial situation of most municipalities is so weak that banks will not lend at any interest rate.

4.6 What arguments should the WWC communicate and to whom?

Most arguments in support of improving sanitation and the funding of sanitation have been made with limited success. Funding for the provision of water services is far easier to motivate for than funding for sanitation. Given that sanitation is a public good, policy makers and practitioners in the sector should be the target audience. Most of these actors are operating in crisis mode and are not able to devote time to much other that the current crisis before them. This means that voluminous documents, streams of emails, etc, are ineffective as communication channels.

Taking management out of their workplace for no more than a few days at a time appears to be most effective. These out of office interventions can be used to facilitate learning visits to municipalities, provide opportunities, for face to face interactions with peers or experts in a particular field and for training.

The use of benchmarking in South Africa has enabled WSA management to learn from each other and thereby start to realise what has to be done to improve performance. However this approach has proved to be less effective in reaching policy makers.

The suggested key messages are as follows:

- The provision of water and sanitation must be integrated at both a policy and service delivery level
- Waterborne sanitation used piped sewers and centralized sewage treatment is generally not affordable in developing country cities and impractical in dense urban slums
- Developments in sanitation technology and waterless toilets have the potential to make conventional sewerage systems redundant in the medium term, with a resultant overinvestment in sanitation infrastructure
- Tariffs must be designed to be welfare maximizing and affordable to the poor
- SFD's are a valuable tool to target investment for optimum impact
- The choice of sanitation technology determines the affordability of the option to both the utility and the customers. In any economic analysis, the externalities should not be excluded in determining affordability to the utility.
- Thought needs to be given to making both access and consumption charges affordable.
- Compliance with the UN declaration of the human right to water and sanitation means that a basic service may need to be charged to customers at below cost or even zero cost. In turn this makes debt management more effective as strong credit control can be introduced for customers using more than the basic amount
- Sewage should be seen as a resource and as a source of plant nutrients and energy and not as waste to be disposed of

Work programme

Increasing Financial Flows for Urban Sanitation

Case study

Dakar, Senegal

Prepared by:

Moustapha SENE

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Abbreviations	Meanings
AAAS	Sanitation Emptiers Association in Senegal
ADB	African Development Bank
AFD	French Development Agency
ANSD	Agency of Statistic and Demography of Senegal
BADEA	Arab Bank for Economic Development in Africa
BOAD	West African Development Bank
BMGF	Bill and Melinda Gates Foundation
CAPEX	Capital Expenditure
DA	Direction of Sanitation
DGPRE	Direction of Water Resources Management and Planning
EIB	European Investment Bank
EU	European Union
F.CFA	Currency for Senegal and others French speaking countries in West Africa (500 F.CFA= 1 USD approx.)
FS	Faecal Sludge
FSM	Faecal Sludge Management
FSTP	Faecal Sludge Treatment Plant
IDA	International Development Association
IDB	Islamic Development Bank
IPA	Innovations for Poverty Action
LDPS	Sectorial Development Policy Letter of Water and Sanitation
MDG	Millennium Development Goals
MHA	Ministry of Hydraulic and Sanitation
MWh	Megawatt per hour
NBED	National Bank of Economical Development
NGO	Non-governmental organization
OFOR	Office of rural wells or boreholes
OLAC	Office of Lakes and Rivers in Senegal
ONAS	National Office for Sanitation in Senegal
OP	Omni-Processor
OPEX	Operational Expenditure
O&M	Operation and Maintenance
OXFAM	Oxford Committee for Famine Relief
PSFSM	Program for the Structuring of the Faecal Sludge Market
PEPAM	Water and Sanitation Program for the Millennium
PPP	Public-Private Partnership
SDE	Senegalese Water Company
SDG	Sustainable Development Goals
SONES	National water company of Senegal
(UN- Habitat)	United Nations Human Settlements Programmes
WB	World Bank
WSA	Water and Sanitation for Africa
WWTP	Wastewater Treatment Plant

PART A: SHORT BACKGROUND ON THE COUNTRY

A.1.: Social, political and economical data at the national level

A.1.1.: Social

According to the census implemented in 2013, by the Agency of Statistic and Demography (ANSD), the total population of Senegal was 13 508,715 inhabitants, with 6,102,800 (45.1 %) and 7,405,975 (54.9%) living respectively in urban and rural areas. The Table 1 shows the population and average annual growth rate from 1988 to 2013 based on the results of the census. At the country level, the annual growth ratio (2013) was 2.5% versus 3.5% for urban and 1.7% for rural. Although, the population in rural is higher than urban, the total increase in urban areas, between 2022 to 2013, was more than 50 %.

Table 1: Population and Growth Ratio of the Republic of Senegal from 1976 to 2013

Years	1976	1988	2022	2013
Periods	-	1976-1988	1988-2002	2002-2013
Urban Population	1,713,295	2,653,943	4,008,965	6,102,800
Growth Ratio (%/year)	-	3.7	3.0	3.5
Rural population	3,284,590	4,242,865	5 849,517	7,405,915
Growth Ratio (%/year)		2.2	2.3	1.7
Total population	4,997,885	6,896,808	9,858,482	13,508,715
Growth Ratio (%/year)	-	2.7	2.5	2.5

Source: ANSD, Census 2013.

The total area of the country is 196,712 Km^2. As for the density of the population, Senegal has a value of 65 inhabitants per Km^2. With a poverty index of 46.7 %, the country has more women (50.1 %) than men (49.9 %). The rate of general literacy and the gross schools enrolments rate, respectively account for 52.1 % and 52.9 % (ANSD, 2013).

A.1.2.: Politics

The Republic of Senegal is a country located in West Africa (14° Nord of the Equator and 14° west of the Prime Meridian), and bordered on the West by the Atlantic Ocean, on the Nord by Mauritania, on the East by the Mali, and on South by the two Guinea (Bissau and Conakry). It is one of the most stable countries in Africa. The country is divided into 14 Regions and covers an area of 196,712 Km^2. A semi-presidential democratic republic regime is applied, where the President of Senegal is the head of State, and the Prime Minister is the head of Government. They compose the executive power. In addition, the country has a legislative and judiciary powers, which respectively, introduce legislation or vote down legislation proposed by the Government, and over control the judiciary.

A.1.3.: Economy

Senegal aspires to become an emerging Country by 2035. To achieve this important target for the country, in 2014 the Government of Senegal adapted a new Plan Senegal Emergent (PSE) designed to help the country, to pull it out of the cycle of low growth and weak poverty reduction that had affected it after several decades. The Gross Domestic Product (GDP) is for the country expanded to 6.4 %. Supported by the sectors of Agriculture and Industry, the Economic growth of Senegal reached about 6.5 % in 2016 and 2017. Therefore, putting the country among the best economic performance in Sub-Saharan Africa. These interesting results were obtained because of a greater competiveness, punctual progress in structural reforms and a favourable external environment. More so, although it is projected an economic growth of 6.8 % (2017) to 6.9 % (2018), the PSE targeted a value of 8.3 % in 2018, to allow Senegal to become a middle incomes country.

A.2. Constitutional structure on setting policies, budget and implementation works

In the Senegalese water and sanitation sector, the National Government defines political orientations, implements strategies and mobilizes resources.
The Ministry of Hydraulics and Sanitation, the technical services (Direction of Hydraulic, Directorate of Water Resource Management and Planning – DGPRE), the administrations (OFOR, ONAS, OLAC) and the national companies (SONES) bounded to it, ensure the implementation of political orientations defined by the National Government. Based on this:

- The Direction of Hydraulics provides supervision and strategic planning of drinking water in rural areas in connection with the Office of Rural Wells (OFOR). OFOR is responsible for the implementation and renewal of hydraulic infrastructures, the management of assets and the water supply public services by means of delegation agreements to privates entities.
- The DGPRE is in charge of the knowledge, management and control of the resource in connection with the Office of Lakes and Rivers in Senegal (OLAC), which integrates the attributions previously devolved in this sense to the Office of Guiers Lakes and the Agency for the promotion of National Hydrographic Network.
- SONES makes the investments and manages the urban water assets in the dedicated areas of interventions. It has been supervising the private sector, the Senegalese Water Company (SDE) which is in charge of operating and maintaining the water supply distributions networks in Senegal under PPP for more than 20 years.
- The Direction of Sanitation provides supervision and strategic planning of sanitation in rural areas. More so, this direction ensures the management of sanitation services investment programmes for rural populations, as well as the technical supervision of ONAS, which is responsible for the management of wastewater and human excreta and storm water sanitation in urban areas.

A.3. Water and sanitation data at the national level

A.3.1: Water and sanitation in urban areas of Senegal

The global access to water supply in the urban areas of Senegal reached 98 % in 2015 (PEPAM, 2016), the reference target rate that was defined by the Millennium Development Goal (MDG, 2015). The access rate for the population to an improved sanitation system in this same urban areas, was estimated to 62.2 % in 2015, which was higher than the average rate obtained in the urban Sub-Saharan Africa (40 %) but lower than the average urban worldwide (82%). Concerning open defecation in urban areas, it was 4 % in 2015.

A.3.2: Water and Sanitation in rural areas of Senegal

In the rural areas of Senegal, the global water access covered 87.2 % of the population in 2015 (Pepam, 2016). As for the sanitation in rural areas, the access rate was counted for 36.7 % in 2015. Similarly, to the access of urban sanitation, the rural access rate for sanitation was higher than the average of rural Sub-Saharan Africa (23 %) but lower still lower than the average rural worldwide (51 %).
In total at the country level, the MDG was almost achieved for the water sector, but not for the sanitation. Conscious about this fact in sanitation, the Senegalese Government recognizes that lot of efforts still need to be done in this regard to fill this gap and meet the United Nation's Sustainable Development Goals (SDG) that is the target for over the next 15 years (by 2030).

A.4. Institutional responsibility for Sanitation at the national level

In Senegal, the key actors in the sanitation sub-sector are: 1) the Ministry of Hydraulics and Sanitation (MHA), 2) the Directorate of Sanitation (DA), 3) the National Office for Sanitation in Senegal (ONAS) and local communities.

A.4.1. Ministry of Hydraulics and Sanitation

According to the Decree No. 2014-877 of July 22, 2014 relating to the attributions of the Minister of Hydraulics and Sanitation, the Ministry of Hydraulics and Sanitation prepares and implements the policy defined by the head of the State in the fields of hydraulics and sanitation. In other words, in Senegal, the Government is represented in the water and sanitation sector by the Ministry of Hydraulics and Sanitation, which is the authority to set policies and approve all plans and projects. Thus, he is responsible for sanitation policy at the national level. Specifically, the Ministry of Hydraulics and Sanitation is responsible, among others of:

- ensuring the development, the monitoring and implementation of strategies, sectorial and tariff policies defined by the State in the field of sanitation in urban and rural areas;
- ensuring the realization and maintenance of infrastructures for the collection, treatment, and disposal of wastewater. Therefore, it oversees ONAS;
- following up with ONAS the planning, the executions of studies and the implementation of urban sanitation (liquid waste) programmes;
- monitoring the activities of companies and other autonomous administrations involved in the sanitation sector;
- following the files related to international organizations and falling within its field of competence.

By virtue of all these powers, the Ministry's mission is to promote, in a sustainable manner, universal access to appropriate sanitation systems.

A.4.2. Directorate of Sanitation

The Directorate of Sanitation directly bounded to the Ministry of Hydraulic and Sanitation assists the Ministry of Hydraulic and Sanitation in the implementation of policies in the water and sanitation sector. More specifically, the Directorate of Sanitation is in charge of:

- ensuring the development, the monitoring and implementation of strategies and sectorial and tariff policies defined by the State in the field of sanitation in urban and rural areas;
- overseeing ONAS through the MHA;
- ensuring the planning and programming of investments, the coordination and projects management, the design and control of studies and implementation works related to sanitation facilities in rural areas;
- promoting sustainable access to sanitation for households living in rural areas;
- ending open defecation in rural areas and promoting behaviour changes of rural population.

A.4.3. National Office for Sanitation in Senegal (ONAS)

ONAS, is a provider of sanitation services in urban and peri-urban areas. It was created in 1996 (Law No. 96-02 of 22 February 1996). It is a public company of industrial and commercial nature and is linked to the National Government by a performance contract, which specifies the reciprocal obligations of the two parties and the objectives to be reached in order to improve sanitation services of domestic and industrial wastewater (classic sewerage, simplified sewerage, onsite sanitation) and to ensure the financial balance of ONAS. More specifically, ONAS ensures:

- the planning and programming of investments, the coordination and projects management, the design and control of studies and implementation works related to sanitation facilities and wastewater works.
- the operation and maintenance of wastewater treatment facilities;
- the development and promotion of on-site sanitation systems,
- the valorisation of by-products generated from wastewater treatments plants.

A.4.4. Municipalities

With regard to municipalities, the sanitation code and the code of municipalities do not give any specific competence to them in the management of wastewater and human excreta. However, they have a general competence in the field of public health, of which sanitation is one component.

A.5. Financing mechanisms for water and sanitation at the national level

The mobilization of finance for the water and sanitation sector for the Republic of Senegal from 2005 to 2015 is shown in the Table 2. For duration of 10 years, a total amount of 1,328.053 billion of F.CFA was mobilized for the water (64.1 %) and sanitation (35.9 %) sector at the country level. As for the financing source of this total amount dedicated to the sector of water and sanitation (Figure 1), 74 % was borrowed from donors, 15 % derived from subsidies (grants), 10 % from State (Central Government) and 1 % from the contribution of municipalities (local Government). Except the case of rural water supply (16.7 billion F.CFA), municipalities do not contribute in general to the sector of water and sanitation financing mechanism.

Table 2: Mobilization of finance for the water and sanitation sector in Senegal (2005-2015)

Sub-Sector	Financial Sources	Amount (Billion F.CFA)	Rate (%)
1. Water Supply			
1a. Urban Water Supply	Borrow	452.334	94.8
	Subsidies (grants)	12.194	2.6
	State	12.419	2.6
	Municipalities	0.000	0.0
	Sub-Total 1a.	476.946	100.0
1b. Rural Water Supply	Borrow	130.472	34.9
	Subsidies	122.317	32.7
	State	104.819	28.0
	Municipalities	16.700	4.5
	Sub-Total 1.b	374.308	100.0
	Total General (1)	851.255	64.1
2. Sanitation*			
2a. Urban Sanitation	Borrow	211.735	85.0
	Subsidies	34.874	14.0
	State	2.491	1.0
	Municipalities	0.000	0.0
	Sub-Total 2a	249.100	100.0
2b. Rural Sanitation	Borrow	185.809	81.6
	Subsidies	31.196	13.7
	State	10.693	4.7
	Municipalities	0.000	0.0
	Sub-Total 2b.	227.698	100.0
	Total General (2)	476.798	35.9
	Total Genera (1) + (2)	1,328.053	100.0

* Sanitation here does not include storm water or flood management

Source: PEPAM, 2016

From 2005 to 2015, 85 % of finance for urban sanitation in the country was borrowed in form of loans. And it is important to mention that the reimbursement of loans strongly depends on the set procedures from each donor. The following loans types was made by the Government and depending on the donors:

- Concessionary loans: Repayment period of 38-40 years, with a grace period of 10 years and an interest rate of 1%;
- Semi-concessionary loans: Repayment period of 20 years, with a grace period of 10 years and an interest rate of 2- 4 %;
- Commercial loans: Shorter repayment periods than those above and an interest rate of 6-7 %.

None of services providers (e.g. ONAS) includes the cost of repayment within its operating costs. Therefore they are not covered by tariffs. The repayment of loans is under the Government responsibility that are in charge of reimbursing them based on the agreements with donors.

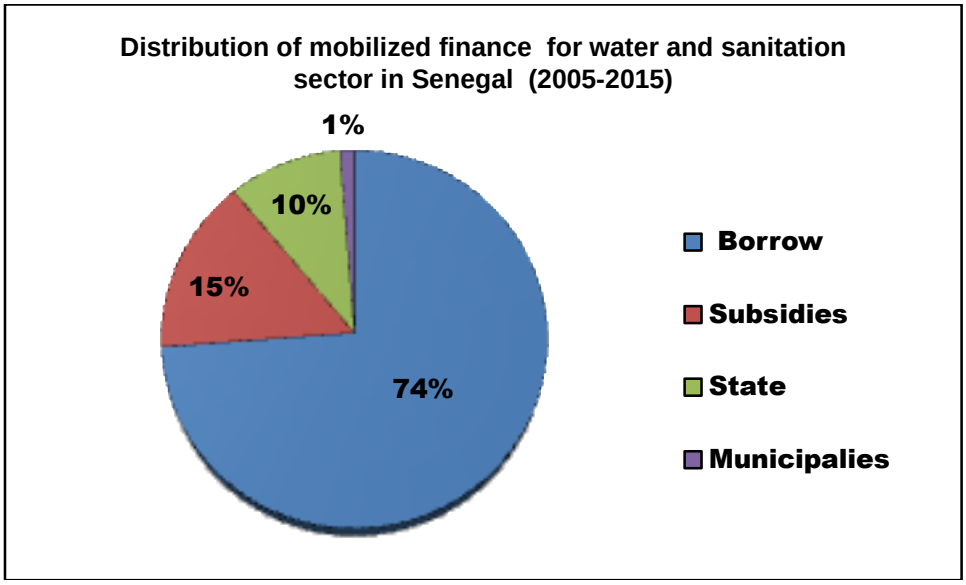


Figure 1: Repartition of mobilized finance for the water and sanitation sector in Senegal (2005-2015)

From 2015 to 2015, several donors contributed to the mobilization of funds for financing water and sanitation in Senegal and among them: West African Development Bank (BOAD), International Development Association (IDA), European Union (EU), French Development Agency (AFD), Islamic Devolvement Bank (IDB), African Development Bank (ADB), European Investment Bank (EIB), World Bank (WB), Arab Bank for Economic Development in Africa (BADEA) United Nations Human Settlements Programmes (UN- Habitat), etc.

Remarks:

Based on the latest information collected in the water and sanitation sector (Sectorial Development Policy Letter, 2015-2025, "LDPS 2016"), from 2005 to 2015, the sector had mobilized an amount of 998 billion F.CFA all financial sources excluding trans borders cooperation's. About 16 % of this global amount was covered by the Central Government. The portion of sanitation was estimated about 147 billion (60.47 billion for rural and 86.4 billion urban), which represents 14.7 % of total mobilized amount from 2005-2015. Considering the portion of water in this same period, it was accounted for 851 billion (374 billion for rural and 477 billion for urban), which constitutes 85.3 % of global mobilized amount. Focusing still on the water part, it is reported that the mobilized financial resources was deriving essentially from loans (34.9 % for rural and 94.8% for urban) and subsidies (32.7% for rural and 2.6 % for Urban) and the contributions from Government through the consolidated budget for investment (26.0 % for rural and 1.7 % for urban). Comparing these above information (LDPS, 2016) with those analysed in the Table 2 and Figure 1 (PEPAM, 2016), a bit of contrast occurred in the total mobilized amount between 2005-2015 in the water and sanitation sector in Senegal (about 998 billion versus 1,328 billion). These contrasts of data attest the reliability or accuracy of these financial data. However, this financial information provides an indication on how the water and sanitation sector in Senegal is being financed at the national level.

The policy preference of the Senegalese Government is to install waterborne sewerage in all urban areas in Senegal in the future. However, since sewerage systems are excessively costly and there is currently an urgent need of sanitary facilities in the urban areas, the Government is accompanying the population with On-site sanitation as alternative option because of its cheapness (low cost sanitation facilities).

A.7. Concept of circular economy views at the country level.

The concept of circular economy is understood and accepted in Senegal. A couple of references corroborated this statement. The decree n° 96-662 of August 7, 1996, which fixes the organization and functioning rule of ONAS, discusses (in its Article 15) the different sources of financial resources of the Institution and among which the by-products are generated from the operations of sanitary facilities (water, electricity, fertilizer etc.). As an illustration, among these financial sources of ONAS, only the sanitation tax (which derived from the sale of water supply), and the by-products obtained from the operation of the treatment plants and the subsidies are currently mobilized. In 2015, the

total revenues amount collected from the sale of by-products was estimated up to 22 million F.CFA (3 % from the sale of treated water, 1.5 % from the sale of treated faecal sludge and 97.5 % from faecal sludge treatment plants (FSTP) activities – FSTP's emptying taxes from trucks) and represented 0.1 % of the total revenues of ONAS, which is not significant. However, even this rate is still low, the water and sanitation authorities recognized that the generated by-products from sanitary facilities should be valued in a sustainable way. For this reason, it is recently plans in the new Sectorial Development Policy Letter for 2025 (LDPS, December, 2016) to reinforce the capacity of the wastewater and faecal sludge treatment plants and subsequently valorised the generated sanitation by- products.

PART B: SHORT BACKGROUND ON THE STUDY CITY

B.1. Social, political and economical data at the city level

B.1.1: Social

The Dakar Region, which is the capital of the Republic of Senegal, is the most populated urban area in the country. Based on the last census (ANSD, 2013), its total population was 3,137,196 inhabitants with an annual growth rate of 3.4 %. The Table 3 represents the population and the growth rate of the Dakar Region from 1976 to 2013.The total increase of the population between 2002 and 2013 is about 50%.

Table 3: Population and Growth Ratio of Dakar Region from 1976 to 2013

Years	1976	1988	2002	2013
Periods	-	1976-1988	1988-2002	2002-2013
Dakar population	892,127	1,488,941	2,168,314	3,137,196
Growth Ratio (%/year)	-	4.4	2.72	3.4

Source: ANSD, Census 2013.

The density of the population in this Region is 5,735 inhabitants per Km^2 and is considerably far demarcated from the values obtained in the other Regions of Senegal. At the country level the total population is 13,508,715 in 2013 and the Dakar Region constitutes nearly a quarter (23.2 %) over an area of only 0.3 % of the Country. Dakar Region has a number of four (04) departments namely the department of Dakar, Pikine, Guediawaye, and Rufisque, and the population in these departments represents respectively 36.5 %, 37.4 %, 10.5 % and 15.6 % of the Regional population. With a poverty index of 26.1 %, the Region of Dakar has nearly the same ratio of men (50.3 %) and women (49.7 %). The rate of general literacy and the gross school's enrolments rate, respectively account for 68,6 % and 64.3 % (ANSD, 2013).

B.1.2: Politics

The Region of Dakar, one of the fourteen (14) Regions of Senegal is located in Cap Vert Peninsula and covers a total area of 550 Km^2. Geographically located between 17° 10 and 17° 32 longitude West and 14° 53 and 14° 35 latitude Nord, the Dakar Region is bounded on the East by the Region of Thies and by Atlantic Ocean in all other sides (Nord, West and South). It is composed by four (04) departments: 1) the department of Dakar (with an area of 79 Km^2), 2) Pikine (87 Km^2), 3) Guediawaye (13 Km^2) and the department of Rufisque (372 Km^2).
It hosts the headquarters of the Government, the National parliament, the Constitutional Council, the Supreme Court, all National Directorates, as well as almost all headquarters of national and private companies, and all national and international organizations settled in Senegal. Thus, the Senegalese capital is a decision-making centre at public and private, national, regional and international levels.

B.1.3: Economy

Similarly, to the social, administrative and political activities of the Country, Dakar the capital city, accounts for the large part of the economy (80 % of the domestic economic outputs). Thus the Region concentrates the vast majority of industries, business, and finances.

B.2.: General Water and Sanitation data for Dakar

In Dakar Region the household water connections was rated to 96.2 % compared to others urban centers of the country (Pepam, 2016). And even within the Dakar Region, several disparities were found with a connection rate of 100 % for Dakar I (Dakar department), 97 % for Dakar II (including Pikine and Guediawaye departments) and 90 % for the department of Rufisque. As for the public facets the access rate for Dakar was 4 %, 10 % for Rufisque and 13 % for the other urban centers in Senegal.
Considering sanitation coverage for the Dakar Region, it was estimated to more than 78 % in 2015. Onsite sanitation system is the most predominant sanitation systems in Dakar Region (over 75 %, Dakar Master Plan 2013). Focussing on the department of Pikine and Guediawaye the biggest peri-urban areas in Dakar, and Senegal, the population is estimated at about 1,500,000 people and more than 80 % are connected to on-site sanitation systems.

PART C: DETAILED INFORMATION ABOUT THE SANITATION OF DAKAR

The total population in Dakar Region was estimated at about 3,137,196 inhabitants with an annual average of Growth of 3.4 % (ANSD, 2015). In the city, it exists three (03) different types of sanitation systems: 1) classical centralized sewerage system (27.4 % of the population is connected), 2) simplified sewerage systems (2.0 % is connected) and 3) on-site sanitation systems (70.6 % of the population is deserved).

C.1. Sanitation infrastructures at the city level

C.1.1. Classic sewerage system

In Dakar, the assets of ONAS in terms of classical sewerage systems (Table 4) are composed of as follows:

- 04 wastewater treatment plants (33 % of the total number of WWTPs in the country);
- 1,326 Km of network lengths (78 % of the total national level network length);
- 55 pumping stations (62.5 % of the total number of pumping station in Senegal);
- 107 467 household connections to sewer lines (83.5 % of the total household connections to sewer at the national level).

Table 4: Assets of ONAS infrastructures in Dakar

Existing types of sanitation systems	Dakar Region
1. Centralized Sewerage Systems	
Network Length (Km)	1,326
Household connections to sewer	107,467
Pumping stations	55
Wastewater Treatment Plants (WWTP)	04
2. Simplified Sewerage Systems	
Network Length (Km)	212
Household connections to sewer	11,477
3. On-site sanitation	
On-site toilets	66,000 >
Faecal Sludge Treatment Plant (FSTP)	04

Source: Financial statement of ONAS, 2015

The total capacity of the wastewater treatments plants in Dakar is estimated at about 27,906 m^3/day (Table 5), while 23,586 m^3/day is currently under operation (2 WWTPs are under commissioning). The total effective existing capacity of the WWTPs in Dakar (23,586 m^3/day) represents more than 70 % of the all country.

Table 5: Features of the mains treatments plants facilities in Dakar

Treatment facilities	Year of Construction	Capacity (m^3/day)	Type of facilities	Current State
1. WWTPs				
1.a. Camberene	1989 & Expansion 2008	19,200	Activated Sludge	Under operation
1.b. SHS	2007	595	Activated Sludge	Under operation
1.c. Niayes	2008	935	Activated Sludge	Under operation
1.d. Rufisque	2004	2,856	Lagoon basins	Under operation
1.e. Tivaouane Peulh	2015	2,520	Activated Sludge	Commissioning
1.f. Diamniadio	2015	1,800	Activated Sludge	Commissioning
Total (1)	-	27,906	-	-
2. FSTPs				
2.a. Camberene	2008	120	Double corridor	Under operation
2.b. Niayes	2009	60	Double corridor	Under operation
2.c. Rufisque	2007	60	Double corridor	Under operation
2.d. Tivaouane Peulh*	2015	400	Double corridor	Under operation
Total (2)	-	640	-	-

* Tivaoune Peulh FSTP has started operating recently (October, 2017), while from 2015-2016, it was under commission's phase. In other terms before 2016, the total capacity of the FSTPs in Dakar was 240 m3/day.
Source: Treatments facilities assets of ONAS in Dakar, 2017

C.2.2. Simplified sewerage system

The specificity of simplified sewerage system is to allow the reduction of the diameters of pipes and the implementation slopes in comparison with the classic sewerage systems. The simplified sewerage system is used in Dakar, with a total length of 212 km for a number of 11 477 household connections (Table 4). Except for the Dakar Region, this type of sanitation system is not yet installed in other cities of Senegal.

C.2.3. On-site sanitation system

On-site sanitation system is the most predominant sanitation system in Dakar (more than 70 %) as well as for the national level. In the peri-urban areas of Dakar (Pikine and Guediawaye), the vast majority of the population (more than 80 %) relies on such kind of systems, and an amount of more than 1,500 m^3 of sludge is produced in a day. Therefore, to contribute to the management of this produced sludge, ONAS has built four (04) faecal sludge treatments plans in Dakar with a total capacity of 640 m^3/day (Table 5). The Dakar faecal treatments plants represent 40 % of the total existing FSTPs in the whole Senegal. As for capacity of the FSTPs in Dakar (640 m^3/day) represents 52 % of total capacity at the national scale (1230 m^3/day).

C.2. Historical trends in Sanitation

C.2.1: Trend of access to sanitation in Dakar (2004-2015)

The trends of access to sanitation in Dakar and all urban areas in Senegal as well as the target objective for urban sanitation at the national level from 2004 to 2015 are presented in the Figure 2. The access trend rate for sanitation in Dakar was constantly higher than both set target and obtained results for the urban at the National level from 2004 to 2015. From 2011 to 2015 a decrease in access rate for Dakar (80.93 % to 78.17 %, respectively) was observed and might be caused by the increase in population in the Capital City due to rural exodus. Similar tendency of decrease was found (63.2 % to 60.2%) in the global urban sanitation access trend results at the national level from this same period (2011 to 2015), perhaps pulled down by the Dakar's results decrease. The access rate gap between the national target and national obtained results related to urban sanitation was (- 0.7) point in 2008 and reached a high value of (– 17.18) points in 2015. These latest results could be explained by the increase of the population in the urban areas

combined with the reduction in funding availability. Because in 2005, the PEPAM was created, and funds available, and several investments were done in the sector of water and sanitation in Senegal including in urban areas.

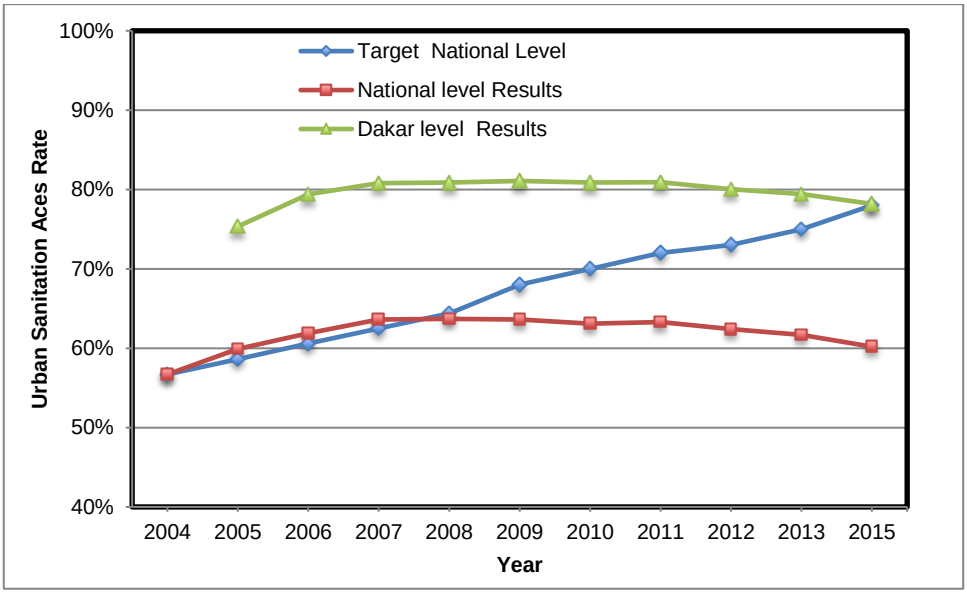
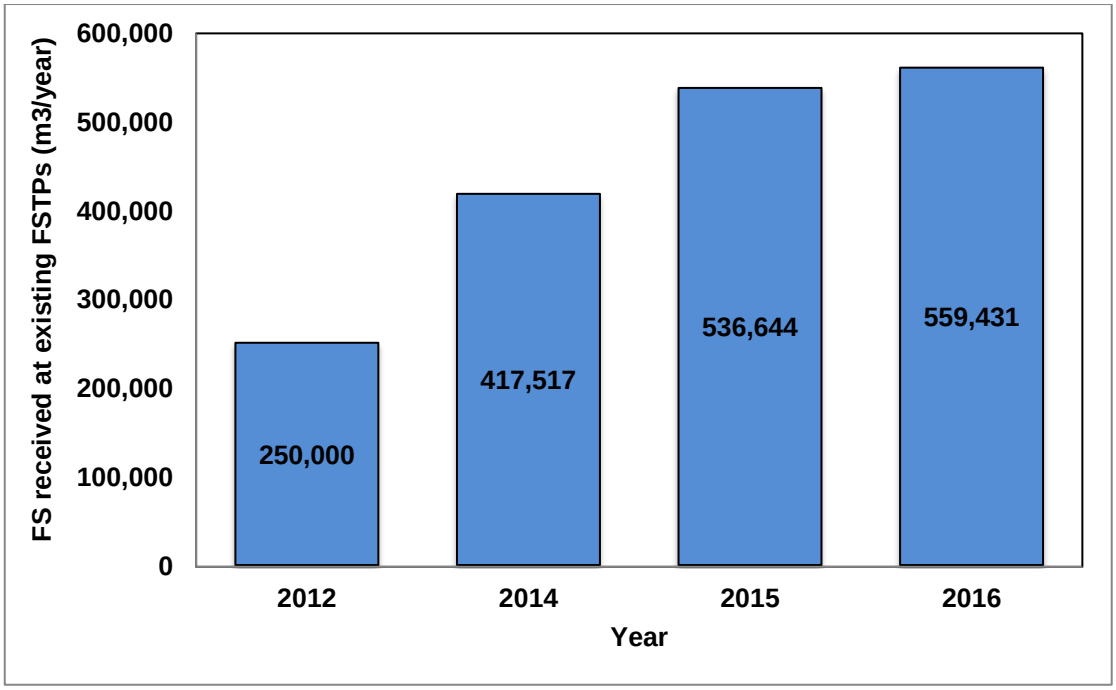


Figure 2: Trend of Urban Sanitation access in Dakar and Senegal from 2004 to 2015

C.2.2: Trend of FS volume received in the FSTPs in Dakar (2012-2016)

From 2008 to 2016, ONAS has built a number of three (03) different faecal sludge treatment plants in the Dakar Region: 1) the FSTP of Camberene, 2) the FSTP of Niayes and 3) the Rufisque's FSTP. These three (03) FSTPs have a total annual capacity of 87, 600 m^3, which is equivalent to 240 m^3/day. The Figure 3 shows the annual total FS volume received in these faecal sludge facilities from 2012 to 2016. The received annually volumes of FS in the FSTPs increase significantly by almost 50 % from 2012 to 2016.

Comparing the total annual designed capacity of these plants (87, 600 m^3/year) with the results obtained in the Figure 2, it is clear that, these facilities are overloaded and sufficient investment in FS infrastructures is necessary for Dakar. That is why a new FSTP called Tivaouane Peulh's FSTP which was built in 2015 and under commissioning with a capacity of 400 m^3/day has been put recently in operation (October, 2017) by ONAS. Subsequently that brings the total capacity of the FSTPs in Dakar to 640 m^3/day (233,600 m^3/year), which is still not even enough to cover the needs in FSTPs infrastructures. Furthermore, the annual FS volumes received in the FSTPs from 2014 to 2016 (more than 400,000 m3/year) were significantly higher than the result of 2012 (250,000 m^3/year). One reason might be the better management of FSTPs by the private sector compared to the public management. Because, in 2012 ONAS was operating these FSTPs; and in 2014, ONAS has delegated their management to the private sector in concession contract based (PPP model). And the private sector records better than ONAS, simply because truck emptying activity to the FSTPs is one of their main sources of revenues (See Section D.2.2.2).



Source: ONAS, Compiled by SenEngineering International S.A.

Figure 3: Trend of the annual FS volume received at the 03 existing FSTPs in Dakar (2012-2016)

C.3. Projected plans on sanitation coverage by 2025 for Dakar

The projected investment program of ONAS for Dakar (Dakar + Rufisque) in 2025 is shown in the Table 6. From 2018 to 2019, the essential portion (87 %) of the plan of WWTPs construction will be completed in Dakar. While from 2018 to 2025 a number of 100,000 household connections to sewer line combined with an extension of network of 1,158 Km will be implemented.

Table 6: Investment plan for Sanitation of wastewater and human excreta for Dakar (2015-2025)

Projected facilities	Years											Total
	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	
Capacity of WWTPs (m3/day)	0	0	0	4,109	157,800	0	0	0	0	0	25,000	186,909
Capacity of FSTPs (m3/day)	0	400	0	80	0	0	0	0	0	0	0	480
Extensions of network (Km)	8	8	56	153	45	150	150	150	150	150	210	1,230
Renewal of network (Km)	4	4	4	54	23	0	0	25	25	25	25	189
Pumping stations	0	19	20	30	10	8	8	8	8	8	16	135
Connections	750	750	3,220	19,150	10,000	10,000	10,000	10,000	10,000	10,000	20,000	103,870
Master Plan	0	0	2	1								3

This investment plan will cover among others the followings:

- Increase the capacity of the WWTPs to 186, 909 m^3/day (representing 72.1 % of the total national plan for 2015);
- Increase the capacity of the FSTPs to 480 m^3/day (10.8 % of the plan for Senegal in 2025);
- Extent the network to 1,230 Km (55.2 % of Senegal plan in the target year);
- Renew a network length of 189 Km (representing 90.4 % of total network renewal plan for Senegal in 2025)
- Install a number 135 pumping stations (58 % of the national plan for 2025);

- Execute 103, 870 household connections to sewerage system (56.7% of Senegal for 2025).

The Figure 4 and Figure 5 show the comparison of the current existing ONAS' assets in Dakar with the projected investment programme of 2025.The capacity of the projected WWTPs in 2015 will be almost seven (07) times higher than the current existing ones

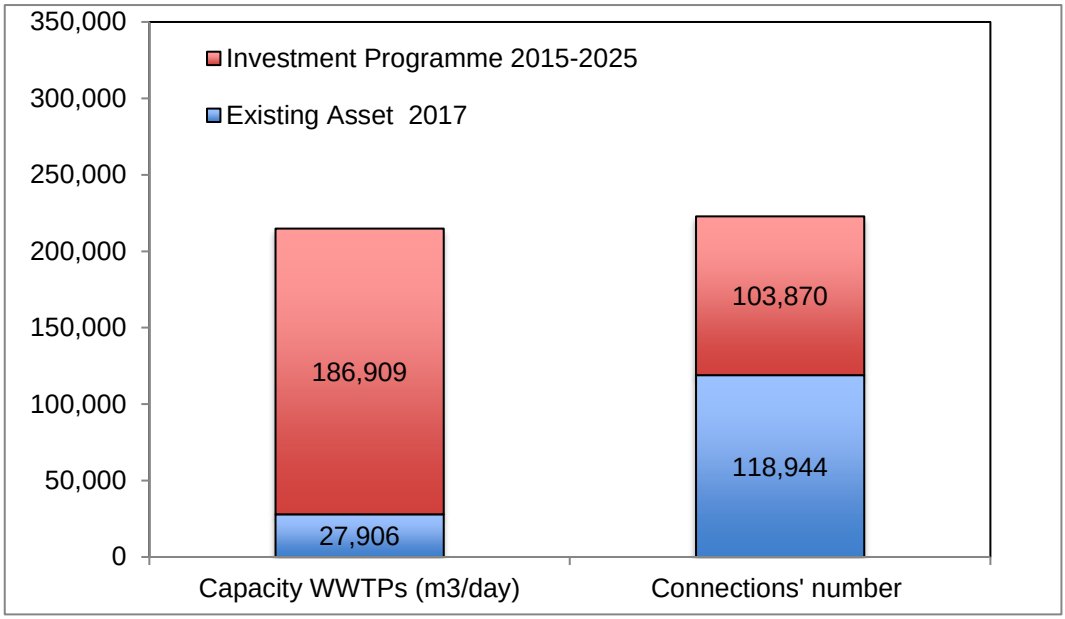


Figure 4: Comparison of the existing WWTPs' capacity and household connections with the investment programme: 2015-2025 for Dakar

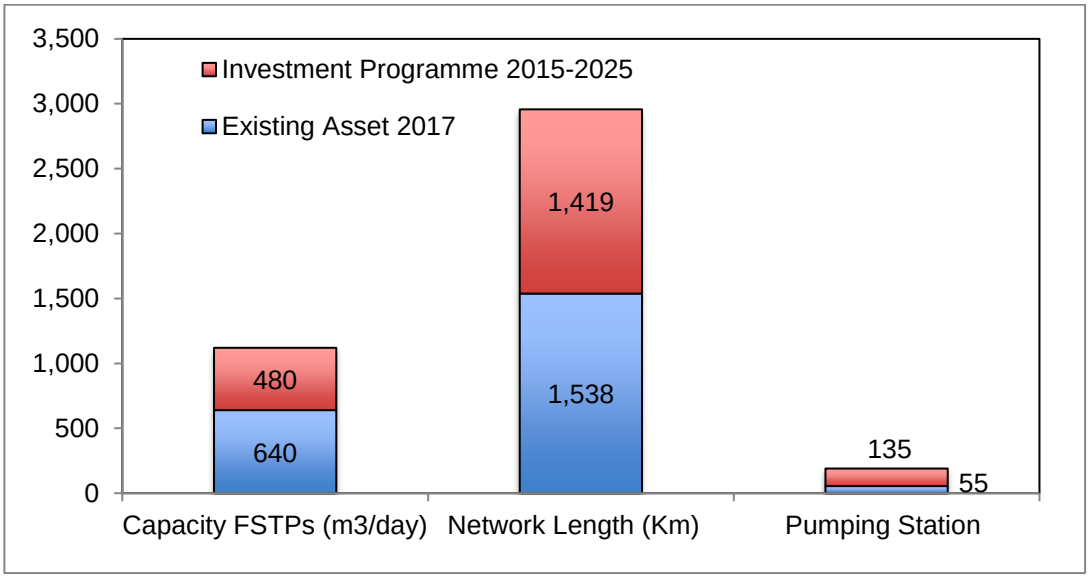


Figure 5: Comparison of the existing FSTPs' capacity, network length and pumping station with the investment programme: 2015-2025 for Dakar

C.4. Financing mechanisms of the projected sanitation plans by 2025

The Figure 6 represents how the investment programme of wastewater and human excreta for Dakar will be funded by 2025. A total amount of 373.164 billion will be necessary to achieve this above ambitious investment programme. This total required amount for Dakar is 62 % of the all-necessary amount (601.133 billions) that should be mobilized for other ONAS' Centers in Senegal for 2025. In Dakar, the sanitation authorities are seeking for 153.565 billion of funding (41. 2 %). Interestingly about 100 billion (26.8%) is planned to be obtained through PPP (Public- Private Partnership)

based contract. National Government will cover only 1.7 % of set budget. A large contribution from donors reached about 30 % of the total required amount for funding the investment programme for the target year of 2025.

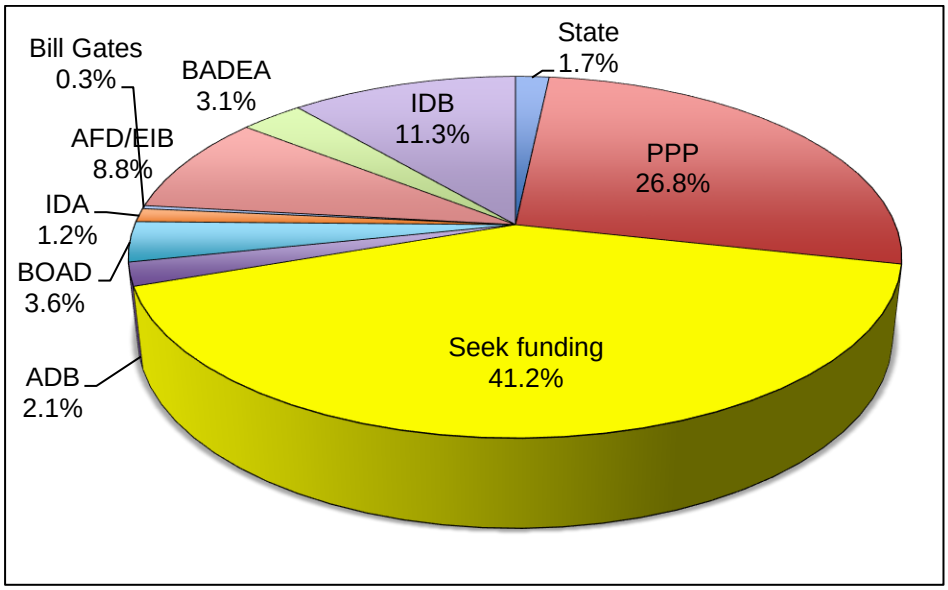


Figure 6: Distribution of funds to finance the investment programme for Dakar - 2015-2025

Considering the 26.8 % part that will be sourced from the private, the payment will done based on the normal market rate (Commercial rate) and the loan money will be repaid by the Government of Senegal (not from operating tariff fees of ONAS). The reason is that all infrastructure investments in Senegal are made by the Government.

Remark: The concessionary loans applied by international donors are much lower in interest rate but repayment periods are higher in comparison with the commercial rate in Senegal.

PART D: ANALYSIS FOR INCREASING FINANCE IN URBAN SANITATION

D.1: Identification of predominant types of sanitation in Dakar

In Dakar, the predominant types of sanitation are sewerage (classical or simplified sewer) and on-sites sanitation systems. Therefore, in this Report, the idea was to consider the financial analysis and the discussions on increasing financial flow for urban sanitation considering the Dakar case, based on these two (02) typologies. However, ONAS do not have an operating account for each of their urban centers including Dakar, but a general operating account for all urban centers of Senegal, where ONAS is intervening. Nevertheless, we could get officially from ONAS, their financial statement Report of 2016 and the balance sheet of expenses and incomes for Dakar. Thus, based on these two (02) references received documents, we prepared the financial operating analysis of ONAS in Dakar for the management of wastewater and human excreta (See Section D.2). Luckily from our interviews with the private sector, which works on FSTPs delegation and the ONAS' Faecal Sludge Management Programme's staffs, we could gather some more detailed financial information for the On-site sanitation systems discussions case (See Section D.2.3). The financial account for On-site sanitation systems started to be conducted recently from 2013 with the delegation of the FSTPs by ONAS to the Private sector.

D.2. Financial analysis of ONAS for Dakar urban sanitation

D.2.1. Measures financing gaps and obstacles for Dakar urban Sanitation

In Section, it was considered and confirmed by ONAS Administrative and Finance Director that, the share of Dakar (Dakar + Rufisque) represents about 80 % (79.5 %) of global activities in all urban areas of Senegal where ONAS is operating. In other words, all ONAS's infrastructures are mainly located in Dakar. And since, ONAS' reported us that there is no financial account for each of their 17 urban centers, where they are working (including Dakar) but as a global; we extracted the information for Dakar from the whole of the Senegalese urban centers financial account, by applying the above ratio of 80% on the validated financial statement of ONAS' Report for the fiscal year of 2016.

D.2.1.1. Stock analysis results of ONAS

The Table 7 indicates the analysis of the Stocks of ONAS in Dakar. It represents the existing stocks of materials and equipment's linked to the operation of ONAS in the fiscal year of 2016. In other terms these materials and equipment were available for the operation of ONAS at the moment, when this financial analysis began. The main stocks of ONAS was composed mainly by the connection materials, which covered a rate of 66 % of the total stock in 2016, with a positive variation of more than 18 % in between, and in addition to other miscellaneous.

Table 7: Financial stock analysis for ONAS.

ONAS' Stock Analysis						
Description of Items	National level – fiscal years		Share of Dakar & Rufisque		Ratio (%)	
	2015	2016	2015	2016	2015	2016
Fuel	3 433 650	9 850 800	2 730 438	7 833 356	2,20%	4,53%
Materials of connections	74 138 464	143 485 346	58 954 907	114 099 547	47,57%	66,05%
Spare parts Plants, Pumping Station – Network	22 024 605	19 703 384	17 513 966	15 668 131	14,13%	9,07%
Spare parts cars / engines	4 168 258	1 560 015	3 314 599	1 240 524	2,67%	0,72%
Small equipment's and tools	17 390 264	15 258 568	13 828 738	12 133 613	11,16%	7,02%
Security stock material	34 700 629	27 389 203	27 593 940	21 779 894	22,26%	12,61%
Total values of Stocks	155 855 870	217 247 316	123 936 588	172 755 066	100,00 %	100,00 %
Provisions	-14 177 790	-17 438 046	-11 274 179	-13 866 734		
Net accounting values	141 678 080	199 809 270	112 662 409	158 888 332		

Source: ONAS Financial statement, 2016; Computing by SenEngineering International S.A.

D.2.1.2. Receivables analysis results of ONAS

ONAS receivables analysis results are shown in the Table 8. The average tariff value for the sanitation tariff (which derived from the water supply bill, issued to customers every 2 months) is 63.3 F.CFA/ m^3 of water consumption. It represents the main sources of incomes for ONAS with a ratio of 96 % for Dakar (2015-2016). In order to increase its revenues and subsequently increase its financial capacity, ONAS is planning to review the average tariff between up to 80 F.CFA/m3. More so, the on-going study on the financial mechanism of ONAS even suggested an increase of 112 F.CFA/ m^3 for the renewal of equipment aged less than 15 years (Draft Interim Report, ARTERIA/EDE 2017).

Table 8: Analysis of receivables from ONAS' customers (2015-2016)

Analysis of receivables from customers						
Description of Items	National urban level – fiscal years		Shared of Dakar and Rufisque		Ratio (%)	
	2015	2016	2015	2016	2015	2016
Sanitation tariffs	6 528 983 600	6 811 249 496	5 191 847 759	5 416 305 599	95,81%	95,92%
Promoter customers	35 520 876	35 520 876	28 246 201	28 246 201	0,52%	0,50%
Particular customer -Dakar	174 855 174	-	139 044 834	-	2,57%	0,00%
Rufisque's customers	20 715 206	-	16 472 732	-	0,30%	0,00%
Thiès'customers	15 613 223	-	12 415 635	-	0,23%	0,00%
Louga's customers	7 804 842	-	6 206 410	-	0,11%	0,00%
Kaolack's customers	6 422 655	-	5 107 295	-	0,09%	0,00%
Saint Louis's customers	5 894 214	-	4 687 079	-	0,09%	0,00%
Least perceived miscellaneous customers	18 237 538	19 033 863	14 502 490	15 135 728	0,27%	0,27%
Customers contribution on network extension	199 932	235 332 243	158 986	187 136 200	0,00%	3,31%
Net accounting values	6 814 247 260	7 101 136 478	5 418 689 421	5 646 823 727	100,00%	100,00%

Source: ONAS Financial statement, 2016; Computing by SenEngineering International S.A.

D.2.1.3. Operating expenditures analysis results of ONAS

The analysis of the different operating expenditures of ONAS is presented in the Table 9. The personal expenses of ONAS in Dakar were accounted for more than 16 % and 18 % of the total charge for the fiscal years of 2015 and 2016, respectively. The consumption of energy (electricity and fuels) for 2016 represents 7.2%, which was not negligible on the operating cost (more than 2.9 billion). Interestingly, it was found that ONAS outsourced a lot part of its operation and maintenance to an external service (32% and 18 % respectively for 2015 and 2016). This latest part covered the highest ratio of all charge just after the expenses related to the personal.

Table 9: Analysis Operating Expenditures of ONAS (2015-2016)

Analysis of Operating Expenditures						
Description of Items	National urban level – fiscal years		Shared of Dakar and Rufisque		Ratio (%)	
	2015	2016	2015	2016	2015	2016
Raw materials et Furniture	83 314 144	221 822 234	66 251 407	176 393 040	0,43%	1,07%
Variations of stocks	10 395 769	-61 391 446	8 266 716	-48 818 478	0,05%	-0,29%
Others purchases	1 963 965 556	1 840 119 965	1 561 745 410	1 463 263 396	10,16%	8,84%
Transports	89 272 530	81 311 315	70 989 516	64 658 758	0,46%	0,39%
Electricity and Fuel	-*	1 501 208 800	-*	1 193 761 238	-*	7,21%
External Services & Out-sourcing	6 136 471 320	3 690 859 584	4 879 721 994	2 934 971 541	31,73%	17,73%
Taxes and fees	301 511 677	2 467 662 111	239 762 086	1 962 284 911	1,56%	11,85%
Others expenditures	1 314 502 637	432 445 624	1 045 292 497	343 880 760	6,80%	2,08%
Personnel expenses	3 134 654 850	3 773 237 512	2 492 677 537	3 000 478 470	16,21%	18,13%
Depreciations	5 916 692 196	6 863 683 937	4 704 953 634	5 458 001 467	30,60%	32,97%
Financials fees	103 293 772	-	82 139 207	-	0,53%	0,00%
Others Taxes	283 105 086	5 000 000	225 125 164	3 976 000	1,46%	0,02%
Total expenses	19 337 179 537	20 815 959 636	15 376 925 168	16 552 851 103	100,00%	100,00%

*ONAS did provide us the General Balance sheet for 2015, which explains the lack of analysis of energy data for this year.
Source: ONAS Financial statement, 2016; Computing by SenEngineering International S.A.

D.2.1.4. Operating revenues analysis results of ONAS

As for the detailed analysis of the operating incomes sources of ONAS, it is indicated in the Table 10. Out of the grants and the non-ordinary activities, in term of operating incomes, the main activity of ONAS is concentrated on the sanitation fees (more than 95%) and the works from sewer connections (more than 3.5%) of the revenues generation. The by-products incomes generation shows a low rate less than 0.5 % (less than 50 million) in the operation activities of ONAS. In 2016, the revenues from the by-products was an amount of 29, 747, 082 F.CFA and distributed as follows:

- Sale of treated wastewater: 2, 731, 817 F.CFA (100 F.CFA/m^3 of treated wastewater);
- Sale of stabilized sludge: 14, 943, 281 F.CFA (500 F.CFA/m^3 of dry stabilized material)
- Sale of Faecal Sludge: 12,071,984 F.CFA (500 F.CFA/m^3 of dry faecal sludge)

Table 10: Detailed Analysis of the Operation Incomes Sources of ONAS (2015-2016)

Description of Items	National urban level – fiscal years		Shared of Dakar and Rufisque		Ratio (%)	
	2015	2016	2015	2016	2015	2016
By-products	21 642 277	29 747 082	17 209 939	23 654 880	0,27%	0,35%
Sanitation tariff	7 911 119 576	8 324 379 696	6 290 922 287	6 380 774 655	94,97%	95,40%
Connections works	408 000 000	300 266 699	324 441 600	238 772 079	4.86 %	3.57 %
Accessories revenues	60 993 082	56 752 666	48 501 699	45 129 720	0,76%	0,67%
Revenues	7 993 754 935	8 410 879 444	6 356 633 924	6 688 331 334	100,00%	100,00%
Operating grants	2 576 016 512	2 657 567 106	2 048 448 330	2 113 297 363	67,32%	99,79%
Other products	1 250 240 267	5 612 639	994 191 060	4 463 171	32,68%	0,21%
Subsidies and others products	3 826 256 779	2 663 179 745	3 042 639 391	2 117 760 533	100,00%	100,00%
Reduction in the provisions	603 759 131	172 710 475	480 109 261	137 339 370	8,02%	2,34%
Transfer of expenses	29 607 210	0	23 543 653	0	0,39%	0,00%
Divestment proceeds	42 609 743	0	33 883 268	0	0,57%	0,00%

Product out of activities	444 441 429	0	353 419 824	0	5,91%	0,00%
Reduction of products out of activities	6 405 113 729	7 215 009 116	5 093 346 437	5 737 375 249	85,11%	97,66%
Others products out of activities	7 525 531 242	7 387 719 591	5 984 302 444	5 874 714 619	91,58%	97,66%
Total Incomes	19 345 542 956	18 461 778 780	15 383 575 759	14 680 806 486	100,00%	100,00%

Source: ONAS Financial statement, 2016; Computing by SenEngineering International S.A.

The global analysis of the revenues distributions sources of ONAS is shown in Table 11. Sanitation tariff covered still remained the biggest part of the total ONAS' revenues with a ratio of 72. 4 %. While the grants represented a rate of 24 %, which is an important part of ONAS' source of revenues (2.1 billion F.CFA, 2016) that mitigated the operating deficit. These grants were mainly from the national Government of Senegal and others donors (technical and financial partners). More explicitly, these operating grants are composed by the financial support from the Senegalese Government for an amount of 203,200,000 F.CFA (57 %) and other part from the donors such as the Bill and Melinda Gates Foundation with a total of 910,097,363 F.CFA (43 %).

Table 11: Global analysis of operating incomes with grants and other products of ONAS (2015-2016)

Analysis of Operating Incomes with Grants and others incomes						
Description of Items	National urban level – fiscal years		Shared of Dakar and Rufisque		Ratio (%)	
	2015	2016	2015	2016	2015	2016
By-products	21 642 277	29 747 082	17 209 939	23 654 880	0,18%	0,27%
Sanitation tariffs	7 911 119 576	8 024 112 997	6 290 922 287	6 380 774 655	66,93%	72,46%
Connections works	408 000 000	300 266 699	324 441 600	238 772 079	3,45%	2,71%
Accessories revenues	60 993 082	56 752 666	48 501 699	45 129 720	0,52%	0,51%
Operating grants	2 576 016 512	2 657 567 106	2 048 448 330	2 113 297 363	21,79%	24,00%
Other products	842 240 267	5 612 639	669 749 460	4 463 171	7,13%	0,05%
Total	11 820 011 714	11 074 059 189	9 399 273 315	8 806 091 867	100,00%	100,00%

Source: ONAS Financial statement, 2016; Computing by SenEngineering International S.A.

D.2.1.3. Net Operating Results (NOR) of ONAS (2015 -2016)

The analysis of the net operating results of Dakar (Dakar + Rufisque), indicates a huge loss of – 1, 872, 044, 458 F.CFA in the fiscal year of 2016 (Table 12). This deficit is the result of a lack of operating capacity that could generate enough revenues to cover the important part of the expenditures of ONAS in Dakar. Similar deficit in net operating results is also found in other urban areas of Senegal. And by considering all the results of ONAS operation in all urban centers of Senegal, a deficit of nearly 2.5 billion was observed in the fiscal year of 2016. Therefore finding innovative financial mechanisms that are able to recover this unhealthy financial situation of ONAS and bring more new investments in the sanitation of urban areas should be one among other ideas to solve these issues in a sustainable way.

Table 12: Analysis of the Operating Results of ONAS (2015-2016)

Analysis of the Operating Results for the fiscal years 2015 and 2016				
Description of Items	Operating fiscal years		Shared of Dakar and Rufisque	
	2015	2016	2015	2016
Incomes	7 993 754 935	8 410 879 444	6 356 633 924	6 688 331 334
Expenditures	6 073 176 854	7 510 858 442	4 829 390 234	5 972 634 633
Added Values (AV)*	1 920 578 081	900 021 002	1 527 243 690	715 696 701
Gross Operating Profit (G.O.P)**	-1 214 076 769	-2 873 216 510	-965 433 847	-2 284 781 769
Operation Results	-6 497 402 624	-9 564 189 972	-5 166 734 567	-7 605 443 866
Financial Results	-103 293 772	-	-82 139 207	-
Net Operating Results	8 363 419	-2 354 180 656	6 650 591	-1 872 044 458

*Added Values (AV) = Incomes – Expenditures;
** Gross Operating Profit" (G.O.P): Incomes – Expenditures excluded depreciations and provisions.
Source: ONAS Financial statement, 2016; Computing by SenEngineering International S.A.

D.2.2. Identification of financing mechanisms for Dakar urban sanitation

To contribute to solving or mitigating these above financial gaps and obstacles (huge financial operation deficit, high subsidies from government and donors in the urban sanitation operation, low by-products generation from the sanitation facilities due to low performance of operation, unique operators remained the public authorities), the following financial instruments can be considered among others:

- Increase the Sanitation tariff

The planned increase of the sanitation fee, which is collected by ONAS from the Senegalese water supply company (SONES) might be one good idea to contribute in the reduction of these above ONAS' operation financial gap and obstacles. This increase of the sanitation tariff is stipulated in the performance contract (2016-2018) between the State and ONAS. Actually the rate of the sanitation fee is 63.3 F.CFA/ m^3 of the consumed water supply and the increase plan is rated to 80 F.CFA/m^3 in 2018.This increase of the sanitation fee could impact on the total revenues of ONAS' operation and subsequently mitigate its financial operation deficit.

- Pollution tax:

Industrial companies must support this tax. Indeed, they represent the biggest wastewater producers and therefore the main customers of ONAS on the sewerage systems in Dakar. Therefore, they should pay some additional fees to ONAS to mitigate its total expenditures. This tax could be grafted to these companies from the water supply sanitation fee that they are already paying to the drinking water company. Hence, the actual sanitation levy will be revised upward especially for industrial producers.

- Sewerage Connection tax

This sewerage connection tax will be paid by property developers, when they apply for building permits. The building areas must be linkable to the ONAS sewerage system for the tax to be applicable. The criteria that will be used to calculate the tax could be the construction surface. The payment will be made to ONAS, which will deliver a discharge that will allow the promoter to get a building permit.

- Gradual Reduction of subsidies

The subsidies represent a non –negligible portion in the management of ONAS (24 % of the total revenues in 2016). In the viewpoint of sustainability, this could be a concern, because the operation of this public institution should be self-independent. In other words, ONAS should operate without relying on such subsidies by optimizing its revenues such as sanitation fee, incomes from by-products etc. Therefore, the gradual reduction of these subsidies should be considered in the future as a sound and sustainable operation of urban sanitation management.

- Increase incomes revenues of the business of sanitation

Product generated from operation of the sanitation facilities (by-products) such energy, water, and fertilizer should be more promoted at the National level. Because the current income generation from the by-product (sale of treated water and sludge's) are still very low and accounted for less than 1% of the total revenues of ONAS. Technology orientation to good and high quality of by-products with lower operating cost could be one idea. The increase in revenues from by-products could cover some important part of the financial operating deficit.

- Involvement of wide actors in the sanitation sector

Another steady and sustainable sources of incomes is to involve national private sector in the management of urban sanitation facilities in order to create more revenues and provide a better management. And that is understood by the sanitation public authorities of Senegal because in the projected financial mechanisms of ONAS by 2015 it is planned 100 billion investment through PPP (Public- Private Partnership) models. This optimistic plans are supported by various Laws including the recently adopted PPP Law of 2014, which stipulates the reinforcement of the alliance private and public sectors in order to develop innovative financial mechanisms for the sector. Furthermore, among actors the involvement of the municipality in the management of wastewater and human excreta, should be also considered.

D.2.3. Examples of innovative financing instruments on the management of faecal sludge in Dakar

D.2.3.1. Background of these innovative examples of financial mechanisms

On-site sanitation is the predominant system used in Senegal for the management of human waste. In the Departments of Pikine and Guediawaye (Dakar, Senegal) the population was estimated at about 1, 200,000 people (2011), and around 80 % of them were relying on on-site sanitation. As a result, a significant amount of fecal sludge was produced daily in these Departments (1500 m^3/day). More so, as the groundwater is shallow in many parts of these areas (intrusion of groundwater into containments especially in rain season), domestic pit-emptying frequency is relatively high with an average of twice in a year. Furthermore, people often had difficulties to get access to emptying trucks when needed. And due to the lack of competition between emptying operators, the cost of the mechanical emptying was unaffordable (65,000 F.CFA/year/household /emptying) for a large segment of the population (where the vast majority live with less than USD 2 /person/ day). Thus, manual emptying became widespread and 52 % of population used such kind of practices. Therefore, to address these issues, ONAS with the financial support from the Bill & Melinda Gates Foundation has set up the "Program for the Structuring of the Faecal Sludge Management Market for the Benefit of Poor Households in Dakar Suburban Areas (PSFSM)". The General Objective of this programme is to improve the living conditions of low-income people living in the peri-urban areas of Dakar (Pikine and Guediawaye), by facilitating access to hygienic and affordable sanitation services. More specifically the program aims to:

- Organize the FSM sector: Organization of emptiers, implementation of licence, delegation of the sludge treatment plant to private sector and researching about innovative sanitation technology adapted to flooded and flood-prone areas of the peri-urban of Dakar;
- Decrease the cost of mechanical emptying: Introduction of a Call Center to foster competition among the emptiers, construction of new FSTP closer to areas of FS production and implement a guarantee fund allowing emptiers to access to fund for renewing or rehabilitating their fleets of truck.
- Transform sanitation into a real market through reuse of FS: Commissioning of the Omni-Processor (OP), which generates water, amendments and energy as by-product.

The total project cost has a value of about 8.3 billion F.CFA (USD 18,370,007) which is entirely funded by the Bill and Melinda Foundation and for a duration of nearly seven (07) years (November 2012 - March 2018). In this program ONAS with its partners (Bill and Melinda Gates, WSA, IPA, Oxfam, private sector and Association of emptying operators and) has developed three (03) different interesting financing mechanisms (1- delegation of the management of FSTPs in Dakar to private sector, 2- implementation of guarantee fund for pits emptying operators in Dakar to get access to credits from bank and at lower rate, and 3- development of toilet market in Dakar to increase the access rate to sanitation), that could be shown to other countries as good examples in the management of human excreta. Among these above financing instruments on the management of faecal sludge, this report discussed only the delegation of the FSTPs to private sector (as Example and the implemented guarantee fund for pits emptying operators.

D.2.3.2. Example 1: Delegation of FSTPs to Private Sector

The overwhelming majority of the Dakar population (over 75%) uses on-site sanitation systems for the management of domestic wastewater including human excreta. This resulted in large production of sludge, which was estimated at

about 1,500 m^3/day (Dakar Master plan 2013). Most of these sludge productions were collected by pit emptying trucks and one portion was collected through Manuel emptying, which consists of digging a hole outside the house and put the emptied sludge in. Thus, to control these illegal dumping, three (03) different FSTPs (Camberene, Niaye and Rufisque) with a total capacity of 240 m^3/day, were constructed and managed by ONAS (ONAS, 2012). Many challenges had been identified and most importantly the advanced deterioration of equipments and the lack of good operations and maintenance of these FS facilities. The Table 12 shows the financial results of the FSTPs in Dakar prior to the delegation of the management to the private sector. From these results it was found that the operation of the FSTPs in Dakar was profitable for Camberene (22.86 %) and Rufisque (16.37 %), while showing a significant loss for Niayes (-41.81%). The distribution of expenses is presented in the Figure 7 and shows that almost 60 % of the expenses were deriving from personnel cost.

Table 13: Results of the Dakar FSTPs' financial situation before the delegation of the management to the private sector

Results of 2012	FSTP of Cambérène	FSTP of Niayes	FSTP of Rufisque	Total
Expenses* (×1000 F.CFA/year)	23,253.60	21,504	18,954	637,11.60
Incomes (×1000 F.CFA/year)	30,146.40	15,163.96	22,662	679,72.36
Operating Results (×1000 F.CFA/year)	6,892.80	-6,340.96	3,708	4,260.76
Profitability Rate (%)	22.86%	-41.81%	16.36%	6.27 %

*These results did not consider in the expenses portion the depreciation and the ONAS taxes.
Source: ONAS, 2012

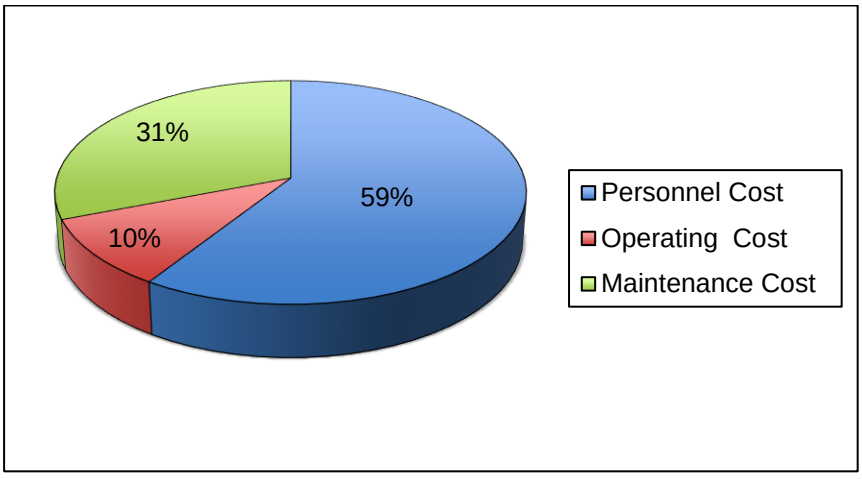


Figure 7: Distribution of expenses of FSTPs in Dakar before the delegation

Discussing deeply these results obtained before the delegation (Table 13), interestingly found that even with a bad provision of FS Services, ONAS could get a net annual profit of 4, 260, 760 F.CFA in 2012. However, it is highly important to mention that the obtained values (Table 13) did not include the expenses related to depreciations and other financial fees such as company taxes. Subsequently, if these expenses were considered, the obtained results would have been lower than these values.

In total, prior to the delegation the operation of the FSTPs in Dakar was financially profitable with a net positive annual result of 4, 260, 760 F.CFA. But in contrast, the operation did not respect the technical and environmental norms associated with these facilities. In addition, the poor maintenance of such facilities was another serious concern for the public sanitation authority.

Considering all these above challenges and poor quality of the services offered in these facilities, ONAS with the financial support from the Bill and Melinda Gates Foundation decided to entrust the FSTPs to the private sector. Therefore, the objective for ONAS was to involve the private sector through PPP model in order to make the FS sector: 1) Technically and financially viable, 2) environmentally compliant with existing regulations and 3) socially acceptable.

In other words, ONAS encouraged the private sector to invest in the sanitation and more specifically in faecal sludge sector.
This was the first time in Africa that the application of principles of delegating FSTPs to private sector has started

- Methodology

To build a sound public private partnership a procedure of three (03) different steps were set by ONAS:

- Study of possible options for FSTPs delegation to the private sector (the delegation of public sanitation service is governed by various existing laws in Senegal);
- Define rights and obligations of stakeholders;
- Selection of the private operators with best bid.

Based on several analyses such as financial, administrative and environmental conditions prior to the delegation (challenges in the FSTPs management, advanced deteriorations of facilities and equipment, low or absence of profitability and lack of recycling systems), a seven (07) years concession contract basis was set by ONAS for the management of the existing FSTPs in the Region of Dakar. This option was profitable for both public authorities and the concessionaire simply because, the public would not bear the necessary investment for the rehabilitation of FSTPs, and the private operator would be able to spread cost over a relatively long period. All FSTPs in Dakar (03 in total, in 2013), was delegated to one single private sector.

- Results of the delegation of Dakar's FSTPs to private sector

Multiples positive results have been achieved since the delegation of the Dakar Region's FSTPs to private sector:

Technical aspects:
In the technical point of view significant improvements of the management of FSTPs in Dakar Region were reached by the delegation:

- Upgrading of all FSTP facilities, in accordance with mutual obligations specified in the concession contract;
- All FSTPs (03) in Dakar are currently operating at their normal stage even if they received 6-7 times higher volumes of faecal sludge (Figure 3) than their nominal capacity (240 m3/day). In other terms a better quality of service is currently being provided by the private sector for the sound management of the faecal sludge facilities in Dakar;
- Increasing hours of operation (16 hours/week) compared to ONAS management (14 hours/week), which led a reduction of illegal dumping and the development of a market for dried sludge;
- Etc.

Social aspects:
Prior to the delegation the workers at FSTPs in Dakar was badly considered at the point that no one want to do such kind of jobs. This view of workers in sanitation has started changing. The current workers at the FSTPs are receiving good treatments because of the delegation:

- Increase of their salaries between 13-60 % depending on their positions;
- Monthly payment of their salaries at due time;
- Solve the issue of late payment of social contribution for retirement.
- Reduction of weekly working time from 52 to 48 hours;
- Availability of paid vacation for the workers (1 month off out of 12 month);
- Availability of enough Personnel Protective Equipment (PPE) for workers.

Financial and Economical aspects:
The financial situation after two (02) years of delegation of the Dakar's FSTPs to private sector is summarized in the Table 14. The total net profit for the 1st (2013-2014) and 2nd (2014-2015) years of operation were respectively 14.463 million and 12.768 million, which was significantly higher than the value obtained before the delegation (4.260 million). The profitability rates for the 1st (11.5 %) and 2nd (7.9 %) years of operation in comparison with the value before delegation (6.2 %) showed similar tendency with the annual net profits. Therefore, the delegation of the FSTs in Dakar causes a healthier financial situation compared to the case where public (ONAS) was performing the management. This is also corroborated by the results obtained from the FSTP of Niayes, where significantly high loss (-41.8 %) was observed prior to the delegation, and after the delegation the negative financial situation was recovered with a net positive profitability rate (2.7 %).

Table 14: Results of the financial situation of the FSTPs in Dakar after the delegation of the Management to private sector.

Results	FSTP of Cambérène	FSTP of Niayes	FSTP of Rufisque	Total
	Period: 2013-2014			
Expenses* (×1000 F.CFA/year)	34,581.52	39,165.39	32,262.84	106,009.76
Incomes (×1000 F.CFA/year)	49,394.40	35,951.10	40,197.65	125,543.15
Operating Results (×1000 F.CFA/year)	11,080.13	-2,567.70	5,951.11	14,463.54
Profitability Rate (%)	22.43%	-7.14%	14.80%	11.52%
	Period: 2014-2015			
Expenses* (×1000 F.CFA/year)	47,368.78	51,482.87	43,847.05	142,698.70
Incomes (×1000 F.CFA/year)	53,742.58	54,016.16	53,789.64	161,548.37
Operating Results (×1000 F.CFA/year)	4,389.91	1,479.22	6,899.40	12,768.53
Profitability Rate (%)	8.17%	2.74%	12.83%	7.90%

*These results include at the expenses portion the depreciation and private company taxes.
Source: ONAS, complied by SenEngineering International S.A.

The Figure 8 and Figure 9 show the distribution of expenses following the 1st and 2nd year of the delegation in all Dakar FSTPs. The maintenance costs in the 1st (52 % of the total expenditures) and 2nd (41 %) of was higher than the rate obtained prior to the delegation (31 %). Similar results were found with the operating cost (15 % for 1st year, 18 % for 2nd year and 10 % before delegation). One reason for these interesting results might be the increase in sludge volume received at FSTPs (Figure 3) at a level of 6-7 times higher than their total capacity (240 m3/day), which led to the increase in operation and maintenance of the facilities. As for the personal cost after the delegation (33 % for the 1st year and 41 % for the 2nd year) in comparison, it has decreased significantly in comparison with before the delegation (59 %), while better conditions for workers were made.

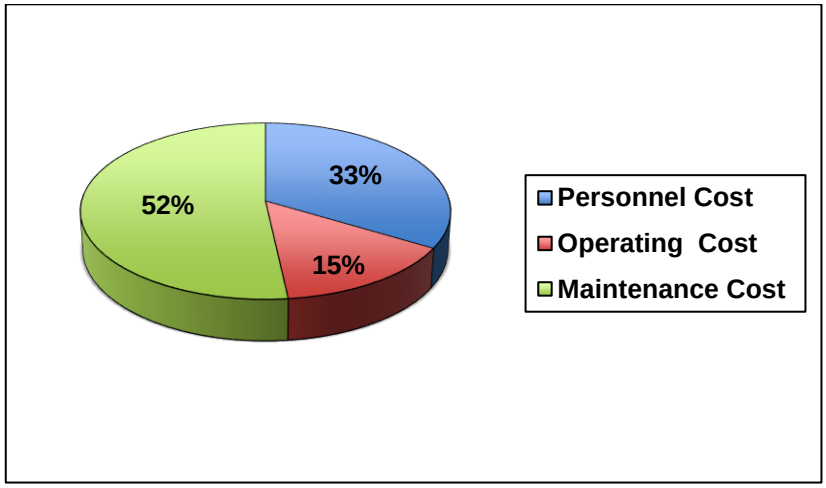


Figure 8: Distribution of expenses of FSTPs in Dakar 1 year after the Delegation (2013-2014)

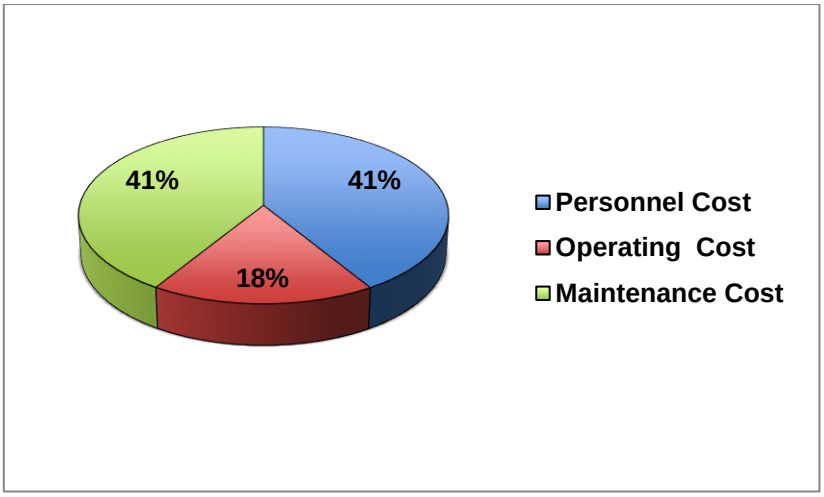
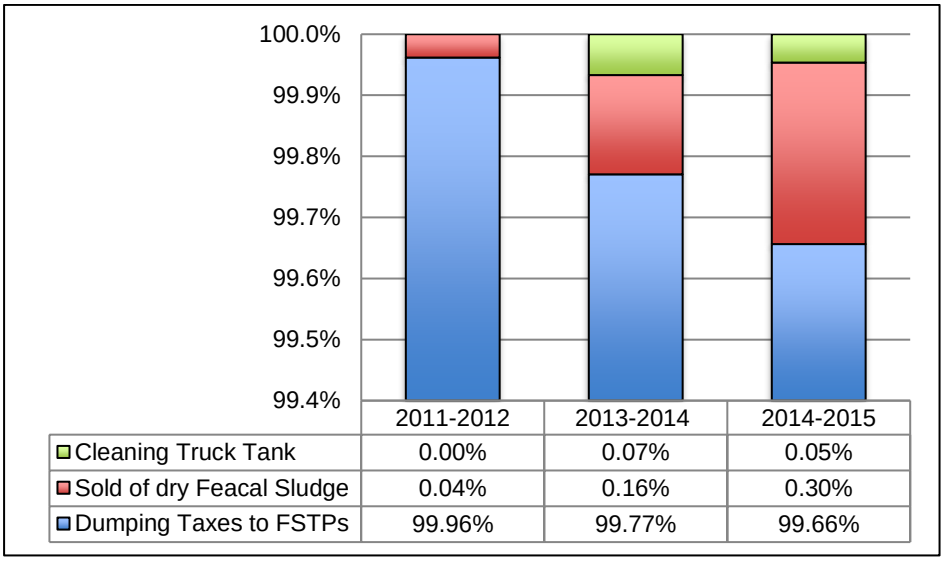


Figure 9: Distribution of expenses of FSTPs in Dakar 2 years after the Delegation (2014-2015)

The main sources of incomes generated from the management of FSTPs in Dakar are discussed in the (Figure 10). In the FSTPs of Dakar, all the revenues (more than 99 %) come from the dumping taxes (300 F.CFA/m^3) regardless whether considering before or after the delegation. Nevertheless, the private sector, is trying to diversify the revenues sources with the sale of dry faecal sludge (500 F.CFA/m^3) and cleaning the pit empting truck tank, even if a lot of efforts need to be done in this sense.



	2011-2012	2013-2014	2014-2015
Cleaning Truck Tank	0.00%	0.07%	0.05%
Sold of dry Feacal Sludge	0.04%	0.16%	0.30%
Dumping Taxes to FSTPs	99.96%	99.77%	99.66%

Figure 10: Distribution of Incomes generated in the Management of FSTPs in Dakar.

Regarding the incomes, the distribution of the net profit generated from the management of FSTPs between the public authority and the private sector before and after the delegation is presented in the Table 15. The concession contract between these parties stipulates a 50 % net revenue shared for a duration of seven (07) years (50% ONAS and 50% private sector). From the results in the Table 9, before the delegation ONAS had Net revenue of 4.260 million. After the delegation the total net revenues to be shared were 14.463 million and 12.768 million, respectively for the 1st year 1 (2013-2014) and 2nd year (2014-2015). In other words, after the delegation each party received a profit of 7.231 million (1st year) and 6.384 million (2nd year). The ONAS's portion after the delegation always includes the payment of the annual licence fee (1,146, 160 F.CFA to be paid at the beginning of each year) and the annual operating fee (3, 438, 468 F.CFA, which is equivalent to 286,539 F.CFA/month).

Table 15: Distribution of shared net profit between ONAS and the private sector before and after the delegation

Organization / Institution	Net shared profit distribution		
	Before delegation	After delegation	
	2012	2013-2014	2014-2015
Private portion (F.CFA)	0 (0%)	7,231,769 (50%)	6,384,263 (50%)
ONAS' portion (F.CFA)	4,260,760 (100%)	7,231,769* (50%)	6,384,263** (50%)
Total	(100 %)	(100 %)	(100 %)

*4, 584 628 FCFA (annual licence fee + annual operating fee) + check of compensation de 2,647,141 F.CFA issued by the private; ** 4, 584 628 F.CFA + check of compensation of 1,799,635 F.CFA issued by the private.
Source: ONAS, complied by SenEngineering International S.A.

From this section it could be retained that, the financial situation of the management of FSTPs in Dakar is significantly improved with the delegation. The public authority gains more revenues with a better a quality of service at the FSTPs. The private sector also finds out more in the set business. Moreover, the private makes more profit and manage better than public authority.

- Lessons learned from the Delegation

The lessons learnt from the Delegation of the FSTPs in Dakar to private sector reveal the following:

- the private sector has been really efficient in the management of the FSTPs ;
- the public authority (ONAS) takes greater advantage from the concession compared the public management (better operation of facilities and increases increase in net profit) ;
- the delegation of FSTPs in Dakar is a financially sustainable delegation model;
- the FSTPs delegation model is technically, socially, economically and financially accepted in Senegal. Therefore, it is a sustainable model;
- the Senegalese sanitation authorities are preparing for scaling up the Dakar model at the country level because of the obtained successful results. The technical and financial partners (Gates Foundation, AFD, etc.) are being more and more interested in such model and are ready to support the scaling up.

Conclusions:

In conclusion we can retain that the delegation of the FSTPs to private sector have resulted in a great achievement which includes the renovation of FSTPs, the increasing hours of operation (16 hours/week), the improvement of social conditions of FSTPs' personnel, the reduction of illegal dumping and the development of a market for dried sludge. This turn led to an increase in revenues generation for the public and private, better provision of quality services, and creation of green job opportunities. Based on these interesting results, the Senegalese Government has decided to delegate the management of all FSTPs in Senegal to private sector since they have a high capacity to generate more revenues (healthy financial conditions) and provide better services in comparison with the public management. Therefore, the Dakar' delegation of FSTPs to private sector is a unique experience in Africa that need to be shared with other countries as good examples of the involvement of the private sector in form of PPP for the sound management of urban faecal sludge.

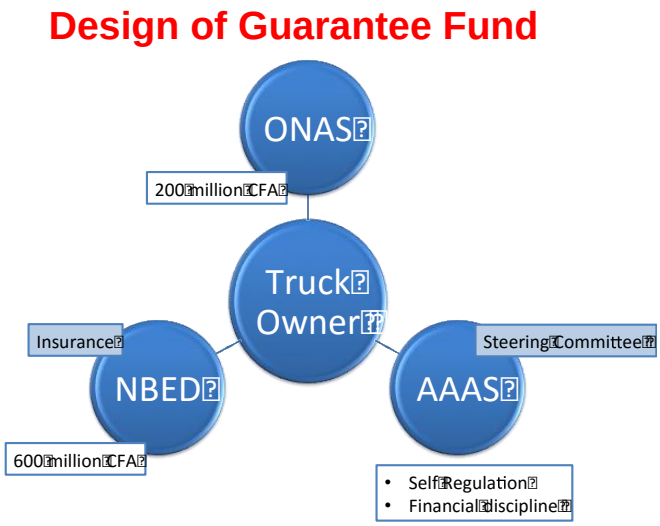
D.2.3.3. Example 2: Organisation of mechanical pits emptying operators

The guarantee fund (GF) could be defined as an amount of money pledged as a contingent for loss, to pay investors if a debtor company is unable to pay. Prior to the ONAS' FSM Program, it was found in Dakar that emptying trucks were old (unfit to business and cause health and environmental problems) and had a high operating cost (maintenance and fuel cost accounted about 50% of the operating cost). These emptying companies had limited resources and difficulties in accessing bank credit. Conscious of these above drawbacks, the program under its Research and Restructuring Markets Component established a guarantee fund to decrease the financial burden of emptying operators companies in order to increase mechanical emptier's incomes. The specific objectives of the guarantee fund are 1) to develop a market to meet emerging demand by providing access to loans for renewal of their fleets or acquisition of spare parts 2) Reduce the service cost by lowering the O&M costs 3) Mitigate the risk of the credit agencies.

- Design of the Guarantee fund

The guarantee fund is established to promote the development of emptying companies in Dakar through facilitating access to credit for renewal of their emptying fleet trucks and /or acquisition of spare parts. The schematic design of the emptiers guarantee fund and the detailed process for the acquisition of the fund is presented respectively in the Figure 11 and Figure 12. ONAS and Bank agreed on a deposit of 800 million in the selected Bank (NBED) as a guarantee fund with a respective portions of 200 million and 600 million each, in order to ease emptiers for accessing to credits at the bank at good conditions. The sharing of risk concerned the three (03) parties, who are 1) the credit institution, 2) the guarantee fund and 3) the beneficiaries of the guarantee fund, which refers to emptier. The financial instrument required a good organization of the actors, that is why the structure of governance in Figure 11 was defined by the different stakeholders (ONAS, Bank, AAAS and Truck owner). It is a requirement that the truck owner (privates companies) should belong to the Association of emptier (AAAS) before pretending to have access to a credit, which is on way of formalizing the sector. To ensure a proper operation of the guarantee fund ONAS, a steering committee has been set up by and composed by the following members:

- ONAS' faecal sludge programme staffs (Coordinator, Financial manager and monitoring and evaluation expert) as well as the administration and finance its headquarter directorate;
- Representative of the Ministry of hydraulic and sanitation;
- Representative of the AAAS;
- Two representatives of selected bank.



"NBED": National Bank of Economical Development
"AAAS": Association of Sanitation Actors in Senegal

Figure 11: Schematic design of the guarantee fund

- Fund floor - Process

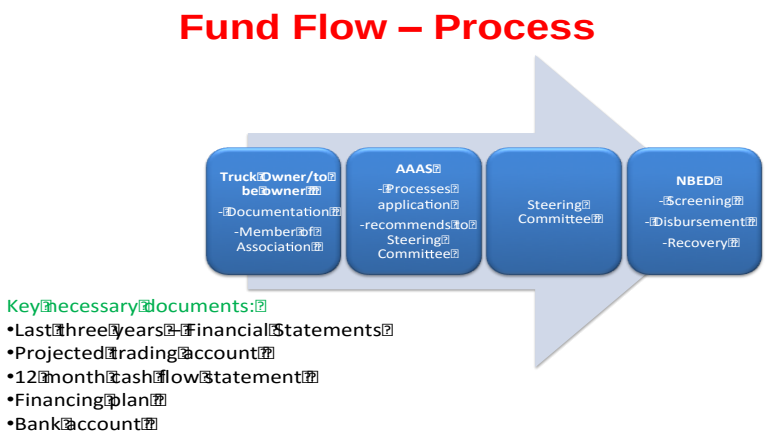


Figure 12: Guarantee fund chart flow process

For granting the loans to emptiers, the steering committee adopted the following strategies: 1) the loans applications are officially made by each borrowing emptier, 2) the bank a link the emptying truck and 3) each borrower signs an agreement with the emptiers's association who reserves the right to recover and entrust its operation with another emptier, in the event the emptier fails to repay its credit.

- Details specifications on Guarantee Fund Operations

The detailed description of the Guarantee Fund (GF) modalities for the emptying operators in Dakar is shown in the Table 15. The total amount of the guarantee fund is 800 million F.CFA. This amount was constituted based on the contribution from ONAS (25 %) and the Bank (75 %). A fixed interest rate of 7.5 % is agreed with the bank, which is significantly low in comparison to the usual interest rates of applied in Senegal (12 -13 %).

Table16: Specific information on the Guarantee Fund for the emptying operators

No.	Designations	Resulted Operations from the GF
1	Total amount of the guarantee fund	800 Million F.CFA (1.6 million USD)
2	Risk coverage	25% (GF) and 50 % (insurance)
3	Average loan amount for new truck	20-25 Million F.CFA/ beneficiary
4	Average loan amount for upgrading	5 Million F.CFA / beneficiary
5	Fixed interest rate	7.5 % (6.5 % banks + 1 % insurance)
6	Loan tenure	6 years with a grace period of 6 months
7	Late payment charge	Less than 3 %
8	Ratio of the current beneficiary	29 beneficiaries out of 38 Applications

Source: ONAS, complied by SenEngineering International S.A.

- Current important results on the guaranty funds

From the results of the conducted interview with the Bank, ONAS' PSFSM and the Association of Sanitation Actors (AAAS) in Senegal, the current following results on the guarantee fund were collected and confirmed by all of these stakeholders:

- the execution rate of guarantee fund is counted for 76 %;
- the Bank has financed 29 applications out of 38;
- a total number of 29 emptying trucks (01 truck per applicant) have arrived in Senegal from Europe and all them are currently operating in Dakar;
- the remaining 9 applications are under processed by the steering's committee and the bank.
- the non-performing loans (NPL) are rated to 8 %, which is low because of lack commitment of the beneficiaries. However, according to the beneficiaries (services providers) these delays in payment of the loans will be fixed shortly through theirs annual business with religious cities in Senegal. These religious cities organize several annual events and since they are not connected to sewer line and the needs of emptying services become annually a big market for them.

- Impacts of the Guarantee fund on the FSM Program

The guarantee is highly relevant for many urban areas, states, and sectors. It's a progress step for promoting FSM Market for an inclusive market. Impacted results of the guarantee fund on the FSM Programme of ONAS is summarized as follows: 1) the used strategies fit within the overall FSM Programme 2) helped in developing the FSM market by increasing fleets to meet emerging demand 3) Promote mechanical emptying 4) lowered interest rates and increase incomes of the services providers (12-13 % to 7.5 %) 5) Self-regulation through the Association of Sanitation Actors.

- Lessons learnt from ONAS guarantee funds:

Considering the ONAS' guarantee fund the lessons learnt are captured in this section and as follows:

- promote financial discipline and professionalize the sector (bank account, tax, and balance sheet);
- for long term sustainability – equity contribution may be considered;
- increasing financial literacy of the steering committee and beneficiaries members;
- potential for scaling up and replicable but communication is necessary to increase the loan recovery rate (because of a NPL of 8 % was reported a result by the bank);

- Recommendations on the guarantee funds:

From these above analyses on the guarantee fund, it could be recommended the following:

- the guarantee fund (financial instrument) is a good way to formalize informal markets;
- the guarantee fund could be used to provide access to financial services for the private companies to effectively provide better sanitation services in cities;
- the guarantee fund is applicable to many sectors including sanitation in itself.

Based on these results, it could be concluded that the guarantee set up by the Bank, the emptiers association and ONAS is a relevant mechanism because it removes one of the main hindrances to the financing of the actors in the sanitation sector, namely guarantees. However, a guarantee fund is not a gift, the beneficiary must be involved in a certain proportion to cover costs that will allow to capture resources. Thus it is a viable model, if there is compliance with the commitments of beneficiaries but also to put a rate of remuneration for this guarantee that the beneficiary will have to support. This rate is usually called a guarantee fee that ranges from 1.2% to 2%.

D.3. Opinions on increasing financial flow on sanitation

This section summarized the different opinions collected during interviews and relates to increasing financial flow of sanitation:

Technical point of views:

- Introducing new technologies that could create more added values in the reuse of faecal sludge. The produced by-products from such facilities should be generated at lower operating cost and have a high market values (sealable products);

Economical points of views:

- In Senegal, the sanitation sector is kind of more social than profit orientation. And the classical way which consists of receiving only loans from donors in order to invest in building new sanitation infrastructures to meet the demands of infrastructures is not sustainable. Because, applied procedures and regulations from these classical donors are very heavy, and the lending amount usually insufficient for the sector. More so, the concessionary loan offer (2-3%) in a long period (15-20 years), that the Government needs to reimburse could be a continuous challenge because continuous investments generally require to meet the continuously wider gap between investments and the demands in facilities. Maintaining existing sanitation facilities is another issue and the deriving costs are not negligible. Therefore, to address these described challenges above, the mixture of investments from both donors and innovative finance instruments, with a more special focus on the latest one is a key. Among the innovative financing mechanism, the provision of finance in a commercial based form "Commercial offer", where the private sector intervenes into the sanitation sector,

invests, constructs and (optional) operates the facilities, and in reverse the State reimburses the investment with a fixed agreed period. Such kind of new commercial financing instruments shall involve the local private sectors. And finally another sustainable innovative mechanism is to create strong local private companies which could capture sufficient funds and invest in sanitation infrastructures to generate useful and reusable by-products for the benefits of all (private sector State, population etc.).

- Increasing financial flow in sanitation could be reached through considering the following: 1) formalize or organize the different actors (city sanitation service providers) so that they can produce stable and reliable financial information, 2) provide financial education to these actors and reinforce their bankarisation rate, and 3) gather these actors within a cooperative, to federate their interventions into the banking sector to increase their benefits as well as those of the external donors (i.e. Government, Strategic technical and financial partners etc.)

- Providing assistance to private sector to have funds, perhaps through loans from Banks, Institutions or states at a lower rate (5-6%) with a long enough repayment period (10-15 years), for not optimizing the operation of wastewater and faecal sludge treatment plants and create more revenues, but also build and operate by their own new facilities (Build and operate schemes application). This is possible only if the mechanisms put in place are supported by a guarantee fund.

Legal points of views:

- Implement favourable legal and regulated environment, which facilitate access to funds and secure transactions for the private sector, is required to increase financial flow for sanitation

Social and cultural points of views:

- Generate useful by-products and that are culturally accepted to promote sound circular economy.

Annexe 1: Interviewed Actors / Summary of Interviews

No.	Nom	Institution/Organization	Contact	Date
	Abdou Diouf	Director/EVE	(221)774506443 abdoudiouf@eve-sn.org	04/11/2017
1	Abdou Diouf is part of the team of EDE and ARTELIA that made the study on ''identifying sustainable financing mechanisms in the sanitation sub-sector'' for ONAS in October 2017. • Sanitation is managed by the State that sets up its policy through ONAS which is responsible for sanitation in Dakar. In relation to sanitation there is no responsibility dedicated to the city. • ONAS has two guardianships the Ministry of Finance and the Ministry of Hydraulics and Sanitation, the guardianship of the Ministry of Finance can be questioned, with the finance program the Ministry of Finance will no longer be the only expenditure authorizing institution (WAEMU reform). The communication between decision-makers in the sector Communication is done at the level of the following instances: • The semi-public sector advisory Committee, which allows ONAS to address its concerns. • The technical commission at the national assembly is also a forum for exchanges that allows actors to express themselves. • The actors can also communicate during the preparation of the finance law by the Ministry of Economy and Finance			
	Dieynaba Thiam KA	Dakar's Municipal Finance Program	(221)778116657 dieynabathiam@villededakar.org	06/11/2017
2	• Mrs. KA is in favor of setting up of guarantee funds like the FIN WASH and the BLUE FUND, which are rather innovative financing mechanisms. FIN WASH, for example, is committed to supporting private operators to fill funding gaps in order to achieve universal access to water and sanitation services through viable and reliable management models. Ms. ka thinks it is necessary to: • Make a market-based approach. Make private operators independent and solvent. Institutions like AFD are doing a good job in this direction by giving guarantees with rates of 7 to 8%. • strengthen the financial viability of service providers and establish a sound financial base to increase public investment and access to private sector financing by local banks, municipal bonds or joint financing mechanisms -There is a need to advocate for increased and monitored public investments -Use mixed financing opportunities, public-private partnerships, local debt financing, development funds and other viable financing models that can be replicated and scaled up in target countries -Leveraging domestic capital markets and host government funds, grants from foundations, multilateral investments in development banks, and private sector participation in shares and debt financing, in order to mobilize investment expertise and access capital market -The delegation of fecal sludge treatment plants must be emphasized in order to give more resources to private operators.			
	Moustapha Lo	ONAS'FSM PROGRAMME	(221)77 579 34 12 Moustapha.lo@onas.sn	13/11/2017
3	• Before the delegation, there was a deficit management of sludge treatment plans with a staff working in laborious conditions. • With the delegation, there is an optimized management of the sludge treatment plants that have become financially more profitable for ONAS and for operators in the sector who pay to ONAS a monthly fee in addition to license which is paid at the beginning of the year. The staff benefits from better salary treatment and good social coverage. • In terms of research development DELVIC is doing a good job not only to improve the working conditions in the plants but also to make the activity more profitable. The drying time is correct with DELVIC.			

	• It should be noted that the sludge treatment plants receive more than their purification capacity, which increases the costs.			
	Bécaye Sidy Diop	DELVIC/Director	(221)77 677 56 42 Becaye.diop@delvic-si.com	13/11/2017
4	• FSTPs have returned to normal operation, despite being 6 to 7 times undersized. Heavy maintenance is carried out in terms of cleaning the sedimentation basins (we are working to reduce these operating expenses, notably with the acquisition of a cleaning truck); • Rehabilitation work on the drying beds, the truck maneuvering area, the fence wall, and a renewal of some electromechanical equipment (pumps). The profit margin would have been much higher if this work had been taken over by ONAS (which should normally have been done); • Salaries were reconsidered upwards (between +13 and + 60%); • delays in the payment of social security contributions (IPRES and CSS) have been regularized and the monthly payments of these salaries and contributions are currently paid on due date; • all staff have health insurance that covers 70% of medical expenses (consultations, tests, drugs) • the weekly working time of the staff has decreased from 52 to 48 hours; • staff receive paid leave; • staff are regularly equipped with PPE; • The operating time of FSTPs has been significantly reconsidered upwards: - before the delegation: from Monday to Friday, from 8am to 4pm and Saturday from 8 am to 2pm - After the delegation: from Monday to Saturday, from 8am to 5pm and Sunday at least one FSTP is open from 8am to 3pm. ϖ Amount of the annual license = 1,146,160 FCFA ϖ Amount of the monthly fee = 286 539 FCFA ϖ ONAS share = Delvic share = 50% of annual net profit (annual operating profit) • Operationally, the truck will drastically reduce cleaning costs in the coming years, the purchase of another trucks is on study. • On the other hand, the financial constraint in the delegation remains the expenses related to the rehabilitation, given the obsolescence of the plants. • In terms of needs, a guarantee fund with flexible access conditions would allow operators to develop their businesses. • For prospects, the introduction of innovative OP-type technologies would add more value to the business. There is the valorization of by-products that remains the future of the sector.			
	GASPAR BADJI	ADMINISTRATION AND FINANCE MANAGER PSMBV ONAS	(221) 77 547 45 49 Gaspar.badji@onas.sn	17/11/2017
5	-The guarantee fund is an excellent financing mechanism, it is a viable and replicable model, but on condition that the beneficiaries, especially the emptiers, respect their commitments. -The rate of the loan is low 7.5% compared to the rates we usually see 12 to 13%. There are unpaid and in the future to solve this problem we can change the selection criteria and make them more rigorous. We are pleased to note that out of the 38 emptiers registered in the funds, the 29 have been financed and the 9 are in the process.			
	AHMED DIALLO	Pit emptying Association	(221)77 640 93 34 elton100@hotmail.com	15/11/2017
6	The guarantee fund is a good financing mechanism that allows them to replace their trucks and equipment that were very old and obviously there are more trucks in Dakar because of the fund. The fund allows them to have access to credit at the level of conventional banks and renew their fleet, which allows to inject a lot of trucks. As a result competition comes into which allows to reduce the prices for the customers. Microfinance mutuals cover emptiers who have no guarantee. The model is viable but for its replication in the other regions of the country, a good organization is needed like the association of the emptiers of Dakar. Each emptier is entitled to one truck. To be financed, if it is an individual company here are the files to provide: - Financial Statements -repayment plan			

	-A request -A training certificate on the guarantee fund -A certificate proving that you participate in the fund's call center Corporations with capital, in addition to the above files must provide: -A cash flow plan -A full year estimated operating account. Regarding the unpaid there is not a problem, the beneficiaries will repay, they have markets with religious cities that will allow them to compensate. In the event that an emptier refuses to pay, the association can pick up the truck and give it to another. The emptying is regulated in Senegal what proves it is the code of the environment and the code of the taxes. In perspective there is the acquisition of the license of exploitation, the decree is being signed at the presidency.			
	Madieumbe Diouf	Administration and finance Director ONAS	(221) 33 859 35 09 Madieumbe.diouf@onas.sn	22/11/2017
7	ONAS does not have an operating account for Dakar but for the whole country. They have recently held a meeting with all center directors to start making operating accounts for centers among which Dakar. Madieumbe said that the work (the city study) that WWC asked us to do cannot be done in one month but two or three months. The WWC study schedule is too tight. Roughly Dakar occupies 80% of sanitation facilities in Senegal. The by-products represent about 3% and the fee represents 95% of the turnover for Dakar. In terms of data we received from ONAS the financial report for the financial year 2016 And the financial balance sheet for Dakar. Dakar has a good secure and integrated system, that is to say that sewerage systems and on site sanitation are taken into account. On how to drain more finance in the sanitation sector, Madieumbe believes that financial offers can attract more investments and get more infrastructures. This is an innovative type of financing compared to what conventional donors do. These donors give loans at concessional rates 2 to 3% over 10 to 25 years. Conventional donors have very slow procedures and often give little money. For Madieumbe using mixed financing is the right solution that is to say investing and going more towards financial offers, involving the local private sector while keeping the classic offers. For commercial offers the private invests and the State pays back little by little. There are also third parties, a private third party invests and operates for a certain time, example: Energy, the valuation of by-products globally.			
	Babacar Ndiaye	operations manager at PEPAM coordination programme	(221)775249039 b.ndiaye@pepam.sn	He travelled
8	Babacar sent us data on the evolution of rates in urban sanitation in Dakar and at the national level. (we could not meet him he travelled)			
	Dr Ababacar Mbaye	Director of Sanitation	(221)8696130 Ababacarmbaye27@gmail.com	
9	-As far as the loans repayment is concerned it is to be noticed that each donor has his own procedures for the World Bank it is the IDA procedures over a ten year period with generally an accepted delay of ten years that are applied. - The Senegalese government is more oriented to the sewerage system in urban areas even if it is extremely costy.The sewerage system represents roughly 30% and the on-site system 70%.It is about supporting the on-site sanitation which accounts for the highest rate to meet the current demand, it is then an alternative because being less costly.			
	Amadou Diallo	PEPAM National coordinator	(221)338590499 projeau@gmail.com	
10	-Concessionary loans: Repayment period of 38-40 years, with a grace period of 10 years and an interest rate of 1%;			

	-Semi-concessionary loans: Repayment period of 20 years, with a grace period of 10 years and an interest rate of 2- 4 %; -Commercial loans: Shorter repayment periods than those above and an interest rate of 6-7 %.

Annex 2: List of Collected material and use in this study

No.	Designations	Year of Publications	Sources
1	Recensement General de la Population et de l'Habitat, de l'Agriculture et de l'Elevage (RGPHAE, 2013) Rapport définitif	2013	ANSD
2	Recensement General de la Population, Rapport Régional définitif	2017	ANSD
3	Lettre de politique sectorielle de l'hydraulique et de l'assainissement en milieu urbain et rural	2017	MHA
4	Etudes d'identification de mécanismes durable de financement de l'assainissement pour le sous-secteur de l'assainissement urbain,	2017	ONAS
5	Revue Sectorielle Conjointe, PEPAM	2016	PEPAM
6	Plan d'action de mise en œuvre de la Stratégie Nationale de l'Assainissement en milieu Rural, Direction de l'assainissement.	2015	DA
7	Modele financier de ONAS en 2016	-	-
8	Plan d'investissement ONAS 2015-2025	-	-
9	Rapport de présentation des états Financiers de l'Exercice 2016 - ONAS	2016	ONAS
10	Balance Generale 31/12/2016 (XOF)–ONAS	2016	ONAS
11	Etat financier		
12	Delegation station de boues de Vidange au prive (Comptes d'exploitations des Stations de Boues de vidanges : Novembre 2013 – Octobre 2014 ; Novembre 2014- Octobre 2015	2014 and 2015	ONAS / Delvic
13	Rapport d'opportunité pour la convention de délégation de services public des station de traitement des boues de vidanges de Camberene , Niayes et Rufisque	2012	ONAS
14	Rapport Semestriel No 1, 2017 sur le Programme de Structuration du marché des boues de vidanges en faveur des populations démunies de Pikine et de Guediawaye	2017	ONAS
15	Brochure WASH Finance Project	2016	USAID / Ville de Dakar
16	Etude actualisation du Plan Directeur d'Assainissement Liquide de Dakar 2025	2013	ONAS
17	Innovations in city-wide fecal sludge management Lessons learned from Dakar, Senegal	2015	ONAS

Work programme

Increasing Financial Flows for Urban Sanitation

Case study

Bogota, Colombia

Prepared by:
Diego Fernandez

Bogotá, December 2017

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Part A: Brief introduction to Colombia

1. COLOMBIA'S SOCIAL, POLITICAL AND ECONOMIC SITUATION

Colombia has a surface area of 1,141,748 km², being the seventh largest country in America and twenty-sixth in the world.

Politically it is a republic constituted in a unitary state (in contrast to a federal, social and democratic country) with a presidential government system. It has a congress composed of two legislative bodies (Chamber and Senate). The country is divided administratively and politically into 32 departments, which in turn are divided into 1,122 municipalities including Bogotá, the Capital District, and other 5 special districts[1].

Departmental governments are led by the departmental governor (executive). Each department has its own departmental assembly[2] which issues mandatory ordinances in its department territorial jurisdiction.

Municipalities and districts are presided over by a mayor (executive). Each municipality has its own council (the administrative body that issues rules of municipal scope) made up of councilors.

The President of the Republic, Governors, Mayors, and members of Congress (senators and deputies), the departmental assemblies' members and the municipal councilors are elected by popular vote, for four-year terms. Neither mayors nor governors may be re-elected for successive terms. The presidential re-election was introduced in 2010 and abolished in 2015[3].

According to official projections by the National Statistics Department (DANE), as of December 2016, Colombia has a population of 48.7 million inhabitants (living in 13.7 million homes), which places the country in 28th place (depending on its size) in the world.

The country is mainly urban, with 76.6%[4] of the population living in municipal capitals (administratively considered as urban). However, in addition to the municipal capitals (that are the areas statistically defined as an urban area), there are some highly consolidated rural populations, so that the population residing in urban areas of the country may be over 80%.

[1] Second level territorial entities (municipalities) with an independent legal, political, fiscal and administrative regime, with special characteristics that make them stand out or differentiate them from others in terms of their economy, resources, culture or administrative and geographical role. To date they are Barranquilla, Buenaventura, Cartagena, Santa Marta and Riohacha.

[2] Public corporation with regional popular election that enjoys administrative autonomy and its own budget, made up of no less than 11 deputies nor more than 50, elected popularly for a period of 4 years.

[3] Two presidents enjoyed the reelection: Uribe (into which first period the reelection was introduces in National Constitution) and Santos (into which second period it was forbidden.

[4] DANE-Projections Estimates and projections of total national, departmental and municipal population by area 1985 - 2020

Table 1 Colombia Population, Houses and Households

2016 (in thousands)

AREA	POPULATION	HOUSES	HOUSEHOLDS[5]
Urban	37,333	10,636	11,024
Rural	11,414	3,052	2,846
TOTAL	48,747	13,688	13,870

Source: Own elaboration based on DANE, Estimation, and projection of the national population, homes, and households 2016.

There are 63 municipalities greater than 100,000 inhabitants, of which 10 have more than 500,000 inhabitants. The country's five main cities, with their respective metropolitan areas, are home to more than 17.6 million inhabitants, 36% of the country total population and 47% of the urban population.

According to the 2016 Quality of Life Survey (ECV), 89.6% of Colombian households had regular (by mains) water service: 97.5% in urban areas and 60.1%. In rural[6] areas. In turn, the sewerage service by networks (without taken in account septic tank or other alternatives) reached 77.5% of the country's households, with 93.6% in urban areas and 17.3%. in rural areas

Table 2 Colombia Water and Sewerage Coverage 2016

AREA	WATER	SEWERAGE
Urban	97.5%	93.6%
Rural	60.1%	17.3%
TOTAL	89.6%	77.5%

Note: Network coverage only; does not include individual systems.

Source: Compilation based on DANE, Quality of Life Survey 2016.

According to the DANE bulletin on "Monetary and Multidimensional Poverty" 2016, poverty in Colombia has maintained a decreasing trend since 2010: it went from 30.4% at the beginning of the decade to 17.8% in 2016. This means that the country went from 13,719,000 people living in (multidimensional) poverty[7] in 2010 to 8,586,000 in 2016, that is a to a reduction of 5,133,000 people in that period.

[5] Households are groups of people who meet basic needs from a common budget, while households can group one or more households together.

[6] Classified as "urban" only the municipal capitals, that is to say where the municipal headquarters are located.

[7] The Multidimensional Poverty Index (MPI) is constructed on the basis of five dimensions:

In the municipal capitals, the percentage of people living in multidimensional poverty was 12.1% in 2016, and in population centers and scattered rural areas, the percentage of people living in multidimensional poverty was 37.6%. The analysis by region shows that the regions with the highest MPI are Pacific (not including Valle del Cauca) and the Caribbean:

Table 3 MPI by Region 2015 - 2016

REGIONS	2015	2016
Pacific	33.8%	33.2%
Caribbean	31.2%	26.4%
Central	22.1%	18.0%
Oriental	17.5%	16.8%
Antioquia	18.7%	15.1%
Valle del Cauca	15.7%	12.0%
Bogotá	4.7%	5.9%

Source: Own elaboration based on DANE, Monetary and multidimensional poverty in Colombia 2016.

Two of the variables analyzed for multidimensional poverty assessment are:

- ✓ Deprivation of access to improved water source: a person is considered private if he or she lives in a household does not have water service. In the case of rural households, that means water obtained from a well without a pump, rainwater, river, spring, tank car, water-tank or another source different to a main or a well with pump.
- ✓ Deprivation for adequate excreta disposal: a person is considered private if he or she lives in a household does not have a public sewer system. In the case of rural households, they do not have a flush toilet or low water sanitary service.

educational conditions of the home, conditions of childhood and youth, health, work, and education.

access to household public services and housing conditions.

The results for these variables are presented below, both in the urban and rural areas, for the year 2016:

Table 4 Percentage of households with deprivation in public services 2016

VARIABLE	URBAN	RURAL	TOTAL
Without access to improved excreta disposal	6.4%	21.7%	9.6%
Without access to improved water source	2.5%	37.1%	9.8%

Source: Own elaboration based on DANE, Monetary and multidimensional poverty in Colombia 2016.

2. COLOMBIA´S POLITICAL AND ADMINISTRATIVE LEGAL FRAMEWORKS

Colombia is a democratic country; citizens elect governors by voting to represent them. The Political Constitution of 1991 determines all the rules, rights and duties of Colombians and the branches of public power, organized in three branches: executive, legislative and judicial, each of which fulfills different functions and acts independently but harmoniously:

- ✓ Legislative branch: it is in charge of creating the laws, it also has the attribute of modifying the existing ones. It is represented by the Congress of the Republic.
- ✓ Executive branch: responsible for enforcing the Constitution and laws. Its representatives are the president, vice-president, ministers, governors, mayors, and heads of administrative departments.
- ✓ The judicial branch is responsible for administering justice and resolving conflicts between the Colombian population, or between them and the State. Its representatives are the Supreme Court of Justice, the Constitutional Court, the State Council, the Superior Council of the Judiciary, the courts and judges.

2.1. Institutional framework

Municipalities are beholden to water and sewerage service in their jurisdiction. They are responsible for ensuring that those services are delivered to their inhabitants through public, private or mixed providers, and can only provide these services directly - that is, through a division of the municipality without administrative independence, rather than having a company - when the general interest so requires, provided that there are no companies interested in providing them.

Although ensuring the provision of public services is the responsibility of the State and, in the specific case of water and sewerage, of municipalities, in Colombia, unlike most countries, public services are provided in open competition, without any barriers, so that any interested party can do so, obtaining the corresponding environmental permits (water concession, discharge permit or landfill permits), which are granted by regional environmental authorities independent of the municipalities governments.

Table 5 Functions of government levels in water and sewerage services

Functions	Nation	Departments	Municipalities
Planning and Policy	MINVIVIENDA DNP	Governor. Units or management of public services	Mayoralties. Public service units or managers
Economic Regulation	CRA	No Competition	Mayoralties. Municipal Councils
Environmental Regulation	ANLA	Regional Autonomous Corporations (CAR)	Municipalities with more than 1 million inhabitants
Water Quality	MINSALUD	Secretaries of Health	No Competition
Surveillance and Control	SSPD, CGN, PGN	No Competition	Personalities
Benefit	No competition	Participation in regional companies	Municipal Public Enterprises. Mayoralties

Source: Own elaboration based on sectorial regulations.

Department' governments have only coordination and support functions in the water and sewerage services. They can provide technical, financial and administrative assistance to public owned service providers or municipalities whose are providing the service directly; coordinate service providers and promote associations of municipalities. Additionally, when a municipality is decertified[8], departments are responsible for administering, on behalf of the municipality, the resources transferred from the nation to the water sector.

As in the case of other utility services, for water and sewer services, it is up to the Nation to define planning and sectoral policies, economic and environmental regulation and the control and monitoring of service providers. Planning and policies are directly linked to the Ministry of Housing, City, and Territory (MINVIVIENDA) and the National Planning Department (DNP). Economic regulation is exercised through the Drinking Water and Basic Sanitation Regulation Commission (CRA) and the monitoring and control through the Superintendence of Public Services (SSPD).

The Ministry of the Environment is responsible for environmental regulation, but the National Environmental Licensing Authority (ANLA) and the Regional Autonomous Corporations (CAR) are responsible for the environmental licensing the sector works require it, and the latter (Corporations) for monitoring and controlling compliance with environmental regulations by water and sewerage suppliers. Municipalities with more than 1,000,000 inhabitants and Metropolitan Areas have some environmental authority functions in their jurisdictions.

[8] The deficient performance of the municipality in matters such as stratification or the management of resources transferred by the National Government through the General Participation System, in accordance with clearly pre-established rules, may lead to the decertification of municipalities in the drinking water and sanitation sectors.

The Ministry of Health defines water quality rules to water providers but the control is carried out by the departmental health secretariats. Finally, control and supervision of water and sewerage provider is the responsibility of the Superintendence of Public Services.

The economic cost of the services is set directly by service providers in accordance with methodologies defined by CRA; in case of municipal direct provision (without a company) it is exclusively up to the Mayor of the municipality to those costs, but equally subject to the methodologies established by the CRA.

The Municipal Councils are in charge to set the number of contributions and subsidies that affect the economic cost in order to define the final tariffs to apply to service's users and have to define the municipal resources aimed to subsidize the lower strata users.

2.2. Legal framework of the drinking water and basic sanitation sector

2.2.1. LAW 142 OF 1994

Law 142 of 1994 or " Public Home Services Law " is the law that governs the provision of domestic public services in Colombia, understood as energy[9], network gas, fixed telephony, drinking water and basic sanitation (sewerage and solid waste management). Although some reforms have been introduced since its enactment in July 1994, the main regulating rules for the water and sewerage sector remains the same.

In article 2 of Law 142 establishes as one of the aims of state intervention in public services:

> "… 2.2. Continued expansion of coverage through schemes to compensate for insufficient user capacity to pay.
>
> … 2.3. Priority attention to unmet basic needs for drinking water and basic sanitation.
>
> … 2.9. Establish a proportional tariff regime for low-income sectors in accordance with the precepts of equity and solidarity.

Article 5 established the competence of the municipalities with respect to the provision of public services, among which the following stand out:

> "5.1. To ensure that its inhabitants are provided, in an efficient manner, the domestic services of water, sewerage, sanitation, electrical energy, and basic public telephone switched, by public utilities of official, private or mixed character, or directly by the central administration of the respective municipality...
>
> … 5.3. Provide for the granting of subsidies to users with lower incomes, charged to the municipal budget, in accordance with the provisions of Law 60/93 and this Law.
>
> … 5.4. Stratify residential properties according to the methodologies outlined by the National Government..."

Similarly, Article 7 indicates the competence of departments, as support and coordination functions:

> "…7.2. To provide financial, technical and administrative support to public service companies operating in the Department or municipalities that have assumed direct services, as well as to companies organized with

[9] In addition to Law 142 of 1994, there are sector-specific regulations contained in Law 143 of 1994.

the participation of the Nation or Departments to develop the functions of their competence in public services:

7.3. Organize coordination systems of the entities providing public services and promote, when technical and economic reasons make it advisable, the organization of associations of municipalities for the provision of public services, or the celebration of inter-administrative agreements for the same effect...".

Finally, Article 8 establishes the competence of the Nation to provide public services:

"…8.4. To provide financial, technical and administrative support to public service companies or municipalities that have assumed direct responsibility for direct provision, as well as to companies organized with the participation of the Nation or Departments to develop the functions of their competence in public services and to companies whose capital belongs mainly to one or more cooperatives or associative companies of a cooperative nature.

8.5. Ensure that those who provide public services comply with standards for protection, conservation or, when required, the recovery of natural or environmental resources that are used in the generation, production, transport and final disposal of such services.

8.6. To provide directly when the departments and municipalities do not have sufficient capacity, the services covered by this Law...".

2.2.2. DECREE 1077 OF 2015

"Through which the Single Regulatory Decree of the Housing, City and Territory Sector is issued". It is a decree compiling pre-existing regulatory standards.

By means of this decree, the government regulated the Water and Sanitation Program for Prosperity - Departmental Plans of Water for the Business Management of Water and Sanitation Services (PAP-PDA), which defines them as "A set of inter-institutional planning and coordination strategies formulated and executed with the aim of achieving the integral harmonization of resources and the implementation of efficient and sustainable schemes in the provision of domestic public services of drinking water and basic sanitation,".

The inter-institutional coordination of the PAP-PDAs member are: the department governor, the Municipalities and/or Districts mayors, the Ministry of Housing, City and Territory -MVCT, the Director of National Planning Department - DNP and the environmental authorities with jurisdiction in the municipalities and/or districts located in the territory of the respective department.

It is made up of a Steering Committee (responsible for approving planning and monitoring, incorporating an analysis of available resources, targets, and indicators) and the Manager (responsible for the management, implementation, monitoring of implementation and matters related to drinking water and basic sanitation in the department).

The resources available for the formulation and implementation of the PAP-PDAs may come from the National General Budget, General System of Participations, General System of Royalties, Environmental Authorities, territorial entities budget, investment resources that the Providers want to execute through the PDA, private sector resources

that are incorporated into the structuring and execution of projects within the framework of public-private partnerships.

2.2.3. DECREE 1076 OF 2015

"Through which the Single Regulatory Decree of the Environment and Sustainable Development Sector is issued". It is also a decree compiling earlier regulations.

With regard to the environmental issue, the head of the country is the Ministry of Environment and Sustainable Development, is responsible for orienting and regulating the environmental planning of the territory and defining the policies and regulations to which the recovery, conservation, protection, regulation, management, use and sustainable exploitation of renewable natural resources and the environment of the Nation will be subject, in order to ensure sustainable development.

The Ministry of the environment is part of the National Environmental Licensing Authority - ANLA, which is responsible for ensuring that projects, works or activities subject to licensing, permit or environmental procedures comply with environmental regulations in a manner that contributes to the sustainable development of the country.

The Sustainable Development Regional Corporations are autonomous public bodies responsible for administering, within the area of their jurisdiction, the environment, and renewable natural resources and promoting sustainable development, in accordance with the legal provisions and policies of the Ministry of Environment and Sustainable Development.

Both ANLA and the corporations are competent authorities to grant or deny environmental licenses, such license is the authorization granted by the competent environmental authority for the execution of a project, work or activity, which according to the law and regulations, may produce serious deterioration of renewable natural resources or the environment or introduce significant or notorious modifications to the landscape.

The sewerage service provider must comply with discharge regulations rules and have the corresponding discharge permit and to have its wastewater treatment and Management Plan – PSMV. Furthermore, it has to control the compliance of non-residential users of the rules of discharge to public sewerage. When it is determined that a user is not complying with that regulation, it must inform the competent environmental authority, providing the pertinent information, so that it can initiate the sanctioning process.

Drains and effluents from industrial plants must be discharged through special networks built for this purpose, in a manner that facilitates the treatment of wastewater, according to the characteristics and classification of the receiving source. Industries may only be authorized to discharge their effluents into the public sewerage system, provided that they comply with the standard of punctual discharge into public sewerage systems.

Any building, concentration of buildings or urban development, tourist or industrial, located outside the coverage area of the public sewer system, must be equipped with systems for the collection and treatment of wastewater and must have the corresponding discharge permit.

Users whose properties or buildings require a special service by the wastewater provider, are required to comply with the current discharge standard and must submit to the service provider, the characterization of it, according to the frequency determined by the Ministry of Environment and Sustainable Development.

The users of the public sewerage service must give notice to the entity responsible for the operation of the waste treatment plant, when an occasional or accidental discharge may harm its operation.

Since more than 20 years the environmental authorities applied rates for use of water and for the direct and indirect use of water sources as a receiver of punctual discharge. For this last the norm defines:

> "Remuneration rate for punctual discharges. This is that which will be charged by the competent environmental authority to users for the direct and indirect use of the water resource as a recipient of direct or indirect specific discharges and their harmful consequences, originating from human-or man-made anthropogenic activities and economic or service activities, whether profitable or not.
>
> The remuneration rate for direct or indirect punctual discharges will be charged for the totality of the pollutant load discharged to the water resource. The levy shall apply even to pollution caused above permissible limits without prejudice to the imposition of preventive and punitive measures where appropriate.
>
> The collection of the fee does not imply under any circumstances the legalization of the respective discharge."

Up to 10% of the income from these environmental rates has to be used to co-financing of studies and designs associated with investment projects in decontamination and monitoring of the quality of the water resource, including elaboration and execution of Water Resources Management Plans, investments in interceptors, final emissaries and domestic wastewater treatment systems.

The proceeds from the remuneration levy for discharges to water are used for investment projects in water decontamination and monitoring of water quality.

To cover the costs of implementation and monitoring of the levy, the competent environmental authority may use up to 10% of the resources collected from the levy. For the above, the competent environmental authorities must make distributions in their budgets of income and expenses to guarantee the specific destination of the tax.

2.2.4. THE TARIFF REGIME

In defining the tariff system, Article 87.3 of Law 142 of 1994 define the principle of solidarity as a basic principle:

> "... 87.3 Solidarity and redistribution means that in implementing the tariff system, measures will be taken to allocate resources to Solidarity and Redistribution Funds so that upper-sector users and commercial and industrial users will help lower-sector users to pay for services that cover their basic needs."

"Solidarity and Redistribution Funds" are budgetary accounts used for the National Government (in the case of energy, gas, and telephony) or municipalities (in the case of water, sewerage and basic sanitation) to allocates the resources to cover the deficits that arise between subsidies and contributions in the rates of utility services.

Law 142 (art. 89.1) established that for all utility services the maximum contribution factor could not exceed 20% of the economic cost of service and subsidies could not exceed 50% of the economic cost of service for stratum 1, 40% for stratum 2 and 15% for stratum 3.

Although the above percentages have been maintained for energy, gas and telephone services, in the case of water, sewerage and basic sanitation services they have undergone substantial changes by subsequent laws that left the contribution factor without limit, increased the maximum subsidy of stratum 1 to 70% and established that it is the responsibility of municipal councils to define (at least every five years) the specific percentages of both contributions and subsidies to be applied in their jurisdiction.

2.2.5. THE STRATIFICATION REGIME

Colombian socioeconomic stratification is a classification of the households, based on the residential properties in which it lives[10], into six groups or strata, based on the concept that quality and characteristics of the housing and its surroundings are a good determinant or reflection of its price and therefore of the family's ability to pay.

The stratification system, despite multiple legal and regulatory provisions to which it has been subjecting, has undergone minimal methodological or conceptual variations since its initial formulation by Decree 2220 of 1993.

In practice, the vast majority of the rules that have been issued on this matter have only corroborated or clarified the existing rules, and in essence, have limited themselves to extending the deadline for mayors to adopt the new stratifications.

2.2.5.1. RESPONSIBILITIES CONCERNING CLASSIFICATION

The user classifications in strata are the result of studies that must be carried out by municipal and district mayors.

Stratification studies can be carried out directly by the Municipality, or contracted with third entities, using methodologies designed and supplied by the National Planning Department (DNP) and further by the National Administrative Department of Statistics (DANE).

Stratification is not a methodology for classifying families or households but rather housing, reflecting the inhabit families' ability to pay.

In accordance with current regulations, stratification studies must be carried out every five years, but can be carried out outside of these limits when natural phenomena occur (floods, geological crack, landslides, earthquakes, etc.) or social (amongst those found, loss of study due to technological or systemic problems, change of local administration without connection, by assault of groups, etc.).

[10] This mandate excludes indigenous settlements located in the rural areas of municipalities and districts, which must be classified according to their socio-economic conditions, taking into account their own cultural aspects.

2.2.5.2. PERMANENT UPDATING OF CLASSIFICATIONS AND THE ROLE OF HOME UTILITIES

During the five years of validity, it is necessary to keep the stratifications up to date to incorporate changes resulting from claims of users and owners or substantial changes in the urban or rural environment and to include new developments (residential real estate) with their respective strata.

Both, the studies and their updating, are co-financed locally in equal parts by the utility companies serving the municipal area and the local government.

3. WATER AND SANITATION SECTOR

For the development of this numeral, the information contained in the Single Information System - SUI[11] -, which is the official system of the domestic public services sector in the country that collects, stores, processes and publishes information reported by the provider companies and territorial entities, will be used mainly.

3.1. Coverage and results achieved

3.1.1. SUBSIDIARY AND CONTRIBUTORY SUBSCRIBERS

In 2016 of the 13.48 million subscribers of the water service reported by the providers, 10.36 million subscribers (households) belonging to strata 1, 2 and 3 that received subsidies, 1.69 million subscribers (households) of upper strata (5 and 6) charged with contribution and remaining 1.43 million are official or stratum 4 residential subscribers who do not receive subsidies nor pay contributions.

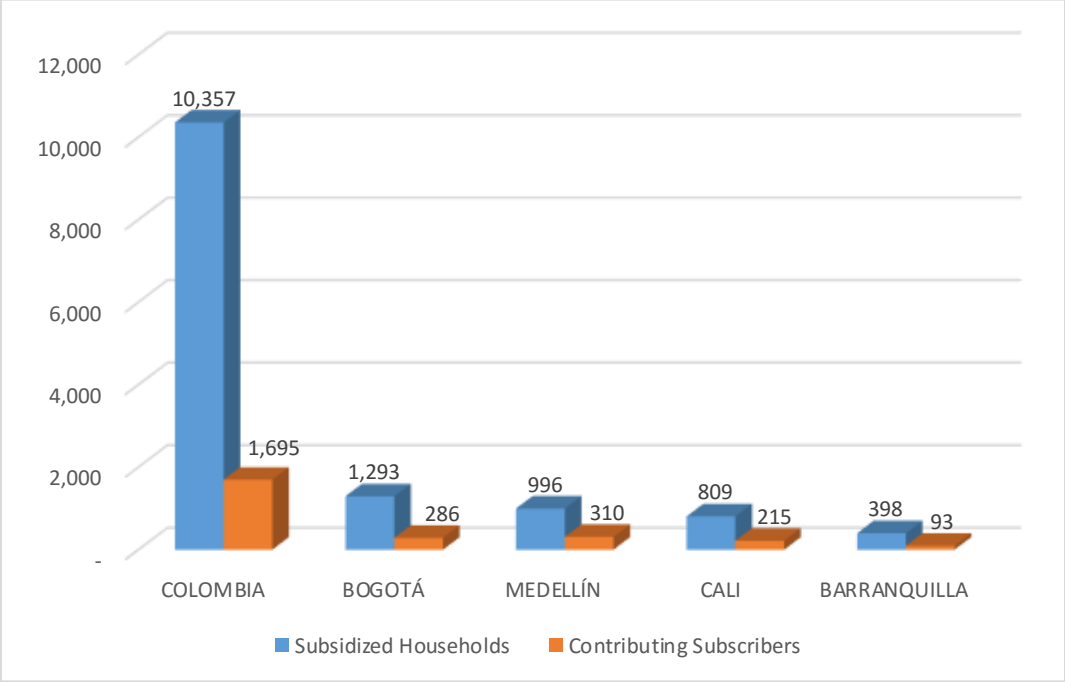
From figure 1, it can be observed that 12% of subsidized users are located in Bogotá, which has 17% of the total subscribers with contributions and the four main cities together host 34% of subsidized users in the country and 53% of users who pay contributions in the water service.

It should be noted that the subsidized users of the water service represent an average of 70% of the total number of users, both nationally and for each city, as shown in figure 2.

[11] http://www.sui.gov.co

Figure 1 Subsidized vs. Contributing Subscribers in the Water Service

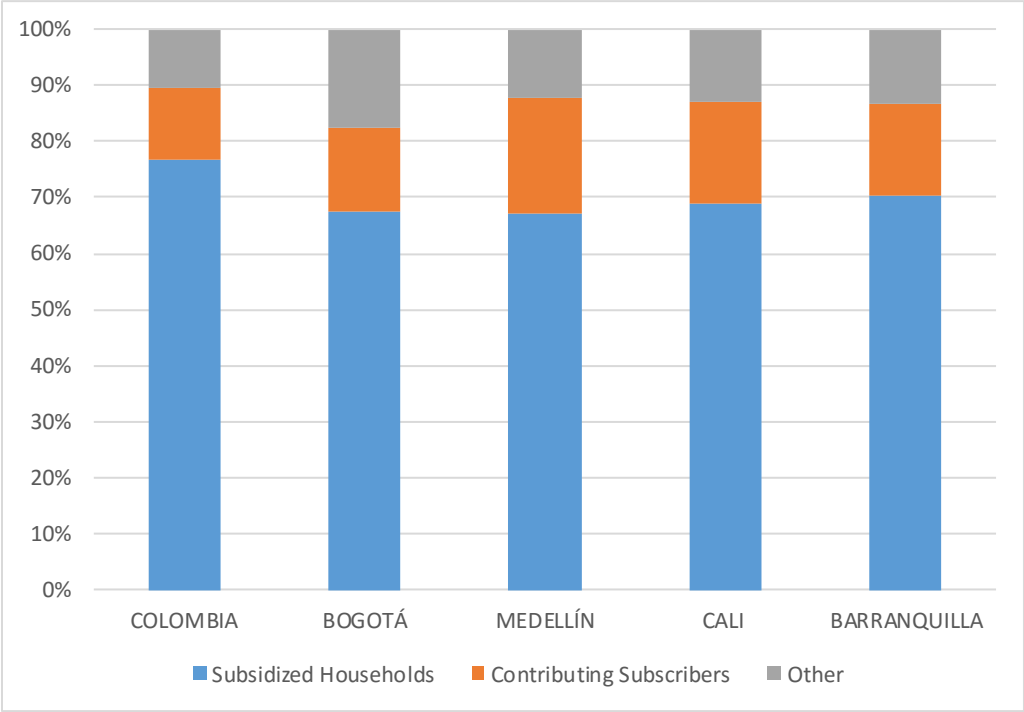
2016, Thousands of Subscribers



Source: Own elaboration based on SUI data.

Figure 2 Percentage of Subsidized vs. Contributing Subscribers in the Water Service

2016 -%



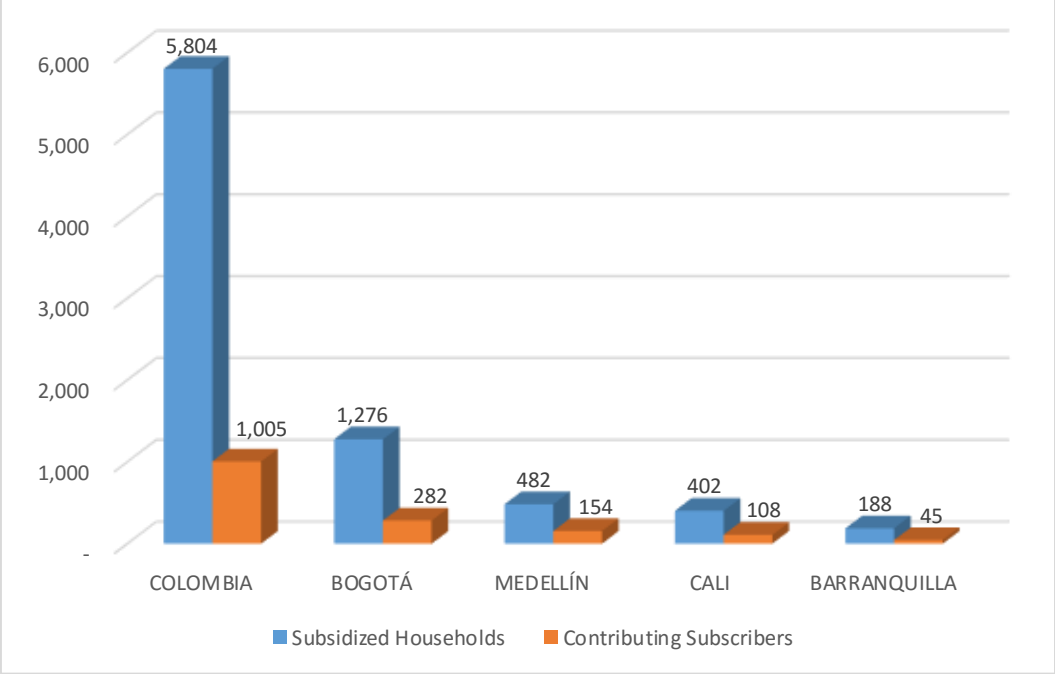
Source: Own elaboration based on SUI data.

For 2016 the providers reported a total of 7.71 million subscribers to the sewerage service, of which 5.8 million, belonging to strata 1, 2 and 3, benefited from the subsidy, while almost 1 million are upper strata (5 and 4) who are charged per contribution and 901,000 belonging to official sector or residential subscribers of stratum 4 whom, according to regulations, do not receive subsidies neither pay contributions.

Based on figure 3, it is observed that 22% of subsidized users are located in Bogotá, as well as 28% of the total subscribers who pay contributions. The four main cities in the country have a total of 40% of subsidized sewerage users in Colombia, and 59% of users who pay a contribution to this service.

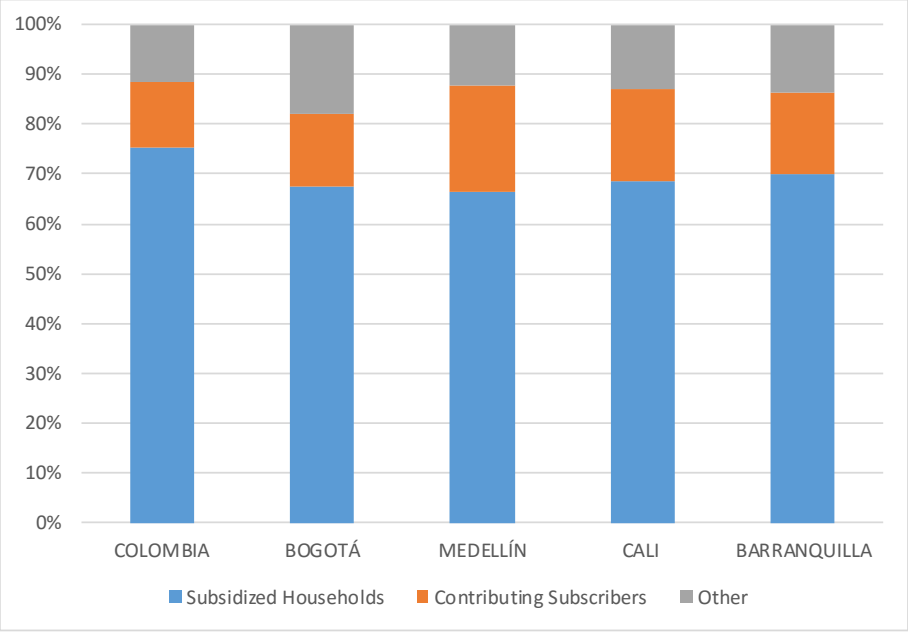
Similarly, it is worth noting that subsidized users represent an average of 70% of the total number of users, both nationally and for each city, as shown in figure 4.

Figure 3 Subsidized vs. Contributing Subscribers in the Sewerage Service
2016, Thousands of Subscribers



Source: Own elaboration based on SUI data.

Figure 4 Subsidized vs. Contributing Subscribers in the Sewerage Service
2016, %



Source: Own elaboration based on SUI data.

3.1.2. VALUE OF SUBSIDIES AND CONTRIBUTIONS

The total value of demand subsidies granted for the water service in 2016 was US$181.7 million, and the total collection of contributions amounted to US$98.5 million. This shows that 54% of the subsidized value was covered by contributions, and a deficit of US$83.2 million had to be covered with budgetary contributions from each of the municipalities where the deficits occurred.

The city with the highest self-financing rate of the crossed subsidy scheme in water service in 2016 was Barranquilla, where contributions covered 88% of the subsidies and registered a deficit of only US$ 992,000. On the other hand, Bogotá managed to cover with contributions only 70% of the subsidies granted, with a deficit of US$ 15 million.

Table 6 Annual value of subsidies and contributions - water service

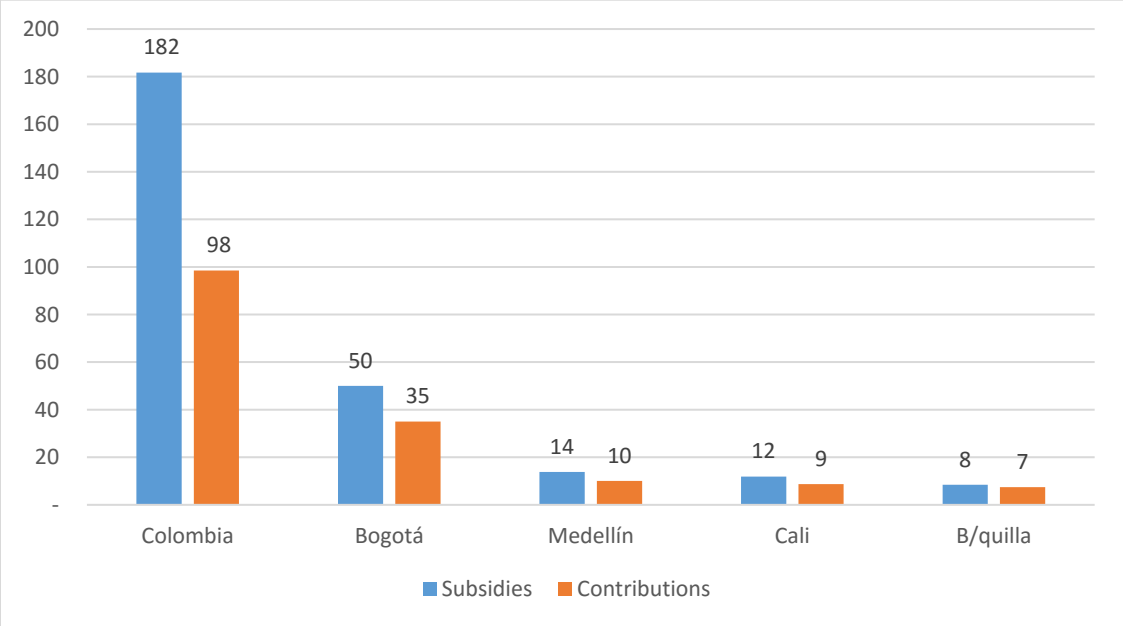
USD 2016

	Subsidies	Contributions	Balance	% Covered
Colombia	181,725,628	98,480,867	-83,244,761	54.2%
Bogotá	50,017,133	35,014,419	-15,002,713	70.0%
Medellin	13,797,890	10,052,049	-3,745,841	72.9%
Cali	11,860,320	8,693,168	-3,167,152	73.3%
Barranquilla	8,426,384	7,434,235	-992,149	88.2%

Source: Own elaboration based on SUI data.

Figure 5 Value of subsidies vs Value contributions - Water Service

Millions of USD, 2016



Source: Own elaboration based on SUI data.

The total value of subsidies granted in Colombia for sewerage service in 2016 was US$119.7 million, and the total collection of contributions amounted to US$73.7 million, which means 62% of the subsidies was covered by contributions, resulting in a deficit of US$46 million, which is covered by municipal budget contributions.

As for the water service, of the four largest cities in the country was Barranquilla in 2016, the city with the highest self-financing rate of the crossed subsidy scheme in the sewerage service, of which contributions covered 84% and left a deficit of only US$ 842,000. Bogotá, meanwhile, financed with contributions 76% of the subsidies granted, resulting in a deficit of US$ 8 million, which had to be covered by the municipal budget.

Table 7 Annual Value of Subsidies and contributions - sewerage service

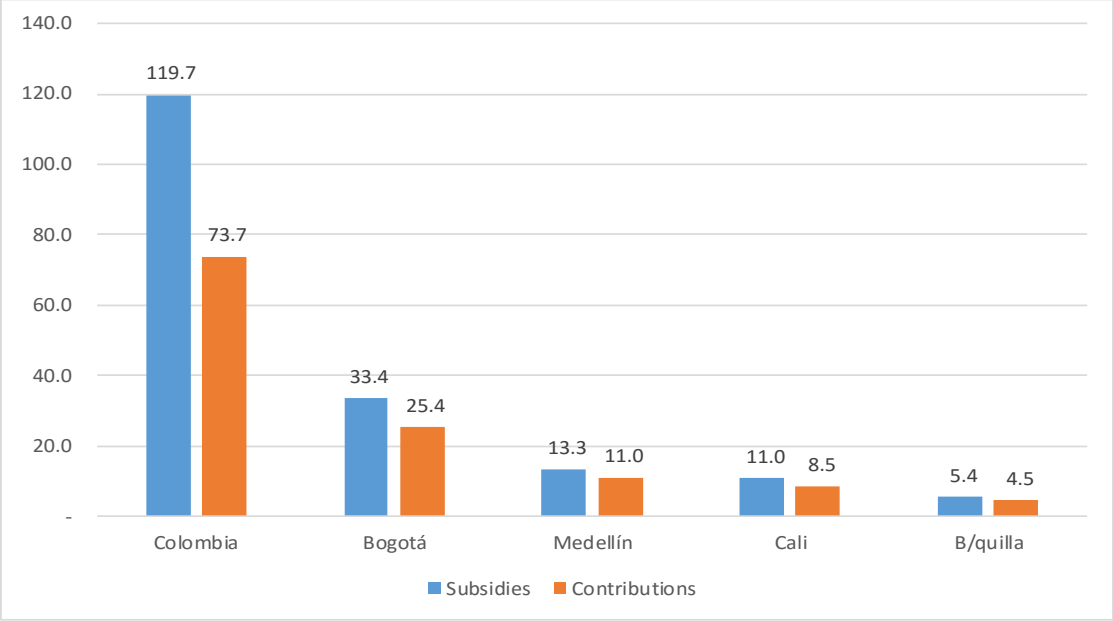
USD 2016

	Subsidies	Contributions	Balance	% Covered
Colombia	119,671,908	73,712,351	-45,959,557	61.6%
Bogotá	33,414,744	25,376,342	-8,038,402	75.9%
Medellin	13,253,378	11,039,189	-2,214,189	83.3%
Cali	10,965,148	8,526,793	-2,438,354	77.8%
Barranquilla	5,357,965	4,515,571	-842,395	84.3%

Source: Own elaboration based on SUI data.

Figure 6 Value of subsidies vs Value of Contributions- Sewerage Service

Millions of USD 2016



Source: Own elaboration based on SUI data.

3.1.3. RESOURCES ALLOCATED BY THE STATE

The Constitution of Colombia establishes that the National Government, owner and collector of the country's main taxes (especially Value Added Tax -VAT-, income and wealth tax, international trade taxes and financial transactions taxes) must distribute, through the so-called General Participation System (SGP), among the country's departments and municipalities, 50% of their income for the financing of the sectors in charge of these territorial entities, basically education.

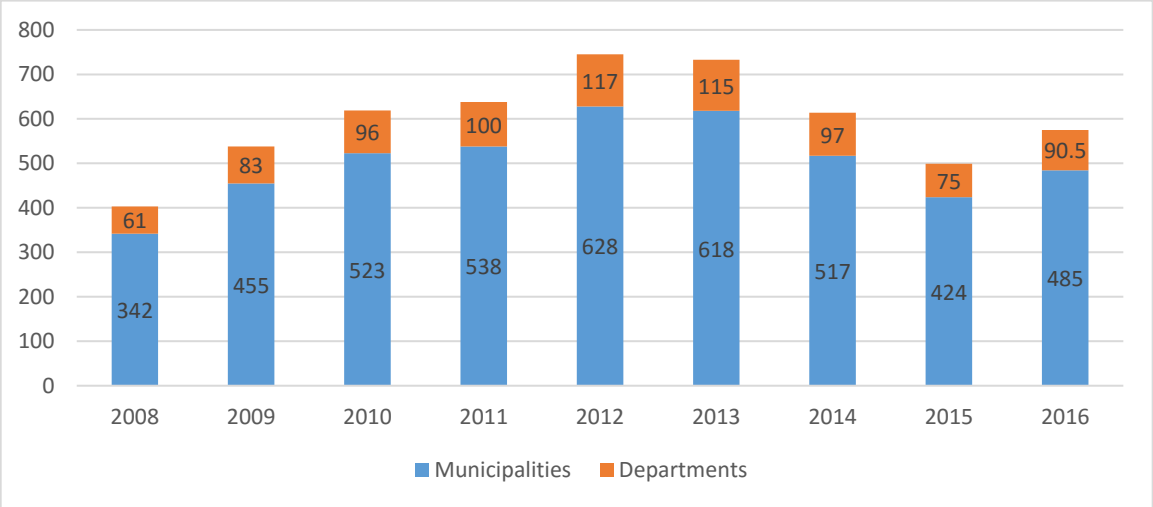
According to article 4 of Law 1176 of 2007, out of the resources granted by the Nation through the General Participation System, 5.4% must be allocated to the drinking water and basic sanitation sector in order to (i) guarantee universal coverage in the shortest possible time; (ii) achieve a more efficient execution of resources, through the definition of incentives that reward those territorial entities that increase coverage as well as quality; and (iii) articulate the quality of public services.

In 2016, that 5.4% represented US$576 million, of which US$91 million was for the departments and Capital District; and US$485 million for the municipalities, to invest and to financing the deficit between subsidies and contributions in water, sewerage and basic sanitation services in their jurisdiction.

The following figure shows the historical values between 2008 and 2016 of SGP resources transferred by the Nation to the drinking water and basic sanitation sector. It should be noted that dollar values were calculated using the COP/USD market exchange rate[12] as of December 31 of each year.

Given that in 2013, and even more strongly in 2014 and 2015, there was a significant depreciation of the Colombian peso, the fall in dollars shown in those years is due exclusively to that effect, since the value in Colombian pesos increased in both nominal and real terms.

Figure 7 GSP resources allocated to the drinking water and sanitation sector
2008-2016. Millions of USD



Source: Own elaboration based on DNP data.

3.1.4. RESOURCES EARMARKED FOR SUBSIDY

In accordance with the provisions of article 7 of Law 1176 of 2007, the distribution formula of SGP resources for drinking water and basic sanitation between municipalities and districts is carried out according to the following criteria:

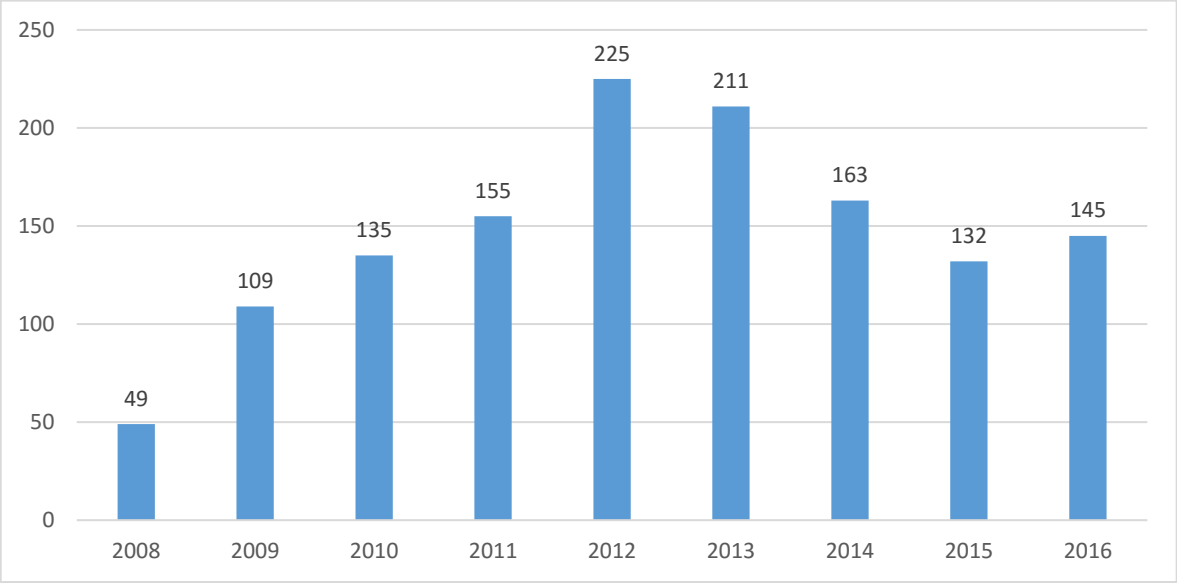
i) 35% (US$168.6 million in 2016) by a shortage of coverage calculated by SSPD.
ii) 30% (US$145.2 million in 2016) by population served and balance sheet of subsidies and contributions.
iii) 5% (US$24.2 million in 2016) by the territorial entity effort to increase coverage.
iv) 20% (US$93.3 million in 2016) by poverty level of the respective district or municipality.
v) 10% (US$48.4 million in 2016) by compliance with criteria of the fiscal and administrative efficiency of each territorial entity in sectorial budget management.

[12] Representative Market Rate (TRM)

The resources allocated to the departments (15%) are used to create a "bag" of resources in order to co-finance the investments made by the districts and municipalities to develop projects contemplated within the Departmental Plan for Drinking Water and Basic Sanitation.

The following is a historical evolution of the resources allocated to finance subsidies for demand in the drinking water and basic sanitation sector between 2008 and 2016. In order to express the values in dollars, the exchange rate was taken as of December 31 of each year.

Figure 8 Resources allocated to subsidies in the drinking water and sanitation sector 2008-2014. Millions of USD



Source: Own elaboration based on DNP data.

3.1.5. SECTOR COMPOSITION

A total of 2,557 water and sewerage service providers are currently registered with the Superintendence of Public Services, of which 283 and 249, respectively, serve more than 2,500 users in urban headwaters. The remaining providers serve less than 2,500 users in urban headwaters and rural areas.

64% of small provider (those with less than 2,500 subscribers or accounts) have the form of direct provision by the municipality, 20% are state-owned public companies and 10% are corporations.

Providers reporting information to SUI had a total of 13.48 million of water service accounts at the close of 2016, of which 12.48 million are residential subscribers; in the sewerage service a total of 7.71 million subscribers, of which 7.1 million are residential.

In the urban areas for the 126 largest municipalities of Colombia (over 50,000 inhabitants) in which 33 million inhabitants are located, public enterprises owned by the municipality is the most common modality, serving 63.6% of the population of this group. These companies include Bogotá, Medellin and Cali, the three largest cities in the country.

Table 8 Modalities for providing water supply and sewerage services

Municipalities with more than 50,000 inhabitants

Modality	Municipalities		Population	
	Number	%	Number	%
Municipal-owned public enterprises	69	54.8	21,091,182	63.6
Contracts with private operator	26	20.6	7,131,055	21.5
Joint venture with public majority	4	3.2	1,372,219	4.1
Regional or departmental public company	8	6.3	556,228	1.7
Public company from another municipality	17	13.5	2,866,610	8.6
Direct benefit by the municipality	2	1.6	126,890	0.4
Total	126	100.0	33,172,665	100.0

Source: Velez, Luis. G. (2013)

Contracts with private operators is used by 26 large municipalities (including 9 departmental capitals), serving 21.5% of the population of the 126 municipalities analyzed.

The principal cities served by a mix public-private companies, with a public majority, are Manizales, Pereira, Popayan, and Pasto.

The two largest regional water companies (both owned by the public sector) are:

- Acuavalle: with 157,757 water users and 124,772 sewerage users, it serves 15% of the department of Valle del Cauca with a total of 33 municipalities, of which 7 falls into the category of large (greater than 50,000 inhabitants).
- Empocaldas: with 77,993 users of waters and 70,965 sewerage users, it serves 20 municipalities in the department of Caldas, of which only La Dorada falls into the category of large.

Municipalities served from companies from another municipality area common in metropolitan areas such as Bogota, Medellin Cali, Barranquilla or Bucaramanga where the provider of the larger municipality serve nearby bordering municipalities.

4. INSTITUTIONAL RESPONSIBILITY FOR SANITATION

See paragraph 2.1 of this document.

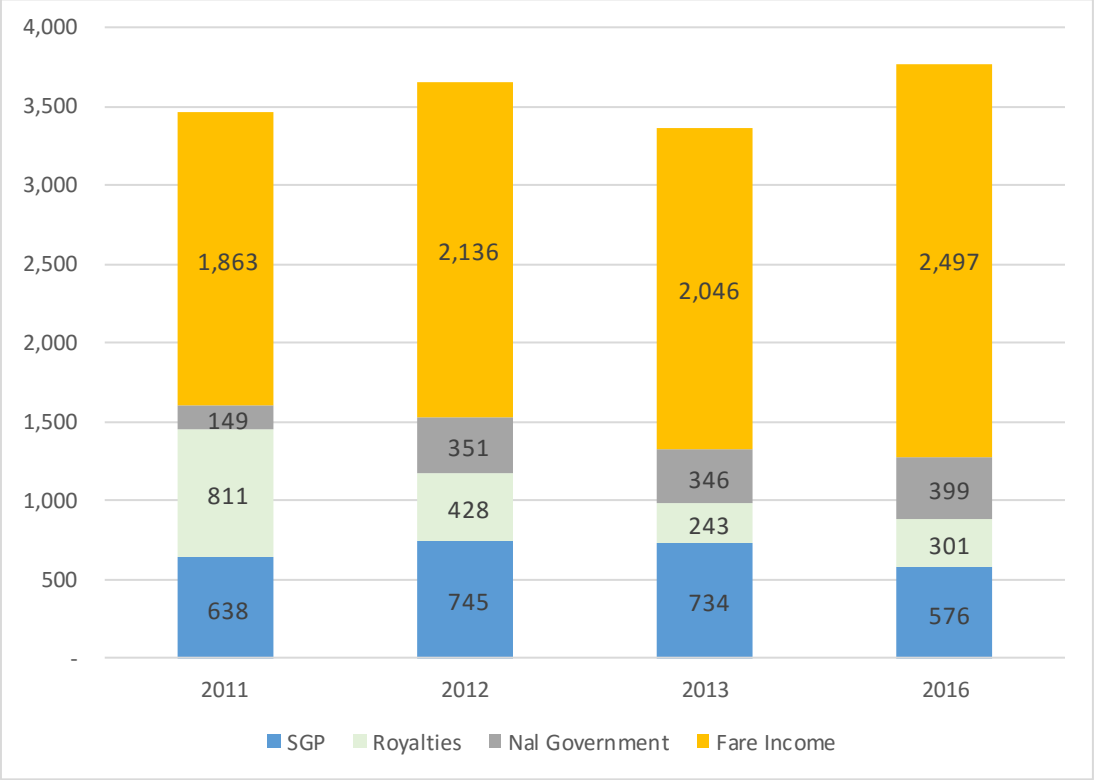
5. NATIONAL FINANCING MECHANISMS FOR WATER AND SANITATION

5.1. Sector financing

The main sources of financing for the drinking water and sanitation sector in Colombia are: (a) user fees; (b) transfers from the National Government to municipalities and departments through the general system of participation (SGP); (c) royalties paid by mining operator to local and national governments; and (d) budgetary contributions (furthermore to SGP) from the National Government to investment projects in different regions of the country.

Figure 9 Primary resources of the sector

Millions of USD



Source: Own elaboration based on information from the DNP and financial statements of companies.

The total primary resources of the sector (total revenues excluding indebtedness), were between $3,500 and $3,700 million dollars per year between 2011 and 2016, with a slight fluctuation caused mainly by changes in the exchange rate. In fact, in national currency it has growing slightly above inflation.

GSP resources are the most important and stable source of financing for the sector and are used to invest (offer-side) or cover the gap of the rate system (demand-side) subsidies. In most of the country's municipalities, providers depend on these resources for both the operation (via the payment of subsidies) and any investment they need.

Royalties are the payments to be made by companies that exploit minerals and hydrocarbons. Part of these resources are allocated to the municipalities and departments where the mine is located and where the ports from which it is exported are located; another part of these resources will form a national exchange that goes to the rest of the country's municipalities and a third is dedicated to funding projects that any public entity presents in the eligible sectors determined by law. Many of the municipalities and departments that receive royalties dedicate part of these resources to invest in water and sewerage. In addition, the Royalties National Fund annually finances numerous projects in these services.

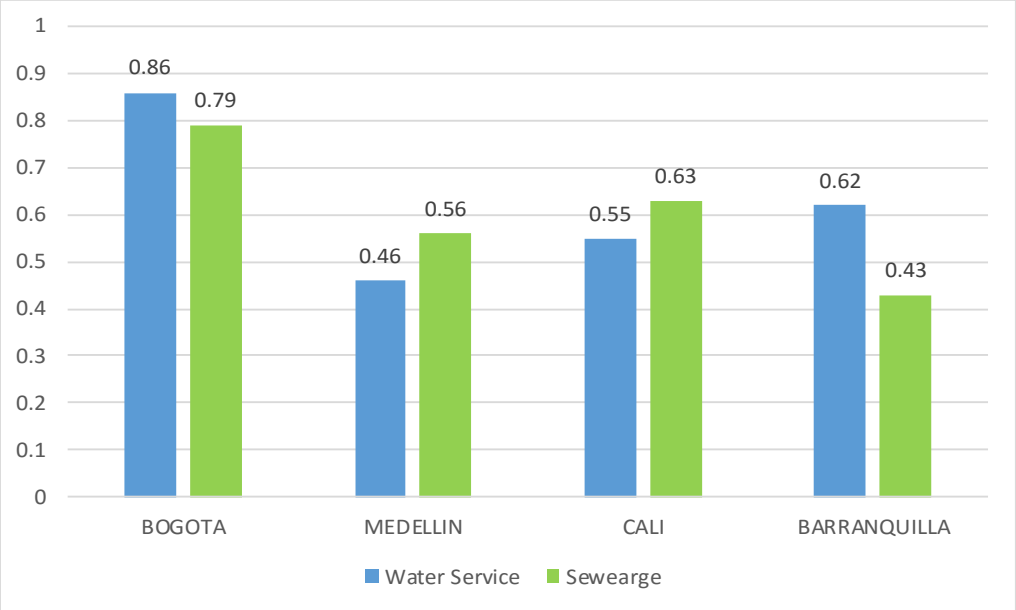
Within the annual debate of the National General Budget, resources to invest in water and sewerage services are always included, either at the initiative of the Government to attend to programs defined by the Ministry of the Sector (Ministry of Housing, City and Territory) or at the initiative of parliamentarians to meet specific regional demands.

The 26 largest companies in the country (for which we have reliable information from their financial statements), by 2016 recorded 8.4 million accounts, serving approximate 29 million urban inhabitants, and had operational income between U$1,863 million (in 2011) and U$2,046 million (in 2013), representing between 54% and 60% of the total primary income of the sector. Based on the lowest average tariff of this group of companies, it can be estimated that the operating income of the rest of the companies operating in the urban sector of the country could be around US$600 million.

Although the tariff revenues of most companies are mainly used to cover administration, operation, and maintenance costs, the largest companies in the country cover the investment requirements with their tariffs and only sporadically receive non-refundable resources from the National Government, more for political reasons than for real financial need.

In 2016, Bogotá had an average water plus sewerage rate of US$1.65 per cubic meter, the highest average rate among all large Latin American cities.

Figure 10 Average rate water and sewerage 2014
in the 4 main Colombian cities USD/m^3



Source: Own elaboration based on commercial and financial information of the companies.

5.2. Characteristics of the cross-subsidy scheme

Cross-subsidies as well as direct demand-side subsidies, are granted using socio-economic stratification.

As mentioned above, the main objective of stratification is to allow differential rates - by strata - of residential consumption of public services, but it is also used by local governments to collect differential tariffs or taxes associated with real estate (such as property tax and valorization tax) and to allocate subsidies in some social programs (such as the price of university tuition fees at public universities) and is even used voluntarily by some companies to apply prices.

The subsidy scheme adopted in Colombia is a combination of the three forms of subsidies: cross-subsidies and direct subsidies to demand, plus direct subsidies to supply. We can summarize the scheme like this:

- Cross-subsidies are applied through a scheme in which upper-sector residential subscribers and non-residential users pay surcharges to finance subsidies to lower (strata 1 2 and 3) residential users.
- Since in most of the country's municipalities, the combination of types of users means that the surcharges applied are not sufficient to finance the subsidies granted, the scheme is complemented by direct subsidies to demand, transferring public municipal resources to W&S companies to cover the lack of subsidies.
- Finally, the municipal governments, with their own resources or with transfers from the departmental or national level, make investments in different components of the services (collections, tanks, networks, PTAP and PTAR and even water distribution network programs), whose value is not transmitted to tariffs, so they are really a subsidy to supply.

The clearest benefits and attractiveness of the Colombian system is the cross-subsidy component, since although its effectiveness (in almost achieving the financial balance between subsidies and contributions) is limited to large cities, as the financial dependence of public resources providers diminishes sharply, it significantly reduces the administrative procedures (and corruption risks) associated with achieving the effective transfer of state resources.

5.2.1. CROSS-SUBSIDIES

Since the beginning of the 1970s in Colombia, for redistributive (not very clearly defined) purposes, differential tariffs have been applied to public water and basic sanitation services[13], taxing non-residential properties and upper-sector housing (richer families) at higher rates and lower-sector housing (poorer families) at lower rates.

The dwellings are classified into six layers. The poorest dwellings belong to stratum 1 and the richest dwellings belong to stratum 6.

The unifying methodologies were issued in the mid-1990s by the National Department of Planning and have been applied by the vast majority of municipalities in the country, ultimately achieving that the classification of each housing is unique, defined by municipal decree and welcomed by all companies that provide public services in the municipality.

Currently, according to the regulations in force in this regard (Law 142 of 1994), subsidies are granted to residential users of strata 1, 2 and 3. Both strata 5 and 6, as well as the commercial and industrial categories, make contributions to finance low-sector subsidies. Finally, users of stratum 4 and official users do not receive any subsidies, but no contributions are charged to them.

The subsidy is granted exclusively on the portion of the invoice corresponding to the volume of water (and sewerage) defined as basic consumption and the corresponding fixed charge. Monthly household consumption above the volume defined as basic is billed at the economic cost of the service to users in strata 1 to 4. For users of strata 5 and 6, and for industrial and commercial users, all volume consumed and fixed charges are taxed with a contribution.

In Colombia, consumption defined as "basic" was fixed at 20 m^3/account/month for the whole country, since the early 1990s. However, Resolution 750 of 2016 orders its gradual reduction in the next 4 semesters according to the altitude of the area served, as well:

Table 9 Consumption range reduction timeline

m3/connection/month

Locations less than 1,000 m.a.s.l.

CONSUMPTION	may-16	jan-17	jul-17	jan-18
BASIC	0-19m3	0-18m3	0-17m3	0-16m3
COMPLEMENTARY	>19m3<32m3	>18m3<32m3	>17m3 <32m3	>16m3 <32m3
SUMPTUARY	>32m3	>32m3	>32m3	>32 m3

Location between 1,000 and 2000 m.a.s.l.

[13] And also in energy, fixed telephony, gas and solid waste disposal services.

CONSUMPTION	may-16	jan-17	jul-17	jan-18
BASIC	0-18m3	0-16m3	0-14m3	0-13m3
COMPLEMENTARY	>18m3<26m3	>16m3<26m3	>14m3 <26m3	>13m3 <26m3
SUMPTUARY	>26m3	>26m3	>26m3	>26 m3

Locations greater than 2,000 m.a.s.l.

CONSUMPTION	may-16	jan-17	jul-17	jan-18
BASIC	0-17m3	0-15m3	0-13m3	0-11m3
COMPLEMENTARY	>17m3<22m3	>15m3<22m3	>13m3 <22m3	>11m3 <22m3
SUMPTUARY	>22m3	>22m3	>22m3	>22 m3

Source: Own elaboration based on Resolution CRA 750 of 2016.

In practically all municipalities in the country, the total value of contributions collected is less than the total given subsidies, with the deficit being financed by municipal budgets using resources from the transfer of the General Participation System to drinking water and sanitation. Those providers that present surplus in the crossing between subsidies and contributions must transfer it to the municipalities (and specifically to the fund of solidarity and income redistribution) to finance other providers of the same territorial entity, in the same service, and if there are still resources, they must be assigned to bordering territorial entities that present deficits in the same services.

Solidarity and income redistribution funds are created by municipal councils to channel budgetary resources to finance loss-making providers at the crossroads between subsidies and contributions or to receive the resources of surplus providers at that crossroads.

The subsidy and contribution factors are established by the municipal councils, within the limits (maximum and minimum) established by law. Currently, Law 1450 of 2011 set maximum limits on the subsidy factors for each of the lower strata (1, 2 and 3); it also sets minimum limits on the contribution factors charged to the upper strata (5 and 6) and to the users of commercial and industrial categories, as well:

Table 10 Limits on subsidy and contribution factors for the W&S Sector

Laws 142/94 and 1450/2011

	Maximum subsidy	Minimum contribution
Stratum 1	70%	N/A
Stratum 2	40%	N/A
Stratum 3	15%	N/A
Stratum 4	N/A	N/A
Stratum 5	N/A	50%
Stratum 6	N/A	60%
Commercial	N/A	50%
Industrial	N/A	30%

Source: Own elaboration based on Ley 142 of 1994 and Ley 1450 of 2011.

Respecting the above limits, the Municipal Councils set the subsidies to be applied, which can be different between services (water supply and sewerage) and differences between the fixed charge and basic consumption. In fact, in some municipalities of the country, there are no subsidies for fixed charges.

It is up to the providers to calculate their economic reference costs, both fixed charge ($/user/month) and consumption ($/m^3) of each service (water and sewerage) according to the tariff methodologies defined by the Water Supply and Basic Sanitation Regulatory Commission (CRA). At present (November 2016) there is a methodology that began to be applied in July 2016 for locations with more than 5,000 subscribers, contained in Resolution CRA 688/2014 and a temporary methodology (while issuing the definitive one) contained in Resolution CRA 287 of 2014[14] of application in locations with fewer than 5,000 subscribers.

Providers must calculate the tariffs to be applied to each type of user, both for fixed charge and for consumption charge, in each service, affecting the economic reference costs resulting from applying the methodology, with the subsidy and surcharge percentages defined by the Municipal Council of each locality. Annually the providers have

[14] Resolution 287 of 2004 contains the methodology that has been applied since January 2006 to all providers in the country, but Resolution 688 of 2014 established that this resolution (the 287) would be used only by Service Delivery Areas under 5,000 subscribers while the new methodology was issued for this group.

to report to the Municipality Secretariat of Finance the deficit that will be generated for the next year and that must be covered with resources from the municipal budget, in order for it to program the corresponding contributions and/or define with the local council the changes in subsidies and surcharges levels to be in order the balance between subsidies, surcharges and municipal contributions be achieved.

5.2.2. DIRECT SUBSIDIES

The tariff and cross-subsidy scheme contained in Law 142 of 1994 is conceptually designed to ensure the financial self-sufficiency of domestic public services. However, the existence in most municipalities of the country of a larger proportion of the population with right to receive subsidies (strata 1, 2 and 3) and minimal or non-existent users who pay contributions (strata 5 and 6 and non-residential users), means that the balance between subsidies and contributions - despite severely limiting subsidies and applying exorbitant contributions[15] - does not achieve its equilibrium.

Thus, in Colombia, we have to apply two types of direct subsidies in drinking water and sanitation services. The former, direct subsidies to demand, are represented by the contributions of municipal budgets to cover the deficit that occurs in most municipalities of the country between subsidies and contributions. The second, direct subsidies to the supply, are represented by the budgetary contributions of the municipalities, departments and the nation for investments in the provision of public water and sewerage services in different municipalities of the country.

Of the resources allocated annually to municipalities and departments for the drinking water and sanitation sector through the SGP, previously presented, the municipalities allocated direct subsidies to demand, i.e. to cover the deficit between subsidies and surcharges in the water and sewerage sector, around 25%. The toilet service is provided by about 5% and the rest was dedicated to direct investment by municipalities, i.e. direct subsidies to the supply.

The remaining budgetary contributions to the sector from the national budget, some departments' budgets, and royalties are entirely devoted to supply-side subsidies.

For the allocation of the Nation's resources, there is a project presentation and qualification scheme in the sectorial Ministry (currently the Ministry of Housing, City and Territory) known as the "Single Window", which can be accessed by all territorial entities (or companies in conjunction with a territorial entity). Through an evaluation and scoring system, resources are allocated to requesting departments and municipalities, but the resources are turned over and executed through fiduciary or similar contracts with direct payment to contractors. The works are normally agreed between the municipalities or departments with the service providers, but in some cases conflicts arise (mainly political) and work is carried out that do not require or cannot be operated by the providers (such as building a sewerage system in a district not yet interconnected to the main network of the municipality).

In the case of royalty resources, two schemes operate: in the case of royalties paid to municipalities and departments, they freely decide what portion to allocate each year to the water and sanitation sector, since this is an eligible sector.

[15] For example, in many municipalities only consumption subsidies (basic) are granted for strata 1 and 2, eliminating subsidies for fixed charges and subsidies for stratum 3. And in some municipalities, the contributions applied to the upper strata reach up to 200%.

The works to be executed are freely selected by each territorial entity, most of the time in common agreement with the providers. In the case of the National Royalties Fund, there is a rather complex system of regional distribution of resources and responsibilities for selecting the projects to be financed: the projects are submitted by the territorial authorities (municipalities and departments) to each of the "Collegiate Bodies of Administration and Decision" - OCAD, which "are responsible for defining the investment projects submitted for their consideration, which will be financed with resources from the General System of Royalties, as well as for evaluating, making feasible, approving and prioritizing the convenience and opportunity of financing them and designating their executor."

5.3. The circular economy in Colombia

Although Colombia has not begun to work massively in relation to the circular economy, this is a concept that has been gaining increasing strength from the academy[16] and the intention of the national government to take a first step on the subject, placing Green growth ", which "requires the circular economy as a cornerstone to contribute to the country's competitiveness, to generate less waste and more business, more green jobs ".[17]

According to data from the District Secretariat of Habitat, Bogotá currently recycles 17% of its solid waste, which leads to 189,238 tons of waste entering the landfill each month.

Colombia has taken some steps towards productive processes that take up aspects of the circular economy. The first case is that of 540 Colombian companies that have joined post-consumer programs of the National Association of Industrialists - ANDI, to better manage the useful life of batteries, tires, lamps, computers, and packaging of pesticides and pharmaceuticals.

It also operates the largest national network for the recovery of plastic (PET) and glass containers, which end up in more OI-Peldar or "ecopet" containers for bottlers, or as an input for Enka fibres used in clothing or tires. 200 tons of used oil has been collected annually from restaurants thanks to the alliance with Ecográs. The collected product is used as an input for manufacturers of soaps or biodiesel.

Another example is companies such as Cementos Argos whom sells and takes sacks filled with cement to their building customers and collects the empty ones, crushes them and serves as an input for fibro-cement for companies that manufacture roof tiles.

All this has led to the conclusion that the Government has an outstanding task in terms of identifying better incentives for the productive sector: rewarding energy efficiency and the use of alternative sources with tax exemptions, and paying more for the one that pollutes the most. This would help to make the circular economy a reality for Colombia, as it already is in developed countries.

[16] http://www.andi.com.co/ForoEconomiaCircular2017/Paginas/ejes.html

[17] Quote by Carlos Herrera Santos, Vice President of Sustainability of the Association of Businessmen of Colombia (Andi) in article http://www.elcolombiano.com/negocios/innovacion/economia-circular-en-colombia-es-negocio-HH3081090

Last October, Colombia was visited by a group of more than 60 businessmen, academics, and European experts, led by the European Union's director general for the environment, with the aim of motivating an exchange between Europeans and Colombians on their experiences and challenges related to the practices of the circular economy.

However, the concept of circular economy remains out of the sanitation sector. Although the country is taken steps toward achieves a greater level of wastewater treatment, there are not project oriented to make excreta a commercial product such as biogas, solid fuel, fertilizer, chemicals, treated water. In fact, actual regulation need to be relaxed in order the sludges coming from waste water treatment plant can be used as fertilizing the agriculture sector.

Part B: Brief introduction to Bogota

6. BOGOTA´S SOCIAL, POLITICAL AND ECONOMIC SITUATION

Bogotá D. C., is the capital of Colombia; having 8,080,734 inhabitants at December 2016. It is administered as the Capital District, and enjoys autonomy - since 1954 - to manage its interests within the limits of the Constitution and the law. Unlike the other Colombian municipal district, Bogotá is a territorial entity that has the administrative powers that the law confers to the departments and municipalities, simultaneously. It is made up of 20 localities[18] and is the political, administrative and economic epicenter of the country.

It is the third highest capital of South America (after La Paz and Quito), as it is having an average of 2,625 meters above sea level. It is located in the center of Colombia, in a region known as the savannah of Bogota, which is part of the Cundiboyacense plateau, a formation located in the Andean Eastern Cordillera.

The city is driven by the Mayor, elected by citizen vote by a four years periods. The Mayor can be reelected but not for continues. In fact, 2016-2020 is the second period for the actual city Mayor (Enrique Peñalosa) whom was Mayor in the period 1998-2000.

The administrative branches of the city are its district secretariats (health, mobility, education, among others) and the Environment Secretariat.

The city council is responsible for approve annually the city and city's owned companies budget and exercising political control over city Mayor; it is made up by 45 councilors (democratically elected every four years) representing the twenty city localities.

The judicial power in the city is made up of different judges and magistrates. As the capital of the country, all jurisdictional hierarchies can be found, such as at the national level: the Supreme Court of Justice, the State Council, the Constitutional Court and the Superior Council of the Judiciary. At the district level, the Superior Court of Bogotá with its different Decision Chambers, which is composed of 9 members and divided into four chambers, each of which sits with three Magistrates as follows: Civil, Agrarian and Family Decision Chamber, Labor Decision Chamber, Criminal Decision Chamber and Administrative Decision Chamber. Finally, at the basic level there are the Circuit Courts and the Municipal Courts in their different specialties (Civil, Criminal, Labor, etc.). In addition, the Superior

[18] These include more than 1900 neighborhoods in the urban area, except for Sumapaz, which is a rural area.

Court of Bogotá also serves as a guarantee control court for those processes that follow the high officials of the state before the Supreme Court of Justice in a single instance.

According to "The Economist", Bogotá stands out for its economic strength associated with the size of its production, the facilities to create companies and to do business, financial maturity, the attraction of global companies and the quality of its human capital. It is the main market of Colombia and the Andean Region, and the first destination of foreign direct investment reaching Colombia (70 %).

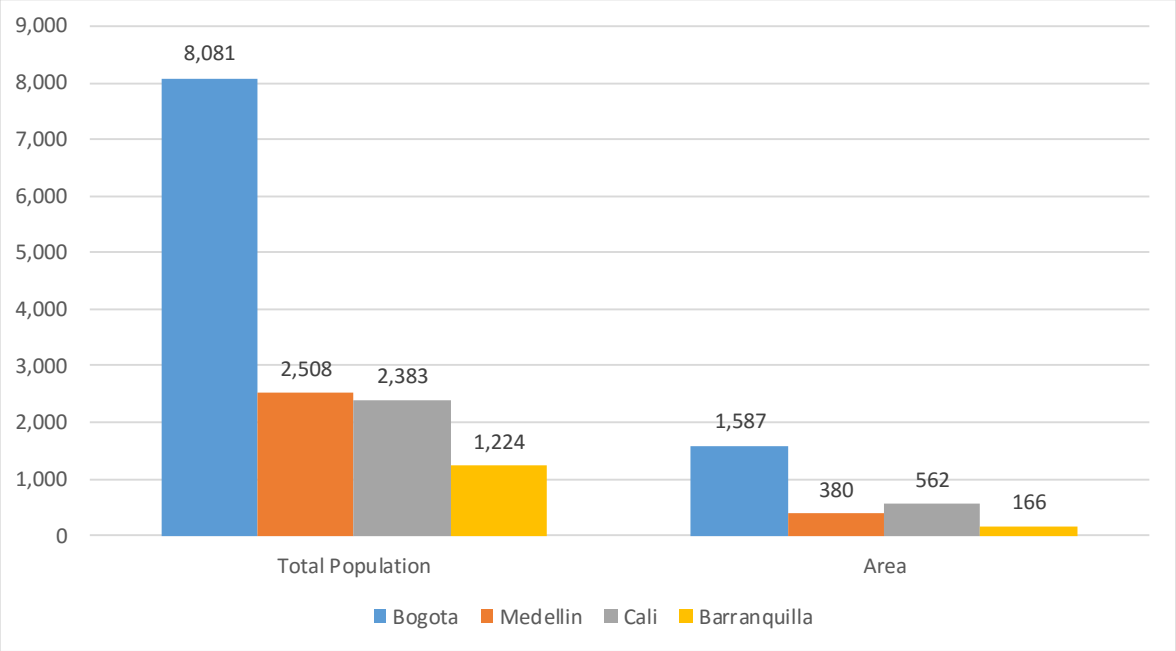
6.1. General features of Bogota

6.1.1. POPULATION

Bogotá has 8 million inhabitants, three times the population of Medellin or Cali (second and third Colombian populated cities) and six times the population of Barranquilla (fourth populated city), counting for 17% of the Colombian population. In the Bogotá rural area lives only 0.2% of its population, while 1.1% (of the city's total population) in Medellin, 1.5% in Cali and 0.3% in Barranquilla.

Although Cali is relative less dense (population/km) than the other 3 great cities, the area occupied by each/ city is proportional to its population.

Figure 11 Population (Thousands of inhabitants) and Area (Km2)



Source: Own elaboration with information from DANE

As a characteristic feature, it has been observed that urbanization and urban economic activities have consolidated over the period 2005 and 2016, as these cities, as well as other intermediate cities, have been gaining importance

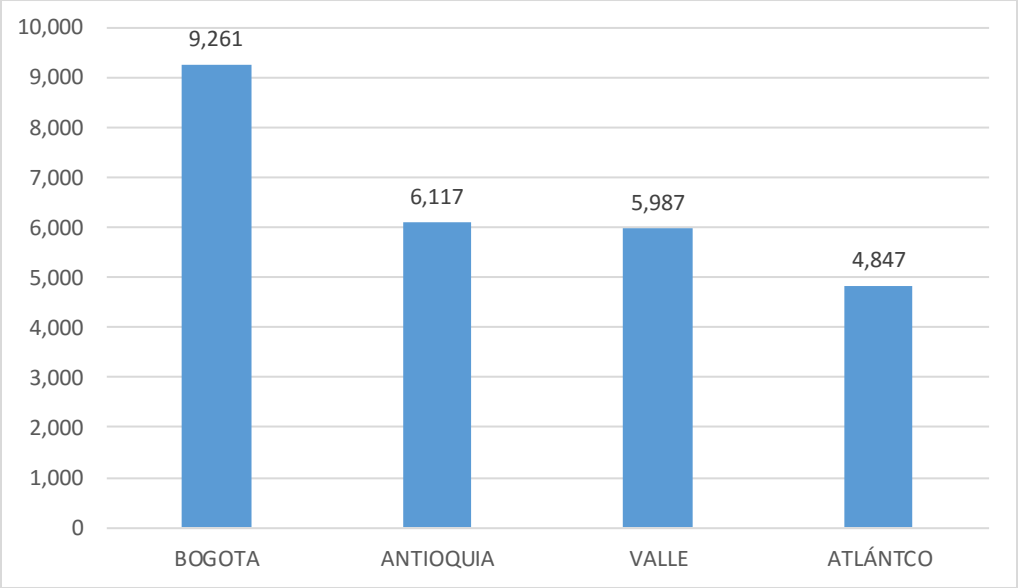
and exerting strategic leadership at regional and national levels, which allows them to have more political and economic power in the country.

6.1.2. PER CAPITA INCOME

Bogotá, with about US$ 106,678 million total GDP, and US$ 9,260 per capita GDP, has the highest both total and per capita GDP in the country, representing 25.7% of the national GDP in 2016; it is the sixth largest city by GDP in Latin America and it is also the largest business platform in Colombia where most high-impact ventures occur.

Since there are no GDP figures per city, the data are presented by department. The participation in the National GDP by 2016 in the departments of Antioquia, Valle and Atlántico was 13.9%, 9.7% and 4.2%, respectively.

Figure 12 GDP per capita USD 2016



Source: Own elaboration with information from DANE

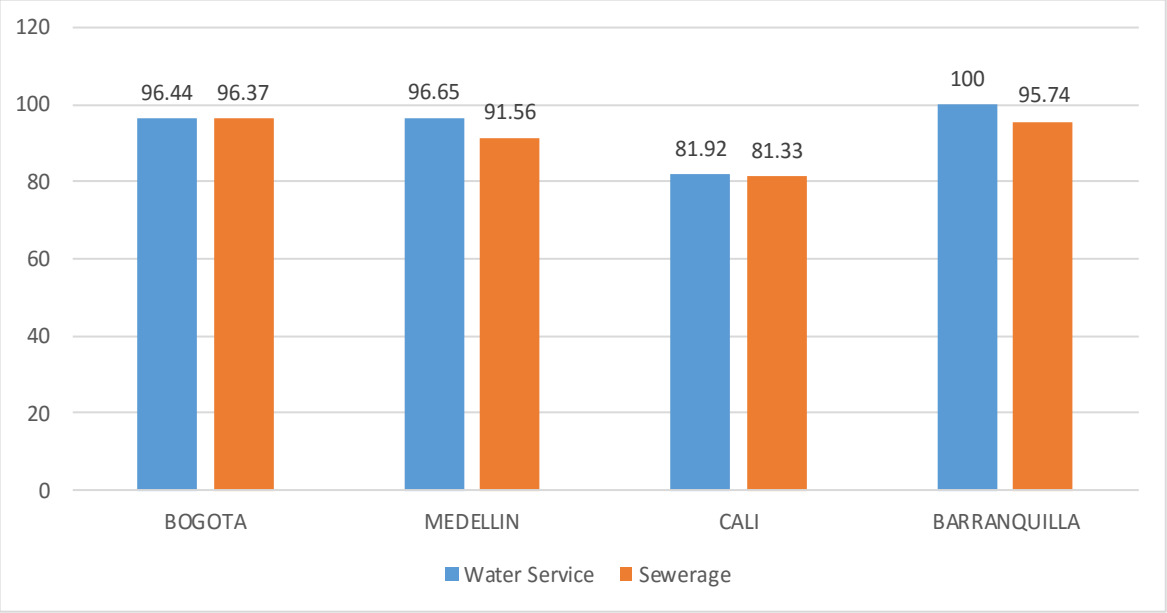
6.1.3. PUBLIC SERVICE COVERAGE

Coverage is an indicator that reflects progress in development policies and infrastructure investment by local and national governments aimed at meeting the primary need for access to safe drinking water and basic sanitation. Thus, increasing coverage and facilitating access to water and sewerage services is the main priority when it comes to investment projects to be carried out in the sector.

In places where 100% coverage is not yet reached, there are difficulties in providing the service to the entire population due to climatic, environmental, topographical conditions and the installed capacity of the infrastructure that the companies have.

With regard to sewerage services, the sector's policy has focused on improving coverage, separating rainwater from sanitary water[19], and increasing the treated flow of domestic wastewater.

Figure 13 Water and sewerage service coverage 2016 (%)



Source: Own elaboration based on SUI data.

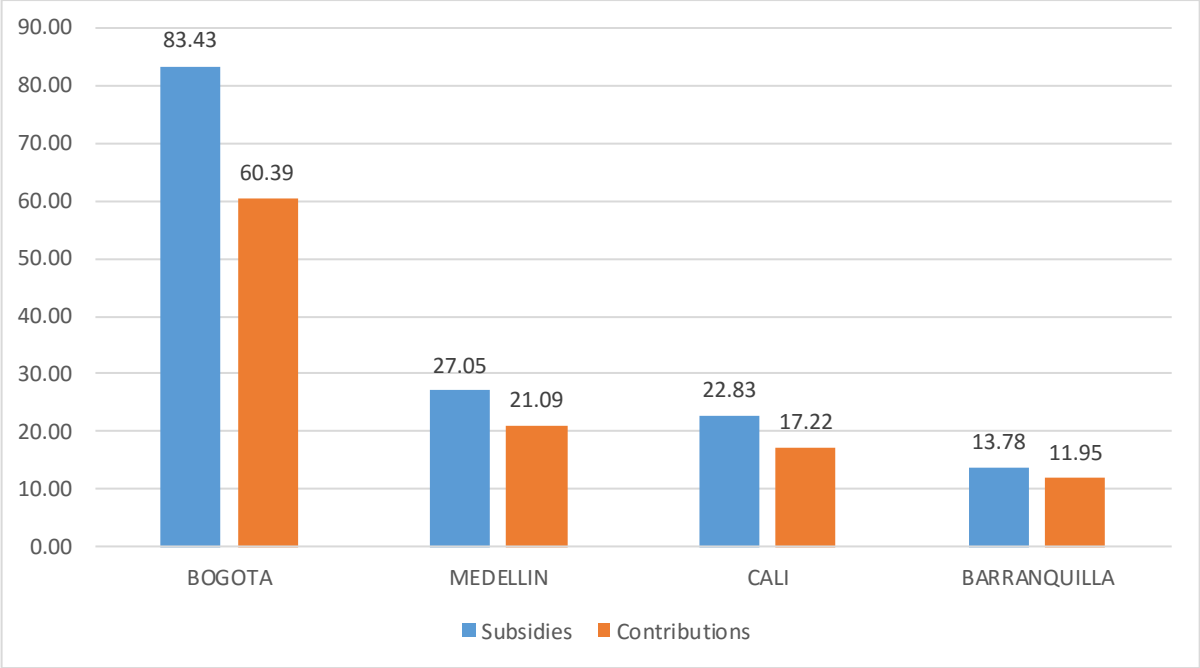
[19] Combined Sewerage Systems: In the country the vast majority of wastewater collection systems are combined, which generates during heavy rainfall, significant changes in the flows transported to treatment systems.

6.1.4. SUBSIDIES AND CONTRIBUTIONS

In Bogotá, contributions cover 72% of subsidies, in Medellin 78%, in Cali 75% and in Barranquilla 87%.

Figure 14 Subsidies vs. Contributions Water Service and Sewerage

million USD 2016



Source: Own elaboration based on SUI data.

According to the information reported by the W&S provider companies in the cities mentioned above, stratum 1 has average subsidies of 53% and 63% in water service and sewerage respectively, with a maximum allowed by the Law of 70%; while stratum 2 is granted average subsidies of 28% in water service supply and 35% in sewerage, with a maximum allowed by the law of 40%.

In terms of contributions, stratum 5 with an average contribution of 56% in water service and 54% in sewerage, with a minimum established by law of 50%. Stratum 6 has 65% and 63% contributions, with a minimum of 60% by law. Industrial use with averages of 42% and 40%, with a minimum of 30% by law. And commercial use with contributions averaging 55% and 52% with a minimum of 50% by law.

It should be noted that, unlike the other cities in Bogotá, there is a considerably higher surcharge on fixed charges for strata 5 and 6 of water services (99% and 136% respectively), as well as for sewerage services (149% and 246% respectively).

6.1.5. WASTEWATER TREATMENT

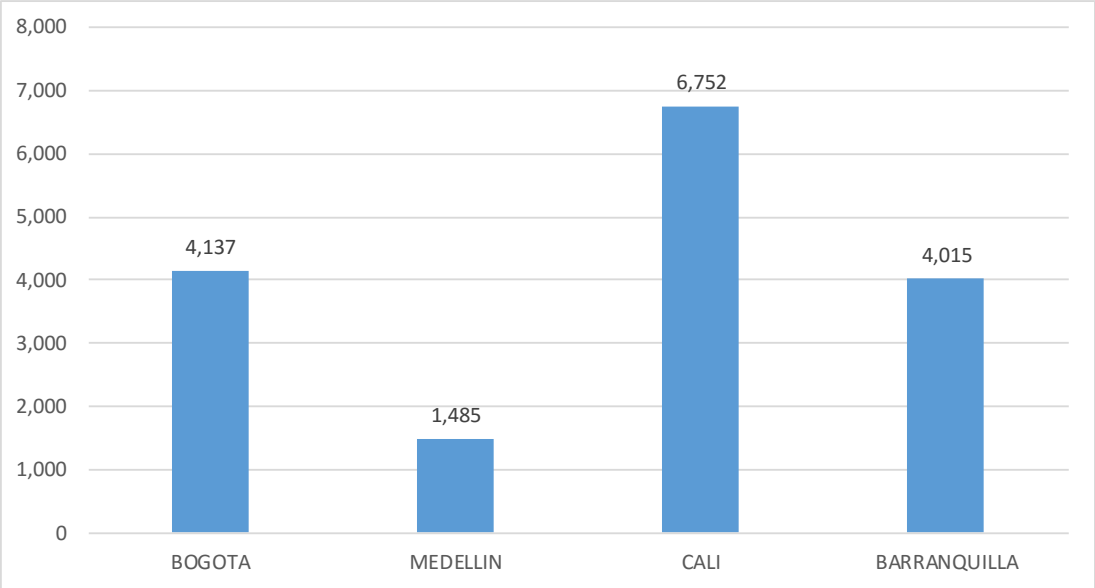
Among the four biggest Colombian cities, Bogotá has the lowest level of wastewater treatment treating only 16% of its wastewater at primary level. The remaining 84% of wastewater produced by the city is discharged without any treatment to Bogotá river. It seems this situation will change in the next few years.

Actually is under expansion and improve to second level treatment El Dorado WWTP, which will cover 20% of the wastewater city discharges; furthermore there was yet signed an agreement between the city and the national government which permit to start the construction of the Canoas WWTP in 2019-20 to begin to operate in 2022, which will cover the remaining 80% of the city discharges for the next twenty years.

Cali have only primary treatment systems too, which cover more than 80% of its wastewater discharges. The largest portion of secondary level wastewater treatment is carried out by Medellin and Barranquilla.

In the city of Barranquilla there are 2 wastewater treatment systems: the first is called "Barranquillita" (preliminary treatment), using submarine outfalls to discharge into the Atlantic Ocean and the second is called "El Pueblo" (secondary treatment).

Figure 15 Wastewater treated flow rate (l/s)



Source: Own elaboration with information from the Sector Report 2015

6.2. Particular features of Bogota

In Colombia, resources pass from the nation to the department and from there to the municipality; as the capital district, Bogotá is the only municipality that receives directly from the nation's budget and therefore has the same powers as a department, while the other districts are administered as district municipalities and operate in a similar way to the municipalities within their respective departments.

Bogotá has a special relationship with the department of Cundinamarca, which does not exercise authority over the capital district; the courts in Bogotá and Cundinamarca have jurisdiction over Bogotá, but not the governor or the assembly.

Bogotá is the country's city with the highest "per capita" budget, since by dividing the $16.7 billion pesos (USD 5,565 million) between the district's 8.08 million inhabitants; each Bogota would have $2.1 million pesos (USD 700).

According to economic analysts, this is the reason why Bogotá concentrates a quarter of the country's economy, which allows important revenues to be generated for the city's budget[20]: the main revenues that the city has are the tax on industry and commerce (3.37 billion pesos in 2016 -US$ 123 million), property tax (2.07 trillion pesos in 2016 - US$ 690 million) and transfers from the Nation (2.4 trillion pesos in 2016 - US$ 800 million).

[20] The industry and commerce tax represents almost 50% of what is collected by this concept in the country, and property tax about a third.

Part C: Sanitation in Bogota

7. THE FINANCING MECHANISMS FOR SANITATION IN BOGOTA

7.1. Section 1: Sanitation in Bogota

7.1.1. POPULATION ANNUAL INCREASE

According to official DANE projections, Bogotá's population grew from 6,840,116 registered in the 2005 census to 7,980,001 to December 2016, which means an annual growth rate of 1.41% between 2005 and 2016, 3 points above the country's total growth rate (1.17%) and largely surpassed by the growth rates of several other cities such as Riohacha (4.37%), Valledupar (2.46%), Villavicencio (2.43%), and Tunja (2.02%).

It should be noted that the annual growth rate EAAB accounts for sewerage service, in the same period, has been 2.71%, with the difference between population and user growth rates explained by large population cohorts forming new households in that period and by the sharp decrease in the average size of households in Bogotá, from 3.56% people per household in 2007 to 3.1[21] in 2016.

In order to make the projections, DANE applies the methodology at the national and departmental levels, based on the adjusted population results of the 2005 Census and the census reconciliation 1985 - 2005; as well as the analyses on the behavior of the variables determining demographic evolution.

The "Method of Demographic Components"[22] is used and at the municipal level, the semi-demographic method of "Cohort Ratio" is applied, obtaining results in accordance with the population structures of the censuses and demographic trends of the recent past, as well as short- and medium-term assumptions for the fertility, mortality and migration components.

The DANE is scheduled to conduct the next population and housing census in 2018.

7.1.2. RESIDENTIAL SUBSCRIBERS TO THE SANITATION SERVICE

Bogotá has practically universal coverage of drinking water and sewerage services in its urban area. The quality of the water distributed is analyzed several times a day, both by the company and the Ministry of Health, taking the number of samples and following the protocol defined by the regulations established in Decree 1575 of 2007[23]. The results show that the risk index of water distributed by the EAB is equal to or very close to zero on a permanent basis.

The only urban areas not covered by water or sewerage networks are those non-legal human settlements, located in areas at risk or in environmental preservation zones. Even areas illegally occupied by human settlements that do not fall into these categories (risk or environmental reserve) are served, as required by law.

[21] http://www.dane.gov.co/files/investigaciones/condiciones_vida/calidad_vida/Presentacion_ECV_2016.pdf

[22] http://www.dane.gov.co/files/investigaciones/fichas/Proyecciones_poblacion.pdf

[23] "By which the System for the Protection and Control of Water Quality for Human Consumption is established."

In urban areas, only those that by law cannot be served, and rural areas, which together account for less than 3% of the city's total population - use alternative systems[24]. In the case of water service, urban areas that cannot be legally served have precarious "illegal" networks (but openly known) connected to the EAB networks; while in the case of rural areas of Bogotá there are community water supply systems that distribute water by hoses or similar means, some of them without treatment. Mainly, for sewage in areas not served by networks, septic tanks are commonly used, although a few households (the poorest of these areas) may have latrines.

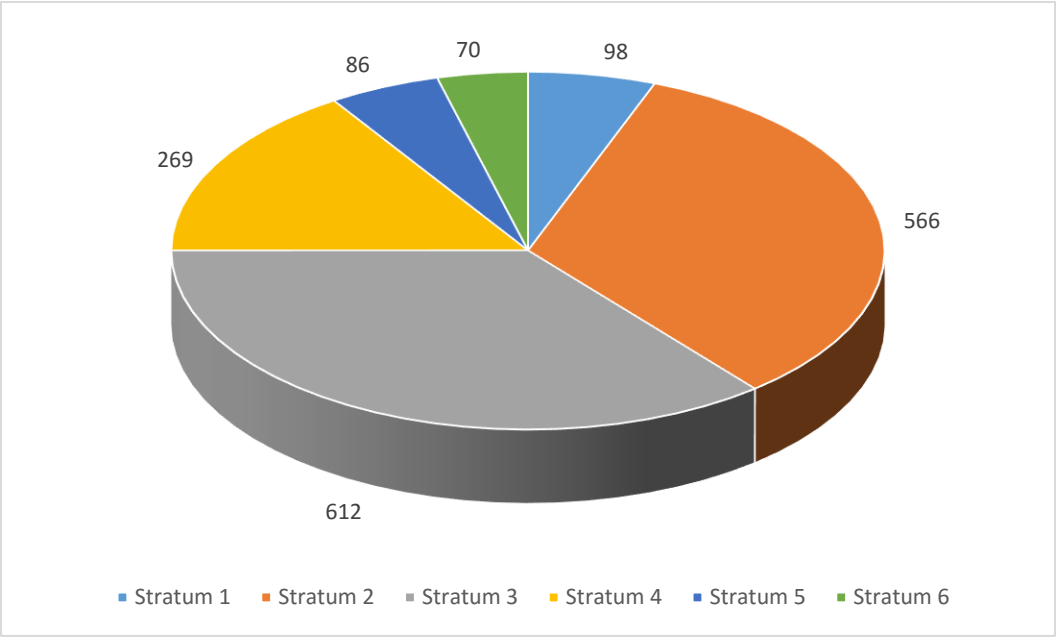
The Water Service, Sewerage and Sanitation Company of Bogotá (EAB or EAAB) is the 100% municipal-owned company that provides water and sewerage services exclusively through networks in the urban area of the city. It is responsible for nearly 7,000 kilometers of sewerage networks (approximately 72% for sanitary sewerage and 28% for rainwater), achieving coverage of more than 97%.

Understanding the question in this numeral as the number of people inhabiting residential units, as a result of the socioeconomic stratification, explained in numeral 2.2.5. of Part A, the number of residential subscribers to the city's sewerage service (1,701,002), by stratum is as follows:

Figure 16 Residential subscribers sewerage Bogotá

Thousands 2016

[24] It is worth noting that according to the Quality of Life Survey - LCS 2016, the percentage of households with access to public, private or communal sewage services is 99.5%.



Source: Own elaboration based on SUI data.

7.1.3. NON-RESIDENTIAL SUBSCRIBERS OF THE SANITATION SERVICE

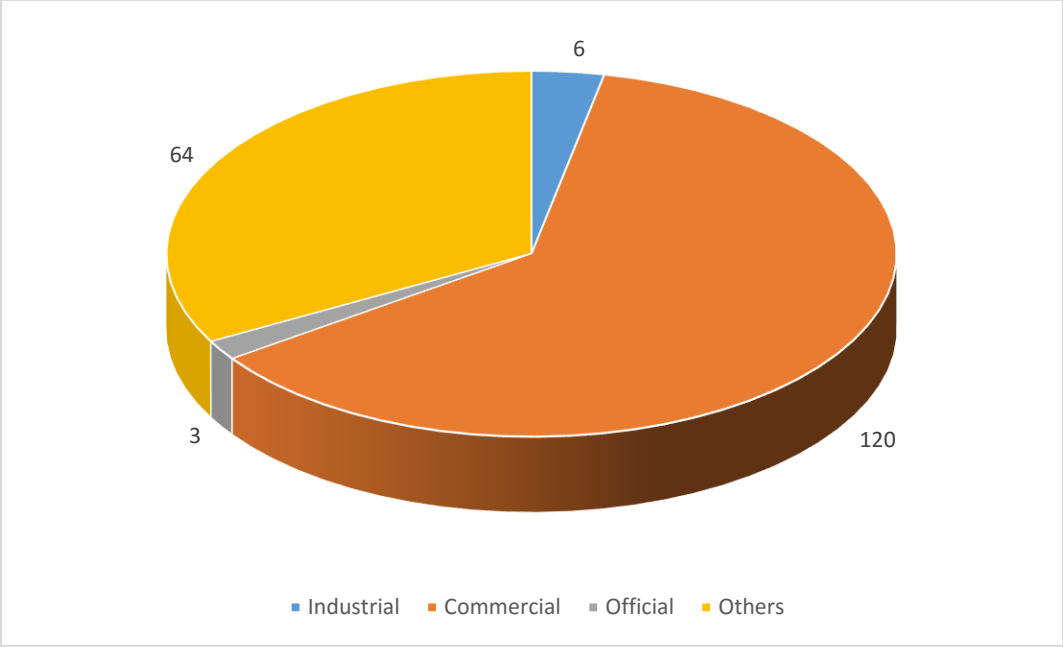
As previously explained, only in rural areas and risk areas or forest reserve zones, in which lives less than 3% of Bogotá's population, there are non-conventional sanitation systems. There are some private businessmen that provide septic tank cleaning services, but in a very limited number compared to other Latin American capitals such as Argentina, Uruguay, Panama or San José de Costa Rica, reflecting the low existence of alternative wastewater disposal systems.

There is no use of shared toilets or open defecation (except for the occasional use of toilets by street dwellers), due to the limited existence of free public toilets or the restrictions they face in using those of cafes, restaurants or shopping malls.

Understanding the question of this numeral as the number of offices, schools, hospitals, factories, shops, etc. that make up the non-residential sector of the city, as a result of the socioeconomic stratification, explained in numeral 2.2.5. of Part A, these properties are classified in Industrial, commercial and Official (193,800). The distribution of EAB users in these groups is as follows:

Figure 17 Non-residential subscribers sewerage Bogotá

Thousands 2016



Source: Own elaboration based on SUI data.

7.1.4. HISTORICAL TRENDS IN SANITATION

- Percentages of people attended

After a period of being in a very delicate financial situation (between 1990 and 1995), the city underwent a strong restructuring (increase) in tariffs and an aggressive investment program, achieving practically universal coverage around 2003-04.

The sharp increase in tariffs initiated in 1996 (thanks to the criterion of financial sufficiency mandated by Law 142 of 1994[25] and the political commitment of the mayors of the following periods) made EAB a very strong financial

[25] Article 87.4. "Financial sufficiency is understood to mean that tariff formulas will guarantee the recovery of operating costs and expenses, including expansion, replacement and maintenance; they will allow shareholders' equity to be remunerated in the same way as an efficient company would have remunerated it in a comparable risk sector; and they will allow the use of technologies and administrative systems that guarantee the best quality, continuity and security to its users."

company with open access to the credit and capital markets. For more than 10 years, the EAB with annual revenues of US$ 1 million/day has been the largest water and sewerage company in the country.

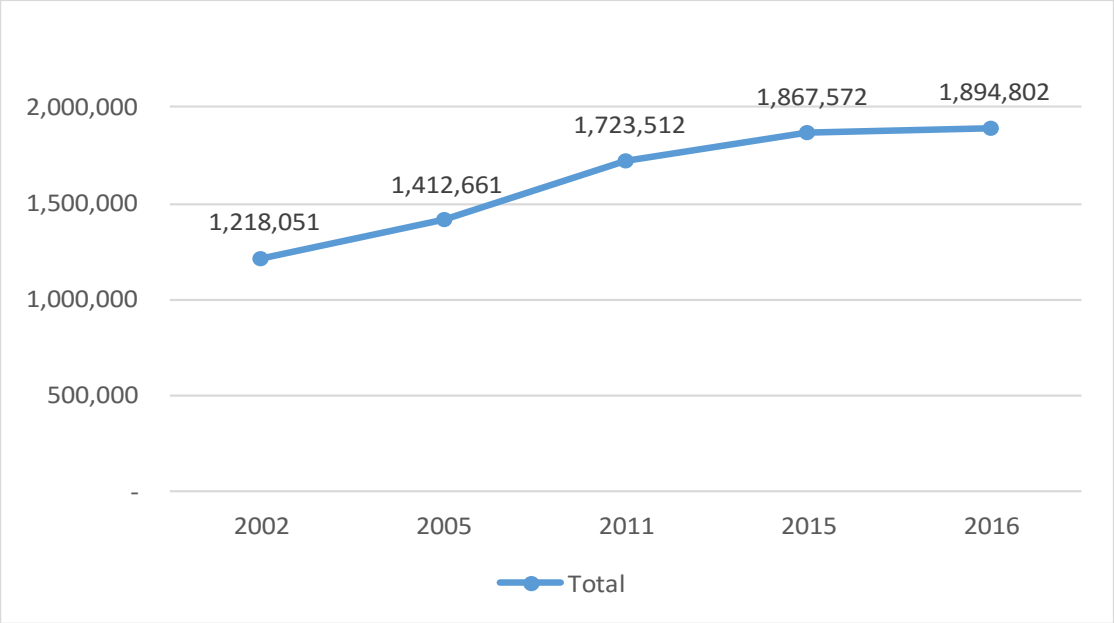
Thus, thanks to the financial sufficiency obtained, the investments of the company EAB in sewerage, have allowed the sanitation of a large amount of urban territory. According to what was indicated in the supporting document of the Water Service and Sewerage Master Plan 2006[26], for the year 2002 the Company's total investments reached 320 billion pesos (107 million USD). The executed plan included the Bogota River Interceptor as a major sewerage project.

Likewise, 453 kilometers of networks were built, including 175.75 kilometers of local sewerage networks, 298.07 kilometers of interceptors to protect the control of dumping into water bodies and 95.63 kilometers of canals and collectors to protect the population from flood hazards. As a result, in sanitary sewerage coverage increased from 2001 to 2002, from 86.7% to 90.1% and in storm sewerage from 80.7% to 83.7%. As of December 2005, sanitary sewerage coverage reached 96.9% and rainwater sewerage coverage reached 93%. In the following years, EAB continued to make important investments for increasing coverage, such as expansion works (interceptors and collectors).

In summary, between 2002 and 2016 in the city of Bogotá, sewer subscribers rose from 1.2 million to 1.9 million, meaning that in 14 years 676,000 households benefited, which represents a growth of 56%.

Figure 18 Increase Sewerage Subscribers Bogotá

[26] http://www.acueducto.com.co/wps/html/resources/empresa/DocumentotecnicoDTS.pdf



Source: Own elaboration based on SUI data.

- Types of sanitation services

Not applicable.

- Quality of wastewater treatment

The Bogota Wastewater Treatment System is immersed in the framework of action established by district and regional authorities to tackle the decontamination of the Bogota River.

The high degree of industrialization and population growth was collaborating in the process of river pollution, generating problems of bad smells, decrease in self-purification capacity, decreased extension, permanent contribution of solid and liquid waste with high pollution loads in organic matter and heavy metals and hazardous substances, a situation that led him to consider one of the most polluted rivers in the world.

In 1991, an agreement was made between the Regional Autonomous Corporation - CAR, the National Planning Department - DNP, EAAB ESP, the Technical Administrative Department of the Environment - DAMA (today the Secretariat of the Environment) and the Government of Cundinamarca in order to recover the river from its source to its mouth. The total recovery of the 365 kilometers of the river at that time was estimated at more than USD 1 billion.

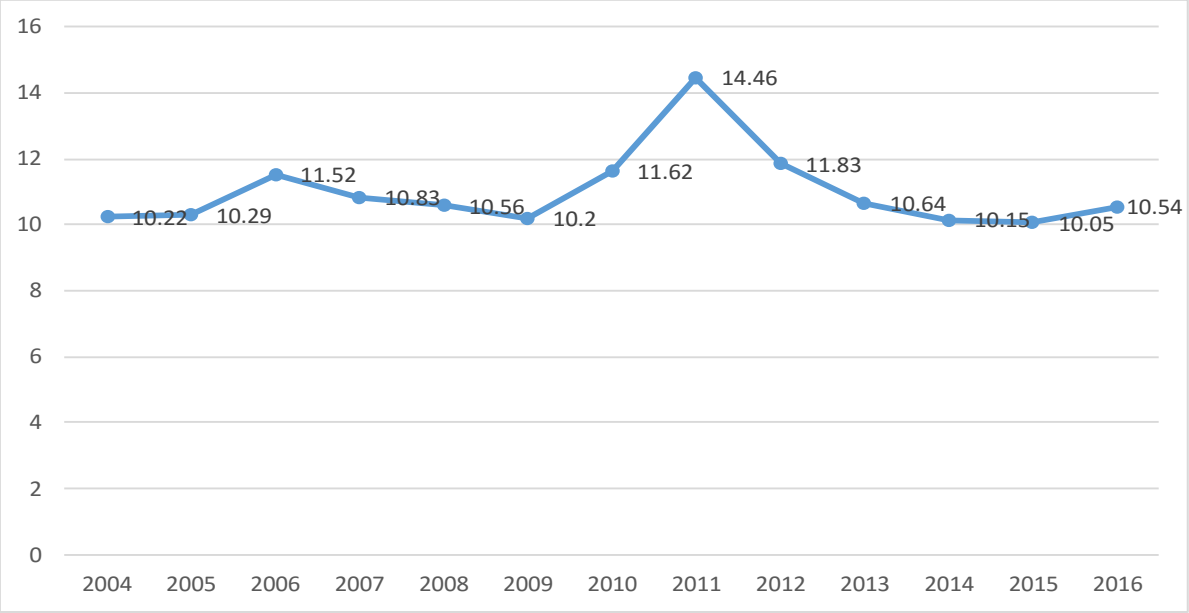
The Water Service and Sewerage Company of Bogota was in charge of the hydraulic adaptation works of the Bogotá River, as well as those of the Bogota River Interceptor. Counting on the resources from the property tax of the city of Bogotá transferred by Law 99 of 1993 to the CAR, National Royalties Fund and other funds of the District, through the concession model was designed, built and operated for some years (from the year 2000), the first phase of the Wastewater Treatment Plant -PTAR- Salitre.

The Capital District, due to cost considerations and the change in the sanitation scheme of the Bogotá River, in 2004, delegated responsibility for the operation, maintenance and administration of the first phase of PTAR Salitre to the Water Service and Sewerage Company of Bogotá.

Since then, this wastewater treatment plant has been in the hands of the EAB, showing the following results (2004 to 2016) for the indicator of Treated Wastewater - ART[27], for the city of Bogota, as reported by the Environmental Observatory of Bogota:

Figure 19 Wastewater Treated ART (Million m³ / month)

[27] This indicator shows the volume of both industrial and domestic wastewaters treated by the District at the El Salitre Wastewater Treatment Plant.



Source: Own elaboration based on the Bogotá Environmental Observatory data (average for the month)

- Regulation of emptying services

The following are the additional standards to those mentioned in section 2.2. of Part A of this report, which were recently issued and which generally regulate the provision of sewerage services at the national level:

✓ Decree 1898 of 2016 of the Ministry of Housing, City and Territory - MVCT

"By which Title 7, Chapter 1, is added to Part 3 of Book 2 of Decree 1077 of 2015, which partially regulates Article 18 of Law 1753 of 2015, in relation to differential schemes for the provision of water service, sewerage and waste services in rural areas."

✓ Decree 1272 of 2017 of the Ministry of Housing, City and Territory - MVCT

"By which Chapter 2 is added to Title 7, Part 3, of Book 2 of Decree 1077 of 2015, which partially regulates Article 18 of Law 1753 of 2015, in relation to differential schemes for the provision of water service, sewerage and waste services in areas of difficult access, areas of difficult management and areas of provision, in which due to particular conditions the standards of efficiency, coverage and quality cannot be met."

✓ CRA Resolution No. 800 of 2017 of the Commission for the Regulation of Drinking Water and Basic Sanitation.

“By which the option of measuring discharges in the domestic public sewerage service is established.”

- Changes in people's perceptions of sanitation?

With regard to citizen perception of water and sanitation, since 1988 the "Bogotá as we go " survey has been carried out, which measures the level of satisfaction of Bogota's citizens with the supply of goods and services in the capital. The latest survey carried out between 14 September and 16 October 2017 showed 76% satisfaction with the city's water and sanitation service. This low perception may be due to the cost of providing the service, which, as mentioned above, is the highest in the country. Likewise, the city's high density and population growth have meant that the sewerage system does not respond efficiently and during intense rainy seasons is insufficient to cover the increase in flow, generating flooding in the city.

The Cities as We Go Network perception survey presents a satisfaction ranking in aspects such as pride, subjective well-being, economic situation, education, health, health, security, public services, mobility, citizen behavior and public management, which are key to improving the quality of life in the main cities of Colombia. In 2016, Bogotá achieved a satisfaction level of 81% in water and sewerage, below that of Medellín (91%) and Barranquilla (88%).

- Political importance of sanitation

As part of the EAB's environmental policy with regard to sanitation, properly managing the drainage of rainwater and wastewater in the city has involved an arduous task of environmental sanitation, which is carried out through the development of programs such as the Sanitation and Discharge Management Plan -PSMV- to detect and correct the problems that affect water bodies, in order to improve the quality of the water resource.

Likewise, the PSMV includes the mega-works that the company is carrying out to recover the city's rivers and the sanitation of the Bogotá River, through the construction of interceptors and collectors in the Salitre, Fucha and Tunjuelo rivers. In addition, at the Wastewater Treatment Plant (PTAR Salitre), the wastewater produced by more than two million people, mainly households, offices, schools and universities, is treated before it reaches the Bogotá River.

7.1.5. PLANS TO ACHIEVE TOTAL COVERAGE BY 2030

As a first step, the EAB in the master plan for water service and sewerage, and therefore in the investment plan that forms part of the tariffs, has defined the priorities within which, for the sewerage service, investments in local networks, rehabilitation of priority infrastructure, wastewater interceptors, canals and collectors are contemplated.

With regard to wastewater treatment, in April 2017, construction began on the second phase of PTAR Salitre, which will last for 4 years and will enable the treatment of approximately 605 million liters of domestic wastewater per day from the north and center of the city, going from treating 4 m^3/s of wastewater to 7 m^3/s. Likewise, by means of a more advanced process, it will stabilize the sludge achieving the degradation of organic matter, converting it mainly into methane gas, which will be used to provide around 30% of the energy required by the plant for its operation.

Similarly, since 2003 work has been carried out, based on an agreement between the CAR and the District, on a second plant (PTAR Canoas) located near the Muña reservoir, at the Canoas site, to treat the wastewater generated in the Fucha, Tunjuelo and Soacha basins.

Last October 2017, the Mayor of the city announced that it has the resources to decontaminate the river (1,333 million USD) - through the expansion of PTAR Salitre and the construction of the wastewater treatment plant (PTAR) Canoas - which will clean 70% of the wastewater produced by the Bogotanos - of which 500 million USD will be provided by the CAR, 20.34 million USD by the Governorate of Cundinamarca, and the remaining amount will be provided by the District through the District. USD 812 million). Work on PTAR Canoas is scheduled to begin in 2019 and be completed by 2024.

7.2. Section 2: Financing sanitation in Bogota

7.2.1. THE MOST IMPORTANT TYPES OF SANITATION

Not applicable.

7.2.2. CAPITAL AND OPERATING COSTS:

The development of the city's drinking water and sewerage services is basically supported by the tariffs applied to users, which, in accordance with the tariff regulation in force in the country since 1996, are established to fully cover the costs of the services, both in their administration and operation components and in their investment component.

The tariff methodologies in force in the country since 1996 are of the "utility approach" type (as defined in AWWA Handbook M6), according to which tariffs must recover the costs reflected in the companies' income statements, which implies that, for the investment component, the tariffs cover only the depreciation and cost of capital (interest tariff per capital base) of the lender.

It should be remembered that in the case of low-income users, subsidies are applied to their bills, which are financed with cross-subsidies plus budgetary contributions from the municipality. The local government's contribution to the EAB for this purpose represents less than 5% of the EAB's annual revenue. The minimum living allowance is covered with the same resources that the EAB transfers to the municipality as annual earnings.

Given the long useful life of the assets of sanitation services, tariffs recover only between 2.5% and 5% of investments annually, making it necessary for companies to go to the capital market (credit or bonds) to obtain financing for their investments.

Bogotá - like Colombia's main sanitation companies - has great access to the internal and external capital markets; it has received credit from the country's main banks and multilateral banks (IDB, World Bank) and has even issued bonds in the local market.

However, for the financing of projects to decontaminate the Bogotá river (see numeral 7.1.5. above), whose cost is estimated at US$ 1,333 million, 39% will be financed with budgetary contributions from the National Government of the Regional Environmental Authority (CAR) and the Government of Cundinamarca, thus avoiding transmitting its total cost to user fees.

7.2.3. FINANCING TO THE PLANS TO ACHIEVE TOTAL COVERAGE

It was answered in the previous numeral.

7.3. Section 3: Institutional and political aspects

7.3.1. DECISION-MAKING AND POLICY

The Vice-Ministry of Water and Sanitation, created in October 2006 under the Ministry of Environment, Housing and Territorial Development, is responsible for establishing the national drinking water and sanitation policy.

The water quality policy and standards for human consumption are regulated by the Ministry of Health and Social Protection, while the policy and standards for discharging wastewater into the environment are established by the Ministry of Environment and Sustainable Development.

Economic regulation (tariffs), quality of services (continuity, complaints, cuts, etc.) and the behavior of providers correspond to the Commission for the Regulation of Drinking Water and Basic Sanitation (CRA). The control of the application of these rules and the legal rules for the provision of services is the responsibility of the Superintendence of Public Services at Home (SSPD).

In the Development Plan defined for the current presidential term (2014-218), the Government proposed to improve the performance of the water and sanitation sector through the following measures:

I. Strengthening the regulatory framework;
II. Implementation of technical assistance programs;
III. Financial support to promote modernization and efficient management, as well as subsidizing the poor; and
IV. Rationalization of the institutional framework at the national level to improve sector coordination. The Government also supports private enterprise participation in the sector.

Additionally, in Colombia there is the Sector Technical Regulation (STR), which was recently updated by Resolution 0330 of 2017, issued by the Ministry of Housing, City and Territory, which regulates the technical requirements to be met in the design, construction, commissioning, operation, maintenance and rehabilitation stages of infrastructure related to public water, sewerage and sanitation services.

Within the framework described above, it is up to the Mayor of the City to define the goals for coverage and quality of water and sanitation services in the city and to the administration of the EAB to define its plans (water and sanitation teachers; investment plans, among others), as well as the projects that will technically respond to the city's

requirements and seek their financing, having to go to the City's Municipal Council to approve the required future indebtedness.

7.3.2. PLANNING THE SANITATION SECTOR

See responses to numerals 7.1.4, 7.1.5 and 7.2.2.

7.3.3. OPERATION OF SANITATION SERVICES

- Operation and maintenance of sanitation services

The operation and maintenance of the sewerage service is assumed directly by the EAB and charged to subscribers through tariffs. See answer to numeral 7.2.2. above.

7.3.4. FINANCING THE SANITATION SECTOR

See answer 7.1.5 above and answers 7.2.

Part D: Sanitation challenges in Bogota

8. THE FINANCING GAPS AND OBSTACLES TO URBAN SANITATION.

Bogotá, nor any of the 10 (or even 20) large Colombian cities, serve as an example to identify the financing gaps in water and sanitation services and especially wastewater treatment that the country faces.

The financing needs for investments in sanitation and wastewater treatment in Colombia are for municipalities with less than 100,000 inhabitants and, of course, rural areas. It is clear that these services present significant economies of scale that these municipalities and areas cannot take advantage of. In that sense, the great challenge facing the country is to achieve a national subsidy scheme for the investments required to achieve universal coverage and the treatment of 100% of wastewater in these areas.

This is how the national government has attempted to identify gaps in the efficient provision of water and sanitation services at the rural level. In July 2014, CONPES[28] document 3810 POLICY FOR THE SUPPLY OF DRINKING WATER AND BASIC SANITATION IN THE RURAL AREA was approved in document 3810, with the objective of promoting access to drinking water and basic sanitation in rural areas, contributing to the improvement of the population's living conditions, setting a target of 2.5 million people with a basic sanitation solution by 2024.

To this effect, strategies were established such as promoting the structuring of sustainable schemes through the creation of authorized organizations and linking specialized operators; technical assistance programs; changes in

[28] The National Council for Economic and Social Policy -CONPES- was created by Law 19 of 1958. It is the highest national planning authority and serves as an advisory body to the Government on all aspects of the country's economic and social development. To achieve this, it coordinates and guides the bodies in charge of economic and social management in the government, through the study and approval of documents on the development of general policies that are presented in session.

GSP distribution criteria to ensure the allocation of resources to rural areas and updating of SARs (which became effective in 2017), among others.

To meet these commitments, between 2014 and 2024, a budget of 7,634,989 million pesos was estimated for 2013 (2,748.2 million USD), represented mainly by the construction of infrastructure (66%) and intradomiciliary connections[29] (23%) and resources from the different sources of financing were allocated: General Budget of the nation - PGN (31%), General System of Participations - SGP (35%), General System of Royalties - SGR (27%) and Departmental Plans of Water - PDA (7%).

9. FINANCIAL MECHANISMS TO IMPROVE THE SANITATION SECTOR.

As explained above, the government has sought to raise the profile of the sector to give greater impetus to increased coverage, surpassing the Millennium Development Goals for the sector in Colombia, and improving the quality of service, especially in small cities and rural areas with the largest service gap.

To this end, the Vice-Ministry of Water and Sanitation was created in 2006, from which four new programs have been launched:

- Departmental Water and Sanitation Plans
- Settlement Sanitation Program (SPA) within the framework of a Comprehensive Neighborhood Improvement Program
- Municipal Dumping Sanitation Program to increase the volume of municipal water treated.
- Hand Washing Program

The Departmental Water and Sanitation Plans program, as explained above, serves to plan and harmonize regional resources and service delivery schemes at the country department level.

Similarly, in relation to the gaps in the rural sector with regard to the adequate provision of drinking water and sanitation services, CONPES document 3810 of 2014 seeks to resolve these obstacles and increase the flow of finances that allow greater investment, as explained in the previous section.

10. INNOVATIVE AND NON-TRADITIONAL FINANCING INSTRUMENTS.

10.1. Incorporation of new subsidy mechanisms

The innovative mechanisms used in Colombia to maximize coverage of water and sanitation services are

a) Subsidies (crossed and direct) to the bill for the basic consumption of the poorest users.
b) Minimum vital consumption: consumption without payment for the first 5 or 6 m^3/family/month, to the poorest families within the same poor strata.
c) Subsidies for intra-domiciliary connections

[29] It is assumed that in 49% of households, intradomiciliary connections will be made (3 points - shower, sink, toilet).

d) Prepaid water (and sewerage) supply

10.1.1. SUBSIDY SYSTEM (CROSSED AND DIRECT)

See response to item 5.2 Part A of this report.

10.1.2. MINIMUM VITAL WATER

In addition to the system of subsidies to the lawsuit previously filed and without having a legal basis in the Colombian legal framework, but using as a basis pronouncements of the Colombian Constitutional Court and the official declaration made by the United Nations of water as a human right[30], some Colombian mayors have established a subsidy scheme called "Minimum Vital Water".

The concept of a minimum vitality is presented as a way to locally concretize the official declaration of water as a human right, recognizing that a minimum quantity of water is indispensable for a dignified life and a precondition for the realization of many other human rights.

Water as a human right is supported by concepts such as:

- No one can be deprived of enough drinking water to meet their basic needs.
- For people, water supply and availability must be continuous for various personal and domestic uses.
- Water quality must be sufficient to make it fit for human consumption.
- Accessibility to water must be a priority in the face of various circumstances of physical and economic access, as well as information on its supply and the prohibition of discrimination.
- The sustainability of the water resource must be guaranteed, so that it is available for future generations under the same conditions as described above.

Furthermore, the human right to water is seen as a fundamental autonomous social right, which is a necessary condition for the realization of other rights contained in the 1948 Universal Declaration.

In the above context, in Colombia the vital minimum is defined as the quantity of drinking water required by each person to meet their basic needs and to preserve their life and health, which must be provided in sufficient quantities and in high quality conditions.

In Colombia, in 2008, a citizens' initiative called "Referendum of Water" was presented to the Congress of the Republic, which proposed that access to water should be a fundamental right, and that a vital minimum free of charge should be guaranteed for all households regardless of their condition or capacity to pay. Finally, this initiative did not prosper (Hernández Escolar & Méndez Sayago, 2013).

In spite of the above, in 2009, Medellín was the first city to implement a minimum vital drinking water program, establishing that families who are in extreme need, according to an evaluation carried out by the municipality itself

[30] This declaration was a product of the International Covenant on Economic, Social and Cultural Rights (ICESCR) and General Comment 15, 2002. General Assembly of the United Nations (UN), which was reinforced by the UN General Assembly in 2010 through Resolution A/64/L. 63/Rev. 1. Similarly, the Dublin Declaration and the Rio Summit, both held in 1992, laid the foundations for General Comment 15, which was updated in 2012.

(without the intervention of the provider) would have the right to consume, at no cost to the family and to be fully covered by the municipal budget, an amount of 2.5 m3 per month (equivalent to 83.3 liters per person) per day.

For its part, Bogotá established the vital minimum in 2012 for strata 1 and 2, which was set at 12 m^3 bimonthly per dwelling (equivalent to 50 liters per person per day). More recently, Cali, since 2015 and Pereira and Neiva (which will begin to implement it in January 2017) have implemented similar programs.

The differential characteristics of the schemes of Bogota and Medellin are:

- Bogotá: Applies to all users of strata 1 and 2; applies to the first 6 m^3/home/month. Only that volume is provided free of charge in the water supply service (not applicable to sewerage or fixed charges). Applies from 2012.
- Medellín: It is applied to users of strata 1 and 2 in an exceptional way, once conditions of extreme lack have been verified. Applies to the first 2.5 m^3/person/month. This volume is provided free of charge in both the water supply and sewerage services and without payment of fixed charges. Applies since 2009.

The scheme of the city of Cali follows exactly the same guidelines as the Bogotá case.

It should be stressed that the Minimum Vital programs are, in all cases, complementary to the cross-subsidy scheme, so that the share of consumption exceeding the minimum vital will be subject to subsidies up to the total of basic consumption, depending on the stratum and subsidy levels applied in each municipality.

10.1.3. SUPPORT FOR INTRADOMICILIARY CONNECTIONS

The program of the Ministry of Housing "Connect with Water" aims to promote access to public water service and sewerage services, through the construction or improvement of intradomiciliary and residential connections when technically required for water service and sewerage services, through budgetary contributions from the Nation and/or territorial entities as a counterpart to cover their costs, in the following areas.

The Ministry determines the municipalities benefiting from the program of intradomiciliary connections of strata 1 and 2 and prioritizes the districts and/or rural nucleated areas thereof, through the application of the targeting criteria established by Decree 1350 of 2012, so that they have drinking water supply and a drainage system, as well as differentiated spaces for bathrooms, kitchens, laundry rooms and bedrooms.

Has been reported for 2015-2016, a total of 31,000 poor families from 20 cities that went from the hose to the shower, from the latrine to the toilet, from the sink to the dishwasher and from the bath to the laundry room. The maximum value of the subsidy per beneficiary property, for the intervention of the intradomiciliary and residential connections of the water and sewerage services, is 9.8 SMLMV (2,409 USD).

10.1.4. PREPAID SYSTEM

The prepaid water system, regularly called "Option of Advance Payment", is a modality for measuring and paying the household water service and sewerage services, in which the provider offers the alternative of prepayment of fixed charges and consumption of water and sewerage, as well as the collection of the public toilet fee, when there is a joint billing agreement in force.

The tariff regulation of this option for water and sewerage services is contained in Resolution CRA 665 of 2013, whose main rules and definitions are as follows:

- The "Refill for consumption" is the amount of money by which a subscriber linked to the prepayment option cancels, prior to its consumption and dumping, a certain equivalent amount of cubic meters of aqueduct and sewerage.
- The provider of water service and sewerage services may offer all its subscribers this alternative, informing in any case, the variations of uniform contract conditions that accompany this option. Once the subscriber declares his or her willingness to use the prepayment option, under this alternative, the provider will determine the conditions for the installation and financing of the prepaid meter.
- The provider must indicate the different means that will be used to carry out the minimum monthly charges and the consumption surcharges required by the subscriber. It must also provide subscribers with the means to make use of the minimum monthly charges and the consumption recharges they require, 24 hours a day.
- The right of the company to suspend the service for non-compliance will be configured when the subscriber does not pay the minimum monthly charge for the term set by the provider, without exceeding in any case the failure to pay the minimum monthly charges for the last three (3) months.
- The value of the minimum monthly charge and the recharge for consumption shall be that corresponding to the rates in force at the time of payment; consequently, the updating of these rates shall not apply to payments previously made by users.

The Prepaid Water program, established by Public Companies of Medellín (EPM), is an exploratory program, not yet available on a massive scale, aimed at delinquent users who have been cut off for lack of payment, and that seeks to provide access to the neediest by improving their living conditions.

Users make a request to the provider, fulfilling certain requirements. Once the request is accepted, EPM installs a meter and gives the user a smart card, with the possibility of recharging from approximately US$2 to a maximum of US$40. There are numerous charging points throughout the city of Medellín.

The cost of the meter and card is borne by EPM, delivering the meter through a lease agreement with the obligation to return it in the event of withdrawal from service. Users can return to the post-payment service by submitting the respective request.

The card is inserted into the meter and, if charged, will allow water to flow into the home and will be discounted from the remaining value on the card, depending on the use of the water service, as well:

- Fixed charges for water service and sewerage (For each m^3 consumed, the user cancels a part of the fixed charge)
- Charge for water and sewerage consumption (m^3)
- Debt repayment value (maximum 10%)
- Toilet fee collection

The values of fixed charge and consumption charge are applied taking into account subsidies and/or contributions according to the stratum in which the user is classified.

The recharge carried out has no expiration date, but its cost depends on the number of inhabitants of each household, the consumption habit and the technology of washing and sanitary appliances.

On June 26, 2015, EPM launched Prepaid Waters commercially, to which 7,351 subscribers were linked.

11. THE POLICIES OF THE NATIONAL GOVERNMENT TO IMPROVE THE SANITATION SECTOR.

- The likelihood that there will actually be more funding for sanitation.

It does not seem necessary to require a greater amount of resources for sanitation, but rather to redirect and concentrate the currently allocated resources towards municipalities that do not have the economic capacity to cover their needs in terms of fees.

Whichever beneficiary identification scheme is used in the country, it is clear that the portion of the population potentially benefiting from subsidies should be reduced, openly limiting the subsidy exclusively to users of strata 1 and 2, reducing the population potentially benefiting from more than 65% of the country's population to no more than 30% or 40%, which would make it possible to focus the delivery of resources and achieve self-financing of the cross-subsidy scheme, by means of cross-subsidies.

While it is true that most municipalities in the country do not subsidize Stratum 3 by decision of their municipal councils alone, it is also true that for political reasons (especially during political campaigns) in several of the country's large cities, subsidies are being granted to Stratum 3, which means that considerable budgetary resources are devoted to assisting a population that, for the most part, does not require such assistance.

- Arguments the World Water Council and others should communicate to whom to improve this probability.

The need to concentrate government aid and assistance in municipalities and towns with lower economic capacity and that will not be able to meet their sewerage and treatment needs based on tariffs to their users or the transfers currently received through the GSP.

Work programme

Increasing Financial Flows for Urban Sanitation

Case study

Blumenau, Brazil

Prepared by:

Cesar Seara

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BLUMENAU CASE STUDY

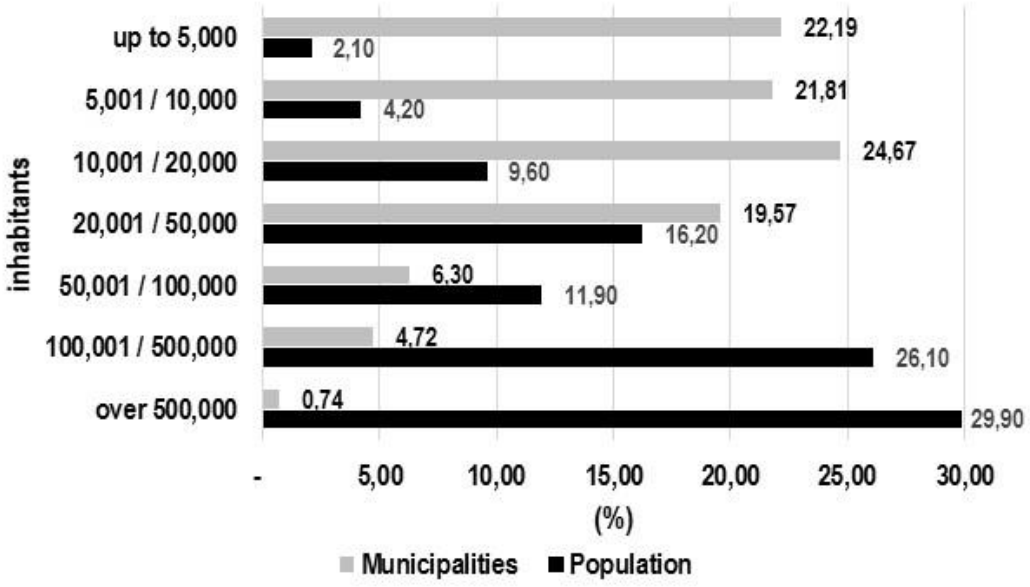
PART A: SHORT BACKGROUND OF THE COUNTRY

1. BRIEF SOCIAL, POLITICAL AND ECONOMIC DATA

Brazil is a Federation Republic, made of 26 States and 1 Federal District, embracing 5 geographical regions, that are: North, Northeast, Southeast, South and Center-West, totaling a comprehensive 8,515,767 km^2 land area.

According to IBGE[1], in 2015 Brazil owned a global population of 204,450,600 inhabitants, distributed throughout 5,570 municipalities, where 84.0% is urban (171,748,500 inhabitants) and 16.0% (32,702,100 inhabitants) is rural. On another hand, more than half population (56.1%) lives in 304 municipalities (5.46%), with over 100 thousand people, as in the Graphic 1 below:

Graphic 1 – Brazil Population Distribution



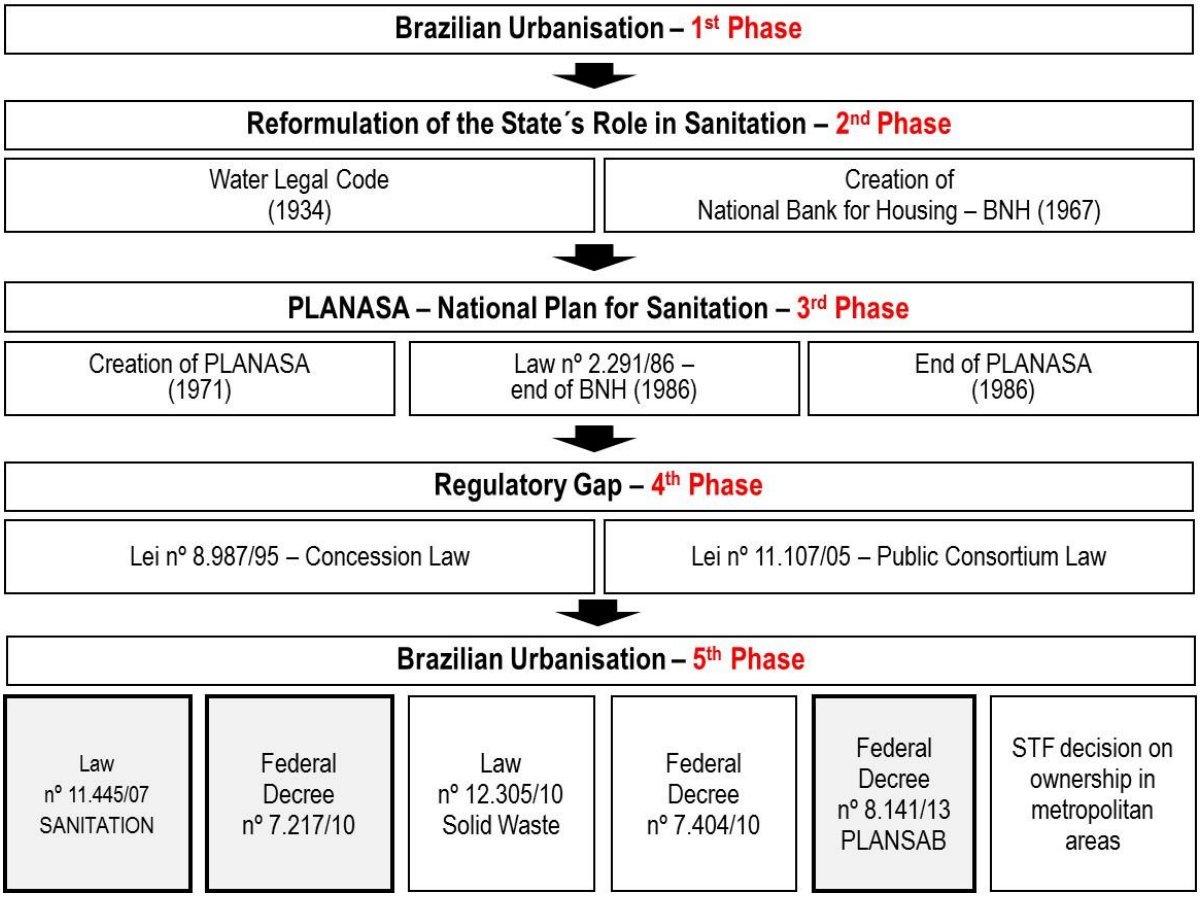
According to IBGE, in 2015 Brazil scored a R$ 5,904 billion GDP (US$ 1,775 billion) by current value, and a R$ 28,876.00 GDP per capita (US$ 8,681.40) by nominal value. HDI was 0.754 ranked at the 79th position worldwide.

[1] IBGE – Instituto Brasileiro de Geografia e Estatística = Brazilian Institute for Geography and Statistics

2. CONSTITUTIONAL STRUCTURE

A brief historical retrospective indicates that until the 60' decade water and sanitation services have been delivered in a deficient way, not only in terms of reduced coverage, intermittent service, poor water quality to the population, as well as of a low score for water and sewage collection and treatment, as described in Figure 1:

Figure 1 – Water and Sanitation Evolution in past 50 years



Unfavourable figures in 1970 indicate that only a little more than 32% of our population (both urban and rural) could have access to piped water and just 13% to sewage collection public network.

Multiplicity of different municipal administration models for management and service supply contributed to its inefficiency. The most adequate model was where state departments were responsible for the entire process, including: (i) production – water catchment, adduction and treatment; (ii) distribution – reservation and distribution network; and, (iii) planning, construction, and operation itself.

When the National Plan for Sanitation – PLANASA arrived in 1971, several state-owned water and sanitation companies were established – CESB. At the same time, the National Bank for Housing – BNH, as central, normative and supervisory body of the Sanitation Financing System – SFS, started issuing rules and conditions to implement PLANASA in

each state, with defined goals, service levels and relative schedules, as well as allocating necessary financial resources, able to implement the whole plan in the States by their water and sanitation companies.

This model ended in 1986, leaving the water and sanitation sector fully headless, without any rules, directions and public policies, with the role and power to finance it transferred to the Federal Savings Bank – CEF, in lieu of the extinct BNH. Service coverage figures in 1991 attest the accomplishments made by the PLANASA model, when compared to 1971, that is 71% of Brazilians were served by piped water and 37% by sewage collection public network.

According to the Brazilian Constitution of October 1988, by its article 30th, municipalities are given the responsibility to decide on matters of local interest, and therefore organizing and providing local interest public services, directly or under a concession or permission regime. Municipalities are also given autonomy and power for self-organization, self-administration, self-ruling and self-management.

Concerning water and sanitation[2], our Constitution also states by its article 21st that the Union has the exclusive power to promote guidelines for urban development. By its article 23rd, it also states about a common power among Union, States, Federal District and Municipalities to "promote programs for housing construction, housing conditions improvement, and water and sanitation"

Nevertheless, water and sanitation sector did not take advantage of a potential offered by several legal acts issued in the 90' and 2000', aiming at infrastructure development, such as: (i) Law 8,987/1995 – concession; (ii) Law 9,074/1995 – concession extension; (iii) Law 11,079/2004 – public-private partnerships; and, (iv) Law 11,107/2005 – public consortium.

A Ministry of the Cities (MC) was established on January 1st, 2001, with the following competence areas: (i) policy for urban development; (ii) policy for housing, water and sanitation, urban transportation and transit; (iii) together with other governmental spheres, private sector and NGOs, promotion of activity and programs for urbanization, housing, water and sanitation, urban transportation, transit and urban development; (iv) policy for subsidizing popular housing, water and sanitation and urban transportation; (v) planning, regulation, ruling and managing financial resource allocation for urban development, urbanization, housing, water and sanitation, urban transportation and transit; and (vi) joint elaboration of general guidelines for urban water systems, and also for adopting the water resource basin as the standard basis to plan and manage water and sanitation.

However, the water and sanitation sector was still lacking a legislation to establish national guidelines able to implement a global federal policy for it. Finally, Law 11,145/2007 was sanctioned on January 5th of that year.

That legislation provided institutional innovations and advances, even though still unable to change existing models for a real infrastructure expansion required by the country.

As a long-range planning tool, a National Plan for Water and Sanitation (PNSB), named PLANSAB, was issued in 2013. It settled W&S guidelines, goals and actions for the next 20 years (2014-2033). Projected investment for that period is

[2] Water and Sanitation – potable water supply; sewage treatment; urban cleansing and solid waste management; drainage and rain water handling.

R$ 508.4 billion. Out of this amount, around R$ 390.3 billion are fully dedicated to water and sewage programs. Financial resources would come from federal agencies (59%) while state and municipal governments and service operators would also have private initiative and international organizations as source, among others (41%).

Plan foresees to attain a service coverage of 99% in potable water supply (100% in urban areas) and 92% in sewage collection (93% in urban areas) until 2033.

An overview on the type of operator providing services of water and sanitation to 5,088 municipalities is shown in the table below, according to SNIS[3] 2015;

Table 1 – Type of Operator

Operator	Number of Municipalities	%
- State-Owned Water and Sanitation Companies (CESB)	4,030	70.0
- Local Municipalities and Micro-regional areas	1,414	25,0
- Private operators	204	5.0
- Subtotal	5,088	100.0
- Did not answer the SNIS questionnaire	482	---
- Total Municipalities	5,570	---

3. NATIONAL – LEVEL DATA ON WATER AND SANITATION

Last SNIS Report – edition 2015, issued on February 2017, presented the following global situation about water and sanitation systems in the country:

Table 2 – Brazilian global water and sanitation profile

Data	Unit	Figures		Δ (%)
		2005	2015	
- Total population having water supply	1,000 inhabitant	138,391.8	164,765.6	19.1
- Water connections	1,000 connection	35,578.3	53,400.7	47.3
- Water network length	km	409,179	602,408	69.2
- Produced water	1,000 m³	13,372,970	15.381.099	15.0
- Water consumption	1,000 m³	7,505,135	9,723,650	29.6
- Total population having sewage	1,000 inhabitant	66,900.5	99,425.7	48.6
- Sewage connections	1,000 connection	15,586.2	28,988.9	86.0
- Sewage network length	km	158,445	284,941	79.8
- Collected wastewater	1,000 m³	3,576,104	5,186,706	45.0
- Treated wastewater	1,000 m³	2,201,880	3,805,022	72.8

[3] SNIS – National Information System on Water and Sanitation by MC

As to rural areas, IBGE data indicate that only 32.8% residences are connected to the water distribution network while the remaining part uses alternative sources with questionable potability many times, such as wells and water springs. As to sewage network, 75% rural residences still use inadequate systems for treatment and final disposal of domestic sewage, most of them being septic tanks, sewage ditches, or even disposal in natura on the ground or on any kind of flowing water.

According to the already mentioned PLANSAB, total investment for the rural area until 2033 is projected to be around R$ 22.7 billion, out of which R$ 7.3 billion for water supply and R$ 15.4 billion for sewage.

4. INSTITUTIONAL RESPONSIBILITY FOR WATER AND SANITATION AT THE NATIONAL LEVEL

Institutional responsibility is shared by several ministries that operate in a coordinated way each one with its own responsibility:

- Ministry of the Cities: supports municipalities with over 50 thousand inhabitants, including the metropolitan regions;
- Ministry of Healthcare: sets and controls water quality standards for human utilization. It also supports and gives assistance to municipalities with less than 50 thousand inhabitants, to rural settlements, to indigenous and other traditional areas, by using FUNASA - National Foundation for Healthcare;
- Ministry of the Environment: acts in water resource management with support from ANA – National Agency of Water;
- Ministry of National Integration: acts in the dry and semi-arid regions of Northeast with the objective of expanding water availability for all uses, especially for human consumption;
- Ministry of Social Development: coordinates implementation of up to 1 million water tanks in the semi-arid regions of Northeast;
- Ministry of Labour: coordinates programs oriented to support cooperatives for recyclable material related to cleansing and solid waste handling sectors.

(see Figure 2 next page)

Figure 2 – Competence of planning by level of government according to the W&S law

LEVEL	PLANNING	REGULATION	OPERATOR	FINANCING
Federal	• Ministry of Cities • Ministry of Healthcare • Ministry of Environment • Ministry of National Integration • Ministry of Social Development • Ministry of Labour	• ANA • IBAMA	• FUNASA	• BNDES • CEF • Multilaterals
State	• State Councils	• State Regulatory Agencies	• CESB • Environmental Agencies	• Multilaterals
Municipal	• Municipal Councils	• Municipal Regulatory Agencies	• Municipal Companies • Private Companies	• Multilaterals

SOURCE: CNI[4]

5. FINANCING MECHANISMS FOR WATER AND SANITATION AT NATIONAL LEVEL

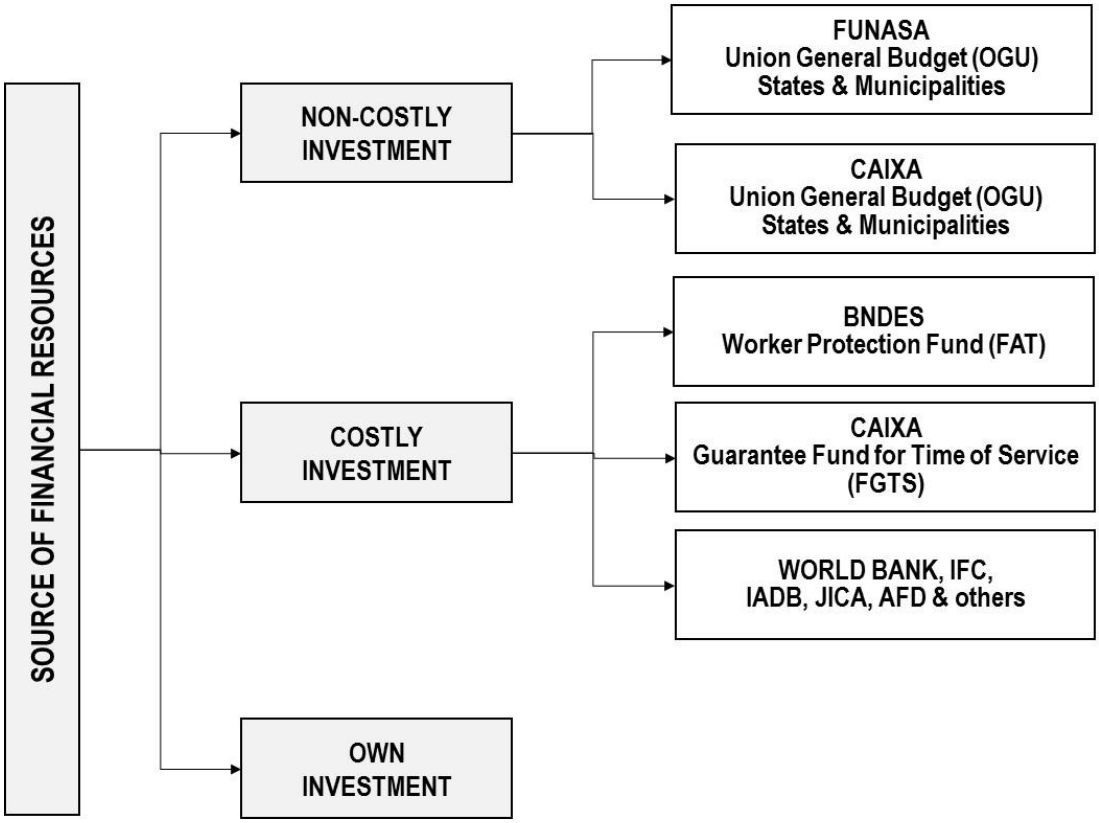
According to the Ministry of the Cities, source of financial resources for application in water and sanitation can be of three kinds: (i) own investment – made with any operator income resources coming from its services provided to users; (ii) costly investment – made with financeable resources to be paid back including all kind of interest taxes; and, (iii) non-costly investment – not returnable financial resources free of interest taxes, also named lost funds.

Available financing resources, either national or international, are: (i) costly-wise –Guarantee Fund for Time of Service (FGTS) and Worker Protection Fund (FAT), under Federal Government management using Financial Agencies such as – Federal Savings Bank (CAIXA) and National Bank for Economic and Social Development (BNDES), respectively. In this segment, there is also availability of resources from multilateral Banks, such as: Inter-American Development Bank (IADB); International Bank for Reconstruction and Development (IBRD) which is a financial institution under World Bank organization, responsible for financing, among others; (ii) non-costly – from the Union General Budget (OGU), from State and Municipalities as well as from operators' self-funds.

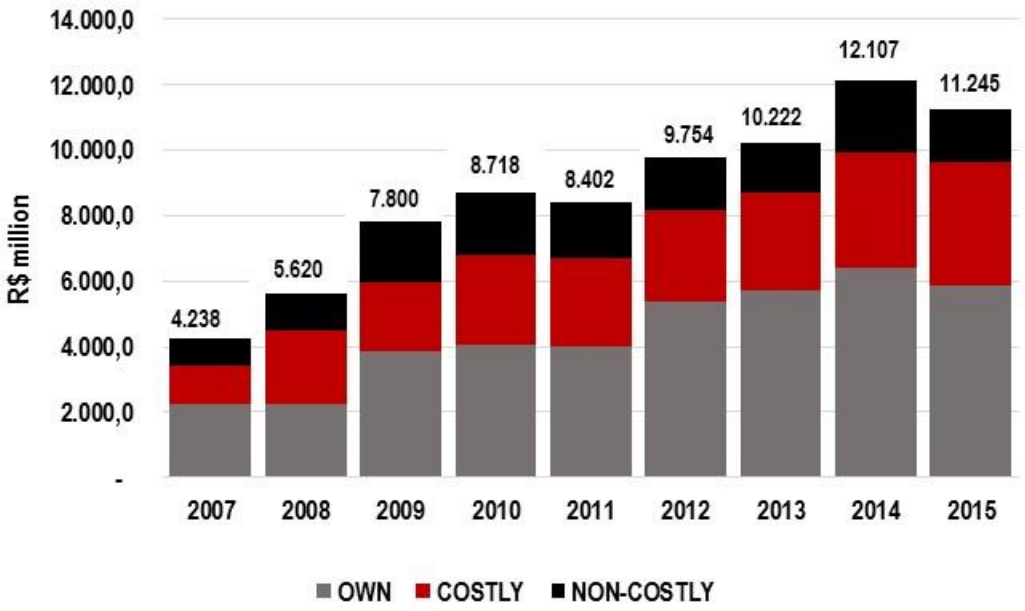
(see Figure 3 & Graphic 2 next page)

[4] CNI = Confederação Nacional da Indústria = National Industrial Confederation

Figure 3 – Source of financial resources



Graphic 2 - Investments

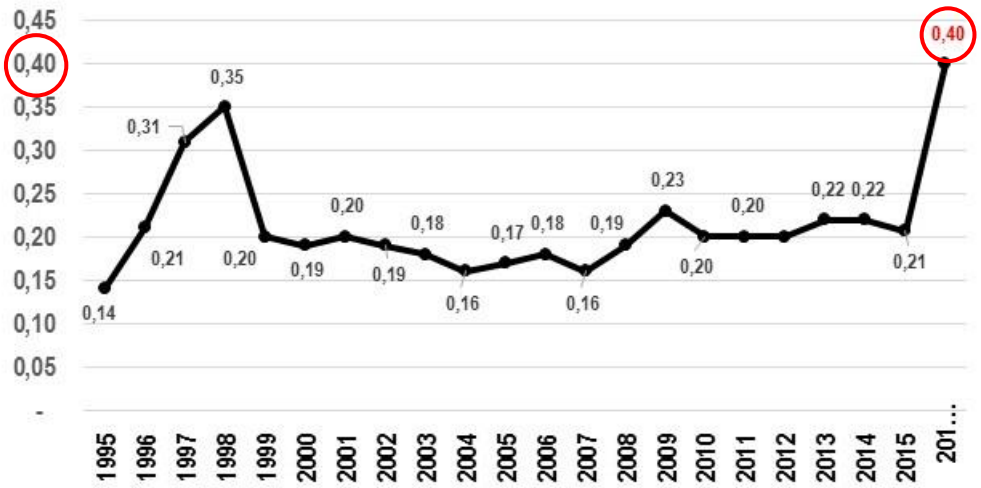


Annual investments in water and sanitation when compared to GDP have shown actual expenditures constantly below the required percentage needed to universalize those services.

Graphic 3 below illustrates the 2005 to 2015 timeframe and shows a projection for the following years, in line with PLANSAB calculation. Required investment in water and sanitation is around R$ 17.0 billion yearly to attain service universalization.

The percentage 0.40% of GDP, which corresponds to the amount required to universalize W&S services, has suffered a significant impact by a GDP slowdown in the past five years, falling back from US$ 2,615 billion to US$ 1,775 billion, around 32%.

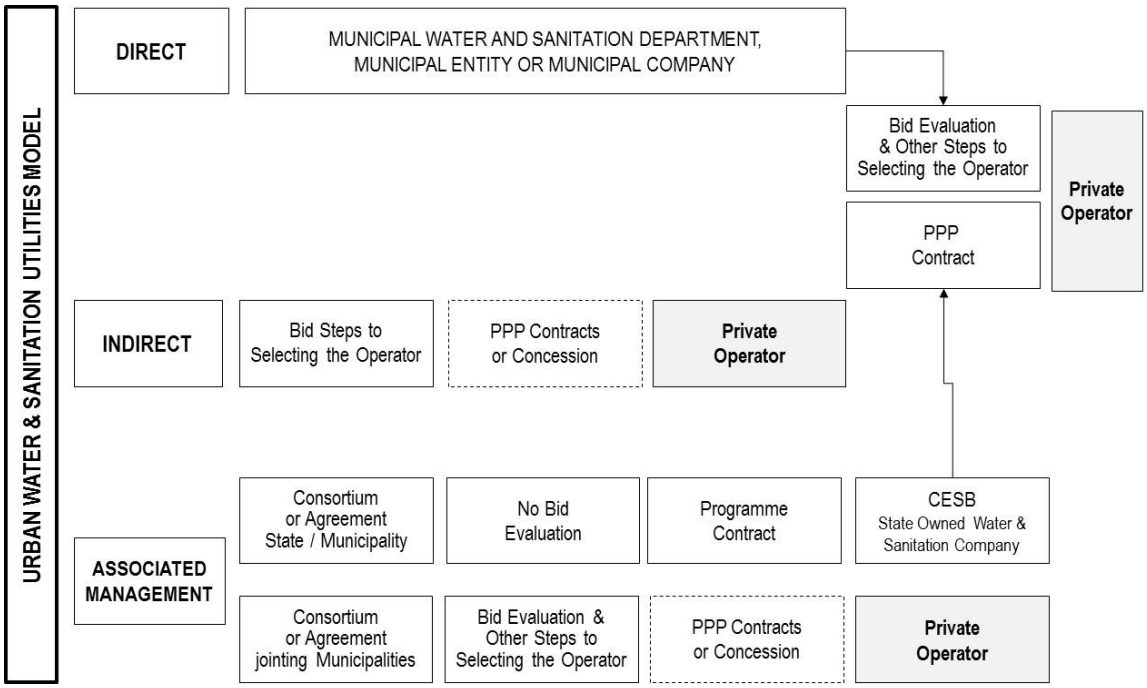
Graphic 3 - GDP x INVESTMENTS



Current feeble economic and financial environment in the country at all levels (federal, state and municipal) is driving hybrid solutions, by applying public-private partnerships (PPPs) - as shown in Figure 4 below. There is a mandatory complementarity by the private sector, mostly for recollection, separation, treatment and adequate disposal of urban sewage, because of its low coverage.

(see Figure 4 next page)

Figure 4 – Urban water & sanitation utilities models



6. CIRCULAR ECONOMY

Circular Economy concept is not well spread out in the country yet. However, some good experiences are already in place. Examples:

Public Area: (i) aerobic granular sludge using Nereda technology to extract alginate, raw material to the pharmaceutical industry and to bioplastic production; and, (ii) transformation of sludge into fertilizer using dehydration and drying. Human excrement is treated in a waste water treatment Plant to produce sludge, which is dehydrated in centrifugal recipients coming dry and inert, turning into a fertilizer for food plantation to be ingested later and turned again into excrement.

Industrial area: conversion of vinasse into reuse water and potassium powder.

In Blumenau city, concessionaire developed study and made attempts to minimize operational costs related to the sludge produced by two waste water treatment plants in line with initial investment agreements.

In the WWTP original project with a larger flow rate, a treatment system using conventional aeration was already foreseen, with subsequent primary sludge digestion in two big anaerobic digesters and sludge drying by using methane gas generated by the bio-digesters. Now, a MBBR-type aeration system is under operation at both WWTPs, with sludge dewatering through a centrifugal equipment and subsequent destination to an industrial sanitary landfill, at 80% average humidity rate.

Concerning the implementation project of the public sewage service, some possible partnerships with potential suppliers have been taken into consideration. Just a few of them are currently viable. They are: (i) utilization of products able to minimize sludge volumes resulting from the treatment process; (ii) utilization of sludge in agriculture; (iii) sludge drying; (iv)

coprocessing on sludge drying; (v) disposal of sludge with different humidity rates; and, (vi) utilization of sludge resulting from the process as a composting system substratum.

Above experiences demonstrated the obstacles found on the search of scale economy for its concrete introduction, considering the countless W&S operators in terms of legal nature, within the objective of consolidating solutions able to reduce operational costs.

BLUMENAU CASE STUDY

PART B: SHORT BACKGROUND ON BLUMENAU CITY

7. BRIEF SOCIAL, POLITICAL AND ECONOMIC DATA

Blumenau, founded in 1850 by German immigrants and settlers, is in the Itajaí valley mesoregion which embraces 53 municipalities, in northeast of Santa Catarina State, latitude 26° 55' 10" South and longitude 49° 03' 58' West, altitude 21 m above sea level.

Along less than 20 years, this city grew up because of countless small factories installation, making a strong footprint in both industrial and agricultural areas, which are representative symbols for the city until these days. Currently, it is the most important city for the textile industry in the country, and a strong technology and university pole.

In Blumenau, cultural shows keep a strong component coming from day-to-day lives and habits of European immigrants, whose highlight is the Oktoberfest for almost three weeks in October, a special German feast "imported" by the German immigration.

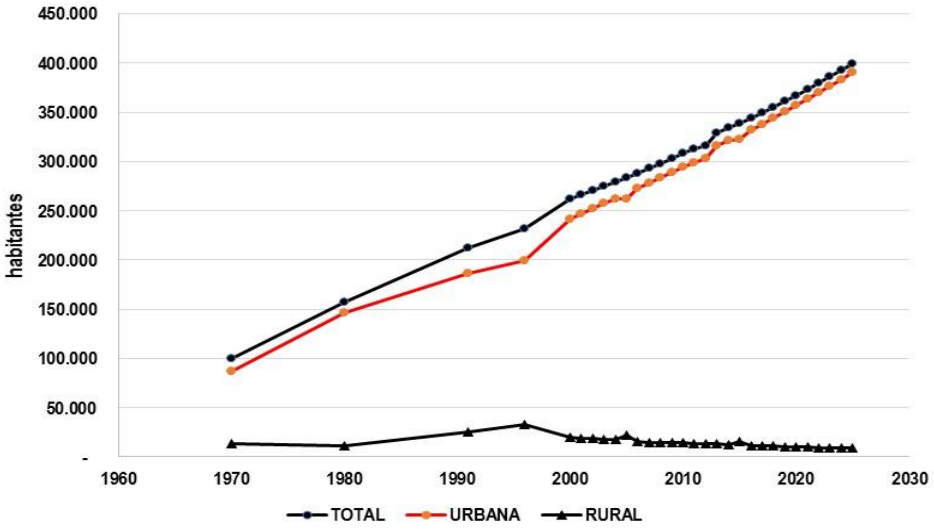
The city owns a global 519.8 km² land area, out of which 206.8 km² (39,8%) are urban area and 313.0 km² (60,2%) are rural. Landscape is rather rugged and hilly with significant variations of heights and slopes. Climate is temperate, warm and humid, with winds coming from East, blending an average temperature from 16 °C to 27 °C.

According to IBGE, its population is estimated around 343,715 inhabitants for 2016, out of which 332,056 inhabitants (97%) live in urban areas while 11,659 inhabitants (3%) in rural ones.

Evolution of Blumenau population until 2025, according to census and IBGE estimate (2011 to 2015 period) and municipal data from 2017 on, is shown by Graphic 4 below, indicating a 1.671% annual growth:

(see Graphic 4 next page)

Graphic 4 – Evolution of Blumenau population



Social and economic indicators have put Blumenau in a comfortable position with relation to Santa Catarina State, to Southern region[1] and to Brazil among the 100 most densely populated cities in the country, notably considering life expectancy (years) and illiteracy rate (%), as shown in tables below:

Table 3 – Life expectancy & Illiteracy rate

Indicator	Blumenau	Santa Catarina	Brazil
Life expectancy (years) – SC 1st place in relation to Brazil	78,6	77,7	75,5
Illiteracy rate (%) – the lowest in Brazil	1,7	3,1	8,3

Evolution of Blumenau 's HDI in relation to Santa Catarina State and to Brazil is presented by Table 4 below:

Table 4 – Human Development Indicator – Municipal (HDI-M)

Human Development Indicator – Municipal (HDI-M)						
	1970	1980	1991	2000	2010	2015
Blumenau	0.674	0.797	0.813	0.855	0.806	Not Available yet
Santa Catarina	0.477	0.734	0.785	0.822	0.774	Not Available yet
Brazil	Not Available	Not Available	0.493	0.612	0.727	0.755

In a developing country with so many and historical social imbalances and poor income distribution, it is relevant to analyze evolution of the GINI indicator on household income per capita (2000-2015 period), especially regarding the indicator decreasing over that period:

Table 5 – GINI Indicator

GINI Indicator				
	1991	2000	2010	2014
Blumenau	0.4776	0.5058	0.4710	Not available
Santa Catarina	0.5482	0.5616	0.4942	0.4510
Brasil	0.6380	0.6460	0.6086	0.4910

As to economic aspects, Blumenau has scored significant results concerning GDP Evolution as well as GDP per capita over 2002 to 2015 period, demonstrating its strong enterprising mind, labour force and industrial pioneering since its foundation, as in following table:

Table 6 - GDP & GDP per capita

Year	GDP (R$ million)	Position		GDP per capita (R$)	Position	
		Regional	State		Regional	State
2002	3,773.7	1st	3rd	13,854.04	4th	21st
2005	5,254.6	2nd	4th	18,826.94	8th	26th
2010	9,908.6	Not Available	4th	32,044.54	Not Available	Not Available
2015	16,767.1	Not Available	Not av.	50,200.62	Not Available	Not Available

8. ITS SIZE COMPARED TO OTHER CITIES IN THE COUNTRY

Blumenau is the most densely populated city in Itajaí valley mesoregion, the 3rd one in Santa Catarina state, the 11th in Southern region, and the 78th in the country.

Colonized by German people, Itajaí valley still preserves its ancestors' habits in gastronomy, in half-timbered architecture or fachwerk – an old German technique for construction - in folklore, in dance and feast.

The city enjoys a good urban infrastructure, and also represents the country in several economic sectors, especially in information technology and textile industry. As to healthcare, it owns four public hospitals and university education.

A comparison with other similar-size cities in Southern and Southeast regions well demonstrates its highlight position, as shown in the table below:

Table 7 – Comparative indicators with other similar-size cities

Indicator	Blumenau (SC)	Pelotas (RS)	Ponta Grossa (PR)	Franca (SP)
Population (inhabitants)	343,715	343,651	341,130	344,704
HDI-M	0.806	0.739	0.763	0.780
GDP (R$ million)	12,893.3	5,920.5	10,280.8	7,342.4
GDP per capita – 2014 (R$)	39,179.51	17,353.20	31,052.10	21,804.80
GINI Indicator – 2010	0.471	0.540	0.540	0.460
Child mortality – 2010	8.6	12.4	12.2	14.3
Life expectancy (years) – 2010	78.6	75.6	75.2	75.5
Illiteracy rate above 15 years old (%) – 2010	1.77	4.12	3.57	3.44

9. SPECIAL FEATURES OF BLUMENAU THAT MIGHT MAKE IT AN ATYPICAL CITY IN THE COUNTRY

One of the positive aspects of the city is personified by the strong German culture, resulting from its colonization and its cultural traditions' maintenance. They are key elements for valuation and attraction of high technology new enterprises, notably for software production, automotive industry and related suppliers.

On another side, its topography with a rugged relief, an unfavourable level of water table forcing the shoring of ditches to lay down pipes, recurrent big water flows causing harmful floods into the city since its foundation in 1852, are all impeditive factors for its full economic development and enough to jeopardize population.

(see Figure 5 next page)

Figure 5 - Blumenau Hydrological Aspects

10. SPECIAL FEATURES OF SANTA CATARINA THAT MIGHT MAKE IT AN ATYPICAL STATE IN THE COUNTRY

Despite the good economic performance in Santa Catarina over the past five years and the above mentioned social and economic indicators, this state presents a visible and worrying deficit in supplying and caring of public sewage services in almost most cities, one of the worst in the country. This fact sounds like a paradox whose reasons and justification deserve an in-depth study in several segments of Society.

Massive investment to recover the existing delay and reverse this disastrous reality will certainly force the state government and all remaining municipalities to search for other external financial resources. These resources will allow to implement, expand and improve public sewage services in both urban and rural areas at the necessary speed, as well as to search for control, management and operational efficiency together with a conscious corporative governance by responsible operators.

According to figures from PLANO NACIONAL DE SANEAMENTO BÁSICO – PLANSAB, over the 20 years' period (2014 – 2033), necessary financial resources would be around R$ 26,926 million for the Southern region, contemplating following activities: (i) replacement of sewage treatment system; (ii) replacement of sewage collection and interception; (iii) expansion of sewage treatment system; and, (iv) expansion of sewage collection and interception.

Because of lack or insecure public sewage system in Santa Catarina, a 4.0 million people deficit is estimated comparing the current population served by water in relation to sewage. Therefore, it is expected that above mentioned investment volume may be strongly oriented to this state.

According to a study promoted by ABES-SC[5] (2008) using data from our State Secretary for Sustainable Development, the required amount to eliminate current deficit would be around R$ 12,690 million.

[5] ABES-SC – Brazilian Association of sanitary and environmental Engineering –Santa Catarina section

PART C: DETAILED INFORMATION ABOUT BLUMENAU CASE

11. DETAILED STUDY OF THE FINANCING MECHANISMS FOR SANITATION

11.1 BACKGROUND

Historically speaking, solution adopted to solve the sewage problem was to disseminate simplified and individual technology by using septic tanks together with anaerobic filters since the 30' decade. That mechanism allowed to achieve a reasonable hygienic utilization even with some releasing in natura into near water flows. That solution was then accepted by the municipal Administration and by SAMAE[6], an Administration's Autarchy, which established it as the standard solution for sewage until the middle of the 80'.

The lack of an effective public sewage system, including collection, removal, treatment and adequate final disposal of urban domestic waste water, have been responsible for some benefit to only 4.84% urban population, still in 2009. In other words, only 9,613 inhabitants from the city central area could be served by an 87 km sewage collection system and a 1,489 km water distribution network, while those people could also enjoy a 1,400-km urban street network. Sewage collected went through a secondary treatment in a specific plant using the RAFA/RALF[7] process providing an output flow volume of 20 liters/s. After a OBD 60% reduction, final flow went into Ribeirão Garcia river within its urban boundary.

Table 8 – Percentage of households per type of hygienic facility

Hygienic Facility (WC or bathroom)	1991	2000	2010
- Sewage network or rain drainage system	0.90	13.30	27.60
- Septic Tank	84.90	75.50	64.60
- Rudimentary Septic Tank	3.70	3.80	4.00
- Cloaca	4.60	3.20	1.70
- River, pond, or sea	Not av.	3.50	1.80
- Another wastewater	4.30	0.40	0.20
- Do not know the kind of wastewater	0.40	Not av.	0.05
- Do not have hygienic facility	1.30	0.30	0.05
T O T A L	100.00	100.00	100.00

SOURCE: IBGE Census & SIGAD

[6] SAMAE – Municipal Autarchy founded in 1966 to provide W&S services
[7] RAFA/RALF – Upward Flow Anaerobic Reactor

That concerning operational environment, including the aggressive environmental pollution impacting all water resources and causing several subsequent diseases, and on another side the impossible financial resource availability to solve that heartbreaking situation, endorsed the fact that sanitation was not a priority for the past municipal administrations. Thus, on December 2008 SAMAE was given authorization by the municipal legislation power to proceed with a service concession for sanitation. That concession should be implemented following a public bid process and a selection made using a parameter combination (lowest tariff with best technique), for a 35-years period.

11.2 THE CONCESSION CONTRACT AND THE SEVERAL CONTRACT'S AMENDMENTS

After a bid process in accordance with all mandatory rules established by legislation, a concession contract was finally signed with a private consortium on February 2010. Concession was set to cover a 519.8 km²area, including commercial management of water supply public service.

According to information from the private concessionaire, the financing loan (CEF 322.172-83) was signed with Caixa Econômica Federal on October 2011 and the disbursements occurred account for 87% (R$ 166.0 million) of the contracted value (R$ 191.0 million).

That contract established a set of guidelines, parameters and targets, by which the public sanitation service was meaning "all activities, infrastructure and operational installations for collection, transportation, treatment and adequate final disposal of sewage, from domestic connections down to the environment".

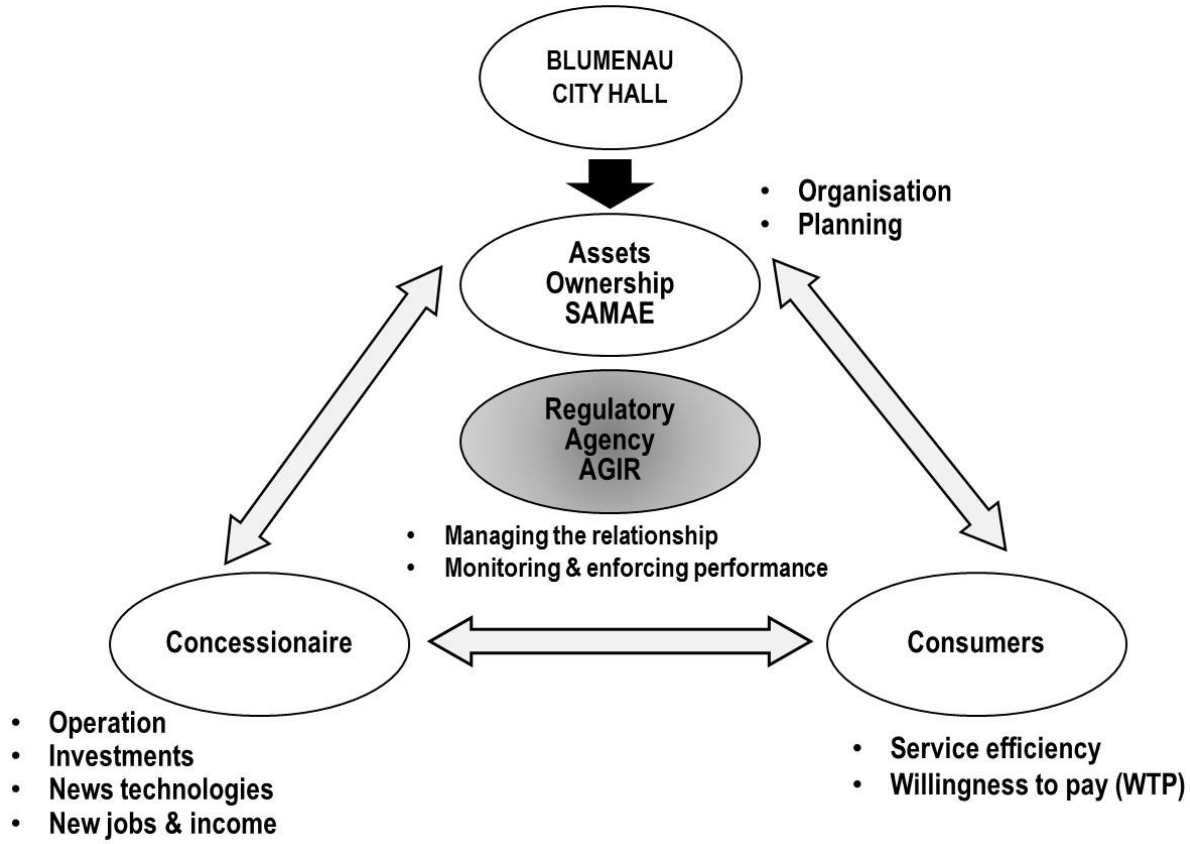
In addition, that contract also clarified that the sewage public service included "planning, construction, operation and maintenance services for the sewage infrastructure and physical, operational and management system. It should also take care of the organization system management, complementary service delivery (please see below), sale of related products and services as well as CONSUMER attendance".

The institutional framework highlighting rights and responsibilities of each intervening player, is shown by figure 6, as below:

- Granting Power (SAMAE) – in line with its Municipal Sanitation Plan (PMSB), it sets local policies regarding sanitation guidelines and standards to be achieved by the Concessionaire;
- Concessionaire – responsible to provide public services, financial resource raise and investment to achieve PMSB defined targets as well as to charge users according to the agreed tariffs;
- Consumers – get all benefits coming by sewage collection, transportation, treatment and adequate final disposal of urban domestic outputs as well as pay monthly tariffs based on corresponding utilization.

- Regulatory Agency (AGIR[8]) – harmonizes relations, approves tariffs, sets regulation and supervises service delivery, in line with the legal agreement, to maintain the necessary economic and financial sustainability of that concession.

Figure 6 – Institutional Framework



Initial Estimated Amount in the 2010 concession contract was R$ 310.0 million. The Private Consortium was also responsible to raise financial resources needed to provide the public sanitation service, moreover to pay R$ 12.0 million to the Granting Power for receiving existing assets capable to cover one quarter of population.

Descriptive Specifications of the Concession Contract (as by its Annex V) contained a summary of works, objectives and targets, as such:

- SEWAGE WORKS

  - ✓ Collection network, main sewer lines and disposal – 1,551 km, out of which 375 km are already implemented (276 km by the Concessionaire);

[8] AGIR –Intermunicipal Agency for Regulation, Control and Supervision of all public services within Itajaí middle valley.

- ✓ Pumping stations (primary & secondary) – construction of 152 units, 50 under operation and 41 implemented by the Concessionaire;
- ✓ Wastewater Treatment Plant (WWTP) – construction of three plants (Fortaleza – 468 L/s, Garcia – 176 L/s and Itoupava – 468 L/s) – final flow rate 1,176 L/s.

- TARGETS & OBJECTIVES

- ✓ Short Term – until 2015, expansion and replacement of obsolete pipe networks together with public service universalization, distributed year by year:
- ✓ Medium Term – until 2030, improvement, modernization and services by sector;
- ✓ Long Term – following vegetative growth in terms of attendance.

Table 9 – Contractual Targets & Objectives

Year	2009	2010	2011	2012	2013	2014	2015
Coverage (%)	4.84	23.2	30.0	35.0	40.0	45.0	50.0
Coverage SNIS/PMSB (%)	Not Av.	Not Av.	5.18	7.57	27.8	30.6	33.0
BOD efficiency (%)	60.0	60.0	70.0	70.0	80.0	80.0	80.0

- MUNICIPAL SANITATION MASTER PLAN – UPDATED DECEMBER 2016

PMSB prepared by a consultancy company presents following projected coverage evolution considering 2009 as the initial step:

Table 10 – Updated Municipal Sanitation Master Plan Coverage

Number	-1	0	1	2	3	4	5	6	7	8	9	10
Year	2016	2017	2018	2019	2020	2012	2022	2023	2024	2025	2026	2027
Coverage (%)	37	39	44	49	67	72	77	82	84	85	86	87

Population (1000 inhabitant)	113.3	121.3	139.0	157.2	218.3	238.3	258.9	280.1	291.5	299.6	309.0	363.8

SOURCE: CONCESSIONAIRE: "Universalization of Sanitation System is projected to be achieved by 2027 only, considering some technical deficit and need for complementary works on physical installations".

In fact, coverage of sewage public service was initially around 4.84% and private concessionaire had to pay R$ 4.0 million in terms of restitution.

There was a need for a detailed report on that implementation, since the concession contract signature on February 2010, within the objective of optimizing the available financial resources, and with no changes in its economic-financial balance.

A 1st Amendment Term was done on November 2010 with following objectives: (i) setting criteria, parameters and standardization with indicators allowing the Granting Power to follow up service quality by the Concessionaire; (ii) change of the estimated contract amount into R$ 2.16 billion; and (iii) ratification of the global investment by the Concessionaire as R$ 310.0 million.

A 2nd Amendment Term was done on December 2012 with following renegotiated clauses: (i) inserting partial measures for contract economic-financial rebalancing; (ii) accountability changes in execution of Works to speed up its implementation in central areas with main people concentration;(iii) implementation by the Concessionaire of an incentive program to connect Social Tariff users' sewage to the public network; and, (iv) tariff review with a 12.0% increase.

A 3rd Amendment Term was done on February 2014 with the central objective as: repair of some flaws in the bidding notice documentation and adequacy to some Concessionaire claims anticipating a tariff review. That Amendment went through a complex review by an Audit company with special skills on concession CAPEX and OPEX, considering the high amounts involved and the severe impacts on the estimated cash flow for that concession and on the internal return rate around 10.54% a year. Those negotiations resulted in a significant reduction of operational costs with no transfer of those costs to population and no relevant tariff increase.

Finally, a 4th Amendment Term was done on December 2014 with the objective of implementing measures already defined within the agreed Reviews, contract terms formatting and improving, and maintenance of the internal return rate, originally agreed on 10.54%. Therefore, following points initially agreed at the 3rd Amendment were also included: (i) extension of concession period for 10 years, that is from 35 to 45 years (2045 to 2055); (ii) ratification to partially return back commercial accountability to SAMAE; (iii) ratification of a new schedule of works; (iv) a tariff review of 17.27% starting March 2015; and, (v) acceptance to pay R$ 2,702.1 million to the Granting Power by the Concessionaire due to penalty and interests for delaying license payment at the very beginning.

11.3 SAMAE & CONCESSIONAIRE TARIFF STRUCTURE

The tariff structure applied by SAMAE (all amounts since January 1st, 2017) meets all requirements established by Law 11,445/2007. On another hand, it is difficult to do a thorough evaluation, since each municipal operator – either public or

private – has its own charging policy, and that depends on a specific model being used to provide services to population – water supply or sewage system. Table 11 illustrates that:

Table 11 – SAMAE water tariff & CONCESSIONAIRE sewage tariff structures

Item	Category	Acronym		Monthly Consumption Range (m³)	Water Amount (R$) & R$/m³	Sewage Amount (R$) & R$/m³
I	Residential (R) Office (E) Doctor´s Office (C)	R E C	1	Up to 10 m³	29.19	31.90
			2	11 – 30 m³	5.31	5.31
			3	31 – 9,999 m³	6.77	6.77
II	Social (S)	S	1	Up to 10 m³	14.41	15,75
			2	11 – 30 m³	5.31	5.31
			3	31 – 9,999 m³	6.77	6.77
III	Commercial (C) Industrial (I) Temporaries (T)	C I T	1	Up to 10 m³	44.24	44.24
			2	11 – 30 m³	6,77	6,77
			3	31 – 9,999 m³	10.16	10.16
	Water truck	X	1	Up to 9,999	2.92	2.92
IV	Public (P)	P	1	Up to 10 m³	29,19	29,19
			2	11 – 30 m³	5.63	5.63
			3	31 – 9,999 m³	10.16	10.16
V	School	E	1	Up to 10 m³	29,19	29,19
			2	11 up to 9,999 m³	5.63	5.63
VI	Hospital	H	1	Up to 10 m³	29,19	29,19
			2	11 up to 9,999 m³	3.67	3.67
VII	Public – Municipal	M	1	Up to 10 m³	29,19	29,19
			2	11 – 30 m³	1.78	1.78
			3	31 – 9,999 m³	3.67	3.67
VIII	Hospital – Social	F	1	Up to 10 m³	29,19	29,19
			2	11 – 1,000 m³	0.36	0.36
			3	1,001 – 2,000 m³	1.78	1.78
			4	Over 2,000	3,67	3,67

SOURCE: SAMAE

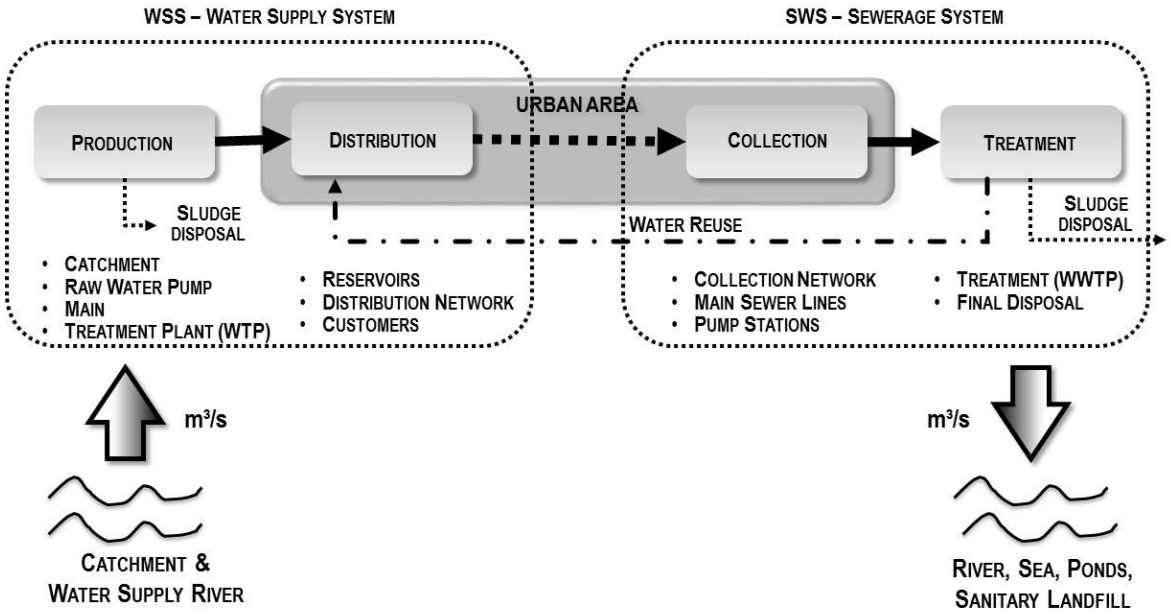
As a benefit policy, many municipalities have adopted a social tariff to households with a very low monthly income, within the purpose of increasing their condition to pay delivered services. By doing so, there is a practical social inclusion for W&S services.

Service costs vary from one municipality to another, considering following technical-operational aspects, such as: (i) closeness to raw water catchment; (ii) existence of collection, transportation, treatment and final disposal of domestic sewage; (iii) evaluation of relief and soil quality in relation to favourable or unfavourable aspects for service implementation, expansion or improvement, notably water distribution and sewage collection networks; and (iv) some other political, economic and financial aspects.

Figure 7 below shows the large variety of components in a water and sewage service system to determine tariffs consequently to a desired level of service. In general, a better technical level and utilization of modern technology imply in a higher tariff.

Therefore, evaluation of service costs in relation to its recovery is a cumbersome and complex exercise by the Granting Power and the Regulatory Agency. Many variables are involved such as level of consumer's income, investment to expansion Works, operational improvements, automation, among others.

Figure 7 – Urban Water Supply & Sewerage System



11.4 CUSTOMER´S WILLINGNESS TO PAY (WTP)

Both consumers' capability and willingness to pay for an installed sewage system directly depends on their family's monthly income, because a little or no aggregate value is considered by those who get benefits with these services.

Unfortunately, obligation of paying monthly bills for W&S services is not also considered a must by most population, mainly in North and Northeast regions resulting in high default indicators.

Urban sewage services are not a priority in a family's budget. In 2014, Blumenau presented a 11.23% default indicator, according to SNIS 2015, in other words one out of ten W&S bills have not been paid on schedule.

According to data from Human Development Atlas, Blumenau scored the following monthly income per capita evolution: (i) 1990 – R$ 733.23; (ii) 2000 – R$ 910,29; and, (iii) 2010 - R$ 1,253.17.

On another side, population percentage with a monthly income per capita below R$ 70.00, which means extreme poverty, presented a shrinkage: (i) 1991 – 0.78%; (ii) 2000 – 0.63%; and, (iii) 2010 – 0.12%.

2010 Demographic Census by IBGE indicated following Families' monthly income distribution in Blumenau, reflected in Table 12 below:

Table 12 – Monthly household distribution income by minimum salary range

Number of minimum salary (R$ 937.00)	R$	Household	%
No wage	---	1,970	1,95
Up to ½ minimum salary	468.50	258	0.26
Over ½ up to 1 minimum salary	469.00 – 937.00	1,993	1.97
From 1 up to 2 minimum salaries	938.00 – 1,874.00	8,960	8.87
From 2 up to 5 minimum salaries	1,875,00 – 4,685.00	37,491	37.54
From 5 up to 10 minimum salaries	4,686.00 – 9,370.00	33,236	32.89
From 10 up to 20 minimum salaries	9,371.00 – 18,740.00	12,438	12.31
Over 20 minimum salaries	18,741.00	4,265	4.22
T O T A L		101,061	100.00

SOURCE: IBGE, 2010 Census

On April 2017, global spared water was 152,402 households, with following distribution by user category: (i) residential (137,448) – 90.15%; (ii) Commercial (11,015) – 7.22%; (iii) office (1,525) – 1.00%; (iv) doctor´s office (475) – 0.31%; (v) social (120) – 0.07%; (vi) public (786) – 0.51%; (vii) industrial (461) – 0.30%; (viii) school (75) – 0.05%; (ix) hospital (24) – 0.02 %; and, (x) temporary (523) – 0.34%.

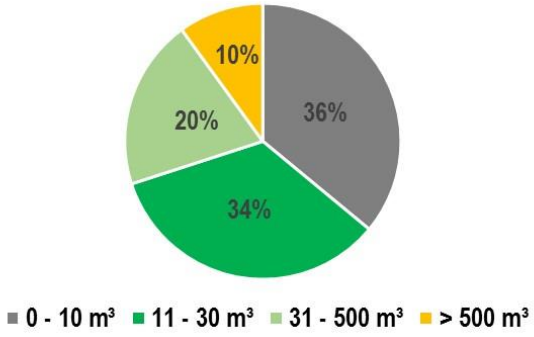
As to global mensal consumption (1,438,634 m³), following distribution by category was: (i) residential (1,297,410 m³) – 90.18%; (ii) Commercial (103,142 m³) – 7.17%; (iii) office (14,609 m³) – 1.02%; (iv) doctor´s office (4,451 m³) – 0.31%; (v) social (1,124 m³) – 0.08%; (vi) public (8,042 m³) – 0.56%; (vii) industrial (4,403 m³) – 0.31%; (viii) school (709 m³) – 0.05%; (ix) hospital (142 m³) – 0.01 %; and, (x) temporary (4,602 m³) – 0.32%.

The concessionaire register confirms 46,026 households attending the following distribution by category: (i) residential – 38,628 (83.92%); (ii) others – 7,359 (15.98%); and, (iii) social – 39 (0,02%).

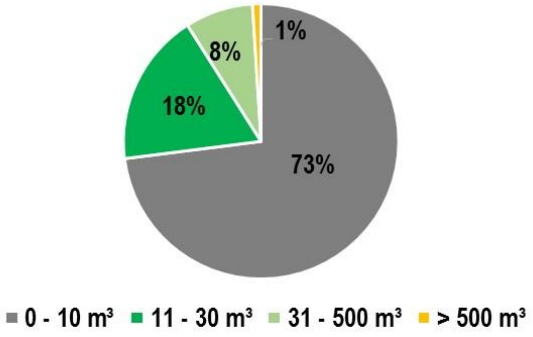
It is verified that residential spare water (90.15%) and respective monthly consumption checked by hydrometers is 90.18% of total consumed volume.

Following graphics demonstrate that 70% of residential spare water indicates a 0 to 30 m³ consumption, and that the highest consumption (73%) varies from 0 to 10 m³.

Graphic 5 – Residential spare effort



Graphic 6 – Residential volume consumption



To calculate an average W&S monthly bill, current tariff structure in place (Table 11) by SAMAE and Concessionaire and following parameters are to be considered: (i) home occupancy rate = 3.06 inhabitants/household; and, (ii) consumption per capita = 150 liters/inhabitant/day (average volume 2010 - 2015, according to SNIS 2015).

Now, for a 10.00 m³ consumption volume, average monthly bill for water supply and for sewage service (same consumption) to residential households is:

RESIDENTIAL TARIFF (10 m³)

- Monthly bill for water = R$ 29.19
- Monthly bill for sewage = R$ 31.90
- Monthly bill for W&S = **R$ 61.09**

SOCIAL RESIDENTIAL TARIFF (10 m³)

- Monthly bill for water = R$ 14.41
- Monthly bill for sewage = R$ 15.75
- Monthly bill for W&S = **R$ 30.16**

On another hand, average monthly volume for residential houses is 13.00 m³. Therefore, considering same consumption also for sewage, final bill for W&S is shown by the new box below:

RESIDENTIAL TARIFF (13.00 m³)

- Monthly bill for water = R$ 29.19 + (3.00 x R$ 5.31) = **R$ 45.12**
- Monthly bill for sewage = R$ 31.90 + (3.00 x R$ 5.31) = **R$ 47.83**
- Monthly bill for W&S = **R$ 92.95**

SOCIAL RESIDENTIAL TARIFF (13.00 m³)

- Monthly bill for water = R$ 14.41 + (3.00 x R$ 5.31) = **R$ 30.34**
- Monthly bill for sewage = R$ 15.75 + (3.00 x R$ 5.31) = **R$ 31.68**
- Monthly bill for W&S = **R$ 62.02**

It appears that above figures and their relationship with Table 11 point out some relevant aspects concerning monthly bill for W&S versus families' income, that is:

- Spare Volume from families with up to 1 minimum salary monthly income is equivalent to 4,221 households;
- Registered data at SAMAE confirm 120 spare water and at concessionaire 39 social spare sewage by April 2017, in compliance with Municipal Decree 10,809/2015, which settled the rules for both SAMAE and private Concessionaire service delivery;
- Involvement of families' income with both water and sanitation services is shown by Table 13 below:

Table 13 – Average Monthly Income x (W + S) Bill

Monthly consumption (m³)	(W + S) Bill (R$/month)		Average Monthly Income (R$/month)		Pledge (%)			
					Regular Tariff		Social Tariff	
	Regular	Social	Up to ½ S.M[9]	½ up to 1.00 S.M	Up to ½ S.M	½ a 1.00 S.M	Up to ½ S.M	½ a 1.00 S.M
10.00	61.09	30.16	468.50	703.25	13.04	8,69	6.44	4,29
13.00	92,95	62,02			13.22	8.82	13.24	8.82

[9] S.M = monthly minimum salary

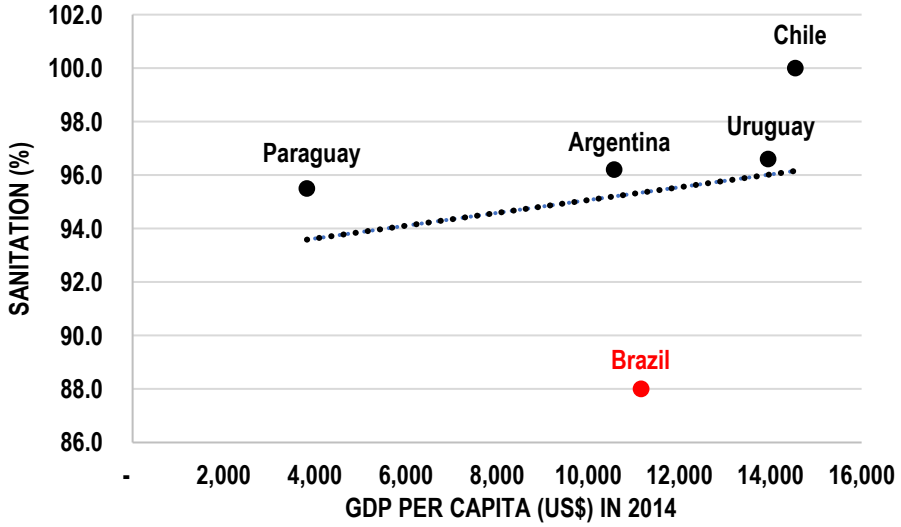
- For families with a monthly income from half to one minimum salary and consumption of 10.00 m³, benefitted by the social tariff, income involvement with W&S services is around 4.29%, considered an acceptable figure by worldwide institution standards (5.00%);
- The monthly household average consumption benefited by social tariff is the quotient of 1,124 m³ ÷120 number of household which is 9.37 m³/household;
- Comparing now average tariffs in whole Santa Catarina region, Blumenau's regular or social tariff platform is slightly above.

PART D: ANALYSIS AND SUMMARY OF BLUMENAU CASE STUDY

12. MAJOR FINANCIAL GAPS AND OBSTACLES

A comparison of W&S service evolution between Brazil and other LA countries, in particular from the Southern Cone – Argentina, Chile, Paraguay and Uruguay, demonstrates the lack of a political policy oriented to healthcare, well-being and quality of life for our population. There are isolated and stratified initiatives, without a common connection and convergent goals among themselves, aiming at service universalization and solving the current unbalances in terms of public healthcare and urban infrastructure.

Graphic 7 - GDP per capita x Sanitation



SOURCE: ECLAC[10]

On another side, there is a full ignorance by both population and public policy makers about following aspects: (i) people health begins with ingesting water of good quality; (ii) implementation, expansion and improvement of a water and sanitation service system are considered a program of physical works by politicians instead of an essential public service to population healthcare; and (iii) people do not give a due importance and priority to these services together with an aggregate value to techniques used to provide potable water as well as collection, transportation, treatment and adequate final disposal of domestic sewage.

Sector indicators issued by SNIS 2015 and reproduced below, attest that water and sanitation keep the same recurrent deficiencies since PLANASA in 1971, reflecting a very severe situation to be overcome, that is:

[10] ECLAC = Economic Commission for Latin America and the Caribbean

- Low sewage treatment coverage – only 42.7% of produced sewage is treated and have an adequate final disposal;
- Reduced people productivity – more than 50% W&S service operators shows an indicator lower than 400 connections / worker;
- High percentage of non revenue water – more than ⅓W&S service operators report an indicator over 30%;
- Low indicator of Cash-collected[11] – almost half W&S service operators report an indicator below 1.00

Above indicators demonstrate not only: (i) fragility of control and technical-operational management; (ii) economic-financial feebleness; (iii) lack of corporate governance, education, capability and qualification of operators' people at three levels (strategic, tactical and mainly operational), notably at CESBs and municipal operators. These facts also prevent access to financing lines.

To better understand the financial mechanisms able to fill up the current gaps and overcome the existing obstacles, it is important that we consider them keeping in mind the "lato sensu" and not the "stricto sensu" concept.

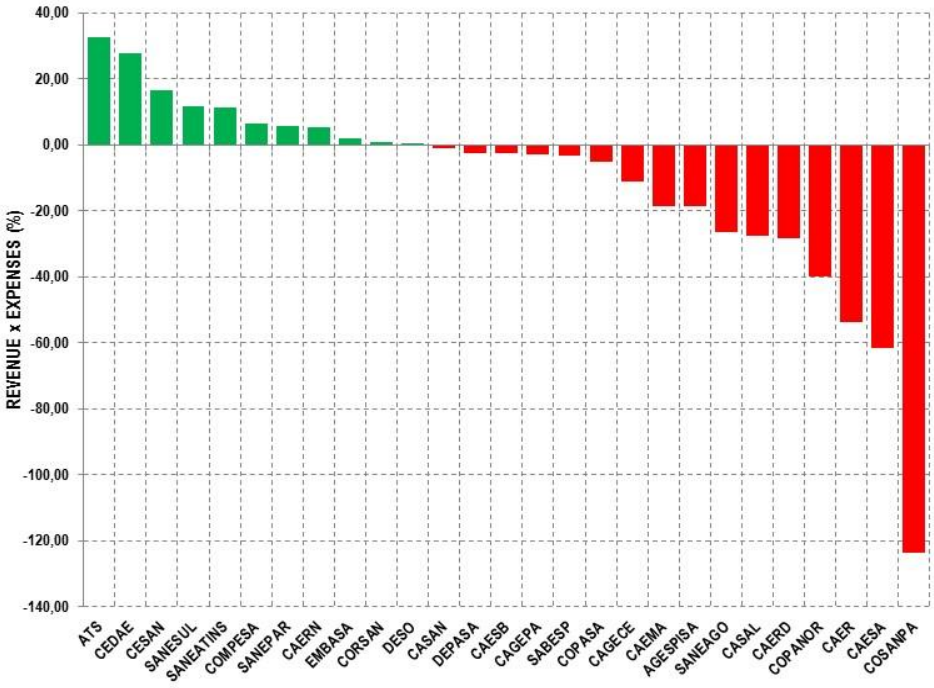
Available financial mechanisms may come from public bank sources (BNDES, CEF), multilateral banks (IADB, WB) or private sources. However, in our environment, their availability does not mean project financing. In fact, many obstacles must be overpassed, such as:

1. Enough guarantee by a company or municipality to get access to financing: (i) out of 27 CESBs, only 8 can do that (besides possible problems with their state economic situation); (ii) very few municipalities with above 50,000 people;

See Graphic 8 (next page)

[11] Cash-collected ÷ (OPEX + Debt Service + Taxes)

Graphic 8 - CESB Revenue x Expenses (%)



According to our population distribution, 88.24% (4,915 municipalities out of 5,570) have less than 50,000 people. In this case, FUNASA – National Foundation for Health – is responsible to provide financial and technical support to them, based on minimum requirements for projects' feasibility. Moreover, FUNASA cannot provide financial support to municipalities for the W&S systems under a private company contract (concession or else) unless several municipal measures guarantee a good financial application and no increase of service tariffs.

2. Low existence of good and sustainable long-term projects;
3. At municipalities, an old remaining ideology against the presence of private resources and lack of economic capability in many cases to fulfill financed projects;
4. Lack of an adequate regulatory system able to assure a good accomplishment to the financing source;
5. Lack of a global priority for sanitation by the Granting Power and by Federal Ministries;
6. Lengthy administrative process to get approval of a financing Project;
7. Country's public financial resources are not enough to reach SDGs goals and W&S service universalization.

In summary: even though traditional financing mechanisms are available, results so far are poor in terms of service coverage, especially for sanitation. Therefore, some "lato sensu" innovative solutions are necessary to make happen the desired urban sanitation.

Considering the city of Blumenau and its expressive social, economic and financial achieved indicators in contrast with its sanitation coverage, this paradox became the symbol for choosing our case study. It had to be investigated to find out all reasons why, all causes and impacts of such a situation.

13. FINANCIAL MECHANISMS

Before going into specific and technical mechanisms for the desired solutions, other activities were considered of fundamental help to achieve success.

Within the scope of starting to revert this unfavourable scenario, the Concessionaire promoted several campaigns over the last seven years with its sanitation system in place. Focus was all society segments with community participation, some of them in a partnership with the municipal government, spreading out information and the importance of sanitation to all of us (for safety, healthcare, environment, among others) programmes:

- Education Campaign on how to use the sewage system
  - Clean River Program begins at home
  - Meetings in Communities
  - Workshops to plumbers
- Campaign on Healthcare and Hygiene
  - WWTP Program – Open Doors
- Education Campaign on the Environment
  - Little Councilmen
  - Mayor for a day
  - Blumenau on board
  - 100 in one day in Blumenau
  - Green June
  - Blumenau meeting on environmental education

For a great social action directly oriented to people's healthcare, communication media used in those campaigns were: (i) posters/flyers handed out to population; (ii) radio, TV, newspapers, among other vehicles; (iii) lectures, courses in schools, churches, and community organizations; and, (iv) home visits by trained agents.

Theoretically, tariff income represents the main financial source to finance and sustain service operators according to Law 11, 445/2007, art. 29th. Moreover, sanitation enterprises can get project financing with available national or international agencies in our capital marketplace. However, all these sources may be negatively affected by: (i) lack of well done and sustainable engineering projects; (ii) financial inability of public operators to borrow new loans; and, (iii) delay time to get financing resources, over 24 months usually.

To overcome the above-mentioned obstacles, including ideological, political and corporate resistances, Blumenau decided to investigate modern and complex business models for sanitation (please see Figure 4) and make decision on a suitable partnership with a private consortium. In other words, a PPP focusing complementarity by a private company could become a financing mechanism and an effective element to solve its situation and historical delays.

In Part C, item 1.4 – Willingness to Pay (WTP), bill payment capability by the low-income people is discussed. Creation of direct subsidies may solve this situation. There are quite successful experiences in Southern America (in Chile for instance) with application of subsidies on demand, not by offer.

Table 14 below shows a comparison between PLANASA relevant topics and current Law on water and sanitation.

Table 14 - PLANASA relevant topics x Water & Sanitation Law

PLANASA	WATER & SANITATION LAW
Self-regulation	External regulation
Public financial resources	Greater emphasis on market financing
More importance on public works	Focus on consumer services
Natural monopoly	Competitive environment
Water as a free utility	Scarcity of water resources and the issue of sustainability awareness
Cross subsidies	Direct subsidies

SOURCE: GO Associates

It is advisable to point out the need of a timely review, modification and modernization of the financing mechanism, in view of the heavy taxation and other key externalities. Good and positive examples are water reuse, desalination, reduction of water losses, recycling of sludge produced by water and sanitation treatment plants, and power generation. Those solutions for the environment should also receive some incentives.

14. POLICIES THAT SHOULD CHANGE TO INCREASE FINANCING FLOW FOR SANITATION

Water and Sanitation sector with its high degree of atomization, in relation to planning and regulation, still causes huge challenges in terms of organization and obedience to each governmental sphere. There is also a pending definition for service ownership in metropolitan regions, where a common responsibility must be shared among the three government spheres (Union, States and Municipalities).

Other obstacle is represented by lack of planning by each municipality. Despite its deadline was established in 2010 by Law, several Decrees have postponed this date. Without a proper planning, it is difficult to get a sign-off by any financial agent.

Multiplicity of Regulatory Bodies without use of a common set of parameters may not help to achieve universalization targets within the established schedule. This aspect also represents an important challenge to be solved if we want to increment and assure an increasing financing flow.

In our case, the Granting Power of Blumenau decided to get the required financing flow to implement, expand and improve the necessary works for a sanitation system by setting a PPP with a private consortium. As to regulation, an agreement was signed between the Granting Power and ARIS – Agência Regulatória Intermunicipal de Saneamento – a very well-known agency in Santa Catarina, regulating more than 177 municipalities.

The key solution does not consist of innovative financing mechanisms alone, or changes of policies for financing of sanitation. We do have those but achieved results have been very poor.

In order to put financing in progress, other policy changes for sanitation are required. As already explained, they are:

1) Service ownership in metropolitan regions. A law is required, since this matter is not clear in our Constitution or an Operational Statement by the Supreme Court.

2) Lack of planning by each municipality. Some national programme must technically support municipalities to plan their future in terms of sanitation and sustainability.

3) Regulation in water and sanitation. An adequate array of agencies, with rules and parameters, through a law.

4) Water and sewage service as a Priority item to population by the Executive and the Congress, including relative public budgets, in a real policy oriented to health and quality of life. Communication to population is mandatory.

5) Priority to water and sanitation projects financing by National Banks such as BNDES, CAIXA (Federal Savings Bank), among others.

6) Promotion of law for PPI – Partnership Programme of Investment, through incentive programmes, and similar ones.

15. INNOVATIVE AND NON-TRADITIONAL FINANCING INSTRUMENTS – CIRCULAR ECONOMY

Within the "lato sensu" concept, the innovative non-traditional financing mechanism consists in a tailored partnership model able to break existing obstacles up.

A model like this owns the necessary conditions to be successful, considering the economic situation of a municipality (this is Blumenau's case) and also the designed project's quality (this is Blumenau's case). Sufficient conditions are represented by a tailored design, instead of adopting a standard PPP for all situations.

This non-traditional financing mechanism is innovative for two main reasons: (i) the mechanism is jointly designed by both parties according to a specific case; (ii) while a typical public-private partnership model has been spread out for roadways, airports and power generation, this mechanism has not been common and also non-traditional for water and sanitation (as explained before, please bear in mind that private presence in this area represents 5% only, quite differently from the other infrastructure areas!).

Circular Economy Concept has been brought up decades ago, but it is still recent in our country. Its birth comes from the solid waste sector addressing the reverse logistics. A radical change has occurred in the usual process - the linear process for utilization of production and consumption has been decreasing. On another hand, circular economy analyses how to explore and increase the economic sustainability of natural resources by planning their re-utilization in a more rationale and efficient way.

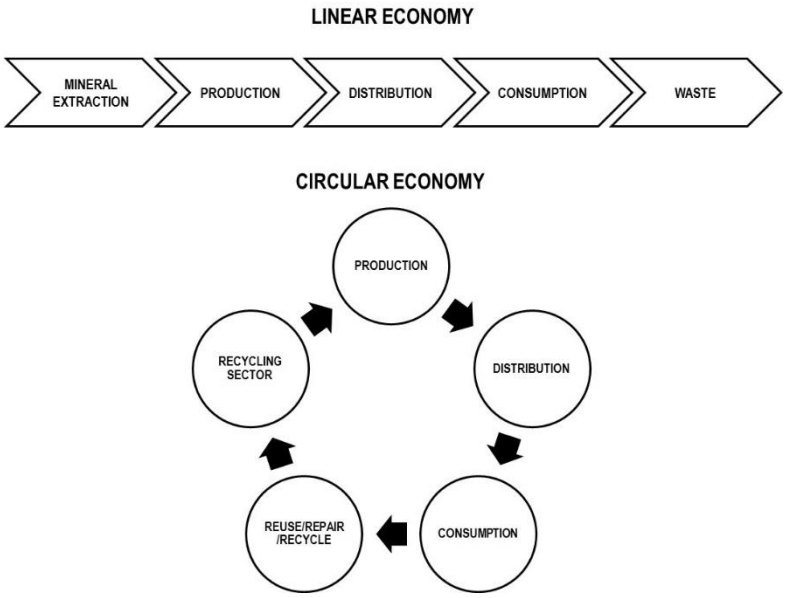
Water and sanitation sectors have already presented pioneer experiences through private companies and some public operators by producing reuse water for industrial purposes, starting from a treated sewage.

A law bill regulating water supply with alternate sources is under discussion at the Congress. Objectives: (i) rational utilization and loss reduction of water resources; (ii) a sustainable use of water resources, with the goal of assuring necessary

water availability to current and future generations; and (iii) reduction of potable water consumption and of produced waste water volumes.

Figure 8, below, presents both mentioned concepts:

Figure 8 - Linear x Circular Economy



16. LIKELIHOOD THAT MORE FINANCE RESOURCE WILL FLOW INTO SANITATION

Household's service coverage without any collection, transportation, treatment and adequate destination of urban sewage was at 4.87% level in Blumenau in 2009. That situation had caused severe environmental problems as well as negative impact on the raw water sources.

A quick and effective solution to recover from that deficit also faced several problems with relation to municipal services, such as: (i) inefficient management and operational control; (ii) reduced cash flow for new investments; (iii) need of high financial investment to expand and modernize its sewage public system; and, (iv) severe limitation or no condition to borrow money, and therefore a poor access to financing banks for sanitation.

Thanks to recent new business models available for sanitation (see Figure 4), Blumenau municipality decided to approve a concession and exploitation of public services in this area to private initiative, according to the general scheme already showed.

According to the concession contract, it was clearly established that the concessionaire was the only one responsible to get and provide financial resources to handle the sanitation public service. This aspect is nowadays very important in our country, being followed by other partnerships.

As to the sources of finance used by the concessionaire, it decided to use CAIXA – COSTLY INVESTMENT, considering a traditional foster programme named "Sanitation for all" (see Figure 3).

To get the necessary financial resources, following specific key aspects were considered in tailoring the partnership Project for Blumenau:

ENGINEERING	ECONOMIC-FINANCIAL	LEGAL
• Design study	• Ability to pay	• Contract
• Basic Project	• Tariff study	• Corporate
• Executive Project	• Risk analysis	• Guarantee
• Specific targets	• Cadastral analysis	• Ownership
• Environmental licenses		

Finally, we do consider this tailored business model (PPP) as innovative, while financial resources almost followed a traditional financing line.

Probability of increasing financial resource flow on a short and medium term is highly dependent on adopting new service delivery models which are available in our marketplace. It is also obvious that without the effective complementary participation by the private sector, desired W&S service universalization will only happen in a remote future.

A Federal Law (no. 13,334/2016) - recently approved on September 2016 - is addressing a Partnership Program of Investment – PPI. Its objective is to expand and fortify interactions between Government and private initiative by partnership contracts for infrastructure public projects and other privatization measures.

This Programme runs very well by using BNDES[12] as the driver of the privatization process, developing projects oriented to PPPs and/or to equity privatization. So far, 18 states have manifested top interest through their CESBs. As shown before in Table 1, CESB's services cover 70% Brazilian population, local and municipal operators 25% and private companies just 5%.

This consideration apparently means low impact. However, firstly, 70% of sanitation services by CESBs does not necessarily mean a good and satisfactory delivery or even a service universalization. Secondly, considering the global situation of the CESBs where only 8 out of the 27 state companies have conditions to invest, most of them are interested in searching innovative tailored models, as Blumenau did. Incidentally, at this moment, BNDES is working with several (16) CESBs (the ones willing to reach SDGs goals and service universalization in a near future) to come up with a specific financing model for each case.

Therefore, most public services will be handled by CESBs either for water supply and especially for sanitation.

[12] BNDES – Banco Nacional de Desenvolvimento Econômico e Social = National Bank for Social and Economic Development

Aiming at water and sanitation service universalization, public policies formulated by Federal Government must go through a full revision of current financial mechanisms. There are too many requirements, which are responsible for countless delays and prevent access to financial resources as well. Most of CESBs and several municipalities do not own ability to guarantee payments (please refer to Graphic 8 - Revenues x Expenses). It is not advisable that current service delivery keeps draining financial resources from States' treasuries in such a ruthless way, since the 70' when CESBs were established.

The continuous financial resource flow oriented to water and sanitation service universalization is a State policy, which also requires short and long-term actions by State governments on CESBS to: (i) encourage improvements in operational control and management; (ii) utilize a strong corporate governance; and, (iii) sign partnerships with private initiative for water loss reduction and system operational efficiency. Reaching W&S service universalization is a duty by each State of Brazil Federation.

If change of most sanitation-related policies (as explained for in the previous pages) is implemented, there are no doubts that more finance resources could flow into this area. Results achieved because of the PPI law's application have already indicated that advance in some other infrastructure areas.

17. OTHER TOPICS THAT HAVE NOT BEEN COVERED

Millennial character of W&S services, since primitive ages up to our days, achieved technology advances for potable water as well as for purification of used water, are examples of mankind creativity to solve day-to-day problems.

However, there are still many continents and regions where water search and catchment to satisfy their basic needs represent a long and dangerous journey. They also still use solutions for waste water and sewage disposal using inadequate ways too dangerous for their health.

If we all do so, we go back to humanity beginnings when governments did not give water and sewage necessary priority. This is an essential service to mankind in all aspects.

In our case study, the city of Blumenau is a symbolic and successful reality, where a partnership between public and private, fully supported by all legal instruments being continuously improved, walks together in search for a desired universalization in a feasible and achievable time.

By the way, an interesting study done and published by CNI (National Confederation of the Industry) suggests following "Priority Agenda for this sector", based upon the Planning, Management, and Regulation tripod:

1. Sector planning improvement, because of our inadequate service delivery for water, and mostly sanitation;
2. Review and modification of current financing mechanisms, not to mention a more rational taxation on a sector with highly positive external impacts;
3. Innovation in CESBs and municipality management;

4. Updating of legislation that could offer more guarantee and legal security, through more robust contracts which may mobilize both public and private resources by using concessions and PPPs;

5. Reduction of regulation risks by re-engineering and institutionally strengthening regulatory agencies;

6. Tailor contract models to foster innovation, efficiency and production chain.

We believe that these suggestions must be addressed to related ministries in each country and also to central Government.

In summary:

- Application of policies for sanitation as explained above (see previous pages 35 and 37).
- Design of innovative tailored models case by case (as Blumenau did), always considering the adequate blending of public resources with private ones as a strong complementary resource, for expansion/modernization of services and use of up-to-date technology for operational efficiency;
- Finally as CESBs have the State Governments as their majority shareholder and any action in relation to public policies of the Federal Government through official development banks (CAIXA, BNDES), there is a need for the intervention of the Governor in order to confer the necessary legitimacy, as currently occurs with the PPI Programme. It is recommended that Governors should be involved in the process as an important and strategical player.

18. BLUMENAU CASE IN SUMMARY

- MAJOR FINANCIAL GAPS AND OBSTACLES:
  - lack of a policy oriented to healthcare, well-being and quality of life
  - full ignorance by both population and public policy makers about benefits
  - several fragilities related to W&S prevented access to financing lines
  - social, economic and financial indicators in contrast with W&S services
- FINANCIAL MECHANISMS
  - Great social actions: Campaigns
  - investigate modern and complex business models for sanitation
  - suitable partnership with a private consortium (a PPP focusing complementarity)
  - direct subsidies for low-income population
  - updating of financing mechanisms in view of using technology solutions
- POLICIES THAT SHOULD CHANGE TO INCREASE FINANCING FLOW FOR SANITATION
  - supporting legislation.

- Definition of service ownership in metropolitan regions
- Activity Planning by each municipality
- Adequate Regulation

- INNOVATIVE AND NON-TRADITIONAL FINANCING INSTRUMENTS
  - Circular economy: from sewage into reuse water

- LIKELIHOOD THAT MORE FINANCE RESOURCE WILL FLOW INTO SANITATION
  - Federal Law (no. 13,334/2016) addressing a Partnership Program of Investment – PPI

- OTHER TOPICS THAT HAVE NOT BEEN COVERED
  - water and sewage service is essential to mankind and needs a necessary priority.

Work programme

Increasing Financial Flows for Urban Sanitation

Case study

Baguio City, The Philippines

Prepared by:
Angelina Victoria M. Ferrer

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Part A: Background on the Philippines

Geography

The Republic of the Philippines is an archipelago found in Southeast Asia. It is surrounded by the Bashi Channel to the north, Sulu and Celebes Seas to the south, the Pacific Ocean to the east and the South China Sea to the west (Fig. 1.) It has a land area of about 300,000 square kilometres and is composed of 7,107 islands. The three largest groups of islands in terms of land area are Luzon (47%), Visayas (19%) and Mindanao (34%) (PSA, 2016a; PSA, 2014). It has two seasons: the wet season beginning June until November, and the dry season during the months of December to May.

Figure 1. Map of the Philippines (National Government Portal, 2017)

Government

The country has a presidential democratic form of government, with equal powers resting on each of the three branches: executive, legislative and judicial. The 24-member cabinet and a Vice President assist the President during his 6-year term. Legislation is performed by the legislative branch composed of the Congress, a bicameral body of 24 elected senators and more than two hundred district representatives. The Philippines a unitary presidential constitutional republic, with the President of the Philippines acting as both the head of state and the head of government. The central government 'maintains supervisory powers and an important financial role over lower levels of government' (UPSIO, 2016).

There are 17 administrative regions which include the National Capital Region (or Metro Manila) and the Cordillera Administrative Region (CAR). As of December, 2015, the country has 81 provinces, 145 cities, 1,489 municipalities and 42,036 barangays. Country development is executed by two distinct government sectors: national and local. The country's resources are shared and used by these sectors. The local government sector has officials elected to serve a three-year term in office. Local autonomy is provided for in the Local Government Code of 1991 in the province, city and municipality (PSA, 2016a).

POPULATION

As of August 1, 2015, the total population grew to 100,981,437 (Table 1). The average population growth rate for the years 2010-2015 is 1.72%. Luzon, composed of eight regions, holds 56.9% of the country's population. Mindanao comes in second with 23.9% for all its six regions, while Visayas, with four regions, comprises the remaining 19.2% of the population. Table 2 shows that as of 2010, the urban population is lesser than that of the rural population. There is, however, a foreseen trend of an internal rural-to-urban migration that will, over time, mean that the urban population surpasses that of the rural population. The data on population is of importance

Table 1. Population for the Philippines, NCR, CAR, Benguet and Baguio City

REGION, PROVINCE, AND HIGHLY URBANIZED CITY	TOTAL POPULATION			POPULATION GROWTH RATE		
	1-May-00	1-May-10	1-Aug-15	2000-2010	2010-2015	2000-2015
PHILIPPINES	76,506,928	92,337,852	100,981,437	1.9	1.72	1.84
NATIONAL CAPITAL REGION (NCR)	9,932,560	11,855,975	12,877,253	1.78	1.58	1.72
CORDILLERA ADMINISTRATIVE REGION (CAR)	1,365,412	1,616,867	1,722,006	1.7	1.21	1.53
BENGUET (excluding BAGUIO CITY)	330,129	403,944	446,224	2.04	1.91	1.99
BAGUIO CITY	252,386	318,676	345,366	2.36	1.54	2.08
Source: PSA						

Table 2. Urban-Rural Population Distribution

Population Distribution, %			
	2000	2007	2010
Urban	48.0	42.4	45.3
Rural	52.0	57.6	54.7
Source: PIF2016			

as, among others, it provides a basis for the apportionment of the Internal Revenue Allocation (IRA) to local government units and for the creation of new legislative areas such as regions, provinces, municipalities and barangays, or further the conversion of a municipality into a city (PSA, 2015a). In 2015, the average country population density was 337 per square kilometre.

In 2015, poverty incidence decreased to 21.6%, but this percentage still equates to 21.9 million Filipinos who are considered poor (Fig. 2).

Figure 2. Poverty Incidence in the Philippines (PSA, 2015b)

[1]http://psa.gov.ph/poverty-press-releases
[2] Poverty Incidence is the proportion of families/individuals with per capita income less than the per capita poverty threshold to the total number of families/individuals.

Sources of the Basic Data: Merged 2015 Family Income and Expenditure Survey and January 2016 Labor Force Survey, PSA

ECONOMY

The Philippines, an emerging market economy, is projected to have a 2017 GDP growth potential of 6.6% and 6.8% percent in the medium term, driven by robust domestic demand. In the ASEAN-5 (made up of Indonesia, Malaysia, the Philippines, Singapore, and Thailand), the Philippines' growth slowed from 6.9% to 6.4% in the first half of 2017, compared to accelerated growth in most countries (in comparison with 2016 figures). The

Philippines, however, continues to be the fastest growing country in the group (IMF, 2017) despite calamities, the controversies on the war on drugs, the Marawi conflict and Martial Law in Mindanao. This fast growth may be attributed to the current government's thrust on poverty alleviation, funding and aggressive implementation of infrastructure projects, anti-corruption, and tax reform.

For the second quarter of 2017, the National Economic and Development Authority (NEDA) reported a GDP growth of 6.5% (Fig. 3).

The Philippines, as an open economy, trades with countries like South Korea, the United States, Germany, Japan and China. Electronics, semiconductors, transport equipment, construction materials, and minerals, among others, are the country's primary exports (About the Philippines, 2017).

Tourism is contributory to the growth of the Philippine economy. In 2013, the country received a record 4.7 million foreign tourists, attributed to the "It's More Fun in the Philippines" tourism branding. Among the top favourites for tourists were Boracay Island in Aklan, Puerto Princesa Underground River in Palawan, Chocolate Hills in Bohol, Mayon Volcano in Albay, and the Banaue Rice Terraces in Ifugao, as well as the cities of Manila, Baguio, Vigan, Cebu, and Davao (About the Philippines, 2017). Tourism's contribution to the economy is increasing, and is reported to be 8.6% of the GDP in 2016 (Fig.4.)

Figure 3. Second Quarter 2017 GDP Growth (NEDA, 2017b)

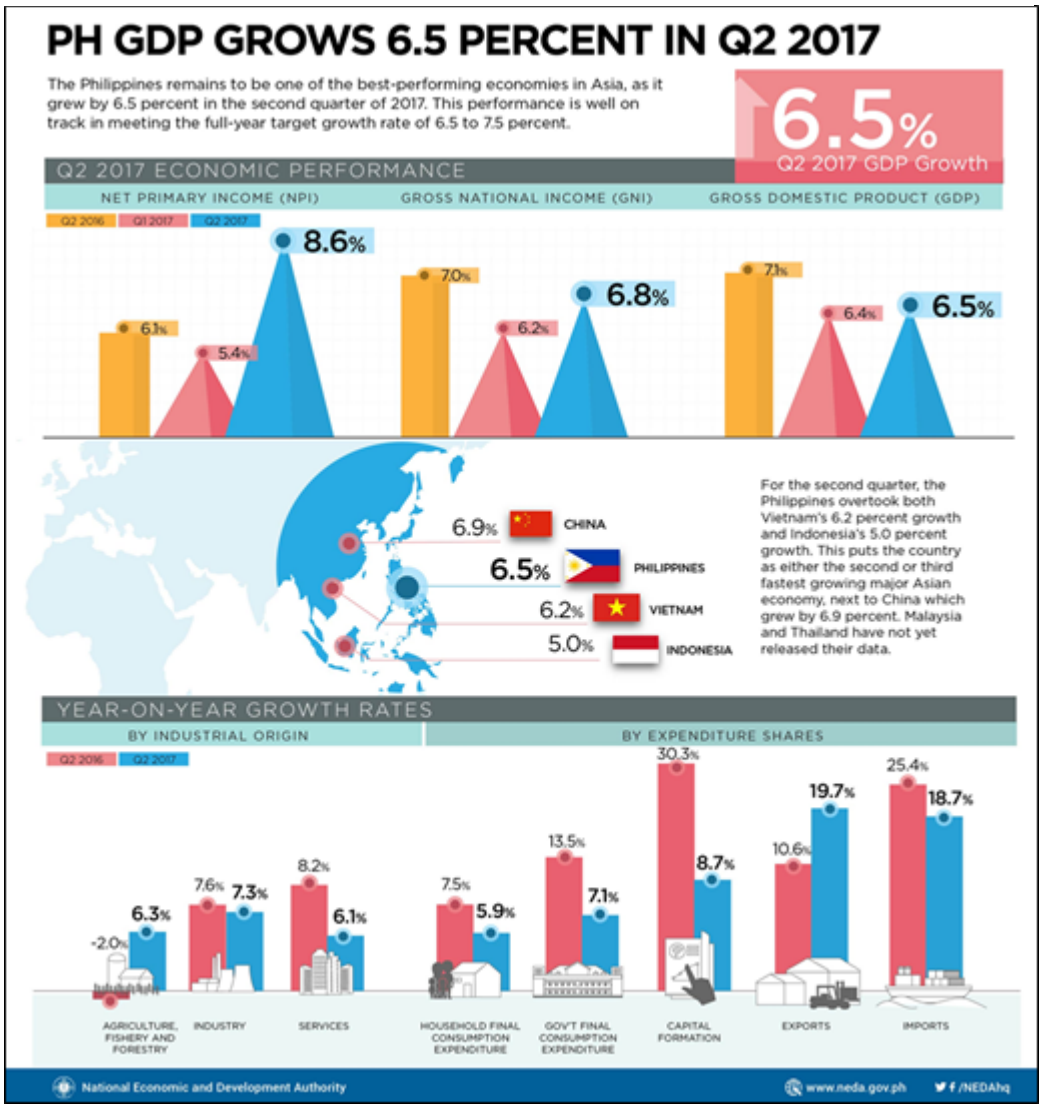
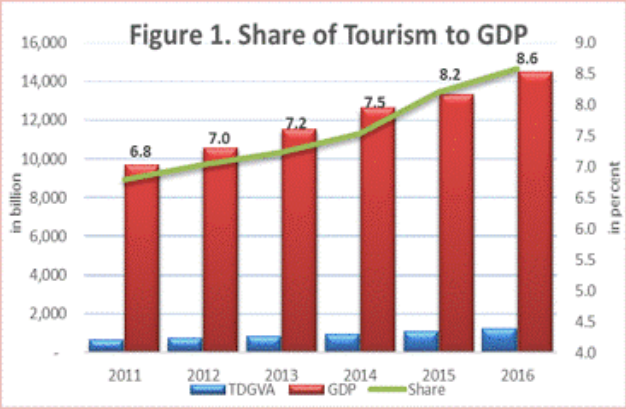


Figure 4. Share of Tourism to GDP (PSA, 2017)



Status of Access

The latest National Demographic and Health Survey (NDHS) carried out by Philippine Statistics Authority (PSA) in 2013 included various health-related parameters in the national sampling of approximately 15,000 households, considered indicators of general health and socioeconomic conditions of the country. Though only surveying 15,000 of 20,171,899 households (in 2010) and therefore maybe not being as accurate, the results of the survey still give a clear picture, to a certain degree, of water and sanitation-related conditions in the country. NDH surveys are completed at five year intervals.

Table 3. Household Distribution Percentage for Drinking Water, 2013 (PSA, 2014)

Table 2.1 Household drinking water

Percent distribution of households and de jure population by source of drinking water, time to obtain drinking water, and treatment of drinking water, according to residence, Philippines 2013

	Households			Population		
Characteristic	Urban	Rural	Total	Urban	Rural	Total
Source of drinking water						
Improved source	98.6	92.8	95.6	98.6	92.2	95.2
Piped into dwelling/yard/ plot	31.2	22.2	26.5	31.9	21.9	26.7
Public tap/standpipe	3.3	9.2	6.4	3.6	9.4	6.7
Tube well or borehole	8.6	23.7	16.5	8.8	23.5	16.5
Protected dug well	1.5	6.6	4.1	1.4	6.6	4.1
Semi-protected dug well	0.3	1.4	0.9	0.4	1.4	0.9
Protected spring	1.4	6.9	4.3	1.3	7.1	4.3
Rain water	0.1	0.6	0.3	0.1	0.6	0.4
Bottled water	52.2	22.3	36.6	51.0	21.6	35.7
Non-improved source	1.4	7.1	4.3	1.4	7.8	4.7
Unprotected dug well	0.3	2.4	1.3	0.3	2.6	1.5
Unprotected spring	0.9	3.9	2.5	1.0	4.3	2.7
Tanker truck/cart with drum	0.1	0.5	0.3	0.2	0.5	0.4
Surface water	0.1	0.3	0.2	0.0	0.3	0.2
Other source	0.0	0.1	0.0	0.0	0.1	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
Time to obtain drinking water (round trip)						
Water on premises	37.0	41.3	39.2	38.0	40.7	39.4
Less than 30 minutes	59.7	50.7	55.0	58.7	51.0	54.7
30 minutes or longer	3.0	7.7	5.5	3.1	8.0	5.7
Don't know/missing	0.2	0.3	0.3	0.2	0.3	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Water treatment prior to drinking[1]						
Boiled	25.6	33.8	29.9	27.7	36.0	32.0
Bleach/chlorine added	0.5	2.0	1.3	0.5	2.1	1.3
Strained through cloth	6.5	11.4	9.1	6.7	11.8	9.3
Ceramic, sand or other filter	3.6	2.1	2.8	3.8	2.0	2.8
Solar disinfection	0.1	0.2	0.2	0.1	0.2	0.2
Other	2.8	4.5	3.7	2.9	4.5	3.7
No treatment	65.0	53.6	59.1	62.8	51.4	56.9
Percentage using an appropriate treatment method[2]	28.9	36.8	33.0	31.1	39.0	35.2
Number	7,104	7,700	14,804	33,607	36,493	70,100

[1] Respondents may report multiple treatment methods so the sum of treatment may exceed 100 percent.
[2] Appropriate water treatment methods include boiling, bleaching, filtering, and solar disinfecting.

Table 4. Household Percentage Distribution for Sanitation Facilities, 2013 (PSA, 2014)

Table 2.2 Household sanitation facilities

Percent distribution of households and de jure population by type of toilet/latrine facilities, according to residence, Philippines 2013

	Households			Population		
Type of toilet/latrine facility	Urban	Rural	Total	Urban	Rural	Total
Improved, not shared facility						
Flush/pour flush to piped sewer system	5.2	1.4	3.3	5.2	1.4	3.2
Flush/pour flush to septic tank	66.2	55.9	60.8	66.9	55.6	61.0
Flush/pour flush to pit latrine	1.0	6.3	3.7	1.1	6.8	4.0
Ventilated improved pit (VIP) latrine	0.1	0.5	0.3	0.1	0.6	0.4
Pit latrine with slab	0.4	2.1	1.3	0.4	2.4	1.4
Composting toilet	0.0	0.1	0.1	0.0	0.1	0.1
Total	72.9	66.4	69.6	73.7	66.8	70.1
Shared facility[1]						
Flush/pour flush to piped sewer system	1.9	0.4	1.1	1.7	0.4	1.0
Flush/pour flush to septic tank	18.5	15.9	17.2	17.7	14.8	16.2
Flush/pour flush to pit latrine	0.7	2.7	1.8	0.7	2.7	1.8
Ventilated improved pit (VIP) latrine	0.0	0.2	0.1	0.0	0.3	0.1
Pit latrine with slab	0.1	0.9	0.5	0.2	0.9	0.5
Total	21.3	20.1	20.7	20.3	19.1	19.7
Non-Improved facility						
Flush/pour flush not to sewer/septic tank/pit latrine	1.7	0.5	1.1	1.7	0.5	1.1
Pit latrine without slab/open pit	0.3	2.2	1.3	0.4	2.4	1.4
Bucket	0.0	0.1	0.0	0.0	0.0	0.0
Hanging toilet/hanging latrine	0.2	0.6	0.4	0.3	0.7	0.5
No facility/bush/field	2.9	9.0	6.1	3.1	9.3	6.3
Total	5.2	12.3	8.9	5.5	13.0	9.4
Public toilet [2]	0.5	0.7	0.6	0.5	0.7	0.6
Other	0.0	0.4	0.2	0.0	0.3	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0
Number	7,104	7,700	14,804	33,607	36,493	70,100

[1] Facilities that would be considered improved if they were not shared by two or more households.
[2] It is not possible to determine if the public toilet is improved or non-improved.

Tables 3 and 4 present parameters surveyed for water and sanitation. The NDHS of 2013 summarised indicators relative to the country's progress toward attainment of the 2015 Millennium Development Goals (MDG). Indicators for water and sanitation are summarised in Table 5. The urban population is recipient to a higher percentage of access to both water and sanitation than its rural counterpart. Nationally, only 3.2% of the population is served by a sewer system. It can also be seen that overall, the country population has more access to improved drinking water sources than to improved, not shared, sanitation facilities.

Table 5. Philippine MDG Goal Indicators for Water and Sanitation, Attainment as of 2013

Goal 7. Ensure Environmental Sustainability			
	Urban	Rural	Total
Indicator 7.8. Percentage of population using an improved drinking water source	98.6	92.2	95.2
Indicator 7.9. Percentage of population with access to improved sanitation (not shared)	73.7	66.8	70.1
Adapted from PSA, 2014			

Table 6 is another summary from PSA's MDG Watch on the country's progress of attainment of MD goals as of 2014. There is a difference in how the water and sanitation indicators are presented. Here, national access to safe water as of 2014 is only 85.5%, while that of sanitation is a high 94.1%, which means that the 2015 MDG target for sanitation of 83.8% had already been met, as of 2014. This percentage for sanitation is much higher

than the result from the NDHS 2013 (Table 3) of only 70.1%; there is no data on the disaggregation between the urban and rural areas in the MDG Watch. There is likewise a disparity in data for water access in the NDHS 2013 and MDG Watch tables, and it is surmised that the definitions used for indicators in Tables 3 and 4 are different from those used in the MDG Watch. As of this writing, exact definitions used for the NDHS 2013 and the MDG Watch have not been obtained.

Table 6. MDG Attainment for Water and Sanitation up to the Year 2014 (PSA, 2016b)

Philippines' Progress based on the MDG Indicators

REPUBLIC OF THE PHILIPPINES
PHILIPPINE STATISTICS AUTHORITY
SOLID • RESPONSIVE • WORLD-CLASS

MDG Watch
as of May 2016

Goals/Targets/Indicators		Baseline	Target	Latest	Status[1/]
target 7.C	Halve, by 2015, the proportion of population without sustainable access to safe drinking water and improved sanitation				
indicator 7.7a	Proportion of families with access to safe water supply[7/]	73.0 1990	86.5 2015	85.5 2014	
indicator 7.8a	Proportion of families with sanitary toilet facility[7/]	67.6 1990	83.8 2015	94.1 2014	

For the Sustainable Development Goals (SDG), NEDA (National Economic and Development Authority) has pledged that it will address gaps in monitoring the country's progress in attaining targets through 'sufficient and good data, and data disaggregation' (NEDA, 2017c). PSA, a NEDA-attached agency, will develop mechanisms for timely and accurate data. NEDA has incorporated SDG targets in the Philippine Development Plan (PDP) 2017-2022, and has included Results Matrices to measure and monitor progress. For water and sanitation, the PDP used the 2014 status in Table 6, above, as its reference (Table 7). The Philippine Water Supply Sector Roadmap (PWSSR), 2nd Edition, 2010, and the Philippine Sustainable Sanitation Roadmap (PSSR) of 2010 aim for universal coverage by 2025 and 2028, respectively.

Table 7. Targets on Water and Sanitation to Accelerate Infrastructure Development (PDP 2017-2022)

Indicators	Baseline Value 2014	End of Plan Target 2022
Percentage of HHs with access to safe water supply increased	85.50	95.16
Percentage of HHs with access to basic sanitation increased	94.10	97.46

Adapted from NEDA, 2017a

The UN-Water Global Water Analysis and Assessment of Sanitation and Drinking Water (GLAAS) 2017 initial report on Financing Universal Water, Sanitation and Hygiene under the Sustainable Development Goals (WHO, 2017) has included various factors and survey data. Table 7 shows extracts from GLASS 2017 tables, derived from the latest 2016-2017 country data.

Table 8. Extracts from Tables in the Initial GLAAS 2017 Report (Annex D of Glass, 2017)

Countries with clearly defined procedures in laws or policies for participation by service users and communities in planning programmes, and level of participation

Procedures exist
✔ Yes
✘ No

Level of participation
✔ High
● Moderate
✘ Low

COUNTRY	Sanitation				Drinking-water supply				Hygiene promotion		Water resources planning and management	
	Urban		Rural		Urban		Rural		National		National	
	Procedures exist	Level of participation	Procedures exist	Level of participation	Procedures exist	Level of participation	Procedures exist	Level of participation	Procedures exist	Level of participation	Procedures exist	Level of participation
Peru	✔	●	✔	●	✔	●	✔	●	✔	●	✔	✔
Philippines	✔	●	✔	●	✔	●	✔	●	✔	●	✔	●

Source: GLASS, 2017

COUNTRY	DEMOGRAPHIC, HEALTH, AND COVERAGE ESTIMATES								
	Population (millions, 2017)[1]	Diarrhoea deaths due to inadequate WASH in children under 5 years (2012)[2]		Use of improved sanitation facilities (% of population, 2015)[3]			Use of improved drinking-water sources (% of population, 2015)[3]		
	National	per 100 000	Total	Urban	Rural	National	Urban	Rural	National
Philippines	103.80	19.8	2 239	78	71	74	94	90	92

COUNTRY	EQUITY								
	Policies and plans have specific measures to reach vulnerable groups							Tracking progress among vulnerable groups	
	National							Sanitation	Drinking-water
	Poor populations	Populations living in remote or hard-to-reach areas	People living with disabilities	Women	Populations living in slums or informal settlements	Populations with high burden of disease	Indigenous populations	Poor populations	Poor populations
Paraguay	✔	✔	✔	✔	✔	✔	✔	✘	✔
Peru	✔	✔	✔	✔	✔	✔	✔	✘	✔
Philippines	✔	✔	✔	✔	✔	✔	✔	✔	✔

✔ Yes
✘ No

✔ Yes
✘ No

EQUITY														
Specific measures in the financing plan to target resources to vulnerable populations														
Sanitation								Drinking-water						
Poor populations	Populations living in remote or hard-to-reach areas	People living with disabilities	Women	Populations living in slums or informal settlements	Populations with high burden of disease	Indigenous populations	Poor populations	Populations living in remote or hard-to-reach areas	People living with disabilities	Women	Populations living in slums or informal settlements	Populations with high burden of disease	Indigenous populations
●	●	●	●	●	●	●	●	●	●	●	●	●	●
✔	●	✘	✘	✔		●	✔	●	✘	✘	✔		●
●	●	●	✔	✔	●	●	●	●	●		✔	●	●

✔ Yes and measures are applied
● Yes, but measures are not applied consistently
✘ No

Note: Data not yet fully finalized. Final data sets will be made available on the GLAAS website.
Source: GLAAS 2016/2017 country survey.

Source: Annex D of GLASS, 2017

COUNTRY	FINANCING																	
	Existence and level of implementation of a government-defined financing plan/ budget for the WASH sector which is published and agreed					Expenditure reports are publicly available and easily accessible, and allow comparison of committed funds to expenditures				Operating and basic maintenance costs are covered by tariffs				Absorption of external funds (% of official donor capital commitments utilized (three-year average))			
	Sanitation		Drinking-water		Hygiene	Sanitation		Drinking-water		Sanitation		Drinking-water		Sanitation		Drinking-water	
	Urban	Rural	Urban	Rural	National	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural
Paraguay	✔	✔	✔	✔	✘	●	●	●	●	✘	✘	✘	✘	✔	✔	✔	✔
Peru	●	●	●	●	●	✔	✔	✔	✔	●	✘	●	✘	✔	✔	✔	✔
Philippines	●	●	●	●	●	●	●	●	●	✔	✔	✔	✔	✔	✔	✔	✔

	✔ Agreed and consistently followed ● Agreed but not sufficiently implemented ✘ No agreed financing plan/budget or in development	✔ Government, ODA, and non-ODA expenditure reports are available ● Some reports available ✘ Expenditure reports are not available	✔ Covers over 80% of costs ● Covers between 50% and 80% of costs ✘ Covers less than 50% of costs	✔ Over 75% ● Between 50% and 75% ✘ Less than 50%

FINANCING

Absorption of domestic funds (% of domestic commitments utilized (three-year average))				Sufficiency of financing to reach national targets				Government WASH budget (US$ millions, constant 2014 US$)		Annual WASH expenditure (US$ millions, constant 2014 US$)					
Sanitation		Drinking-water		Sanitation		Drinking-water		National		National		By source of funding			
Urban	Rural	Urban	Rural	Urban	Rural	Urban	Rural	Year	Budget	Year	Expenditure	Households	Government	External	Repayable
●	●	●	●	✘	●	✔	●	2015	226	2016	254	24	61	18	152
●	●	●	●	✔	✘	✔	●	2015	1 745	2015	2 360	405	2 181	86	
✔	✔	✔	✔	✘	✘	●	✘	2016	210	2015			276		

✔ Over 75% ● Between 50% and 75% ✘ Less than 50%	✔ More than 75% of what is needed ● Between 50 and 75% of what is needed ✘ Less than 50% of what is needed	*Data for financial year 2016–2017

Note: Data not yet fully finalized. Final data sets will be made available on the GLAAS website.
Source: GLAAS 2016/2017 country survey.

Source: Annex D of GLASS, 2017

MONITORING

COUNTRY	Most recent Joint Sector Review	Data availability for decision-making						
	National	Sanitation			Drinking-water			
	Year	Policy and strategy	Resource allocation	Status and quality of service delivery	Policy and strategy	National standards	Resource allocation	Status and quality of service delivery
Philippines	2015	✔	✔		✔	✔	✔	●

✔ Data available, analysed, and used for a majority of decisions
● Data available but not sufficiently used for decision-making
✘ Only limited data collected and limited availability

Source: Annex D of GLASS, 2017

From the extracted tables (which used initial, not fully finalised data), it can be summarised that:

- Water and sanitation policies exist, but there is only moderate participation by end-users in planning
- Nationally, 74% use improved sanitation facilities (78% urban, 71% rural)
- Nationally, 92% have access to improved drinking water sources (94% urban, 90% rural)
- There are policies for equitable delivery of services to vulnerable groups but specific measures to finance these are not applied consistently
- There is sanitation data available on policies, strategies and resource allocation used for decision-making
- Financing:
  - Published and agreed WASH budgets are not sufficiently implemented, and only some reports of expenditure are available
  - Tariffs cover over 80% of operating and basic maintenance costs
  - There is less than 50% sufficiency of funds to reach national targets for urban and rural sanitation and rural drinking water; the 2016 national budget is US$ 210 Million
  - The government spent US$ 276 Million for WASH in 2015

What is consistent across all the data published is that the urban population has greater access to both water and sanitation, compared to access of the rural population. For water supply national targets to be attained by

2025, US$838 million per year is needed, and US$619 million is needed annually for sanitation targets to be reached by 2028 (World Bank, 2015). The reported budget spent for WASH programmes of US$276 Million in 2015 and US$210 million in 2016 is not sufficient to attain national targets when compared to World Bank's service delivery assessment costing.

The Philippine Water Supply and Sanitation Master Plan (PWSSMP)

In August of 2017, the NEDA has awarded a PHP89.32 million contract for consulting services for the formulation of the Philippine Water Supply and Sanitation Master Plan. Acknowledging, among others, the institutional fragmentation, fragmented financing and weak regulatory framework for the sub-sector (NEDA, 2017d), the ultimate aim of the masterplan is to set the direction in achieving universal access to safe drinking water by 2025 and universal basic sanitation by 2028.

Among the PWSSMP's outcomes are (NEDA, 2017d):

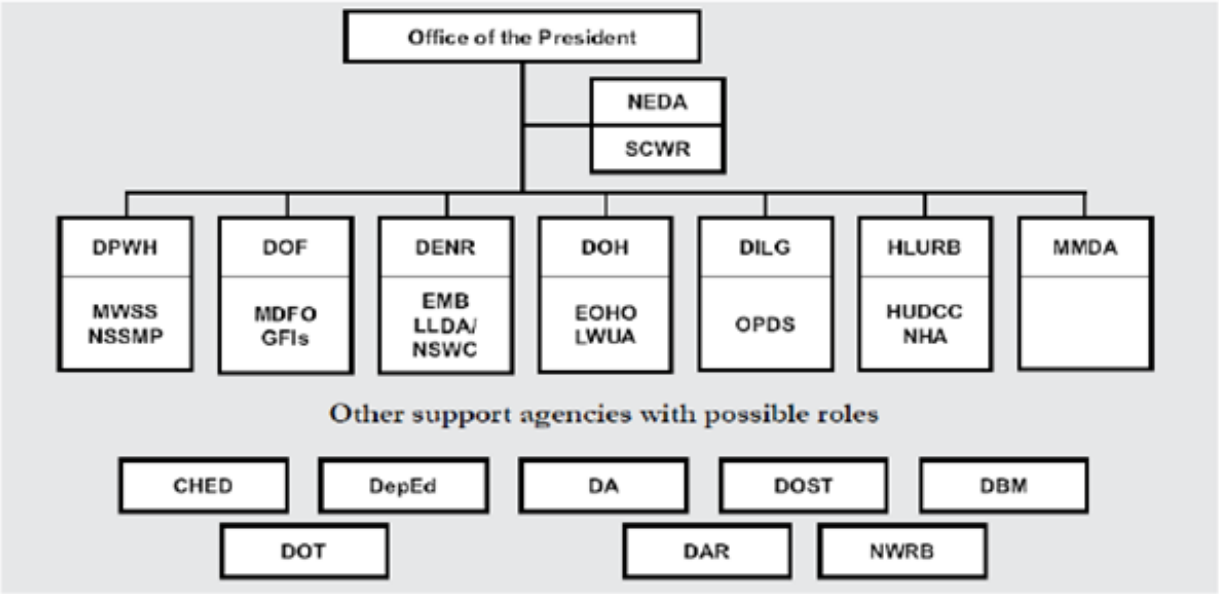
a. A coherent institutional and regulatory framework
b. Capable government institutions and service providers, sustainably managing the sub-sectors for improved service delivery
c. Strengthening strategic alliances
d. Adequate financing and investment to water supply, sanitation and sewerage infrastructure in priority strategic areas

INSTITUTIONAL RESPONSIBILITY

There is no single national department in charge of water and sanitation in the country. The current national institutional setup to oversee water and sanitation programmes is often described as fragmented. The Inventory of Sanitation Policies and Programmemes in Philippines (ICLEI, 2012) and the East Asia and the Pacific Region Urban Sanitation Review Philippines Country Study (World Bank and Australian Aid, 2013) provide more on the roles of the various departments and agencies involved in the water supply and sanitation sectors. Figure 5, extracted from DOH, 2010, shows the various and numerous national departments and supporting agencies involved (acronyms and agency mandates are defined in Annex B), in one way or another, with water and sanitation concerns.

The Metropolitan Waterworks and Sewerage System (MWSS) is the country's chief agency on water and sewerage services, deriving its mandate from Republic Act 6234 for the operation and maintenance of water and sewerage systems. Its service area covers the whole of Metro Manila and parts of Cavite and Rizal. However, in 1997, a 25-year Concession Agreement with two private consortia comprised of local and international partners transferred the operational responsibilities of MWSS to Manila Water Company, Inc. for the East Zone and Maynilad Water Services, Inc. for the West Zone (MWSS Concessionaires, 2017). The public-private partnership has been lauded for its successful delivery of water and sanitation services in the said coverage areas.

Figure 5. National Agencies with Clear Sanitation Mandates (DOH, 2010)



Within the Department of Health (DOH), is the Environmental and Occupational Health Office (EOHO) of the National Disease Control and Prevention Centre. The EOHO develops policies, programmes and strategies to manage health hazards and risks associated with environmental and work related factors. Its mandate on sanitation, however, is limited to policy formulation (DOH, 2010). DOH chairs the Inter-Agency Committee on Environmental Health (IACEH), which has sectors on water and sanitation. DOH had previously made a Sanitation Policy in 2009 ,targeting zero defecation by 2022.

The Department of Public Works and Highways has been tasked, under the Clean Water Act of 2004, with formulating and implementing the National Septage and Sewerage Programme (NSSMP.) The NSSMP is part of the Philippine Sustainable Sanitation Roadmap (PSSR.) These frameworks aim to address sanitation issues such as open defection and untreated sewage (DPWH, 2013). There is mention of the crafting of the National Sustainable Sanitation Plan (NSSP), but this report is unable to access such document.

PSSR (DOH, 2010) contains a table of agencies and roles related to sanitation (see Annex A.) Findings noted in the PSSR recognise institutional fragmentation and the existence of varied and outdated policies and laws, but weak implementation of these due to vague mandates. The PSSR pushes for a national sanitation agency that will accord focused and full attention to concerns of the sanitation sector.

The roles of a few of the more prominently involved offices and departments are listed in Table 9 (World Bank, 2015). The World Bank 2015 Service Delivery Assessment finds 'there is no formal, clear-cut distinction between the (rural and urban water and sanitation) subsectors.'

Table 9. Roles and Responsibilities of Agencies Involved in Water and Sanitation (World Bank, 2015)

Current Roles and Responsibilities of Sector Agencies	
Local Government Units (LGUs)	• Mandates generally based on the Local Government Code and include resource regulation, water supply provision and economic regulation of utilities. This includes responsibility for the planning, implementation and monitoring of water supply and sanitation programs. • Provision of support to water service providers such as the Rural Water and Sanitation Associations, the Barangay Water and Sanitation Associations and cooperatives including funding from their development funds.
Local Water Utilities Administration (LWUA)	• Capacity building support to water districts, including technical, institutional and financial assistance. • Regulation of Water Districts.
Department of Interior and Local Government (DILG)	• Management of the water grants under SALINTUBIG Program of the government. • Capacity building support to LGUs. – Provision of capacity building training to LGUs. – Coordination of LGU master plan preparation. – Provision of information to LGUs on available sector programs and financing.
National Water Resources Board (NWRB)	• Resource, Economic and Service Regulation of water service providers.
National Economic and Development Authority (NEDA)	• Coordinates the preparation of national development plans and investment programs. • Monitoring implementation of policies, programs and projects.
Department of Public Works and Highways (DPWH)	• Provision of technical support to LGUs upon request including implementation of piped water supply projects. • DPWH is hosting the Project Management Office for the National Sewerage and Septage Management Office. • They also provide oversight functions over LWUA and the MWSS. • Leads the Inter-Agency Committee on Water created under Executive Order 62.
Department of Finance(DOF)/ Government Financing Institutions (GFIs)	• Financing support for the water supply sector. • DOF oversees performance of GFIs like the Development Bank of the Philippines, the Land Bank of the Philippines and the Local Water Utilities Administration.
Metropolitan Waterworks and Sewerage System (MWSS)	• For water supply and sewerage services in Metro Manila through its two private concessionaires. It also has its own economic regulatory office, created by contract to regulate tariff and performance of the utilities.
DWSD	• Implements the KALAHI-CIDDS program, a major anti-poverty program of the national government that have water supply and sanitation sub-projects in rural areas.
NAPC	• Coordinates the pro-poor water supply projects of the national government.

The NEDA is advocating for the institutional strategy of creating an apex body for the water resource sector. The apex body shall manage water resources by integrating and coordinating national policies and plans (Table 10).

Table 10. Proposed Legislation Extracted from the PSSR (NEDA, 2017a)

PROPOSED LEGISLATION	PURPOSE
Water Resources	
Enactment of a Law Creating an Apex Body for the Water Resources Sub-sector	Aims to address the weak and fragmented institutional set-up of the water resources sub-sector with the creation of an Apex Body that will act as the single lead agency to oversee/coordinate overall policy and project/program implementation.

PROPOSED LEGISLATION	PURPOSE
Enactment of a Law Creating an Independent Economic or Financial Regulator for Water Supply and Sanitation	Harmonizes the regulatory practices, processes, fees and standards on water supply and sanitation while addressing the overlapping functions or jurisdictions of existing regulatory entities.

There are a number of national departments which have, in their budget, included allocations for water and/or sanitation programmes or projects. This study attempted to obtain national data on apportioned amounts for water and/or sanitation, but found it difficult to find all departments which have such budgets. There was further difficulty in finding, within a concerned department's budget, disaggregated allocations for water or sanitation in the annual General Appropriations Act (GAA) available online. The annual GAAs list approved allocations for the implementation of various government programmes. The Department of Public Works and Highways (DPWH), Department of Agrarian Reform (DAR), Department of Interior and Local Government (DILG) and the Department of Health (DOH) are departments that have evident water and/or sanitation allotments in their department annual budgets in the GAA.

The PSSR identified the most immediate needs for sanitation, and estimated a budget of P87.37 billion for 2010-2016 investments for five outcome areas listed in table 11. This study is unable to acquire information on whether the P87.37 billion had actually been allocated and spent for the purposes listed in the 2010-2016 sanitation roadmap operational plan, detailed in the PSSR. The DPWH has been tasked to implement infrastructure projects for sanitation under the NSSMP. The PSSR also lists numerous and varied ongoing and pipeline sanitation-related programmes, as of the year 2010.

Table 11. Investment Requirements 2010-2016

Responsive Governance and Regulatory Strengthening for the sanitation sector	30,050,000
Improved Service Delivery through Communications and Capacity Development	95,800,150
Strengthening of strategic alliance	26,600,000
Financing Sanitation investments and infrastructure development	87,193,784,000
Adequate Sanitation for emergency situations	25,750,000
Grand Total for the 5 outcome areas:PHP	**87,371,984,150**

Source: DOH, 2010

The World Bank and Australian Aid, 2013, Philippine Country study, East Asia and the Pacific Region Urban Sanitation Review, found that only 3% was allocated for sanitation, based on the PHP 16 billion appropriated for water supply and sanitation for the years 2001 to 2007. Annual investments on water and sanitation continue to be underfunded compared to budgets of other national programmes, perhaps because there is no national sanitation investment framework that should be used as guide. The Gender and Development (GAD) programme, for example, receives yearly support of at least 5% of the annual budget.

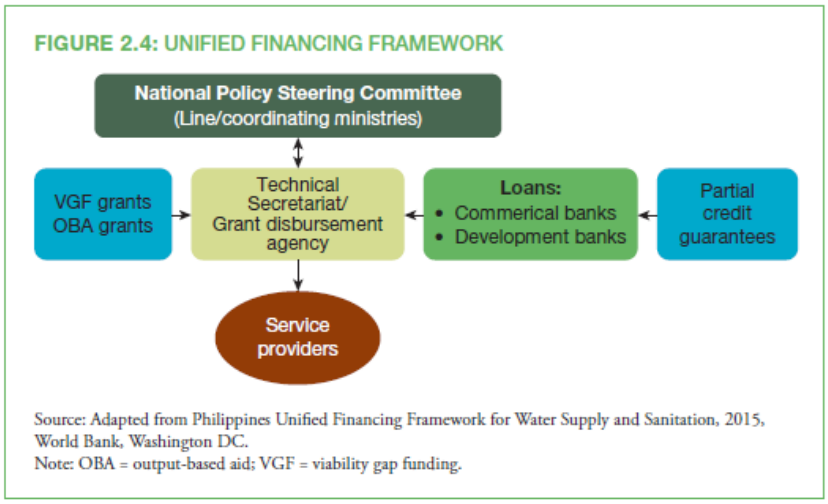
Based on institutions and roles described previously, the World Bank 2015 study further finds that:

- MWSS oversees water and sanitation in Metro Manila through its two private concessionaires
- LWUA provides finance and technical assistance to around 600 water districts (WD), with or without sanitation services
- There are numerous small private service providers including housing developers and water cooperatives
- some LGUs are service providers, mostly for water supply, rarely for sanitation systems

- Most rural pipe water schemes are LGU-operated with DILG support through the SALINTUBIG Programme, a programme for LGUs with less than 50% of population having access to potable water
- The Department of Social Welfare and Development (DSWD) is a major supporter of rural water supplies through the Kapit-Bisig Laban sa Kahirapan – Comprehensive Integrated Delivery of Social Services (KALAHI-CIDSS) Project initiated in 2003. The DSWD plans to invest up to PHP 1.9 Billion a year from 2013-2019 for rural water supply projects alone
- The Department of Agrarian Reform funds some water supply projects usually operated by cooperatives, barangays, or rural water and sanitation associations

The Philippine Water Supply and Sanitation Master Plan (PWSSMP), due to be completed in 2018, is expected to integrate the water supply, sewerage and sanitation sub-sectors into a single roadmap and shall link all other initiatives, such as the Unified Financing Framework (Fig. 6), relating to water supply and sanitation (NEDA, 2017d).

Figure 6. The Unified Financing Framework (Menzies, 2017)



The proposed establishment of a national account for water and sanitation is expected to enable better monitoring of financial flows for water and sanitation programmes, projects and investments (World Bank, 2015).

CIRCULAR ECONOMY

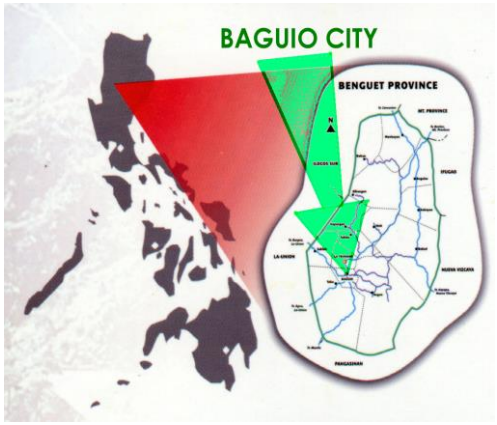
The term Circular Economy is not well-known nor widely-used in the country as yet, though the term has been cropping up in studies related to reuse and recycling. The PSSR contains no mention of the circular economy. The concept of circular economy, however, may be analogous to the common concepts and terms more familiar and commonly used in the country: reuse, reduce, recycling, up-cycling, closed-loop, waste-to-resource, nexus, self-liquidating, and the like. These terms and concepts have come to the fore due to their significance in relation to solid waste management, protecting the environment or mitigating pollution.

Part B: Baguio City

Geographical Location, Land Area and Climate

Baguio city is a popular tourist destination in Northern Luzon, visited by both local and foreign tourists. It is dubbed the Summer Capital of the Philippines because of its cool climate, averaging 18 degrees centigrade and dropping below 15 degrees between the months of December and February. It is also the rainiest zone, receiving an average of 4,096 millimetres of rain per year, the highest recorded in the country.

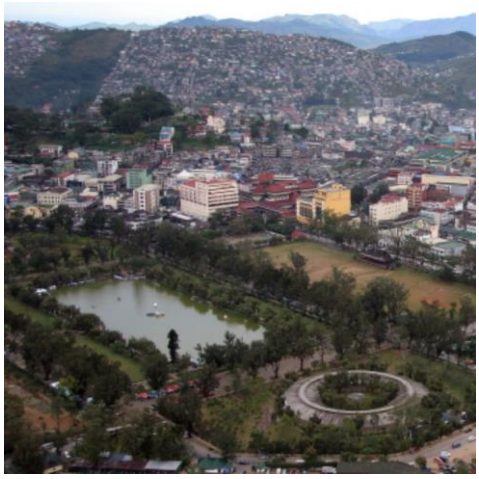
Figure 7. Baguio City within the Benguet Province



Source: WAMD-CEPMO

It is a commercial, educational and recreational centre of the Cordilleras and northern Luzon. It is part of the Cordillera Administrative Region (CAR), situated in the Benguet province and landlocked by three municipalities (Fig. 7). About 250 kilometres north of the Philippine capital Manila, Baguio city has a land area of 57.49 square kilometres, enclosed in a perimeter of 30.6 kilometres and is at an elevation of 1,417 metres above sea level. Within the city are steep hillsides and mountains, with half the city area having a slope of 25% or more.

Figure 8. The Burnham Lake, Central Business



The city has a first class income classification, having an average annual income of more than thirty million pesos. Baguio City sees its functional roles as a Garden/Flower City, Summer Capital of the Philippines, Regional Government Centre, Tourist Centre, Education Centre of the North, Centre for Health Services and Top Ten Next Wave Cities.

Population Profile

As of the August 2015 Philippine Statistics Authority (PSA) census, the city has a total population of 345,366 persons. Baguio's 2010-2015 annual growth rate is 1.54% (Table 12). Though the growth rate has a decreasing trend, at the present growth rate the population is expected to reach 372,791 in 2020 and double in thirty five years (PSA, 2015).

Table 12. Baguio City Population and Growth Rate

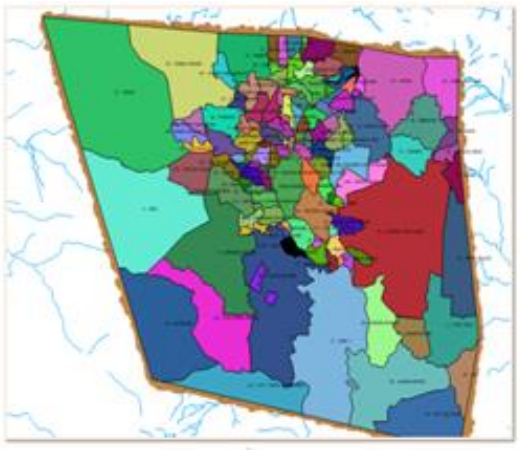
Censal Date	Total Population	Number of Households	Average Household Size	Censal Years	Population Growth Rate, %
May 1, 1990	183,142				
May 1, 2000	252,386	52,302	4.8	1990-2000	3.26
May 1, 2010	318,676	78,313	4.0	2000-2010	2.36
August 1, 2015	345,366	89,987	3.8	2010-2015	1.54
Source: PSA, 2015					

The current population density is 6,005 people per square kilometre, 69 times higher than the Cordillera Administrative Region's (CAR) population density of 87 persons per square kilometre (Table 13). Compared to the capital city of Manila, which is smaller in land area than Baguio, and has a very high density of 71, 263 people per square kilometre. Nearby Tuba, a municipality with an area of almost 296 km^2, has a population density of only 161 people/ km^2.

Table 13. Population, Land Area, Population Density of Selected Regions, Province, HUCs and Municipalities

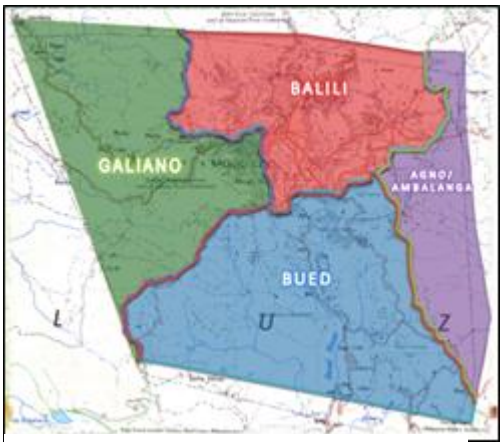
Region, Province/Highly Urbanized City, and City/Municipality	Population	Land Area (square kilometers)	Population Density (persons per square kilometer)
PHILIPPINES	**100,979,303**	**300,000.00**	**337**
National Capital Region (NCR)	**12,877,253**	**619.54**	**20,785**
City of Manila	1,780,148	24.98	71,263
City of Mandaluyong	386,276	9.29	41,580
Cordillera Administrative Region (CAR)	**1,722,006**	**19,818.12**	**87**
Benguet (excluding Baguio City)	**446,224**	**2,769.08**	**161**
La Trinidad (Capital)	129,133	70.04	1,844
Tuba	47,648	295.97	161
Tublay	17,892	102.55	174
Baguio City	**345,366**	**57.51**	**6,005**
Source: NSA, 2016			

Figure 9. Baguio's 129 Barangays



Source: WAMD-CEPMO

Figure 10. The Four River Basins within Baguio City



Source: WAMD-CEPMO

The city is composed of 129 barangays, the smallest administrative division in the Philippines, (Fig. 9) and is one of the most highly urbanised cities (HUCs) in the country. Its population is of mixed ethnicities.

Each barangay differs in land area and household population, and is governed by elected officials overseen by a Barangay Captain.

The headwater of four rivers emanate from Baguio: Balili River, Agno River, Galiano River and Bued River (Fig. 10). The Balili River has been designated as a Water Quality Management Area (WQMA) by the Department of Natural Resources (DENR) due to its current state of pollution.

The central business district (CBD) is located within the Balili river catch basin and almost half of the city population live within this river basin. Sources of river pollution are solid and liquid wastes. Building sewers, septic tank effluent pipes and storm drainage pipes that receive illegally connected building sewers, have been found to be the biggest sources of river pollution. Other city demographic data are listed on Table 14.

As with other highly urbanised cities in Table 15, Baguio likewise experienced a decrease in its growth rate for the censual years 2010-2015. This decrease holds true for the country's population growth rate trend.

Table 14. Population Profile

Characteristic	2010	2015
Population Density (Density per Square Kilometer)	5,541	6,005
Most Populated Barangays	Irisan, Asin Road, Camp 7, Loakan Proper, Bakakeng Central, Bakakeng Norte/Sur, Fairview, Gibraltar, San Luis Village, Sto. Tomas Proper, Pinget, and Pacdal	
Most Dense Barangays	Lopez Jaena, Balsigan, Upper Magsaysay	
Not in the Labor Force	31.00 % (2010)	
Labor Force Participation Rate (%) (15-64 yrs. old)	69.00% (2010)	66.0 (2015, CAR)
Employment Rate	93.49%	95.5 (2015, CAR)
Unemployment Rate	3.41%	4.5 (2015, CAR)
Visible/Invisible Underemployment	3.10%	
Gender Distribution: Males	48.8% (2010)	51.3 (2015, CAR)
Females	51.2% (2010)	48.7 (2015, CAR)
Dominant Industries: Services	57.00%	
Real Estate, Boarding House	25.18%	
Construction	17.82%	
Annual per capita poverty threshold (in PHP)	19,140 (2012, Benguet)	21,561 (2015, Benguet)
Source: CPDO, 2016		

Table 15. Growth Rates of Selected Regions and HUCs

REGION, PROVINCE, AND HIGHLY URBANIZED CITY	POPULATION GROWTH RATE		
	2000-2010	2010-2015	2000-2015
PHILIPPINES	**1.90**	**1.72**	**1.84**
NATIONAL CAPITAL REGION (NCR)	**1.78**	**1.58**	**1.72**
CITY OF MANILA	0.44	1.43	0.78
CITY OF MANDALUYONG	1.67	3.12	2.17
CORDILLERA ADMINISTRATIVE REGION (CAR)	**1.70**	**1.21**	**1.53**
BENGUET (excluding BAGUIO CITY)	2.04	1.91	1.99
BAGUIO CITY	2.36	1.54	2.08
Sources: PSA 2000,2010,2015			

Annual Per Capita Poverty Threshold and the Incidence of Poor Families

Baguio City experiences high immigration, most likely because the city plays a vital socio-economic role in the area. Based on the PSA survey (Table 16), the incidence of poor families is down to 2.5 percent in 2015 (Benguet data here also includes Baguio City). The annual per capita poverty threshold increased from PHP 13,341 in 2006 to PHP 21,561.00 in 2015, and economic opportunities continue to be available in the city. However, according to the City Planning and Development Office (CPDO), the city needs to intensify socio-economic mitigations to buffer the expected proportionate increase of the incidences of poor families as the city's population grows.

Table 16. Poverty Indicators

Social Indicator	2006	2009	2012 Benguet	2015 Benguet
Incidence of Poor Families, %	4.0	4.2	2.8	2.5
Annual Per Capita Poverty Threshold	13,341	16,217	19,140	21,561
Source: PSA				

ECONOMY

Small, Medium Scale and Major Industries

Baguio's economy thrives on tertiary economic activities particularly dependent on commerce and services that equally support the growing tourism industry. Taxes derived from economic activities and employment generate substantial income for the city. The latest recorded number of legitimate economic and business establishments is 25,912, as of 2016. The three most dominant economic activities are as follows: 42.20 % are retail activities, followed by services at 32.23% and real estate leasing (for boarding houses, apartments, transients) at 25.57% (CPDO, 2017.)

There are also small and medium scale industries and various distinctive handicrafts in the city that provide economic opportunities for various ethnic groups. These indigenous products continue to lure tourists because of the superior hand-made craftsmanship in wood-carving, basketry and textile weaving. Other medium scale industries produce metal craft, particularly brass and silver wares, knitted garments, and processed food, including strawberries, peanuts, and pastry products (CPDO, 2017).

Tourist Arrivals

Baguio City remains a prime tourist destination area in North Luzon because of its cool climate, fresh, green and peaceful environment. It is also a favourite venue of seminars and conferences. Baguio City is also the gateway to other tourist destinations in the North. This highlights the strategic role that Baguio City plays in the region's tourism industry.

Tourist arrivals for 2016 was measured at 1,294,906 representing an increase of 16.11% from arrivals in 2015 arrivals. Foreign and overseas travelers increased by 62.96% and 60.86% respectively. The city's natural ambiance remains an integral and indispensable pull factor for local and foreign visitors. Statistics reveal that domestic tourists still outnumber foreigners and balikbayans (Filipino returnees.) The peak of annual tourist arrivals annually occurs during the Panagbenga (Flower Festival) celebration in February and the Lenten period in March to April, when transients triple the city population (CPDO, 2017).

Financial Institutions and Local Industrial Exports

In 2016, there were a total of 407 banks and other financial institutions operating in the city, a sign of a robust economy. Private capital investments by the businessmen increased by 655.02% percent from PHP 2,589,675,200 in 2015, to PHP 22,637,630,000 in 2016.

The presence of the Baguio City Economic Zone (BCEZ), Philippine Export Zone Authority (PEZA) has greatly enhanced the dynamics of the city's economy. There are 32 locators in the zone and most are multi-national

corporations. Investments in BCEZ-PEZA, however, decreased by 24.15 percent from the previous year due to the transfer of some locators to Clark, where locators benefit from a wider allocated land area. Total capitalisation for new business permits for PEZA amounted to PHP 22,637,630,000 in 2016.

INFRASTRUCTURE AND URBAN AMENITIES

Communication Facilities and Transport

Companies like PLDT, DIGITEL, SMART, PT&T, RCPI, Telecom, Bayantel, Eastern Telecoms and Globe Mackay provide various telecommunications services that link the city locally and internationally. There are government-run postal services and also supplemental courier services provided by JRS, FEDEX, LBC, DHL and others. Telex, Fax, Radiotelephone and internet services are also available in the city.

Being a major urban centre in the North, at least sixteen large transport companies operate in the city, providing transport services to Metro Manila, the Ilocos Region, interior Cordilleras, to as far as the Quezon province. Public utility vehicles such jeepneys and taxis are available, and ply routes within the city and to adjacent municipalities, transporting goods and people.

Education

There are 389 educational institutions that cater to different levels of education. 70% is owned by the private sector, with the remaining 30% run by the government. Total enrollees across all levels for the 2015-2016 school year was 155,046 students.

Water Services

The Baguio Water District (BWD), a quasi-government entity, administers the water supply system for the City of Baguio. Wastewater is separately managed by the city government through the Wastewater, Water and Ambient Air Management Division of the City Environment Office (WAMD-CEPMO).

Table 17. Baguio Water District Data

Particulars	2012	2103	2014	2015	2016
Total Annual Budget, PHP	394,173,000.00	376,873,888.70	410,873,888.70	428,935,752.66	525,624,567.00
Estimated Annual Collections, PHP	489,874,000.00	485,601,000.00	501,073,246.00	516,616,482.00	538,514,765.00
Actual Total Annual Collections, PHP	427,341,703.61	454,254,637.13	480,495,089.93	506,105,017.42	523,929,871.74
Assumed per capita water consumption, L/d	117	117	117	120	120
Population Equivalent of Recorded Consumers	213,918	220,470	227,394	235,014	242,424
Projected Total Annual Water Production (m3)	16,645,400	13,026,000	13,032,000	14,684,000	13,034,840
Actual Total Annual Water Production (m3)	15,315,455	14,751,157	14,157,125	14,594,424	14,646,253
Actual Total Annual Water Distributed via pipe networks (m3)	13,453,875	12,346,699	12,392,598	12,698,485	12,885,138
Total Number of Recorded Paying Consumers	35,653	36,745	37,899	39,169	40,404
Residential A	25,980	26,733	27,692	28,696	29,580
Residential B	5,032	5,228	5,333	5,399	5,525
Residential C	449	504	521	548	612
Residential D	0	0	2	10	13
Government A	219	228	229	235	234
Government B	75	76	79	79	84
Commercial A	706	718	738	766	824
Commercial B	3,114	3,176	3,213	3,338	3,430
Commercial C	71	75	85	92	96
Commercial D	7	7	7	6	6
Total Volume of Water Delivered via BWD Delivery trucks, m3	26,000	32,013	17,667	26,221	31,531
Total Volume of NRW, m3	4,895,506	3,937,599	3,705,239	3,636,596	3,508,275
Number of Barangays Served	122	122	122	122	122
Barangays not within scope of BWD service	Atok Trail, Fort del Pilar, Happy Hallow, Apugan-Loakan, Pucsusan, Scout Barrio				
Source: BWD					

The BWD operation covers water production & distribution, including the maintenance of 60 deep wells. Water storage facilities are limited, and due to Baguio's relief, distribution operations is costly. Though BWD assumes a 120 l/d per capita water consumption (Table 17), piped water is not available 24 hours a day, instead being available on a schedule basis. The areas within the CBD receive water daily, but only for a number of hours in a day. Other areas have water in their pipes only a number of days a week, and also for a set number of hours. About 12.8 million cubic metres of water was distributed to 14,400 recorded consumers in 2016 (Table 17). The minimum monthly water rate for a residential type of connection consuming from 0 to 10 m^3 is PHP 370.00. Cost per cubic metre increases, the bigger the volume is consumed (BWD, 2017).

Wastewater Management

The City Sewerage System of Baguio is managed by the Wastewater, Water & Ambient Air Management Division (WAMD), a division under the City Environment and Parks Management Office (CEPMO) of the government of Baguio. The sewer network primarily serves the Central Business District (CBD) and certain adjoining Barangays.

Housing

Because of a high demand for housing, some high density residential areas are congested, especially those in the central and northern parts of the City. Housing has also expanded towards protected areas, encroaching on watersheds and forest reservations, with forest cover currently in a state of rapid decline. Encroachment thus threatens the City's water supply sources and the natural landscape. The increase in population has resulted to water shortage, traffic congestion and environmental degradation. It has raised carrying capacity concerns on solid waste management, wastewater management, infrastructure and other facilities.

Revenue Sources

The city appropriates its yearly budgets based on income generated from tax and non-tax revenues, including its share of the Internal Revenue Allotment (IRA) from the national government. The city collections for the general fund have been increasing annually, from PHP 1,146,216,504.31 in 2012 to PHP 1,515,289,894.85 in 2016. Increase in annual collection ranged from 4% to 11% between the years 2012 to 2016, while IRA dependency was between 39% to 43% for the same period.

Part C: Financing Mechanisms for Sanitation in Baguio City

Section 1: Sanitation in Baguio city

1.1 City Population and Population Growth

With a 2015 population of almost 350,000, the city continues to grow at a 1.54% growth rate. The PSA defines population as 'the total number of individuals in a territory at a specified time. It covers both nationals and aliens, native and foreign born persons, internees, refugees and any other group physically present within the borders of a country at a specified time. In assembling national demographic statistics for publication, the basic aim has been to obtain data for the physically present (or de facto) population rather than for the legally established resident (or de jure) inhabitants.'

It is noteworthy, however, to see a decreasing trend in the population growth rate, with the rate of 3.26% in censual years 1990-2000 decreasing to 1.54% in 2010-2015, as shown in Table 18. The number of households is growing, while the household size conversely is decreasing. The average household size in the city is now 3.8 people.

Population growth influences, water needs and wastewater generation, among other concerns, and provide the basis for planning better delivery of city services.

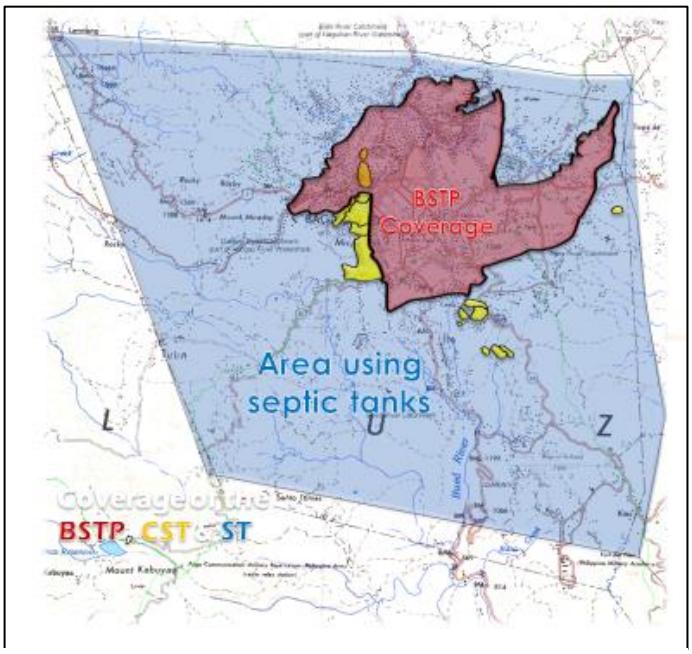
Table 18. Baguio City Population, Households and Growth Rate

Censal Date	Total Population	Number of Households	Avergae Household Size	Censal Years	Population Growth Rate, %
May 1, 1990	183,142				
May 1, 2000	252,386	52,302	4.8	1990-2000	3.26
May 1, 2010	318,676	78,313	4.0	2000-2010	2.36
August 1, 2015	345,366	89,987	3.8	2010-2015	1.54
Source: PSA					

1.2 Types of Sanitation

Wastewater in Baguio is managed by the city government itself, through the Wastewater, Water and Ambient Management Division of the City Environment and Parks Management Office (WAMD-CEPMO). Wastewater management includes the use of individual or private septic tanks (PST), communal septic tanks (CST) and a sewerage system. The coverage of each is roughly depicted in Fig. 11.

Figure 11. Coverage of the BSTP, CST and ST CONNECTIONS TO THE CITY SEWERAGE SYSTEM



Source: WAMD-CEPMO

Baguio is one of the very few cities in the country with a sewerage system. Its Baguio Sewage Treatment Plant (BSTP), designed as an activated sludge system, was built primarily to treat wastewater collected by a sewer network covering the central business district (CBD). The CBD is a mix of commercial, institutional and residential structures. The construction of the BSTP was made possible through a grant from the government of Japan (GOJ) at a cost of Y1.576B as of the treatment plant's handover in 1986. Further grants from the GOJ were given for sewer mains and other projects in the years 1993-1994, that amounted to Y1.1218B. The grant received by the city totaled to Y2.6978B, as of the formal turnover in May, 1994. The city continues to do its counterpart share of installing new and rehabilitating old sewer pipelines to collect as much wastewater generated within the CBD, for proper treatment at the BSTP. Recently, the city acquired sludge dewatering equipment and a siphon truck. By mid-2018, it is set to install and operate a small septage treatment plant within the BSTP's 1-hectare compound.

Based on data gathered from WAMD-CEPMO, the list of 129 barangays was identified as either being: 1) sewered and connected to the BSTP, 2) using PSTs, 3) partially sewered (connected to the BSTP) and partially using PST and 4) connected to a CST. Table 19 below roughly estimates percentages of coverage of each sanitation type used. Each of the 129 barangays were identified as having either of the four sanitation types mentioned; the number of households using a sanitation type were summed up. The number of households per barangay and average household size were based on the PSA 2015 population survey data. Table 19 shows that about 28% household population equivalent in 51 fully-sewered and 15 partially-sewered barangays is connected to the sewerage system. This is much greater than the national percentage of 3.2%.

Individual and Communal Septic Tanks

Communal Septic Tanks

Since the city sewer network covers only the CBD, areas outside its scope use onsite treatment systems: 1) PST and 2) CST. There are currently 12 CSTs that each serve from a few to a hundred households. The CST volumes range from 10 m^3 to 230 m^3. All but one CST are overloaded and dispose their effluents to either a waterway or a drainage canal. The government funded the construction of the CSTs, including main collecting sewers; costs to connect to the main pipes are by the concessionaires. The city continues to maintain these CSTs. The land on which 10 CSTs were built are government-owned, while two are built on private lots, however there are a few CSTs that have been built over by residents.

As per Table 19, an equivalent to 5% of the population is connected to the 12 CSTs. A house-to-house survey completed between 2008 to 2015 attempted to identify connections to the CSTs through dye-tests. This city-wide survey was made possible through the Benguet Electric Cooperative (BENECO)-LGU Baguio partnership

project, entitled 'the Inventory of Sewer Connections and Other Treatment and Disposal Systems.' Input of surveyed data are yet to be completed in a GIS platform.

Private Septic Tanks

Private septic tanks are still predominantly used, since sewer lines are only found in the CBD. The financing, design, construction, installation and maintenance of STs are the owners' responsibility. Owners get the services of engineers and contractors for this purpose. The older STs usually have a two-chambered design, where the second chamber is a leaching chamber. Other STs have a sealed two-chamber design, but have effluents that drain to a drainage canal or to a water body. The City Buildings and Architecture Office (CBAO) now require a one-day retention, three-chambered, sealed septic tank for structures that cannot connect to the sewerage system. The ST walls are generally made of hollow blocks that is plastered. Currently, regular septage desludging is not mandated. The city environment code mentions a desludging frequency of 3 to 5 years, however there is no mention of how, by which entity, and at what cost regular desludging should be undertaken. Mechanisms of the city-wide desludging operation are yet to be made.

Table 19. Estimated Coverage of Each Sanitation Type

Sanitation Type	No. of Households (Based on 2015 PSA HH data)	Population equivalent (based on 2015 PSA average HH size of 3.8)	% of total 2015 City Population
Sewered and connected to the BSTP (51 fully sewered and 15 partially sewered barangays)	24,764	95,043	28%
Use of Private Septic Tank, PST (53 barangays fully using PSTs and 15 Barangays partially using PSTs)	60,663	232,822	67%
Connected to a Communal Septic Tank, CST (10 Barangays)	4,559	17,497	5%
Totals	89,986	345,362	100%

Note: Figures may not add up due to rounding off

Table 19 shows that the private septic tank is used by an estimated 67% of the total households. There is no complete information on whether these PSTs have been desludged, and if desludged, at what frequency. The only source of data that can be used is the recorded data of disposed septage at the BSTP by accredited septage haulers.

Table 20. Summary of Septage Disposed at the BSTP by Private Haulers 2012-2016

BAGUIO SEWAGE TREATMENT PLANT SEPTAGE DISPOSAL BY PRIVATE HAULERS 2012 - 2016											
	HAULERS	2012		2013		2014		2015		2016	
		VOL (cu.m.)	AMOUNT (Php)	VOL (cu.m.)	AMOUNT (Php)	VOL (cu.m.)	AMOUNT (Php)	VOL (cu.m.)	AMOUNT (Php)	VOL (cu.m.)	AMOUNT (Php)
1	Action Agad	152	45,600.00	336	100,800.00	268	80,400.00	226	67,800.00	218	65,400.00
2	Benny Tami-ing	412	123,600.00	268	80,400.00	236	70,800.00	504	151,200.00	400	120,000.00
3	Federal Management & Maintenance	56	16,800.00	38	11,400.00	44	13,200.00	46	9,000.00	8	2,400.00
4	Marks Pusonegro Works							192	58,800.00	368	110,400.00
5	Mines View Park Hotel Sanitary Services			22	6,600.00	88	26,400.00	110	33,600.00	120	36,000.00
6	Pal-og Atiwag	278	83,400.00	337	101,100.00	135	40,500.00	66	19,800.00		
7	PNB	342	102,600.00	318	95,400.00	196	58,800.00	116	36,000.00	30	9,000.00
8	Quick Fix	672	201,600.00	714	214,200.00	672	201,600.00	476	119,400.00	650	195,000.00
9	R & R Management			44	13,200.00	342	102,600.00	442	157,800.00	434	130,200.00
10	Yanganot Pozonegro							226	67,800.00	266	79,800.00
	TOTAL	**1,912**	**573,600.00**	**2,077**	**623,100.00**	**1,981**	**594,300.00**	**2,404**	**721,200.00**	**2,494**	**748,200.00**
Note: All the above figures are based on manifest forms and corresponding gate passes ISSUED for the period covered											

From WAMD-CEPMO

There are currently ten accredited septage haulers, and four of them are specific-purpose haulers (i.e. haulers 3, 5, 7 and 9 in Table 20). These specific-purpose haulers handle septage only from their hotel or pay-restroom business or their own commercial business, and do not accept hauling from other establishments or residences. Discounting septage volume hauled by these specific-purpose haulers, the total septage volume hauled in 2016 by the six other haulers total to 1,902 m^3. If the average volume hauled from one client is about 2 m^3, the total hauled septage in 2016 will then approximate to 951 unique clients served by the six haulers. If it is assumed that one client is associated to one household, then only 951 (or 1.6%) of 60,663 households using PSTs, may be presumed as having regulated emptying, while the remaining 98.4% do not avail emptying services.

No Sanitation

The table derived from WAMD-CEPMO data (Table 19) assumes 100% sanitation coverage of the city. For data on households without sanitation facilities, the PSA and Department of Health (DOH) surveys may be referred to. Each have different parameters surveyed. Table 21, as lifted from DOH's Field Health Service Information System Annual Report 2015, shows two parameters, 1) with sanitary toilet and 2) with complete basic sanitation facilities. It may be deduced that 0.35% and 2.02% are without complete basic sanitation facilities and without sanitary toilets, respectively. The base number of households is from DOH's own estimated number of households and not necessarily based on PSA's population survey data. Those without sanitation facilities are assumed to be using others' toilets, or possibly practicing open defecation.

Table 21. Households with Sanitary Toilet and Households with Complete Basic Sanitation Facilities

Area	HHs with Sanitary Toilet		HHs with Complete Basic Sanitation Facilites	
	No.	%	No.	%
Philippines	16,073,218	84.18	13,013,214	68.15
NCR	2,388,244	110.32	2,390,995	110.45
CAR	284,438	83.95	179,255	52.91
Baguio City	58,586	97.98	59,586	99.65

Source: DOH, 2015

On the other hand, there is the PSA 2000 and 2010 survey data related to sanitation, shown in Table 22. Nine kinds of toilet facilities or sanitation types were considered. Assuming the categories closed pit, open pit, others and none fall under 'no sanitation', these total to about 1.8%, which is within the range of DOH's 0.35% to 2.02% estimate. This PSA survey is based on 20% sample households. Definitions of categories used by the PSA survey can be found on the PSA website.

Table 22. Households by Kind of Toilet Facility in Baguio City

Year	Total No. of Households	Water-sealed sewer septic tank used exclusively by households		Water-sealed sewer septic tank shared with other households		Water-sealed other depository used exclusively by household		Water-sealed other depository shared with other households			
		No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**		
2000	53,302	**38,749**	72.7%	**8,492**	15.9%	**n/a**	n/a	**n/a**	n/a		
2010	78,313	**61,660**	78.7%	**13,168**	16.8%	**1,196**	1.5%	**1,135**	1.4%		
Year	Total No. of Households	Other Depository Public Water - sealed		Closed pit		Open Pit		Others		None	
		No.	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**	**No.**	**%**
2000	53,302	**890**	1.7%	**972**	1.8%	**1,321**	2.5%	**159**	0.3%	**41**	0.1%
2010	78,313	not included in 2010 survey		**658**	0.8%	**658**	0.8%	**183**	0.2%	**72**	0.1%
Note:Figures are based on 20% sample households. Details may not add up due to rounding off											
Source: PSA-CAR, 2010											

1.3 Breakdown of Types of Sanitation for Commercial, Institutional and Industrial Structures

There is currently no readily available source of data for the breakdown of types of structures and relative sanitation type employed. When completed, the GIS-based system resulting from the BENECO-LGU Baguio survey will by then be able to generate such types of breakdown.

It is to be noted, however, that most of the offices, schools, hospitals, factories, shops, transport stations and other such commercial or institutional buildings, are located within the CBD, and more likely than not, have acquired a business permit to operate. As of March 2016, there were 14,846 approved business permit registrations. In the process of obtaining or renewing yearly a business permit, the structure the business operates in is monitored by a WAMD-CEPMO personnel with respect to wastewater management. However, there is no readily available detailed data on the type of sanitation employed by each of these businesses. It is noteworthy that sewerage payments made by these businesses compose a large bulk of the total sewerage fees collected by the city annually, and there are many concessionaires from residential areas that do not dutifully pay sewerage fees.

The city is host to the Baguio City Economic Zone (BCEZ). The BCEZ manages its own wastewater collection and treatment facilities.

Other On-site Toilets with Regulated Emptying Services

There are seven pay restrooms recorded in the list of businesses at the city licensing division. These are found in the market area and in tourist spots within the city. These restrooms are either connected to the city sewer line or have individual septic tanks that are desludged as the need arises.

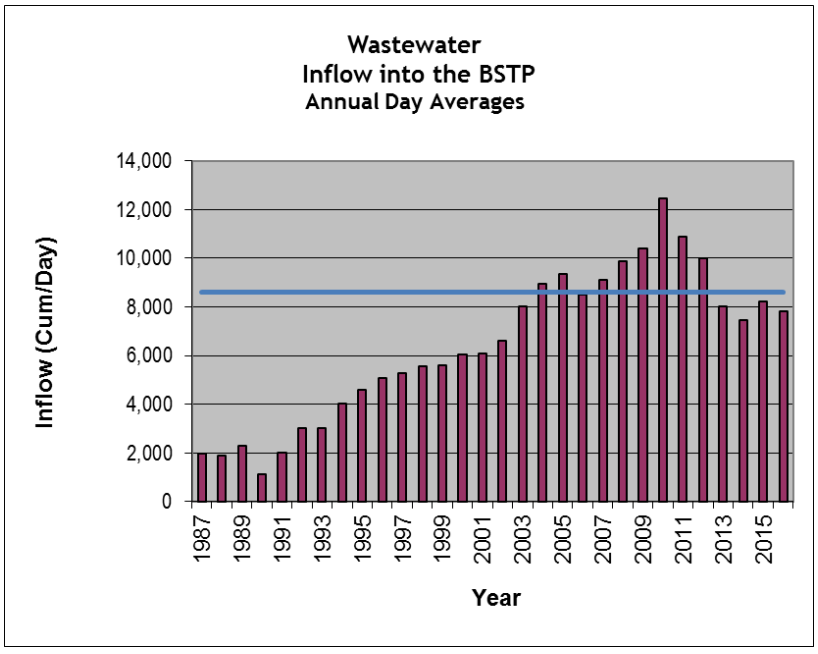
1.4 Historical Trends in Sanitation

Since it began its operation in 1986, connections to the sewer system grew from a few hundred to 10,052 concessionaires/applications at the close of the 2016 year. This is mostly due to City Ordinance (CO) 98 s. 1995, an ordinance on Maximising the Utilization of the BSTP. An ordinance was needed to compel connections to the sewer lines since people were at first hesitant to connect and pay sewerage fees. Applications for legal connections to the sewer network has grown as people now see it more economical to pay sewerage fees than to have their septic tanks desludged frequently. Further, during the city-wide survey, a number of illegal tapping operations to the city serwerline were discovered. Owners were told to apply to legalise their connections.

The BSTP has now been operating for 31 years. Inflow volume has increased over time, and is now operating more or less within its design capacity of 8,600 m^3/d (Figure 12). Some pumps have been replaced but generally, most of the original pumps, motors, aerators and other mechanical equipment are still running. A sludge dewatering system is the only additional equipment added to the BSTP since 1986.

The pipe network continues to be added to yearly and the rehabilitation of dilapidated pipes is also allocated for annually. The expansion of the BSTP is planned and the city is hoping to get approval of a partial grant under the National Septage and Sewerage Programme (NSSMP). The city is also currently making its Sanitation Safety Plan through a partnership with DOH and the WHO.

Figure 12. Inflow to the BSTP(WAMD-CEPMO)



Tariffs related to sewer connection have been increased in 2016, after 13 years of fixed rates. Increases ranged from 0% to 200% on sewage fees per toilet or per toilet bowl, depending on the type of establishment. Sewerage tariffs cannot be made on volume-basis, as the city and the BWD have not had earnest talks on the matter as yet.

From one communal Imhoff tank construction in the 1950's, there are now 12 CSTs existing. PSTs are still the sanitation type of choice in areas outside the sewer network coverage area. Whereas before, PSTs had a leaching chamber, or even bottomless design, the required design now is a three-chambered sealed septic tank.

In the past, there were reports of unregulated septage hauling and disposing of septage indiscriminately. With the acceptance of the disposal of collected septage into the BSTP, the number of registered private septage haulers increased. The number of reported PSTs desludged and volume of septage hauled has therefore increased. A small-sized septage treatment plant will be built in the coming months to allow the separate treatment of septage within the compound of the BSTP. WAMD-CEPMO is in the process of planning mechanisms on imposing the regular desludging of PSTs in the city.

Constituents and barangay officials are now much more aware of sanitation issues. In 2011, WAMD-CEPMO launched a programme called "SALAKNIB TI WAIG", or Guardians of the Waters. Though the programme focused on river protection against pollution, much of the advocacies were related to sanitation. This programme is supplementary to the regular programmes and activities of the sanitation division under the Health Services Office (HSO) of the City. The HSO has functional district health and sanitation teams that monitor sanitation conditions in barangays. Data is reported to the DOH national office. In effect, due to collective action among WAMD, HSO and the barangays, sanitation awareness and sanitation issues reported at the barangay level and at city level have grown.

Prior to the construction of the BSTP, Baguio City was sued by the downstream municipality of La Trinidad for polluting the Balili River. Sewer pipes built during the American time (1950's) disposed into the river without treatment. La Trinidad, called the "Salad Bowl of the Philippines", has agricultural areas that use Balili River as one of its irrigation sources. Vegetables and strawberries are produced here and marketed all over the Philippines. With the BSTP, wastewater collected by the city sewer network is now treated before its disposal to the Balili River. The water quality of the Balili River, however, still remains polluted due to indiscriminate wastewater disposal from residences, commercial structures, piggeries and other sources.

Sanitation remains to be fully incorporated into the city's agenda, plans and policies. Sanitation-related issues have been included in accomplishments of politicians, or in politicians' platforms during election campaign periods. Increase in tariffs, however, is usually avoided by politicians. The Tax Ordinance (TO) on 'Rationalizing the Payment of Sewerage Fees for the Maintenance and Operation of the Sewerage System of the City of Baguio' (TO 04 s. 2003) was passed in 2003. The 2016 council approval of the City Environment Code or CO 18 s. 2016 (Annex C) was welcomed by WAMD-CEPMO and the City Budget Office as it gave support to wastewater management policies and approved the increase in tariffs meant to help augment subsidies for wastewater operations.

1.5 City Plans to Achieve 100% Sanitation Coverage by 2035

In 2015, the city was beneficiary to a US$200 thousand grant by the Cities Development Initiative Asia (CDIA), through the Asian Development Bank (ADB), for a Pre-Feasibility Study on Green and Integrated Wastewater Management (PFS GIWWM) covering the years 2015-2035. The PFS GIWWM outlined short, and medium-term plans for wastewater management in the city. Sector targets are as shown in Table 23, projecting 100% sanitation coverage will be achieved by 2035.

Table 23. Wastewater Management Sector Targets

Indicator	How Measured	Measured By	2015	2020	2025	2030	2035
Sewerage Connections	Master Plan updates data then by GIS & connection fees	WAMD, Water District & City Finance Office	15%	25%	50%	70%	100%
Wastewater Treated	By inflows at WWTPs – already measured	WAMD	33%[1]	50%	70%	85%	100%
Septage Treated	Already measured by WAMD	WAMD	20%	100%	100%	100%	0%[2]

[1] This assumed only wastewater reaching the WWTP is treated, not at septic tanks.

[2] With all houses connected to the sewerage system, there will be no septage.

From CDIA, 2016

The city is currently studying how to incorporate the PFS GIWWM results into its city development plans, annual infrastructure plans and budgets. It is also in the process of getting the city council's approval of the city's application to be beneficiary to roll-outs of the National Septage and Sewerage Programme (NSSMP). The city has so far only sent a letter of intent to the Department of Public Works and Highways (DPWH), the national department overseeing implementation of the NSSMP. The NSSMP will give a 40% grant to highly urbanised cities (HUC) proposing projects related to septage management and sewerage systems.

Meanwhile, annual allocations for sanitation-related development projects continue. The GIS-based system being completed will give a more reliable database of sewerage concessionaires and types of sanitation systems used by structures in the city.

Section 2: Financing of Sanitation in the City

2.1 Four Most Important Types of Sanitation

The four types of sanitation seen to be most important to the city are:

1. Building sewers connected to the city sewerage network. It is important to the city to gain a more complete database of the piping system and all concessionaires connected to the sewer system. Rehabilitation work and new pipe installation will be guided by this database, as it is important for the city to monitor and prevent leakages to prevent pollution. The database will be the basis for collecting tariffs from those who benefit from the service.

2. Building sewers connected to the CSTs and building sewers directly disposing to drainage canals or waterways. Information on structure connections to the CSTs will help the city assess how to alleviate the overloaded CSTs. Collection of tariffs can be tricky as treatment by the CSTs is not sufficient to pass effluent standards set by the DENR. Likewise, there is concern on building sewers disposing of untreated wastewater to drainage canals and water bodies. There are drainage inlets that emit foul odor, for example, at the CBD, which are caused by the illegal disposal of wastewater into the storm drainage system. Direct disposal to waterways are causing BOD levels to elevate and therefore pose the threat of pollution to water resources.

3. Septic tanks with regulated emptying services. The increase in PSTs being desludged is a positive sign that people are beginning to realise the necessity of regular desludging and are willing to pay for desludging services. The current services of private haulers will provide input to formulating mechanisms for a city-wide septage management programme.

4. Septic tanks with unregulated or no emptying services directly disposing to drainage canals or waterways. The pollution caused by this indiscriminate disposal of wastewater and septage into waterways has been a source of conflict with municipalities downstream. Septage management, therefore, has been on the fore of WAMD-CEPMO's agenda, in the hope of revitalising polluted waterways.

2.2 Capital Costs and Running Costs of Sanitation Types

The BSTP and sewer mains were provided through a grant by the Government of Japan for a total of 2.6978 billion Yen as of 1993 (Table 24). The budget for the construction of additional laterals and branches, the rehabilitation of the sewers and other implements needed to maintain and operate the sewerage system, are allocated annually by the city. From 2010 to 2017, WAMD-CEPMO has been receiving between 1.87% to 6.53% of the city's total budget to cover capital costs and running costs for wastewater management (Table 25).

Table 24. Grants from the Government of Japan

PROJECTS IMPLEMENTED THRU GRANTS FROM THE GOVERNMENT OF JAPAN		
DATE COMPLETED	DESCRIPTION	AMOUNT in Billion Yen
March 1986	Construction of the BSTP	1.576
January 1993	Rehabilitation of City Sewerline (Phase I)	0.484
January 1994	Rehabilitation of City Sewerline (Phase II)	0.63
March 1994	Follow-up Projects	0.0078
TOTAL		**2.6978**

Source: WAMD-CEPMO

Concessionaires shoulder all costs to connect their building sewer to the nearest city manhole, including shouldering maintenance costs of this connection.

WAMD's budget is broken down into personnel services (PS), maintenance and other operating expenses (MOOE), capital outlay (CO) and development projects that are part of the Annual Investment Plan (AIP). Allocation for development projects are not fixed and depends on the priorities of the budget year vis-à-vis the exigency of projects.

From the same Table 25, WAMD has had annual budgets ranging from about PHP 24 Million to about PHP 82 Million for the years 2012 to 2017. The 2012 development project allotment includes PHP 50 Million for a sequential batch reactor (SBR) meant to increase the BSTP capacity. It remains unspent, however, as the city awaits grants from the NSSMP.

Sewerage-related collections include sewer fees and surcharges mostly from commercial businesses. Only residents who regularly pay annual real estate taxes are required to provide sewerage fees since payment of the latter is a prerequisite. There are many residential sewerage concessionaires who do not pay sewerage fees. A revenue source that is increasing yearly comes from septage disposal by accredited septage haulers (Table 20), from about PHP 575,000 in 2012 to PHP 750,000 in 2016. The sale of dried sludge as a soil conditioner is another source of revenue. Table 26 shows that in 2013, some 850 sacks of dried sludge were sold to farmers at a total amount of PHP 17,000. Sales have been decreasing, but with the dewatering equipment, the city aims to produce compost-quality bio-solids and sell these at a much higher price. The city mayor has also instructed the parks division to use the treated sludge in the parks to patronize this by-product and lessen the city's fertiliser expenses. Testing of treated sludge quality and suitability for agriculture is yet to be programmemed.

Table 25. WAMD-CEPMO Allocation in City Annual Budget

Particulars	2012	2013	2014	2015	2016	2017
Annual Budget	1,018,242,000.00	1,126,143,000.00	1,279,582,000.00	1,341,510,000.00	1,458,910,000.00	1,546,213,147.00
WAMD Budget for Fiscal Year (includes development projects)	66,464,109.00	25,032,147.48	23,965,317.25	51,466,678.00	46,616,745.00	81,701,518.00
PS	15,964,109.00	6,348,540.00	6,405,624.00	10,149,906.00	11,278,000.00	12,433,300.00
MOOE		5,183,607.48	5,103,693.25	12,460,772.00	10,338,745.00	17,632,268.00
CO			3,056,000.00	3,500,000.00	15,000,000.00	5,565,950.00
Development Projects	50,500,000.00	13,500,000.00	9,400,000.00	25,356,000.00	10,000,000.00	46,070,000.00
WAMD Share of General Fund (GF), %	6.53%	2.22%	1.87%	3.84%	3.20%	5.28%
Source: City Budget Office						

Table 26. Dried Sludge Sales

BAGUIO SEWAGE TREATMENT PLANT SUMMARY OFSALES OF DRIED SLUDGE 2012 - 2016										
MONTH	2012		2013		2014		2015		2016	
	No. of Sacks	AMOUNT (PHP)	No. of Sacks	AMOUNT (PHP)	No. of Sacks	AMOUNT (PHP)	No. of Sacks	AMOUNT (PHP)	No. of Sacks	AMOUNT (PHP)
TOTAL	**770**	**15,400.00**	**856**	**17,120.00**	**761**	**15,220.00**	**346**	**6,720.00**	**205**	**4,100.00**
PHP20/sack; 1 sack = 25 kg (approximate)										
Source: WAMD-CEPMO										

The CTO disaggregates its collections into either the General Fund, Special Education Fund or the Trust Fund. Sewerage fees are accrued to the General Fund. A summary of sewerage-related collections in Table 27 shows the city is able to collect between PHP 13 Million to PHP 17 Million annually. Tariffs are based on tax ordinance 04 s. 2003, of which rates have been updated through the City Environment Code (CO 18 s. 2016), excerpts of which are shown in Annex A. During the years 2012 to 2015, sewerage-related collections contributed about 0.99% to 1.28% of total annual city general fund collections.

Table 27. Sewerage-Related Collections by the City Treasurer's Office

City Treasurer's Office (CTO) Collections Related to the Sewerage System, PHP					
Descriiption	2012	2013	2014	2015	2016
Sewer Certificate Fees CEPMO/PUSO Account Code 654-7	1,567,983.50	1,673,705.00	3,062,900.00	585,150.00	No breakdown available due to migration to a new computer system
Sewerage Fees Account Code 658-3	11,447,430.29	12,207,275.24	14,167,883.63	13,508,852.08	
Sewer Connection Fees (Renamed Sludge Fees in 2014) Account Code 658-4	129,850.00	90,150.00	3,210.00	340,280.00	
Sewer Penalties Account Code 729-2	14,080.97	23,242.65		3,361.53	
Totals	**13,159,344.76**	**13,994,372.89**	**17,233,993.63**	14,437,643.61	
% of Total General Fund (GF) Collection	**1.15%**	**1.10%**	**1.28%**	**0.99%**	
Source: CTO					

A comparison between annual sewerage-related collections and WAMD allocations for expenditures show that wastewater management is highly subsidized by the city. All collections received by the office of the city treasurer is pooled into a General Fund (Table 28), then apportioned to budgets of city departments for use in the proceeding year. Funding for wastewater management is not ring-fenced, as the city does not currently consider sanitation–related services or wastewater management an economic enterprise, but rather a basic service it must provide for the general welfare of its constituents. The city believes that it should subsidise basic services, to a certain extent, rather than aim for full cost recovery.

Tariff collection is low because majority of those who pay sewerage fees are only those who process yearly business permits and those who regularly pay real estate taxes, since updating sewerage payments is a prerequisite to paying real estate taxes. Sewerage concessionaires who are connected to the sewerage system but do not have businesses or do not pay real estate taxes have not been paying annual sewerage fees, yet continue to be beneficiaries of the service.

Table 28. Sources of City General Fund

City Annual Budgets 2012-2017, PHP						
Fund Type	2012	2013	2014	2015	2016	2017
Internal Revenue Allotment	441,527,000.00	451,533,000.00	501,567,000.00	569,280,000.00	625,000,000.00	700,548,147.00
Non-Tax and Tax Revenue	576,715,000.00	674,610,000.00	778,015,000.00	772,230,000.00	833,910,000.00	845,665,000.00
Total General Fund	**1,018,242,000.00**	**1,126,143,000.00**	**1,279,582,000.00**	**1,341,510,000.00**	**1,458,910,000.00**	**1,546,213,147.00**
IRA Dependency Ratio	43%	40%	39%	42%	43%	45%
Source: Approved City Annual Budgets						

The city has no existing loans whatsoever and operates only within the General Fund, consisting of the internal revenue allotment (IRA) from the national government and local tax and non-tax revenues generated annually. Its dependence on IRA ranges from 39% to 45% for the period of 2012 to 2017.

Connections to the Communal Septic Tanks and Direct Disposal to Drainage Systems or Waterways

CSTs constructed and collection pipes installed after the 1950s have been funded by the city. CST concessionaires bear the cost of connecting to the main collection pipe. Only a few of the CST concessionaires pay sewerage fees, and these are concessionaires that process business permits. For the moment, payment made by those connected to the BSTP and those connected to the CSTs cannot be disaggregated.

Maintenance works include cleaning and desludging CSTs. BOD-COD tests are also performed for CST effluents. Manual labor is used on the inspection and monitoring of CSTs and disposal to drainage canals or waterways. Maintenance of the CSTs is done by the same WAMD-CEPMO personnel who maintain the sewerage system. Expenditures related to this are integrated in WAMD's budget.

Use of Private Septic Tanks: Desludged and Not Desludged

The cost of construction and maintenance of private septic tanks are shouldered solely by the building owner. Desludging frequency is recommended to be in 3 to 5 year intervals. Regular desludging, however, is uncommon as it is not mandated, nor regularly monitored. Moreover, owners would like to avoid paying desludging fees that would cost at least PHP 5,000 per load of 2 m^3. Owners generally find ways to drain their septic tanks illegally into canals or waterways.

WAMD-CEPMO used to do septage desludging services, but discontinued the service when its 31-year old siphon truck was declared to be un-roadworthy. Accredited private desludgers/haulers now perform the service for a fee they determine on their own. The fee for the disposal of septage at the BSTP by accredited haulers is now PHP400 per cubic metre, an increase of PHP 100 from the old tariff of PHP300.

Should WAMD once again perform desludging, new tariffs are set PHP 4,000 for the first 2 m^3 and an additional PHP 600 to PHP 800 for each m^3 in excess of 2 m^3, depending on the PST's distance from the BSTP (Annex C). PSTs are not individually monitored and overflows are known only when complaints are made.

Should the city be able to craft mechanisms for septage management, mandated desludging of the remaining 98.4% unserved households will generate revenue for both the city and private haulers for every 3- to 5-year desludging cycle.

Aside from the above, the city is planning to push through with talks with the Baguio Water District for: a) a possible tie-up on a revenue-sharing scheme for the collection of sewerage fees by BWD, which shall be proposed to be based on water consumption, and/or, b) the possible take-over by BWD of the management of

wastewater in the city. LWUA, the national overseer of water districts, has started interviewing the city and BWD regarding item b.

The GIS-based database, when completed, will be key to better planning and decision-making, as information on concessionaires, sanitation type employed, condition of treatment systems and other such relevant and comprehensive sanitation data will be made available.

2.3 Financing of Plans

The PFS-GIWWM estimated costs to attain the targets of 100 % sanitation coverage by 2035 (Table 29). Table 30 shows the sources of funds to finance the projects needed to attain this goal. The city's share/equity is 51%, while it is anticipated that the NSSMP and the DPWH will cover 31% and 18% respectively.

Table 29. Proposed Investment Program Outline Cost Estimate

Cost Components (All costs in PHP million)	Total	% Distribution	Short-term	Medium-term
Wastewater Management	4,328	71%	1,579	2,749
Drainage & Flood Control	1,059	17%	577	481
Total Construction Cost	**5,386**	**89%**	**2,157**	**3,230**
Capacity Building	5	0%	5	-
Project Management Support	681	11%	299	383
Total Project Cost	**6,073**	**100%**	**2,460**	**3,613**

From CDIA, 2016

The proposed sources of funds related to wastewater management are the NSSMP grant fund and the city's counterpart, which will come from the general fund. Based on the high capital investment costs needed, the city is open to Public Private Partnerships (PPP) which allow plans to be formalised. The city council has previously approved an ordinance to allow the city to enter into PPPs as the need arises.

Table 30. Proposed Investment Program Outline Financing Plan

Sources of Funds	Total	% Total	Short-term	Medium-term
City Counterpart Fund	3,091	51%	1,181	1,910
NSSMP Grant Fund	1,858	31%	676	1,182
DPWH Budget Allocation	1,123	18%	603	521
Total Project Cost	**6,073**	**100%**	**2,460**	**3,613**

From CDIA, 2016

Section 3: Institutional and Policy Aspects

3.1 Decision-Making and Policy

Decision-Makers for Technical Types of Sanitation Services in the City

Building permits are issued by the City Buildings and Architecture Office (CBAO). CBAO's review of building plans encompasses the sanitary plans of the structure to be built. Currently, a three-chambered sealed septic tank design is required by CBAO as the minimum design for onsite wastewater treatment. As WAMD, a division of the City Environment and Parks Management Office (CEPMO) handles the maintenance and operation of the sewerage system, all building plans have also to pass through WAMD-CEPMO for an assessment of a possible connection of the building sewer to the city sewer line.

On the other hand, all technical matters, including planning related to the sewerage system, CSTs and other off-site sanitation services, emanate from discussions among concerned WAMD engineers, but the final decision-making responsibility lies with the WAMD chief. WAMD engineers conduct research on technical designs by networking with experts and soliciting proposals from technical personnel of design firms and technology and equipment suppliers.

The WAMD chief initiates plans and programmes and proposes the same to the CEPMO department head, who in turn defend the plan and relative budget to the Local Finance Committee (LFC) during the budgeting period. There is no guarantee that all department-proposed projects will be funded in the upcoming year, and budgeting depends on priorities set for the preceding year. The current WAMD chief and the CEPMO department head are strong and are known to be adamant in campaigning for WAMD PPAs.

Impact of National Laws

The Philippines has a number of laws and policies related to sanitation. Annex 4 of the PSSR (DOH, 2010) and studies like that of ECLEI in 2012, catalogue the numerous laws and policies. The Sanitation Code of the Philippines, or Presidential Decree (PD) 856, prescribes rules and regulations on water supply, collection and treatment of wastewater, septage management, noise pollution and other sanitation-related matters. Provisions relate to control, design - though not in detail, frequency of tests, limits and standards. There is also the Plumbing Code of the Philippines and the National Building Code, which contain sanitation-related provisions. The many sanitation-related laws and regulations are fragmented and need to be reviewed and harmonised for better local planning and more effective local implementation by LGUs.

Typically, national laws have good provisions and penalty clauses, but do not mention funding plans for the implementation of programmes. There exist certain ambiguities and overlaps in functions, may be reasons for agencies or LGUs to not take it upon themselves to prioritise the allotting of funds to implement their mandates on sanitation.

Older national laws also lack communication and awareness components. LGUs expected to implement laws therefore do not have a high awareness of their responsibilities. The PSSR is built upon existing sanitation-related laws and should have been disseminated to LGUs nationwide, yet at the time of this research, the WAMD-CEPMO of Baguio was unaware of the PSSR. This may imply that dissemination of the PSSR was not intensively carried out by the national government.

Local government units (LGUs) commonly localise, by way of an ordinance, provisions of national law that are applicable to their situation and include provisions on how to fund the implementation of such ordinance. Subsequently, the LGU department in charge of implementing such law, on sanitation for example, takes it upon itself to include, in its budget, necessities to implement sanitation plans, programmes and activities (PPAs) to be able to comply with such law. LGUs lacking sufficient budget, however, struggle to implement such laws.

Baguio City has been doing its sanitation activities and making its wastewater management plans and programmes based its own targets, largely because it is one of the very few cities outside of the Manila metropolitan zone that has a sewerage system. However, Baguio - and all other LGUs for that matter - should still align their sanitation plans and programmes with the PSSR in order for national targets to be achieved. In relation to national directives on Climate Change, Baguio's climate proofing programmes have included drainage and wastewater management.

It is notable that LGUs establish plans and programmes when a legal basis exists. The main regulatory function emanates from the national government, but there is a gap in downloading national laws to the LGUs. Policies, therefore, are not fully implemented nationwide.

Furthermore, national laws generally lack compliance monitoring and reporting mechanisms, including the identification of an office that shall store and analyse data gathered through these mechanisms. Collected data is important for making an integrated assessment of not only the progress and achievements made by the implementation, but also the assessment of the sufficiency or insufficiency of finances in the effective implementation of such law.

Some of the sanitation-related laws are also not updated to consider current situations and technologies. These newer technologies may require different costings, which should be considered where applicable in financing sanitation programmes.

NATIONAL RESEARCHES

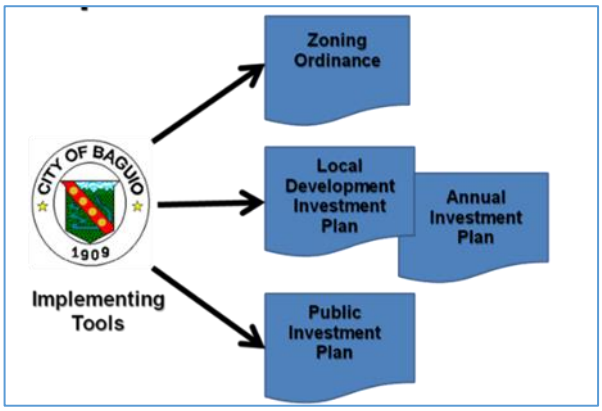
Most of the papers encountered for this study were of national scope and completed in collaboration with, and funding by agencies like the World Bank and AUSAid, ECLEI, WHO and ADB. Studies covered the country's existing governing policies and programmes, the state of sanitation, economic returns, identifying investment plans and programmes, service delivery assessment among others. These studies were made as far back as 2011 to as recently as 2016, and are listed on the 'Reference' page.

3.2 Planning for Sanitation

City Plans

The city has incorporated its sanitation-related plans within its Comprehensive Land Use Plan (CLUP) 2013-2023. The CLUP lists priority sectoral PPAs for liquid waste management that include infrastructure projects for additional communal septic tanks, expansion of the BSTP, a mini-wastewater treatment plant, rehabilitation of old sewers and installation of new sewer pipes, among others. The city, through the CPDO, makes Local Development (medium-term) Investment Plans (LDIP) that include PPAs on wastewater management. Annual Investment Plans (AIP) are supposedly aligned with the LDIP (Fig. 13). However, as to how wastewater and sanitation-related investments will translate to achieving city MDGs, SDGs and other city sanitation targets is not distinctly defined in the plans.

Figure 13. Implementation Mechanism (CPDO)



Although there is an absence of a city sanitation plan, the Green and Integrated Wastewater Management (GIWWM) pre-feasibility study commissioned by the CDIA is currently the city's guide in planning for Baguio City's sustainable sanitation and wastewater management covering the years 2016-2035.

As per Lacsamana, 2017, the purpose of the GIWWM project is to provide LGU Baguio with sufficient information to make decisions on the most appropriate actions for providing sustainable, improved and affordable sanitation and wastewater management. The overall objective of the GIWWM Project is to minimise the City's vulnerability and fragility to hazards (natural and man-made) by improving its wastewater and storm water management. These will be done by increasing the city's capacity in urban management and promoting private sector participation in the provision of urban services (Lacsamana, 2017).

Subprojects are to be implemented via links to existing city programmemes and promoting better cooperation between the LGU and the residents. The GIWWM project comprises of sanitation and wastewater management and a sewerage upgrading programme. Some specific subprojects include the formulation of a city wastewater master plan, the construction of septage treatment facility, the expansion of the sewage treatment plant and the replacement and construction of sewer networks. The goal is to have a sustainable improved sanitation and wastewater management that covers the entire city by 2035, as well as the restoration of Baguio City's river systems and the reduction of costs and impacts of flooding that will be brought about by extreme weather events, which are most likely to occur in the city (Lacsamana, 2017).

The GIWWM study has short-term and medium term-coverage targets. It is, however, much more focused on the structural components of wastewater management. The comprehensive wastewater masterplan to be made aims to cover all of the city's sanitation issues.

Both the CLUP and the GIWWM cite exploring and considering development complementation with adjacent municipalities in the Baguio-La Trinidad-Itogon-Sablan-Tuba-Tublay (BLISTT), a cluster of adjoining independent LGUs, with the BLISTT Framework Plan as reference. The CLUP also endeavors to be consistent with other regional and national development plans.

The 2010 Philippine Sustainable Sanitation Roadmap (PSSR) was made as a guiding tool for the development and implementation of sustainable sanitation. Its targeted outcome is the universal access to sanitation by 2028. Investment priorities for the Medium Term Development Plan, covering the years 2010-2016, are incorporated in the PSSR. DOH is currently assisting the City, as one of the pilot cities, in making a sustainable sanitation safety

plan. However, Baguio has yet to align its sanitation and wastewater plans with the PSSR and has still to formulate its city sanitation plan.

Financing

Financing schemes suggested by the GIWWM study are as mentioned in Item 2.3.

Major Obstacles

Though the city aims for 100% sanitation coverage by 2035, the current lack of a specific source of funding for the wastewater management PPAs currently offers the greatest impediment. The city has not ventured into availing loans and therefore has no existing loans whatsoever. As such, critical and large development projects are carried out in phases or deferred; a piecemeal approach is often used in financing these big projects.

From interviews with the CEPMO and CBO, there were other obstacles mentioned: 1) lack of institutional support, 2) lack of in-house technical capacity, 3) absence of a long-term city utilities plan, 4) intervening factors crop up necessitating the diversion of funds from priorities, 5) local PPP implementing mechanisms are not in place, 6) some political and cultural issues, 7) the city's reluctance to making loans.

Previous Plans: Successes and Failures

The sewerage plan for the CBD of the 1980's was completed with the aid of the GOJ grant for the construction of the BSTP and counterpart funding of pipelines by the city. Effective maintenance has kept the BSTP working for around 30 years. Ever since the tax ordinance approved the sale of biosolids was already incorporated, advocating the use of so-called 'waste' as resource. Computerisation of the pipe network and concessionaire database under a GIS platform is ongoing. Collection of user fees in the last five years, though still not with a 100% collection efficiency, has significantly increased, compared to earlier annual collections of less than PHP10 Million.

However, the city overlooked formulating a masterplan or sanitation plan to address current and future programmes for wastewater management and sanitation. As such, data related to the wastewater system have only recently been collected. There was no strategic plan to finance and upgrade components of the BSTP or replace dilapidated pipes at a point in time. Protecting or purchasing land required for CSTs, DEWATS, or for traversing pipes, was not foreseen. The plan targeting 100% sanitation coverage was not formulated until recently. Full cost recovery is also not being considered.

The city has both successes and failures, and but is now working towards holistic planning and managing for both wastewater and sanitation of the city. Communication and stakeholder involvement, upgraded service delivery, financing and cost-recovery are now being taken into account during the annual planning and budgeting period.

3.3 Operation and Maintenance

The operation and maintenance of the sewerage system and the CSTs is solely done and financed by the city government, specifically under the WAMD-CEPMO budget. Regulated PST desludging, however, is for now

beyond the capacity of the city. On-demand desludging of PSTs is currently done by ten accredited haulers. Desludging fees are not regulated and are not standardised among the haulers. Since there is growing interest by the private sector in desludging business, this may be an indication that the septage hauling business is profitable and viable, especially when regular desludging is to be mandated by the city.

3.4 Finance

Major Finance-Related Gaps and Obstacles to Sanitation in the City

The following are seen to be direct and indirect finance-related issues affecting sanitation in the city:

1. The city has no sanitation plan for which sanitation investments shall be based upon and monitored against
2. There is no coordinated planning between the city and the BWD regarding wastewater and sanitation. The city alone takes responsibility for wastewater management, while the BWD handles water services separately.
3. Incomplete data of sewerage concessionaires. Not all service users pay fees.
4. Low collection efficiency. Not all users in the current database pay tariffs due.
5. The basis of tariff fees is unsuitable as it is based on the type and/or number of fixtures, rather than the actual volume of water used or volume of wastewater generated.
6. The city has yet to fully incorporate the GIWWM-proposed investment scheme into the city's LDIP and AIPs.
7. Piecemeal funding for large projects will delay attaining targets.
8. NSSMP grant requirements are not easy to comply with.
9. The city is reluctant to avail loans, having never offered any loans.

The GIWWM, made through the auspices of CDIA, is currently the only study made that includes, among others, institutional and various financing strategies to reach 100% coverage.

The city has not used blended finance as it has been funding its own wastewater and sanitation programmes since the turnover of the BSTP by GOJ in the 90s The IRA and city revenues are the only fund sources. It is worth mentioning the participation of the private septage haulers, as they provide sanitation services in relation to PSTs. There is also the case of a private party handling the commercial business of management of public toilets in the market and tourist areas.

The GIWWM and the City Sanitation Safety plan are two samples of 'soft' components of sanitation received through a grant. The city has previously networked with the Manila Water Company (MWC) for some technical assistance and tours of MWC facilities. Currently, infrastructure, operation and maintenance costs are solely shouldered by the city government.

To increase tariff collection, the city is considering talks with BWD for a collection and sharing scheme. It will be proposed that BWD shall collect an agreed surcharge of the water bill to cover sewerage fees. For clients using PSTs, the cost of septage hauling will be made in installments, spread out to the 3- or 5- year septage desludging cycle. BWD shall get a percentage of the sewerage and septage tariffs it collects. It is also proposed that, while talks with BWD are still underway, the Barangays will collect the sewerage fees and receive an incentive of an agreed percentage of their barangay sewerage tariff collections. Furthermore, to encourage concessionaires to pay annual sewerage fees, the CTO applies a discount once the annual fee is paid early and in full.

The city is now opening its doors to PPP, as the council has approved an ordinance on allowing PPP for city projects to invite investors. The ordinance, however, needs to have implementing rules and regulations (IRR) before it is fully implemented. The city is considering turning over wastewater management to either the BWD or any entity that may interested.

To encourage the upgrading of existing undersized and/or leaching, bottomless PSTs, financing can be offered by the city, local banks or credit cooperatives to residents when they agree to replace it with more efficient onsite treatment systems (e.g. prefabricated ecotanks, jokhaso, rotaloos, etc.). Residents could perhaps also take a loan and pay the cost to connect to the sewerage system or a CST on an installment basis.

3.5 Circular Economy

Circular Economy in the City

The term Circular Economy is still new to the city and is not as yet used. However, akin to the circular economy the city is more familiar with the nexus triad of food security, water sufficiency and energy. There are also the more familiar and relatively similar terms of sustainability and climate-proofing, which are frequently used by the city in its plans.

Financing Instruments/Concepts in Relation to the Circular Economy

The city sells dried sludge or biosolidsto cut-flower and ornamental plant farmers growers, as this is considered a soil conditioner. These products are produced as by-product of the sewage treatment process at the BSTP. The city plans to purchase further equipment, called an Environment Recycling System (ERS), which will convert wet sludge into high grade compost.

The city mayor has also given a directive for employees at the city's parks to use dried sludge from the BSTPs, in order to save costs on fertilizers being purchase by the city. Sludge is provided free for use in barangay and school gardens.

WAMD-CEPMO has in plans to generate power from a micro hydro plant which may be built downstream of the BSTP effluent pipe. It is also planned that some of the effluent be used for irrigating parks at the CBD to minimise on the cost of water. Biogas generation is also being considered, but capital cost to make this possible may prove to be greater than the cost of power generated.

Part D: Analysis

Financing Gaps and Barriers to Urban Sanitation

Finance-related issues affecting sanitation in Baguio are issues encompassed by gaps previously identified in national studies mentioned in item 3.1. These include insufficient funding, the need for data collection and data banking, the need for capacity building for appropriate tariff setting and sustainable sanitation planning in Baguio. There are also similar issues raised in the national studies. More particularly, the gaps and barriers cited in the PSSR and the Urban Sanitation Review (World Bank and AusAid, 2013) are listed below:

The PSSR (DOH, 2010)

1. Lack of effective sanitation leadership
2. Absence of a national sanitation policy on investment for sanitation, promotion of pro poor financing, sanitation entrepreneurship, regulation for sanitation and wastewater
3. Numerous regulations are not integrated and updated and have no targets
4. Funding for sanitation is low; no clear identified sanitation programmes funded in the GAA; low priority given to sanitation by the national government; no clear sanitation programmes in the medium term Philippine Development Plan (MTPDP) and the Medium Term Philippine Investment Plan (MTPIP);
5. Hesitance of private sector investment due to insufficient incentives and efficiency issues

The Urban Sanitation Review by World Band and Australian Aid (2013)

1. Lack of regulation and enforcement of penalties
2. Lack of financing
3. Fragmentation of institutional arrangements; lack of institutional arrangements to support viable financing schemes
4. Lack of awareness of community on impacts of inadequate sewerage and septage management systems; lack of willingness to pay by community
5. Lack of a national sanitation investment framework

It should be noted, however, that more recent GAAs like those of the years 2013 to 2016, contain project descriptions that include keywords like sanitation, septage and sewerage, specifically under the DPWH budget. Combing through the GAA to look for sanitation-related budgets is not easy. The lack of a 'sanitation account' and monitoring system to track investments made on sanitation, including actual fund utilisation, are further gaps which need resolution.

Financial Mechanisms to Address Gaps and Increase the Flow of Finance into Sanitation

This study lifts financial mechanisms to address gaps from the 205 World Bank paper on Water Supply and Sanitation in the Philippines. Turning Finance into Services for the Future. A Service Delivery Assessment. Table 31 recommends actions to address issues that directly or indirectly relate to financing sanitation and salient action points are summarised below.

Salient recommended action points (World Bank, 2015):

1. Improve Institutional Arrangements. A lead agency must be identified or established to oversee and steer the national sanitation programme. A dedicated unit for water and sanitation be instituted within the agency to improve coordination among stakeholders down to the municipal level. Improved institutional arrangements should facilitate the implementation of the NSSMP.
2. Establish a national sanitation investment framework and mandate LGUs to formulate and implement LGU sanitation plans.
3. Establish a capacity building programme to enable successful planning, financing and implementation, and increase technical knowhow.
4. Harmonise data collection systems, standardise definition of terms, for more efficient review and monitoring.
5. Increase investments/allocations on sanitation that is inclusive of funding for the rural areas, and funding of 'soft' components.
6. Align budgeting with sanitation strategies. Plans should be supported by appropriate funding.
7. Increase local accountability and incentivise LGUs to access additional funding through matching grants by the national government. LGU plans and actions shall be monitored.
8. Create a national account for water and sanitation, disaggregated between urban and rural water and sanitation sectors, for more efficient monitoring of financial flows.

Additional suggested mechanisms:

9. Revisit, integrate and update sanitation regulations and policies to facilitate and support implementation of sanitation programmes.
10. Encourage private sector participation through attractive PPP packages.

A national sanitation investment framework and a LGU sanitation plan give clarity on what is to be achieved and how, identify who shall take the lead, and overall will provide an environment for better communication and coordination between stakeholders. Direction shall be guided by sound sanitation and investment plans that are based on harmonised sanitation regulations and supported by guaranteed sufficient funding. Regular monitoring and assessment of the implementation of sanitation PPAs shall ensure that local and national sanitation targets are met.

Financial flows are to be identified in the national sanitation investment framework and in each LGU's sanitation and investment plans. LGU fund sources will be the collection of tariffs, loans, national grants and other sources, or may originate from PPP agreements. It is anticipated that the availability of a national sanitation investment plan will attract entrepreneurs and investors to the sanitation sector.

Table 31. Sector-wide Priority Action Points

Sector-Wide: Institutions, Financing and Monitoring

- Implement new institutional arrangements including an expanded role for the National Water Resources Board as the sector regulator and its transition to a National Water Resources Management Office, and the establishment of a dedicated Water and Sanitation Unit as a lead sector agency (hosting department/agency to be identified through institutional review).
- Improve coordination mechanisms between actors at provincial and municipal levels
- Establish a national capacity building program, especially to address rural subsectors, by consolidating various initiatives already in place including the regional capacity building hubs established under DILG
- Harmonise data collection systems, standardise the definition of terms and develop a coherent sector monitoring framework
- Establish a collective platform for a multi-stakeholder review process to monitor subsector performance (for example Joint Annual Sector Reviews)
- Increase sector investment, particularly in rural areas where large disparities exist between rich and poor, as well as funding for "software", specifically for rural sanitation programs
- Align budgeting to support the implementation of long-term strategies and investment plans by public service providers, and translate these into annual work plans and budget
- Introduce key results areas for local water supply and sanitation services to increase local accountability for service improvements and incentivize LGUs to access additional funding sources including matching grants from national government and private sector sources
- Create a national account for water and sanitation, disaggregated between urban and rural to enable monitoring of financial flows towards the subsectors

Priority Actions for Urban Sanitation and Hygiene

- Establish institutional arrangements to facilitate implementation of the National Sewerage and Septage Management Program (NSSMP) and increase Local Government and Water District accountability for the coverage and quality of urban sanitation services
- Develop a sanitation investment framework and mandate local governments to adopt City Sanitation Plans incorporating measures to improve cost recovery and extend affordable services to the poor
- Adopt a cost-effective approach to investment whereby the gradual expansion of sewerage is complemented by measures to maximize connections and to improve fecal sludge management, since most households will continue using septic tanks for the foreseeable future
- Build local capacity to enable successful planning and implementation of the NSSMP

From Work Bank, 2015

Innovative and Non-Traditional Financing Instruments

For sanitation programmes to be sustainable, funding sources to continuously finance plans and programmes need to be identified. Most of those enumerated from below centre more on the value chain (waste as resource) of a treatment system's by-products which add revenue (monetising 'waste-resource'), lessen expenses or involve stakeholders in sanitation entrepreneurship:

1. Ensuring by-products from STPs, such as dried sludge (biosolids), be used in-house in LGU parks or gardens, or be sold for use as either soil conditioner, fertilizer or compost.
2. Biosolids be made food for animals.
3. STP sludge or septage from septic tanks be converted to briquettes and used as fuel.
4. Treated faeces and urine recovered separately from ECOSAN toilets can be used in agriculture.
5. Should conditions be ideal, LGUs can put up sewage treatment systems that generate biogas to be used as fuel or for the generation of power.
6. Effluent from STPs be reused in agriculture.
7. Effluent from STPs be used to generate hydropower.
8. Septage hauling fees can be collected through 'instalment' basis, where the total fee is divided by the number of months in a three- or five-year hauling cycle.
9. To increase collection of sewerage of septage fees in LGUs that handle only wastewater management and not water supply, a sharing scheme can be agreed upon with the barangay. The barangay collects tariffs house-to-house and a percentage of collections remains with the barangay. Alternatively, the water district could collect sewerage fees as surcharge over water fees and a sharing scheme between LGU and the water district can be agreed upon.
10. LGUs can give micro-loans or incentives to constituents who need to change leaching or bottomless septic tanks to better designed and constructed ones.
11. Involve private stakeholders to take part in sanitation entrepreneurship (e.g. briquette-making business, septage hauling, vermi-composting or vermi culture, septic tank upgrading or rehabilitation works, etc.).

Policies that National Government Needs to Change to Achieve Increased Flows of Finance for Sanitation

1. There should be a policy guaranteeing a certain percentage of national and agency budgets shall be allocated for sanitation programmes and projects, not unlike the GAD programme which receives at least 5% of an agency's annual budget.
2. The policies on availing NSSMP grants should be modified in such a way that LGUs can easily access the grant. The programme could perhaps fund the feasibility study that is required for LGU applications, to speed up the submission of applications. It has been six years since the NSSMP had been approved in 2011, with no beneficiaries to date.
3. National government can make a policy on an incentive scheme for sanitation entrepreneurs and investors
4. A policy is needed to include provisions mandating reuse of by-products of treatment systems, e.g. biosolids from a sewage treatment plant (STP), STP effluent, septage from septic tanks, in accordance to existing regulations available for such reuse.

Likelihood that More Finance Will Actually Flow into Sanitation

One of the current president's thrusts is to accelerate the implementation of infrastructure projects. In a working draft of the Public Investment Plan (PIP) for 2017-2022, under 'Accelerating Infrastructure Development', about PHP10.480 billion is earmarked for 'sewerage systems and management systems' for HUCs and other critical

areas, in compliance with the Clean Water Act. NEDA has procured consultancy services for the formulation of the Philippine Water Supply and Sanitation Master Plan (PWSSMP). NEDA is likewise preparing better mechanisms to effectively monitor the country's progress in the attainment of SDGs, which include sanitation targets. These are some of the indications that attention is being given to sanitation.

As to the actual flow of finances into sanitation, should NSSMP grant policies continue to be stringent with LGUs left on their own to comply with grant application requirements, it will be as it was: funding available but not utilized. Wealthier LGUs may be able to fund sanitation programmes, but poorer LGUs may be left behind without financial assistance from the national government.

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Annex A. Government Agencies with Saniation-Related Responsibilities

ANNEX 2. GOVERNMENT AGENCIES WITH SANITATION-RELATED RESPONSIBILITIES

AGENCY	LINE BUREAU/ ATTACHED AGENCIES	FUNCTIONS
NEDA Infra Com	Sub-Committee on Water Resources	Ensures that the direction set for the sector is carried-out in accordance with the sector plan (i.e. Roadmap); Coordinates sector monitoring as well as the conduct of periodic review, evaluation and assessment of the sector (e.g., extent and status of the implementation of programs/activities identified in the Roadmap, deviation of actual performance from programmed targets, problem areas encountered in the program implementation); Coordinates and/or advises the conduct of studies, researches, and policy analysis on various aspects of the sector and make subsequent policy recommendations to the NEDA Board through the INFRACOM; Formulates areas of cooperation and coordination among the various agencies and instrumentalities of the government involved in the sector programs and projects to avoid duplication of efforts; Serves as clearinghouse of sector information; and venue for the discussion and resolution of arising issues in the sector.
DOH	Environmental & Occupational Health Office	Develops plans, policies, programs and strategies to manage health hazards and risks associated with environmental and work related factors
	Local Water Utilities Administration (LWUA)	Specialized lending institution that promotes the development, regulation and financing of water districts outside Metro Manila
DPWH	Metropolitan Waterworks and Sewerage System (MWSS)	Constructs, maintains and operates domestic/municipal water supply and sewerage projects in Metro Manila and adjacent cities.
	Central Labor Based/ Comprehensive Agrarian Reform (CLB/CARP)	Took over the leadership in preparing the National Sewerage and Septage Management Plan (NSSMP)
DENR	Environmental Management Bureau (EMB)	Formulates environment quality standards for water, land, air, noise and radiation; Approves environmental impact statements and issues Environmental Compliance Certificates

ANNEX A, continued

	National Solid Waste Commission	Created to oversee the implementation of the National Solid Waste Management Act
DILG	Water Supply and Sanitation Unit (WSSU)	Spearheads the; • Provision of capacity building programs for LGUs • Technical assistance in the preparation of the water supply and sanitation sector plans • Provision of information to LGUs on available sector programs and financing including available sanitation technology options • Provision and facilitation access to financing of water supply and sanitation projects
DOF	MDFO GFIs	Financing support for water supply and sanitation sector • DOF oversees performance of GFIs like DBP, LBP and LWUA • GFIs provide funding for capital investments of LGUs and WSPs
DOST		Verifies technologies
CHED		Provide assistance in developing IEC Programs
DepEd		Provide assistance in developing IEC Programs
DBM		The Department of Budget and Management, created under Executive Order No. 21 dated April 25, 1936, is mandated under this Order and by subsequent issuances to promote the sound, efficient and effective management and utilization of government resources (i.e., technological, manpower, physical and financial) as instrument in the achievement of national socioeconomic and political development to help create an environment that encourages and facilitates the full and active participation of all sectors, especially the marginalized in the development process
HLURB		Promulgates and enforces land use and housing regulations to sustain a balance among economic advancement, social justice and environmental protection. As one of the key housing agencies, HLURB enhances rational land use and housing and real estate delivery through policy development, planning and regulations.
DA		Issues Guidelines on Wastewater Management for Irrigation;
NHA		Tasked to develop and implement a comprehensive and integrated housing program to embrace among others, housing development and resettlement, sources and schemes of financing, and delineation of government and private participation.
MMDA		Solid waste disposal and management which include formulation, and implementation of policies, standards, programs and projects for proper and sanitary waste disposal. It shall likewise include the establishment and operation of sanitary landfill and related facilities and the implementation of other alternative programs intended to reduce, reuse and recycle solid waste.

ANNEX A, continued

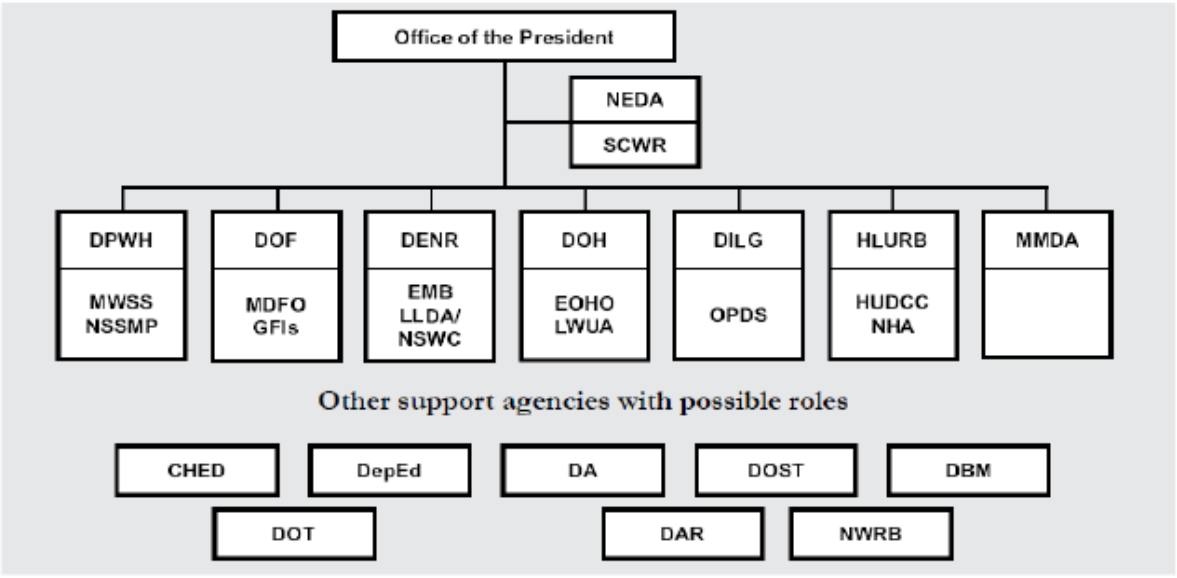
		Flood control and sewerage management which includes the formulation and implementation of policies, standards, programs and projects for an integrated flood control, drainage and sewerage system. Urban renewal, zoning and land use planning, and shelter services which includes the formulation, adoption and implementation of policies, standards, rules and regulations, programs and projects to rationalize and optimize urban land use and provide direction to urban growth and expansion, the rehabilitation and development of slum and blighted areas, the development of shelter and housing facilities and the provision of necessary social services thereof. Health and sanitation, urban protection and pollution control which includes the formulation and implementation of policies, rules and regulations, standards, programs and projects for the promotion and safeguarding of the health and sanitation of the region and for the enhancement of ecological balance and the prevention, control and abatement of environmental pollution.

Under the Local Government Code, LGUs at various levels have their sanitation related mandates:

LGUs	Provincial and City/Municipal Level	• Resource regulation, water supply and sanitation and economic regulation of their utilities. Planning, financing and implementation of water supply and sanitation programs including: • Preparation of water supply , sewerage and sanitation sector plans; • Monitoring of local water and sanitation coverage and updating of sector profile; • Provision of support to WSPs such as R/BWSAs, cooperatives and water users' group including funding from their IRA
	Barangay Level	Can initiate local (barangays) level ordinances and coordinates closely with the municipal government in addressing the needs of their constituents.

Source: Annex 2 DOH, 2010

ANNEX B. National Agencies with Clear Saniation Realted Mandates



1. NEDA - National Economic And Development Authority (Infrastructure Committee)
    a. SCWR - Sub-Committee on Water Resources
2. DPWH - Department of Public Works and Highways
    a. MWSS - Metropolitan Waterworks and Sewerage System
    b. NSSMP - National Sewerage and Septage Management Program
3. DOF - Department of Finance
    a. MDFO - Municipal Development Fund Office
    b. GFIs - Government Financial Institutions
4. DENR - Department of Environment and Natural Resources
    a. EMB - Environmental Management Bureau
    b. LLDA - Laguna Lake Development Authority
    c. NSWC - National Solid Waste Commission
5. DOH - Department of Health
    a. EOHO - Environmental and Occupational Health Office
    b. LWUA - Local Water Utilities Administration
6. DILG - Department of Interior and Local Government
    a. OPDS - Office of Project Development Services
7. HLURB - Housing and Land Use Regulatory Board
    a. HUDCC - Housing and Urban Development Coordinating Council
    b. NHA - National Housing Authority
8. MMDA - Metro Manila Development Authority
9. CHED - Commission on Higher Education
10. DepEd - Department of Education
11. DA - Department of Agriculture
12. DOST - Department of Science and Technology

Source: ECLEI, 2012

SECTION 120. REQUIREMENTS TO SECURE LOCAL AUTHORIZATION FOR WATER RECYCLING AND/OR RE-USE. - The proponent shall submit all the requirements stated in this Code to secure authorization for water recycling and re-use and other documents which may be prescribed by the City Water Resources Board. Standards for re-use must be drafted by the City Water Resources Board.

SECTION 153. SEPTAGE DESLUDGING. - Septic tanks require desludging on an average of every three (3) to five (5) years. Septic tanks shall be desludged when the sludge volume is one-third (1/3) of the total volume of the septic tank.

SECTION 156. CONNECTION TO SEWER NETWORK. - Any person, natural or juridical, who shall connect to the water supply and sewage line shall be subject to national laws and standards such as the National Building Code, the Sanitation Code of 1975 [Presidential Decree 856], the Plumbing Law [Republic Act No. 1378], the Subdivision Law [Presidential Decree No. 957], *Batas Pambansa Bilang* 220, the Clean Water Act of 2004 [Republic Act No. 9275], and the Revised Implementing Rules and Codes of such laws.

The Baguio Water District collect the sewer fee from those who are connected to the city water system. The Baguio Water District shall be tasked with septage management after they have finished improving the water supply system of the City of Baguio.

The City Buildings and Architecture Office shall establish and maintain a database of all toilets in buildings in the City Baguio as basis for collection of sewerage fees, and to periodically monitor building developments for proper adjustments. The City Environment and Parks Management Office shall validate the inventory list as basis for policy recommendations.

SECTION 163. SEWERAGE AND OTHER FEES. - There shall be collected sewerage fees for the maintenance and operation of the sewerage system of the City of Baguio in accordance with the following schedule of flat rates per month:

Sewerage Fees

	Description	Amount	Unit
A.	For schools and universities	P40.00	per toilet bowl
B.	For lodging houses, boarding houses and dormitories	P150.00	per toilet bowl
C.	For banks, grocery stores, variety stores, convenience stores, refreshment and ice cream parlors, beauty shops, tailoring and dress shops, clinics, radio stations, stock exchanges, drug stores, photo studios, department stores, offices for personal services and other offices	P75.00	per toilet bowl
D.	For private residences and apartment/s (per unit)	P60.00	per toilet bowl
E.	For hotels, condominiums and hospitals	P60.00	For each toilet bowl and kitchen sink
F.	For motels, hostels, inns, pension homes	P50.00	per toilet bowl
G.	For restaurants, eateries, *carinderias*, franchised food outlets, cocktail lounges, night clubs	P60.00	per toilet bowl and kitchen sink
H.	For stalls clustered in food centers and food court	P60.00	per kitchen sink
I.	Small laundry businesses	P500.00	
J.	For industrial-sized dishwashing or laundry facilities	P1500.00	
K.	For comfort rooms for use by the general public in shopping centers, malls, food centers and food courts, market areas, bus terminals, gasoline stations, churches, parks, sports and health club facilities, recreation facilities, auditoriums and gyms, theaters, hospitals	P100.00	per toilet bowl
M.	Establishment with shower rooms like Spas, gyms, businesses providing for bath service, and similar establishments.	P60.00	Per shower head
N.	Other business establishments not specifically provided herein	P60.00	per toilet bowl

ANNEX C, continued

SECTION 166. OTHER SEWERAGE FEES AND CHARGES. - The following fees shall be collected for the following services and products:

A) Laboratory Fees per sample:

	Parameter	Cost
1	PH Test	P80.00
2	Chemical Oxygen Demand (COD)	P500.00
3	Biochemical Oxygen Demand (BOD)	P500.00
4	Dissolved Oxygen (DO)	P100.00
5	Suspended Solids (SS)	P300.00
6	Total Solids (MLSS)	P300.00
7	Turbidity Transparency	P300.00

B) De-sludging or sludge removal of septic tanks/vaults including hauling of sludge to the Sewage Treatment Plant:

	Description	Amount	Unit/Parameter
1	Septage hauling Septic tanks by CEPMO	P4,000.00	For the first two (2) cubic meters
		P600.00 Distance =< 5Km	For every cubic meter in excess of two (2) cubic meters, or a fraction thereof
		P800 Distance< 5Km	
2	Delivery of sewage/sludge to the Sewage Treatment Plant for treatment and disposal by allowed/accredited private contractors	P400.00	per cu.m or fraction thereof
3	Sale of treated sludge (dry)	P30.00	per sack (size of 50kg rice sack)

C) Sewer Connection Permit Fees and Other Fees:

Owners of sewer lines found connected to the city sewerage system but without connection permit shall be compelled to apply for sewer connection permit pursuant to Ordinance Numbered 098, series of 1995.

	Description	Amount	
1	One Time Sewer Connection Permit Fee	P500.00	Residential Buildings
2	One Time Sewer Connection Permit Fee	P1,000.00	Commercial Buildings
3	Surcharges (per year)	P200.00	Residential
		P400.00	Commercial
4	Sewer connection inspection fee	P100.00	
5	Certification for sewerage and non-sewerage connection	P100.00	

Annex D. Summary of Issues in the Philippines Sanitation Sector

Summary of Issues	Defining the Issue
GOVERNANCE AND REGULATORY ISSUES	
Low LGU awareness and political will to improve sanitation	At the LGU level, local development plans do not prioritize sanitation. This is gleaned particularly in the investment plan of the LGU where allocations for sanitation are minimal or none at all. To date, there are only a few LGUs who have demonstrated political will to improve their sanitation situation through the development of local sanitation policies, plans and programs.
Weak, fragmented institutional framework and policies on sanitation	The sector is beset with institutional fragmentation, a lack of an enabling policy environment, and gaps in the regulatory framework. While policies and enabling laws and national legislations have been formulated to set the directions for the sanitation sector, policy implementation has not been ideal, thus, policy goals have yet to be fully met. For instance, the National Sector Plan for Water Supply, Sewerage and Sanitation failed to gain national and local support for the implementation and updating despite the clear mandates of the institutions involved.
Weak, fragmented regulatory framework on sanitation.	Regulation in sanitation is not clearly defined. While there are enabling laws, this have to be revisited and updated. Standards have to be clearly defined and its implementation monitored by proper authorities. Economic Regulation in sanitation and wastewater is non-existent at the moment.
SERVICE DELIVERY RELATED ISSUES	
Inadequate capacity to facilitate sustainable sanitation.	A significant number of LGUs do not prioritize sanitation programs in their investment plans A great number of people cannot associate unhygienic (open) defecation practices with transmission of excreta-borne diseases leading to high morbidity rates of these diseases. Lack of sanitation focused human resources who specialize in planning, implementing and evaluating sanitation programs, developing and improving designs on sanitation technology, and coordinating sanitation projects/programs. These include professionals and practitioners such as sanitary engineers, sanitarians/sanitation inspectors, public health specialists, and teachers among others. There are no guidelines to develop or strengthen LGU initiatives on policy formulation, planning and managing sanitation programs There is lack of definition of a national policy on the management of sanitation at the local government and household level translated in the forms of: Guidelines or management models on technology options, social marketing/ advocacy strategies, coordination and linkages techniques which could guide local governments and other interest groups in planning, implementing, monitoring and evaluation of sanitation services/programs. Front-liner Sanitary Inspectors, majority of them, lack adequate sanitation education, training, knowledge and skills Institutional guidelines on cooperation and coordination on approaches, methodologies, and technology options to support local government units in implementing sanitation programs.

Annex D, continued

LACK OF COORDINATION AND SUPPORT FOR MULTI-STAKEHOLDER PLATFORMS	
Low multi-stakeholder involvement in sanitation	Low priority from key stakeholders, i.e., community, local and national levels. Behavioural, "I don't care" attitude from many stakeholders, from households, community to local and national levels Low private sector involvement on sanitation Lack of champions to advocate sanitation for public awareness Poor data availability. Poor knowledge sharing and dissemination
FINANCING RELATED ISSUES	
Sanitation is considered a mere adjunct to water programs, resulting in low investment in sanitation	Sanitation is not a priority of the government, and as a result, there is very limited to no investments at all. Identified government agencies with sanitation mandates such as DOH, DILG, NEDA have no program, activities nor project distinctly included in the General Appropriations Act (GAA); nor there is any clear sanitation program included in the MTPDP and the MTPIP The current focus of sanitation program and projects, if any at all, is on large scale infrastructure such as centralized treatment and sewerage facilities which tend to be very costly making cost of recovery very difficult. This can be seen from the few sanitation infrastructure being constructed and funded. With very low recovery, sanitation projects tend to be not self sustaining making it necessary to introduce sustainability in sanitation projects While there might be a demand for the construction of toilets at the household level, there are no clear financing schemes which families can access There is a clear absence of national and local policies on investment for sanitation, promotion of pro poor sanitation financing including promotion of sanitation entrepreneurship. There is no current law/program that mandates pro poor sanitation financing. Private Sector hesitates to invest in sanitation due to insufficient incentives and efficiency issues.
SANITATION CRISIS DURING CALAMITIES AND EMERGENCY SITUATIONS	
Sanitation and hygiene promotion is not a priority in disaster preparedness and relief response.	Policy, practice and strong coordination for sanitation and hygiene promotion in different types of emergency situations (i.e. floods, landslides, etc) are not yet in place.

ANNEX E. PRIORITY ACTION POINTS

Sector-Wide: Institutions, Financing and Monitoring

- Implement new institutional arrangements including an expanded role for the National Water Resources Board as the sector regulator and its transition to a National Water Resources Management Office, and the establishment of a dedicated Water and Sanitation Unit as a lead sector agency (hosting department/agency to be identified through institutional review).
- Improve coordination mechanisms between actors at provincial and municipal levels
- Establish a national capacity building program, especially to address rural subsectors, by consolidating various initiatives already in place including the regional capacity building hubs established under DILG
- Harmonise data collection systems, standardise the definition of terms and develop a coherent sector monitoring framework
- Establish a collective platform for a multi-stakeholder review process to monitor subsector performance (for example Joint Annual Sector Reviews)
- Increase sector investment, particularly in rural areas where large disparities exist between rich and poor, as well as funding for "software", specifically for rural sanitation programs
- Align budgeting to support the implementation of long-term strategies and investment plans by public service providers, and translate these into annual work plans and budget
- Introduce key results areas for local water supply and sanitation services to increase local accountability for service improvements and incentivize LGUs to access additional funding sources including matching grants from national government and private sector sources
- Create a national account for water and sanitation, disaggregated between urban and rural to enable monitoring of financial flows towards the subsectors

Priority Actions for Rural Water Supply

- Enable economies of scale and financial viability in service provision by encouraging the consolidation of small service providers
- Formalize the management of small piped schemes and introduce light-handed regulation including the use of performance contracts to drive service quality and reliability and incentivize service provision to the poor
- Expand the provision of technical support to small providers, combined with business planning services to facilitate access to finance for system expansion
- Operationalise policies for full cost recovery for rural scheme operation to reduce the investment gap and improve sustainability of services
- Enhance rural water supply improvements (piped schemes) via other poverty alleviation programs such as the Bottom-Up Budgeting Process and the National Community Development Driven program
- Develop systems for management support to schemes operated by community-based organizations, through partnerships with private sector and water districts

ANNEX E, continued

Priority Actions for Urban Water Supply

- Establish a comprehensive regulatory framework covering all types of service providers, including local government-run schemes, water districts plus private and independent operators, both large and small, and consolidate these roles gradually within a national regulator
- Develop a financing policy and strategy, linked with a graduation policy for utilities based on creditworthiness, in order to attract commercial finance, and accelerate access to concessional finance to support the expansion of services
- Strengthen the capacity of local government to contract, manage and oversee private sector participation modalities, in order to leverage private sector investment, use professional capabilities of the private sector and encourage the consolidation of small-scale service providers
- Introduce multi-stakeholder, performance-based planning and monitoring including a system of annual subsector reviews
- Build capacity and increase the accountability of LGUs for improving the quality and sustainability of service provision, using performance benchmarks and an incentive and/or penalty system

Priority Actions for Rural Sanitation and Hygiene

- Operationalize the Zero Open Defecation program, within the framework of an equitable rural sanitation and hygiene promotion policy, a capacity building plan, an implementation plan and a monitoring system
- Develop a financing strategy for the program that includes public investments to generate household demand for sanitation, output-based subsidies to the very poor and collective incentives for barangays and LGUs in achieving Zero Open Defecation
- Strengthen rural sanitation promotion via other poverty alleviation programmes, such as the Bottom-Up Budgeting Process, the National Community Development Driven programme and target poor households through the National Cash Transfer Program (4Ps)

Priority Actions for Urban Sanitation and Hygiene

- Establish institutional arrangements to facilitate implementation of the National Sewerage and Septage Management Program (NSSMP) and increase Local Government and Water District accountability for the coverage and quality of urban sanitation services
- Develop a sanitation investment framework and mandate local governments to adopt City Sanitation Plans incorporating measures to improve cost recovery and extend affordable services to the poor
- Adopt a cost-effective approach to investment whereby the gradual expansion of sewerage is complemented by measures to maximize connections and to improve fecal sludge management, since most households will continue using septic tanks for the foreseeable future
- Build local capacity to enable successful planning and implementation of the NSSMP

SOURCE: World Bank, 2015

Work programme

Increasing Financial Flows for Urban Sanitation

Case study

Nairobi, Kenya

Prepared by:

John Mwangi Gathenya

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Abbreviations

AFD	Agence Française de Dévelopment
AWSB	Athi Water Services Board
KFW	Kredit fuer Wideraufbau
NCWSC	Nairobi City Water and Sewerage Company
WASREB	Water Services Regulatory Board
WB	World Bank
WSTF	Water Services Trust Fund
MDG	Millennium Development Goals
SDG	Sustainable Development Goals
KPI	Key Performance Indicators
PPP	Public Private Partnership
NWMP	Nairobi Water Master Plan
KESSHP	
KESSF	

1 Introduction

The World Water Council officially launched the project "Increasing Financial Flows for Sanitation", under the "Cities: At the heart of growth" Task Force's work plan.

The project aims at identifying the most appropriate financial mechanisms that could better support the development of the sanitation sector of cities around the world, with the purpose of raising awareness about innovative financing instruments to increase sanitation provisions and of involving more actors in the national sanitation financing plans.

Under the guidance of a coordinating consultant, eight national consultants are developing the analysis for the eight cities selected as case studies, of which Nairobi is one.

2 Background of Kenya

2.1 Socio-political and economic data

Kenya is among the lower-middle income country in sub-Sahara Africa and is located in East Africa. It has a population of 48.6 million people, a GDP of USD 70.529 Billion and a GNI per capita of USD 1,380 (World Bank, 2016). The national population growth rate was 2.6% but urban areas grew at 5.2%. Based on the national population census of 2009, the urban population was approximately 30% and it was estimated to grow to 45% in 2015 and 54% in 2030 (GoK, 2010; GoK, 2015). At national level, the access to improved water stood at 63% while access to improved sanitation was much lower at 30% (World Bank, 2016). Within the last 10 years, the country has experienced an average annual growth rate of 5% while ranking fairly high compared to the neighboring countries in terms of human development index. However, Kenya has high poverty rates observed in the arid and semi-arid regions which account for 80% of the land mass and 20% of the total population. The main contributor to Kenya's economy is the service sector accounting for close to 60% of the annual gross domestic product followed by the agricultural sector which accounts for 29% of the annual gross domestic product. In 2015/2016 financial year, the annual budget stood at 2.1 trillion Kenya shillings which was a 17% increase from the previous year, the largest budget in Kenya's history. This budget was largely anchored on economic growth and sustainable development with a key focus on food security, agriculture, and transport infrastructure and water security.

Kenya has been going through rapid social, political and economic changes in the last fifteen years. Devolution remains the biggest gain from the August 2010 constitution, which ushered in a new political and economic governance system that has strengthened accountability and public service delivery at local levels. From 2010, Kenya has two levels of governance namely: National Government and County Government. The rights of Kenyan citizens as well as the functions of national and county government are stipulated in the constitution. With regard to sanitation, the constitution states:

I. Article 42: Every person has the right to a clean and healthy environment.
II. Article 43 (1) (b): Every person has the right to accessible and adequate housing, and to reasonable standards of sanitation;
III. Fourth Schedule Part 2 states the functions of the County government as:
    - Section 2: County health services, including, in particular (a) county health facilities and pharmacies; are a function of the county.

- Section 8: Planning and development, including housing
- Section 11: County public works and services, including (a) storm water management systems in built-up areas; and (b) water and sanitation

2.2 National level data on water and sanitation

In the Millennium Development Goals (MDGs) era, Kenya had committed to reduce the proportion of the population without access to improved sanitation by 63% by 2015. By the end of 2015, Kenya was off target with regard to the MDG goal for sanitation. The coverage with improved sanitation was only 31% by June 2015. Sewerage coverage was at 15% in 2014/2015 in the areas served by Water Service Providers (WSP) against a target of 40% (Impact 2016). To meet universal access to sanitation by 2040, Kenya needs to increase the acceleration rate from the current 0.75% per year to 3.5% per year. An even higher level of acceleration is needed if the goal of universal access is to be achieved by 2030. This calls for substantial investments in water supply and sanitation (WSS) infrastructure for both rehabilitation of existing infrastructure and expansion into non-served areas. Although Kenya has the largest economy in East Africa, in terms of access to improved sanitation, it lags behind Burundi and Rwanda but does better than Tanzania and Uganda especially in rural areas (Table 1).

Table 1 Status of four East African countries towards attaining the MDG on sanitation

Country	Year	Use of sanitation facilities (%)					
		Urban		Rural		Total	
		Improved	Unimproved	Improved	Unimproved	Improved	Unimproved
Burundi	1990	31	69	42	58	42	58
	2015	44	56	49	51	48	52
Kenya	1990	27	73	24	76	25	75
	2015	31	69	30	70	30	70
Rwanda	1990	61	39	32	68	33	67
	2015	59	41	63	37	62	38
Uganda	1990	28	72	11	89	13	87
	2015	29	71	17	83	19	81
Tanzania	1990	6	94	7	93	7	93
	2015	31	69	8	92	16	84

Source: UNICEF (June 2015)

Kenya loses an estimated US$324 million annually or 1% of GDP due to poor sanitation (KESHP, 2016). This translates to; (1) 21 million Kenyans use unsanitary or shared latrines (2) 5.6 million have no latrine at all and defecate in the open and (3) the poorest quintile is 270 times more likely to practice open defection than the richest. Open defecation alone costs Kenya US$88 million per year, yet eliminating the practice would require less than 1.2 million latrines to be built and used. The urban population in Kenya account for close to a third of the total population. The urban centers in Kenya are characterized by high populations, poor infrastructure, lack of planning and only less than 10 towns have sewerage

infrastructure and good wastewater treatment systems. Water supply and sanitation is characterized by low levels of access in both the urban and rural areas, this is exacerbated by the seasonal variations in water supply across majority of the urban centers that rely on surface water. According to the Joint monitoring programme (JMP) for water supply and sanitation in 2015, two thirds of Kenyans (82% in urban areas and 57% in rural areas) had access to improved drinking water sources. However, JMP data also reports a 10% decline in access to improved water sources in urban areas between 1990 and 2016. On sanitation, the JMP estimates a third of the Kenya population (31% in urban and 30% in rural) have access to improved sanitation including sewerage. The Water Services Regulatory Board report of 2015 did not report on access to sanitation in the broad sense but estimated 1 in every 6 people in the urban areas have access to sewerage services.

The total number of people lacking access to improved water services in 2016 is estimated, by most reports, to be 17 million people while the total number of people lacking access to sanitation is estimated to be 32 Million people. These statistics show large populations with poor or without access to environmental sanitation and hygiene which are a pertinent link to health and socio-economic development at both the household level and nationally. Poor access to sanitation in Kenya is largely driven by societal, policy, structural and systematic challenges within the institutions responsible for sanitation services, i.e., ministry of health and its partner the ministry of water and irrigation. These challenges include; poor perception of sanitation, Low sanitation priority in the national development agenda, Low public investment in sanitation, Institutional fragmentation, Inadequate multi-sectoral coordination mechanisms, Inadequate information management system, Low sanitation and hygiene awareness, Insufficient institutional operational and technical capacity, Inadequate appropriate technology solutions, Weak research and development systems and Cultural beliefs and practices among others.

2.3 Institutional responsibility for sanitation at national and county level

The institutional framework of the WASH sector in Kenya has undergone significant changes in the last 10 years. In 2010, Kenya signed in a new constitution that advocated for decentralization of the national government to 47 County governments across the whole country. Services in the water sector, health, agriculture, among other sectors, have been decentralized since then. The fourth schedule part II Articles 2(c) through to 2(g) and 11(a) and (b) of the new constitution of Kenya devolved the sanitation functions and services to the county governments while the national government continues with the responsibility for national policy, training, capacity building, technical assistance and formulation of standards. Given these changes in the governance, policy and the service delivery environment, the 2007 National Environmental Sanitation and Hygiene Policy (GoK, 2017) had to be reviewed leading to the formation of a new sanitation Policy, the Kenya Environmental Sanitation and Hygiene Policy 2016-2030, KESHP (GoK, 2016).

The new sanitation policy (KESHP) agenda is to direct the country's movement towards achieving universal access to improved sanitation and clean and healthy environment culminating in better health, dignity, social well-being and quality of life for all the people of Kenya by 2030. This new policy recognizes the devolution of the sanitation services while taking the rights based approach. It also heavily advocates for an increased public and private sector investments through public-private partnerships to enable realization of its goals. The policy further provides clarity on the roles and responsibilities of the stakeholders and agencies involved in the sanitation sector, i.e., the roles of the County and National government in service provision and providing an enabling environment for Public Private Partnerships (PPPs). It

further addresses the institutional fragmentation and financial bottlenecks for sanitation by formation of the National Environmental Sanitation Coordination and Regulatory Authority (NESCRA) and the National Sanitation Fund (NSF).

The institutional setup for sanitation at national and county level is as follows:

At the national level, the ministry of health leads as far as planning, coordination, policy formulation and regulation of health services is concerned. The health ministry has many subdivisions; sanitation falls within the department of preventive and promotive health under public health and environmental health. Other national ministries dealing with water and environment have sanitation roles as well. The ministry of water has staff at the national level who deal with policy issues. Following the Water Act 2002 (GoK, 2002) the following organizations under the Ministry of Water were created: The Water Service Boards, the Water Service Providers and Water Services Regulatory Board. The Water Service Boards develop bulk water and sewerage infrastructure while the Water Service providers manage the infrastructure leased from the Water Service Boards. Under the environment line ministry is the National Environmental Management Authority NEMA. NEMA was established under the Environmental Management and Coordination Act (EMCA) of 1999 as the overarching national institution dealing with environmental policy formulation and enforcement. At the County level there are also ministries dealing with health, water and environment. The Physical Planning office at the County level is very crucial in ensuring planning integrates sanitation facilities alongside other works.

The challenges arising from this setup are:

- There is a dispersion of human resource capacities and financial resources among the different institutions so that it becomes difficult to assign responsibilities and to monitor activities that are contributing to improved sanitation. The ministry of health has strength in public health and hygiene while the ministry of water has strength in planning and design of sewerage services and onsite-sanitation. These two ministries do not seem to be coordinated in a way that would speed up the growth of improved sanitation access.
- Some of the roles e.g. policy formulation, implementation and regulation are duplicated.
- There is poor monitoring of sanitation services provision by water utilities. Whilst WASREB is supposed to monitor performance of water and sewerage, its role in monitoring sewerage services has lagged behind that of water supply services.
- Failure of the physical planning departments at the county to enforce regulations that facilitate development of sanitation facilities has contributed to reduced access to improved sanitation especially where on-site facilities are the main solution.

2.4 National and county level financing mechanisms for water and sanitation

The fifth strategy of the KESHP focuses on financing sanitation in Kenya and obligates the national and county governments as well as the municipal authorities to establish enabling and sustainable financing mechanisms for sanitation services and development and to make yearly budgetary provisions with timely release for the implementation of sanitation plans, programmes, activities, services and functions. The private sector, communities and all individuals are equally encouraged and mobilized to contribute towards funding hygiene and sanitation services. The policy recognizes the major constraints in the provision of sustainable sanitation services to be the low levels of funds allocated to the

sanitation sector, the non-economic tariffs charged for sanitation services as well as low revenues collected by urban service providers such as Nairobi City Water and Sewerage Company Limited. Another part of the problem in financing sanitation is linked to high priorities given to fundraising finances for water and little to none for sanitation and hygiene.

The key sources of sanitation funding and investment in Kenya consist of the private sector, public sector, civil society organizations, development partners, communities and households. The sanitation financing approach that Kenya currently is implementing is comprised of three key approaches;

1. Sector wide sanitation financing: this comprises of sourcing for funds from all sectors of the economy including individual households. These funds will go to remedy the current deteriorating sanitation incrementally matching the population growth.
2. Cost Sharing: this spells out a cost sharing arrangement moderated by the Intergovernmental Budget and Economic Council between the national and county governments on financing capital investments in sewerage, on-site sanitation, storm and waste water management both in peri-urban, slums and informal settlements.
3. Cost Recovery: this comprises of direct cost recovery where the private sector service providers participating are allowed to charge full commercial price covering all operating costs for sanitation service as long as it is feasible. In the case where this is not feasible, then the County government shall subsidise the full cost of providing sanitation services from additional revenues generated in other sanitation services, Constituency Development Funds, Equalisation Funds among other streams of finances.

From the NCWSC 2014-2019 Strategic plan, the water company requires an estimated Ksh 42 billion to implement the strategic plan. Wastewater management is allocated approximately 40% of this budget. The company planned to raise the bulk of these funds through revenues from water and sewerage services and the balance from PPPs and development partners. The PPPs will generate funds for secondary and tertiary sewer reticulation.

Kenya National Water Development Report 2006, MoWI)

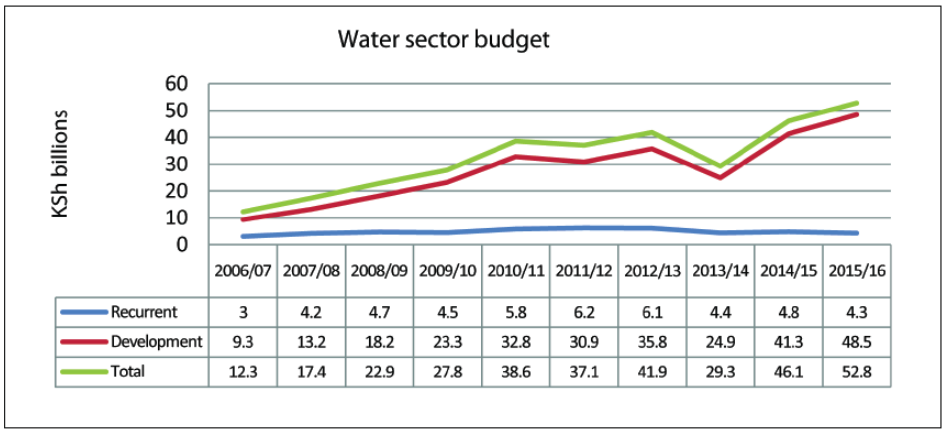
Annual water Sector Review 2016:

The funding to the water sector increased from just under KES 1.0 billion in 1998 to almost 8 Billion in 2004 (GoK 2006). From the most current annual water sector review report (GoK, 2016), the Water Services Trust Fund WSTF has reached over 2,500,000 people with safe water supply and over 350,000 people with improved sanitation since 2008. This shows that on average for every ten people supported by WSTF to access safe water, only one person gets access to improved sanitation. The received actual budget for the water sector for the financial year (FY) 2014/15, at national level, was KSh 31.80 billion (development: KSh 28 billion and recurrent: KSh 3.80 billion). The received actual budget for the water sector at the national level in 2015/16 was KSh 33.55 billion (development: KSh 29.50 billion and recurrent KSh 4.05 billion). In FY 2014/15, KSh 10 billion was received from development partners and KSh 18 from the Government of Kenya (GoK). In FY 2015/16, KSh 27.4 billion came from development partners and KSh 6 billion from GoK. More GoK funds were received in 2014/15 because of the transfer of irrigation development to the ministry responsible for water. Funds received by the sector as loans amounted to KSh 8.3 billion while grants amounted to KSh 1.7 billion in FY 2014/15. These funds were KSh 22.4 billion and KSh 5.0 billion, respectively, in FY 2015/16. Internally-generated funds

within the sector were about KSh 3.6 billion in FY 2014/15 and about KSh 3.2 billion in FY 2015/16. Thus the total water sector investment in 2014/2015 at national level was approximately KSh 28 billion, which is about 10% of the required annual sector investment as per the Sector Investment Plan (SIP) of May 2014. The total water sector investment budget in 2015/16 was KSh 29.5 billion, which is about 10% of the required annual investment. A big financing gap still exists in the annual development budgets for the water sector. This requires urgent, innovative, resource mobilisation strategies. If it is not bridged rapidly, the sector may not achieve its Vision 2030 objective for universal access. Customers can contribute to the full cost of providing water services in urban areas so long as the services provided are reliable, affordable and of good quality. Operating costs can also be fully covered by consumers in rural areas to increase sector self-financing.

The budgets for the water sector at the national level grew continuously from 2006/07 to 2015/16 during implementation of the reforms. The budgets showed a significant drop in 2013/2014 because some funds were transferred to the counties for devolved functions (figure 3.1). No accurate statistics are available to show the budget growth with regard to the water sector at county level and in CSOs. Tracking of budgetary expenditure at County level needs to be improved so that investments to different sectors can be accounted for. At the same time, the expenditures by civil society organizations in the water and sanitation sector need to monitored.

Figure 3.1: Growth in original sector budget from 2006/07 to 2015/16



	2006/07	2007/08	2008/09	2009/10	2010/11	2011/12	2012/13	2013/14	2014/15	2015/16
Recurrent	3	4.2	4.7	4.5	5.8	6.2	6.1	4.4	4.8	4.3
Development	9.3	13.2	18.2	23.3	32.8	30.9	35.8	24.9	41.3	48.5
Total	12.3	17.4	22.9	27.8	38.6	37.1	41.9	29.3	46.1	52.8

Source: GoK (2016) Annual water sector review 2014/2015-2015/2016

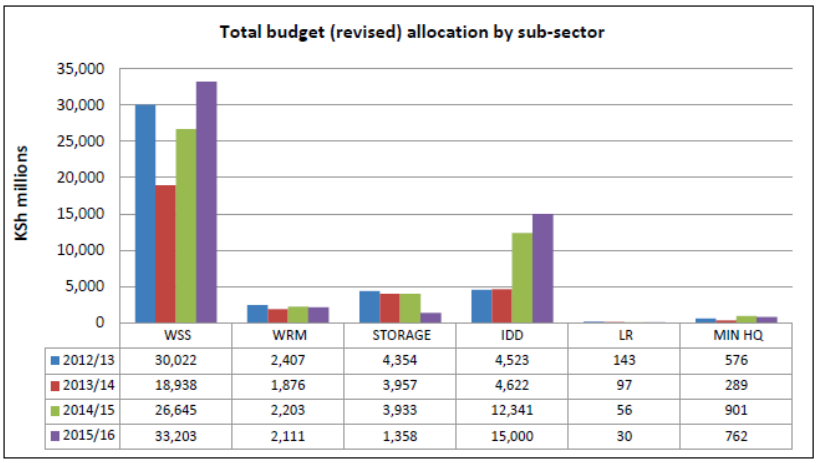
The current investment level is only about 10% of the required annual investment.

Table 3.1: Required investment as per SIP

Sub-Sector	Required investment (KSh millions)	
	2014/2015	2015/16
Water supply and sewerage services	58,099	64,784
On-site sanitation systems and services	66,898	68,868
Water resources	112,813	116,141
Land reclamation, drainage and irrigation	31,985	32,623
Sector management	3,641	3,722
Total required investment	273,436	286,138

Source: GoK (2016) Annual water sector review 2014/2015-2015/2016

Figure 3.10: Total budget (revised) allocation by sub-sector from 2012/13 to 2015/16



	WSS	WRM	STORAGE	IDD	LR	MIN HQ
2012/13	30,022	2,407	4,354	4,523	143	576
2013/14	18,938	1,876	3,957	4,622	97	289
2014/15	26,645	2,203	3,933	12,341	56	901
2015/16	33,203	2,111	1,358	15,000	30	762

Source: GoK (2016) Annual water sector review 2014/2015-2015/2016

2.5 Awareness about circular economy

Circular economy in sanitation in Kenya is fairly known in Nairobi but it's not yet mature in terms of uptake. This is evident from when one looks at the shit flow diagrams for a number of counties in Kenya. These shit flow diagrams are generally comprised of 4 stages namely; containment, emptying, transport and treatment phases. For example, in Nairobi County there are at least two existing shit flow paths; the sewered section of Nairobi ends up with a treatment system that thereafter returns the treated waste water back into the environment. This system only serves at least 45% of the population, leaving slightly more than half of the population relying on either a system that terminates at the containment phase or a lack of a sanitation system all together. In a circular economy, one expects to see entrepreneurial innovations after the emptying phase of the shit flow diagram; these innovations may convert waste into other products of economic value such as fertilizer. In Nairobi, Sanergy is one of the few examples of a private company that collects waste from pit latrines in the urban slums of the city and safely converts it to fertilizers for sell to farmers. This model has however been

faced with challenges of financial sustainability and currently requires a better business model to grow to scale. More is discussed about this in section XXX below.

3 Background of Nairobi City

3.1 Social, political and economic data

What is the importance of the city? The population and its annual growth rate and related to other cities? What is Nairobi's contribution to national economy? What makes Nairobi non-typical of other cities in Kenya and region? Any special characteristics of Nairobi County that might make it non-typical of other Counties in the country?

Nairobi is the capital city of Kenya and it contributes significantly to Kenya's economy. The population of Nairobi stood at 3.1 million during the 2009 national census and was estimated at 3.9 Million in 2017. A report published in 2015 and ranking the 47 Counties in Kenya on wealth basis put Nairobi at the eighth position. It had the highest contribution to the national GDP at 13% and its per capita wealth was estimated at USD 1,081 (World Bank, 2015). The contribution to national GDP was however much lower than the 60% stated in an earlier brief (CSUDP, 2013). The water and sewerage services are provided by Nairobi City Water and Sewerage Company (NCWSC). NCWSC was incorporated in December 2003 and appointed by Athi Water Service Board (AWSB) as its agent in providing water and sewerage services within the city of Nairobi. It is one of the 84 regulated public utilities in Kenya and has the highest annual turnover of Ksh 7,175 Billion. Its non-revenue water stands at 38%. (WSRB, 2016). After the Constitution of Kenya 2010, NCWSC became wholly owned by the County Government of Nairobi (ESAWAS 2015). There are unresolved issues with AWSB and Nairobi County Government laying claim of ownership of assets.

3.2 Sanitation in the city

According to the WASREB' s Impact Report 2016, the population of Nairobi City was 3,9 Million in 2016. The area of the city is 695 km^2 giving a population density of 5600 persons/km^2. The population increased by almost four times between 1979 and 2009; it rose from 0.8 million to 3.1 million.

Two thirds of Nairobi's population lives in slums with poor access to clean drinking water and a sewerage system among other services (APHRC, 2014). This number continues to grow as more people migrate from their rural homes to the city. A similar picture is observed in other cities in Kenya with urban population growth and little to no improvements in water services, health services, sanitation services and infrastructural constraints. Nairobi City loses KES 1.7 Billion each year due to poor sanitation. This includes loses due to poor access time, premature death, health care costs and productivity (WSP, 2014).

About 80% of the population in Nairobi is supplied by Nairobi Water Company while 46% is covered by sewer infrastructure. The total water connections in April 2017 were 293,446 while the total connections to sewer were 204,842. From January to March 2017, 3,123 new connections were added; out of these 2,542 had sewer connections. The classification of customers is based on consumption rather than type of consumer (high consumers -- >100 units/month, low consumers (Mbugua Pers. Com, 2017). Compared to the information given by Nairobi Water

Company, the Impact Report 2016 gives a much higher number of total active and inactive connections of 564,834 of which 93% were active. The poverty rate in Nairobi County is 21% and is considered to be the most significant predictor of open defecation after controlling for unimproved water supply and population density (Njuguna and Muruka, 2017).

NCWSC uses an increasing block tariff for water and sewerage services are charged at 75% of the water bill for all customers with a sewer connection. Those with no water connection but are connected to the sewer system pay a flat rate of Ksh. 200 per month (USD $2/month). The average tariff of water is Ksh 53/m3 (WSRB, 2016). Those with septic tank system incur an estimated cost of approximately Ksh. 4,000 – 5,000 for emptying by NCWSC exhauster trucks while sewer connection charges range from Ksh. 5,000 to 15,000 depending on user (domestic, commercial, and industrial). The private exhausters are allowed to discharge the sewage collected from users into the sewer system managed by NCWSC at a cost of Ksh. 15,000 per truck per month. The revenue collected from water and sewerage services has grown from KSh 5,613 Billion in 2010/2011 to KES 7,175 Billion in 2015/2016 (WSRB, 2012, 2016). Over the same period the sewerage coverage, based on proportion of city population served, has grown from 35% to 48%. The coverage of O&M costs was reported as 169%, 104% and 157% in 2006/2007, 2010/2011 and 2014/2015 respectively (WSRB, 2008; 2012; 2016).

Table X below summary of sanitation coverage in Nairobi City and institutions within the city.

Table X Summary statistics on sanitation coverage in Nairobi City

	Total	Per cent coverage	Data Source
Total Population in Nairobi	3,138,369		KNBS Census 2009
Number of households	985,016		KNBS Census 2009
Population covered by sewer network in absolute values and as percentage of total population as per 2009 census	1,379,059	45%	Own GIS analysis, NCWSC interview, WSRB (2016)
Total connections for water by April 2017	293,446		NCWSC interview
Total number of sewer connections in April 2017 in absolute values and as percentage of total water connections	204,842	70%	NCWSC interview
Population living in informal settlements		60-70%	APHRC (2014)
Population practicing open defecation		< 1 %	WSP and MoH 2014, Njuguna and Muruka (2017)
Population with improved sanitation		47%	WSP 2014
Population with unimproved sanitation		12%	WSP 2014
Population with shared sanitation facility		40%	WSP 2014
Number of Schools in Nairobi	1254		Kenya Open data
Number of Schools Sewered	611	49%	Own GIS assessment

Number of County Public Health Facilities in 2014	81		Nairobi County Government Website
Public ECD Centres and Primary Schools	225		Nairobi County Government Website
Public Secondary Schools	225		Estimated
Private Secondary Schools	109		Nairobi County Government Website
Number of Health Centres Sewered	50	56%	Own GIS analysis
Number of Market Centres	45		Nairobi City County Government Website
Population in Informal Settlements	512,350		NCWSC GIS data and Own GIS analysis
Number of Ablution blocks in Informal Settlements	789		NCWSC GIS data and Own GIS analysis

Water and Sanitation Program and Ministry of Health 2014

Breaking down sanitation access by type of facility, we see that over one third of the population use traditional pit latrines while 1 in 10 have a septic tank. Those with septic tanls are characterized by high standards of living and are more likely to be private homes. This data is summarized in the table below.

Type of sanitation facility	Proportion of population
A. Sewer connection (cistern or pour flush toilet connected to sewer, shared or not shared)	45%
B. Septic tank (with or without regular emptying by vacuum trucks, shared or not shared)	10%
C. Improved Pit latrine (with or without regular emptying of faecal sludge to sewer by vacuum trucks, shared or not shared)	3%
D. Open defecation	< 1%
E. Traditional Pit latrine (with or without regular emptying of faecal sludge to sewer, shared or not shared)	38%
F. Public ablution blocks (some with biogas digester)	< 1 %
G. Urine Diverting Dry Toilets or in short UDDTs (with separate containers for faeces and urine which is collected and for fertilizer production at an off-site factory (operated by Sanergy)	< 1 %

H.	Peepoo (a biodegradable, single use slim bag containing urea which kills pathogens in human waste). After use the bag is deposited at a collection centre and composting is done off-site. This is a project in Kibera slums that has an unproven business model.	< 1 %
I.	Sequencing-Batch-Reactor (SBR) Wastewater Treatment Plants – these are suitable for households where wastewater generation is not continuous. The units take in wastewater and release clear water that can be use for gardening and other similar functions that require low quality water. Sludge is also a by-product that has to be removed regularly. It can be used for agriculture or forestry.	< 1 %

Source: KNBS 2009

Some households with flush toilets may also have a pit latrine for use during periods with no water supply. Some cistern flush toilets become pour flush toilets when there is no flowing water. For shared facilities this presents some health concerns as the flushing may not be regular. Reduced water for flushing also causes clogging of the sewers.

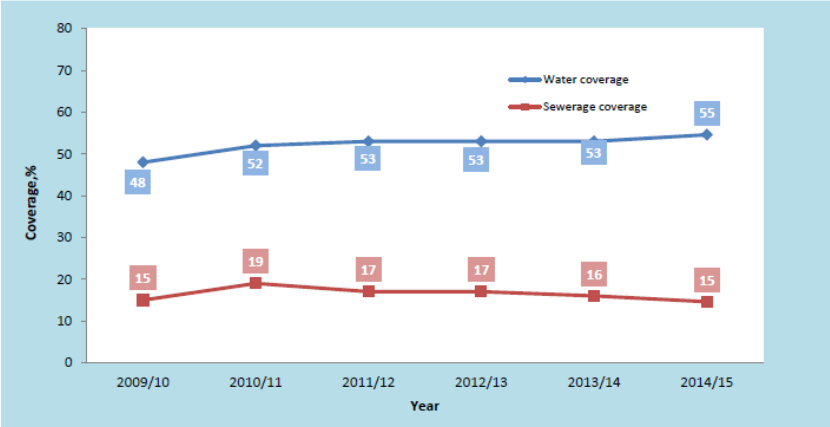
There is need to find out how many households use traditional pit latrines, improved pit latrines and septic tanks and the growth rates of the three types of sanitation in areas that are not sewered. Enforcement of the physical planning and public health regulations plays a vital role in ensuring that private developers invest in the best option among the three.

National Trend

In Nairobi's informal settlements, households using flush toilets increased from 7.3 percent in 2000 to 46.2 percent in 2012; that notwithstanding, this is far below 82.0 percent of households in the rest of Nairobi who use flush toilets. The use of traditional pit latrines decreased from 78.8 percent to 44.0 percent between the two surveys (APHRC, 2014).

The sanitation coverage as reported by 86 utilities in urban and urbanizing areas that are monitored by WASREB has been declining over the last six years (Impact 2016). It was only 15% in 2016.

Figure 2.1: Trend in Water and Sewerage Coverage



Trend in water and Sanitation coverage in 86 urban utilities in Kenya that are monitored by WASREB (Source: Impact 2016)

In the National Water Master Plan (NWMP, 2013), 95 out of the 215 urban centres are to have sewer systems by 2030. This plan will cost Ksh 476.5 Billion plus an additional Ksh 25 billion for sewerage maintenance. In the Athi Catchment Area (ACA) where Nairobi is located, the development strategy is to rehabilitate and expand existing sewerage system for the 25 Utility Companies, construct new sewerage systems in 19 Utility companies that have no systems. On-site sanitation facilities will also be improved outside sewerage service area. Table x compares the sanitation situation in 2010 with that of 2030 (NWMP, 2013) for Athi Catchment Area. The capacity of the sewerage system is expected to reach 1.4 million m3 to serve a population of 16 million, while on-site sanitation facilities will serve a population of 4.3 million. For Nairobi City, which is the largest urban centre in ACA, the service population is projected to be 6,085,297 by 2030 and the sewerage capacity was to be increased from 152,000 m3/day in 2010 to 568,367 m3/day in 2030.

Table x Sanitation situation in 2030 in the Athi Catchment Area

Items		Sewerage System	On-site sanitation facilities
Service Population (million)	2010	2.15	6.95
	2030	16.26	4.28
Required treatment capacity (m3/day)	2010	244,000	-----
	2030	1,389,000	-----
Operating body		Registered Water Service Providers	Individual, Community, etc
Target town areas		25 Urban Centres	10

The Athi Water Services Board (AWSB) is mandated to plan, develop and expand bulk water and sewerage infrastructure within its area, which includes Nairobi City. In its 2012-2017 Strategic plan, a budget of Ksh 72 Billion was foreseen. AWSB planned to extend trunk sewers within Nairobi and in the metropolitan area around Nairobi City. They also aimed to expand the Dandora Wastewater Treatment Plant by 40,000 m3/day, to prepare national water and sewerage development plans and to develop a sewerage master plan for Nairobi Metropolis by 2014. In the medium

term the financing would come from lease fees from the Water Service providers like NCWSC, Government grants, concessionary loans from development partners such as ADB, AFB, WB, KFW and EU. In the transition period it hoped to increase funds from the private sector and in the long-term to achieve financial sustainability through innovative financing mechanism such as infrastructure bonds, private equity placement and public-private partnerships. It also

In the 2012-2017 strategic planning period, AWSB hoped to increase its revenue by 5% through tariff restructuring, introduction of bulk water tariffs, generation of income from energy from hydropower and wastewater treatment plant in Dandora. It also planned to raise the Ksh 72 billion from the national and county government, the private sector, development banks, Capital Markets and Project Finance.

3.3 Financing of sanitation in the city

The Kenya Environmental Sanitation and Hygiene Policy (KESHP, 2016) lists three funding streams for sanitation and hygiene in Kenya.

- Funds from Treasury transferred to the Ministry of Health or the Water Service Boards.
- Funds from donors transferred to Ministry of Health or Ministry of Water via various mechanisms.
- Off-budget funding – these are not effectively captured as part of national or county budgets. These could include private funds or funds coming to communities through NGOs.

Kenya has allocated 0.2% of GDP to sanitation; this falls below the global target of 0.9% (KNSHP, 2016). In 2010, Kenya's expenditure on water and sanitation was 0.86% of GDP compared to 1.10% in 2010.

Table x: Analysis of financing mechanisms for different sanitation systems

Sanitation facility	Owner / Operator	How are O&M costs covered?	How are CAPEX covered?
Wastewater treatment plant	County Government	NCWSC from tariffs of water and sewerage services	AWSB from Grants/ Loans / GoK (taxes and transfers)
Trunk sewer	County Government	NCWSC from tariffs of water and sewerage services	AWSB from Grants/ Loans / GoK (taxes and transfers)
Lateral sewer lines	County Government	NCWSC from tariffs of water and sewerage services	NCWSC from tariffs of water and sewerage services
In-house flush toilet connected to central sewer	Private owner	Own funds	Own funds

Public ablution blocks in informal settlements and CBD	NCWSC	Tariffs paid by users	Tariffs
Toilets connected to septic tanks and pit latrines in private residences	Private owner	Own funds	Own funds
Toilets connected to septic tanks and latrines in private and public institutions	Private / GoK / County Government	Private and public funds	Private and public funds
Vacuum trucks	Private owner NCWSC	Own funds Tariffs	Own funds Tariffs

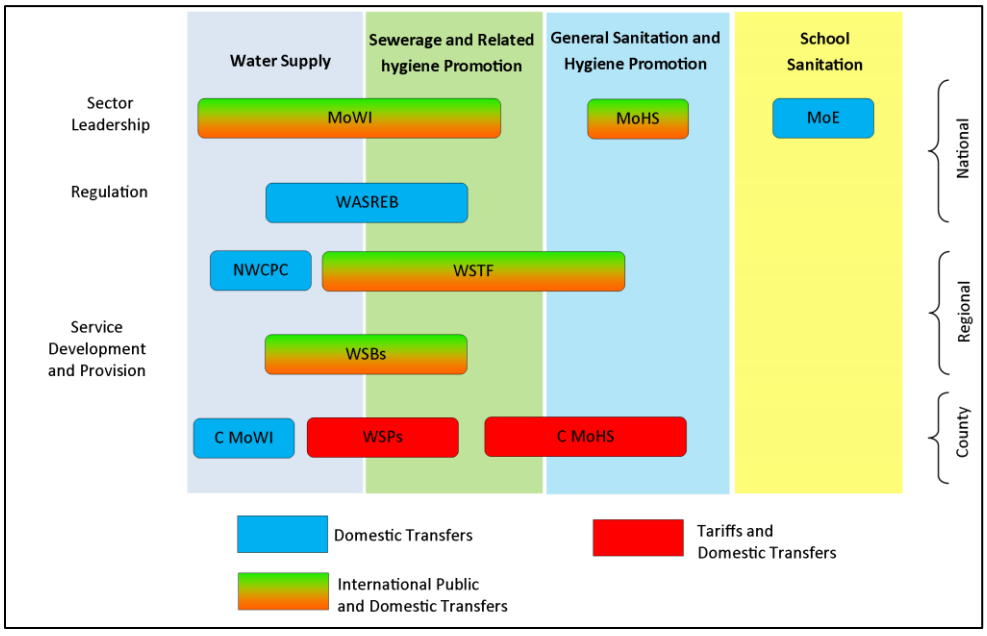


Figure 1 Institutional Financing Mechanisms of WASH in Kenya

3.4 Institutional and policy aspects

Centralized sewerage services

The maintenance and expansion of the centralized sewerage system in Nairobi is a responsibility shared between Athi Water Services Board (AWSB) and Nairobi City Water and Sewerage Company (NCWSC). In its mandate, AWSB states that it is the owner and custodian of water and sewerage assets in Nairobi City and is responsible for infrastructure planning, development and expansion. Thus it plans and mobilizes funds for development of trunk sewers within the city. The AWSB is financed from government budget allocations, subsidies, grants and charitable contributions. AWSB is expected to prepare ten-year capital works plan which includes detailed investment strategy and financing plan. The investments in capital works are recovered from NCWSC from the tariffs paid by the customers. NCWSC is expected to operate and maintain the water and sewerage infrastructure leased from AWSB. The finances come from the water and sewerage fees collected from its customers. To ensure this happens smoothly, an agreement is signed between AWSB and NCWSC in which the lease fees to be paid by NCWSC to AWSB are articulated. However, there has been a misunderstanding between the Nairobi City County Government and the AWSB regarding the ownership of the assets which formerly belonged to the Nairobi City Council before the 2010 constitutional reform.

In its 2012-2017 Strategic Plan of AWSB, a budget of Ksh 72 Billion was foreseen in the medium-term and long-term. In the medium term, AWSB planned to finance itself from lease fees from water service providers, the national government, development partners and private investors. For the long term AWSB hoped to achieve financial sustainability by innovating new financing models to mobilize funds for infrastructure development and expansion. This would be done by raining money from the private sector through infrastructure bonds, equity financing and Public-Private-Partnerships. It is unlikely that AWSB will achieve financial sustainability within the 2015-2017 strategic plan period given that this goal was also in the 2007-2012 strategic plan.

Therefore AWSB makes decisions about the technical types of infrastructure needed to expand sewerage infrastructure and how to mobilize resources for this development. In deciding what sewerage infrastructure is needed in Nairobi City, the engineers in AWSB are expected to work in consultation with those in NCWSC and agree on what needs to be prioritized. This does not always work well. There are obvious power games and AWSB assumes superiority over NCWSC. Also AWSB tends to prioritize development of trunk sewers without due attention to the development of laterals needed to allow the consumers access the sewer network. This task of developing the laterals is assumed to be a responsibility that NCWSC can bear but the financial resources to do this are not always sufficient. In some areas, trunk sewers have been developed but no plan was put in place to lay out laterals that can accessed by the developers. Such infrastructure remains unused and does not generate revenue. However the funds used for their development have to be recovered. This is one area where private investors could be encouraged to fill the financing gap. Meanwhile private investors who want to have their buildings occupied develop their own on-site facilities. The total cost of individual investments in most cases is higher than what the collective solution would have costs. Also standards are

sometimes compromised due to challenges in enforcing environmental and public health regulations and the environment is polluted.

AWSB decides makes decisions on how to finance infrastructure development. It does this in consultation with the major stakeholders namely: central government, county government and NCWSC. The consultation with NCWSC is crucial because the payments for loans spent to finance these developments is passed over to the water company and ultimately to the consumer.

The Water Act 2002 created new institutions in the water sector with the aim of separating the functions of coordination and policy formulation, water and sewerage services provision, water resources management and regulation. The Water Act 2002 also aimed to create financially efficient water companies that could attract funding from government, development agencies and the private sector. The Water Services Regulatory Board (WASREB) role is to issue licenses to Water Service Boards and determine the standards of services to consumers. The Water Service Boards in turn contract and license the Water Service Providers with the consent of WASREB. The Water Service Boards were created to plan, develop and expand water and sewerage infrastructure. WASREB gives guidelines and standards and approves appropriate tariffs for water and sewerage services provision.

The Water Act 2016 recognizes the devolved government with separate functions for the national and the county government. As per the Kenya Constitution (2010), the County Government now has the responsibility to deliver water and sewerage services to the County. WASREB still has the mandate to license and regulate water and sewerage service providers nationwide. The Water Act 2016 allows the WASREB to impose a sewerage services levy on water services to cover a reasonable part of the cost of disposing wastewater. With the approval of WASREB, the water utility company may withhold a portion of the levy and set it aside for expansion of the sewerage system. This is one measure that was introduced to ensure that expansion of sewerage services is not neglected in favour of water services.

The Kenya Constitution 2010 guarantees every Kenyan the right to basic sanitation and a clean and healthy environment. The Kenya Vision 2030 envisions universal access to improved sanitation by 2030. Kenya is also committed to achieving ODF status and access to improved sanitation for all in line with the international Sustainable Development Goals.

The Kenya Environmental Sanitation and Hygiene Policy (KESHP) of 2016-2030 provides broad guidelines towards achievement of universal access to improved sanitation by 2030. This includes measures to achieve ODF status by 2030, meeting the MDG goals that were missed, and increasing public investments to sanitation and hygiene from 0.2% to at least 0.5% by 2020 and 0.9% of the GDP by 2030. The interventions set out in the policy include scaling up access to sanitation in urban areas, fostering private sector investments in sanitation, building governance and leadership capacity for sanitation, building enabling legal and regulatory environment and strengthening monitoring and evaluation systems for the sanitation sector.

The Kenya Environmental Sanitation and Hygiene Strategic Framework (KESSF) of 2016-2020 is the implementation instrument of KESHP. KESHP aims to tackle the financial, policy and structural challenges that led to the

underperformance of the sanitation sector in the MDG era. Some of the strategic interventions of KESHP are scaling up sustainable access to improved sanitation in rural and urban areas, promoting private sector participation and sanitation marketing, ensuring sustainable sanitation financing and building an enabling legal and regulatory environment for sanitation. Under the KESHP, high quality standards of sanitation products and services will be promoted, a National Sanitation Fund will be set up, advocacy for increased public sector investments to sanitation will be done, private sector financing for households, utilities and small-scale independent service providers will be promoted. A resource mobilization strategy would also be developed.

One of the weak areas that affect provision of sanitation services is the failure of the county governments to enforce regulations on buildings and other physical infrastructure that needs sanitation services. In some cases, development plans that are supposed to incorporate plans for sanitation end up being approved or constructed without complying to the building regulations.

The financing towards county public works is weak and the money allocated to sanitation services is low. The budget towards Nairobi County public works transport and infrastructure in 2015/2016 was USD 74 million (25% of total County Budget) and 80% of it targeted maintenance of existing infrastructure and not development of new infrastructure. Sewerage was not targeted at all. This could be due to the fact that Nairobi Water Company is perceived as having adequate resources to maintain and expand sewer network.

There are some sanitation-related projects going on in the city that provide evidence that principles of the circular economy have been accepted in the city. Some of these are:

- The Sanergy model – This is a private company that operates UDDTs in the informal settlements of Nairobi. Urine and faecal sludge are deposited in two separate containers which are then collected every day and transported to a central facility for the production of fertilizers, energy and insect-based animal feeds. These toilets are franchised to members of the community who operate them as a business. Users pay about Ksh 5 per use. This company started in 2011 and is financed through a venture capital initiative. The toilet owners get a 12-24 month interest-free loan from a microfinance institution to purchase a unit for USD 500.
- Umande Trust, a Kenyan NGO has installed communal ablution blocks equipped with flush toilets and shower cubicles in Kibera slums. Human waste is fed to a biodigester to produce methane gas which is sold to the residents or used in communal kitchens. Residents pay Ksh 5 to use the bathrooms or the toilets and Ksh 10 to cook in the communal kitchen. The faecal sludge from the biodigester is composited for use in agriculture. Some of these so called biocentres are located in schools and other public areas.
- Elikham Systems is a local company that installs (sequencing batch reactor (SBR) units to residential homes and rented apartment blocks. These SBR units treat wastewater and recover clear water for reuse in gardening. These SBR units are best suited to high end residential areas.
- Peepoo (a biodegradable, single use slim bag containing urea which kills pathogens in human waste). After use the bag is deposited at a collection centre and composting is done off-site. This is a project in Kibera slums that has an unproven business model.
- There has been discussions on the possibility of generating methane gas from the wastewater treatment plants in Nairobi.

These initiatives can be scaled up. The Sanergy model has the potential to become a self sustaining business outfit once the develop markets for the fertilizer generated from the production units. The SBR units installed by Elikham could be promoted by giving subsidies and tax-discounts to people who invest in such systems.

4 Analysis

4.1 Major financing gaps and obstacles to urban sanitation

The investments in the water sector averaged Ksh 20 billion in the last three years against a budget of KSh 300 billion required annually (WB, 2015). The Annual Water Sector Review of 2016 gives a total investment requirement of Ksh 273 and 286 for 2014/2015 and 2015/2016 financial year. The budget over the same period was KSh 46 and 53 billion indicating a huge budget shortfall. The National Water Master Plan of 2014 shows that the investments required for rehabilitation and expansion of sewerage to achieve 2030 goals is Ksh 477 billion and the available government budget is only Ksh 31 billion.

The main sources of funds for WSS in Kenya are

1. Budgetary allocations
2. Equalization Fund
3. Decentralized funds (from the Counties)
4. Donor funds (either through treasury of directly to Projects)
5. WSS Development Funds (WSTF)
6. Consumer Tariffs and contributions

The gap in the financing of the water sector can be closed by

- Reducing the costs
- Increasing the revenue
- Improving the enabling environment to attract new financing

The challenges to financing urban sanitation

- The low public budget allocation to sanitation both at national level and at county level – This has been a problem in the past but hopefully with the new government commitment to increase the funding to 0.9% of the GDP, this problem will be sorted.
- Limited involvement of the private sector in financing sanitation services
- Lack of a dedicated budget for sanitation at national and county level – this problem needs to be addressed so that there is transparency and accountability in the way funds are allocated and utilized.
- Lack of clear performance targets focusing on sanitation for urban water utilities – the performance measures and reporting mechanisms have a heavy focus on water and very little on sanitation. The national regulator has not developed sufficient tools to hold water utilities to account with regard to delivery of sanitation services.

- Lack of a clear mechanism to plan, coordinate and account for the total financing for sanitation that comes through the different public, private and NGOs channels – currently the funding for sanitation is channeled through the line ministries of health, water, environment and public works at national and county levels, the national environmental management authority (NEMA), various NGOs and the private sector.
- Bigger focus on sanitation software rather than hardware – most of the actors in sanitation sector have tended to spend human and financial resources in software rather than hardware. This may be due to the fact that it is easier to meet performance targets and account for funds spent when one pursues software rather than hardware options to the sanitation problem.
- Inadequate enforcement of physical planning regulations – the private sector would have been more committed to develop improved sanitation facilities and to set aside adequate land for sanitation infrastructure if the legal and regulatory requirements with regard to development of land in the city had been better enforced.
- The lack of a sanitation and hygiene investment plan has been lacking due to lack of expertise within the sector.
- Legal and regulatory environment is not conducive to allow the needed level of investments in sanitation – the devolution process that started in 2010 brought a huge need to develop new policies, strategies, laws, regulation and institutions at the two levels of government. We have made considerable progress in the seven years but this flurry of activity has meant that a lot of things still need to be fine-tuned to respond to the needs of the sector. For instance, the role of sanitation services delivery falls heavily on the counties but so far, the counties have not adequately appreciated the full weight of this obligation. There is need to develop a coherent legislative and regulatory framework to enable counties and national government meet the national and international goals regarding sanitation. To this end KESSF recommends enactment of a National Environmental Health and Sanitation Bill and a National Environmental Sanitation Coordinating and Regulatory Authority (NESCRA). Among the proposed roles of NESCRA is to provide leadership in the sanitation sector, coordinate stakeholders, issue licenses to sanitation service providers, develop service provision standards and monitor compliance, develop tariff guidelines for sanitation service providers. However some of these roles are perhaps better handled by WASREB.
- Unclear institutional roles and responsibilities – we have several institutions under the line ministries of health, water, environment whose roles and responsibilities are unclear; there gaps and overlaps and power struggles. For instance the role of NEMA and WASREB in regulating effluent discharge and standards of wastewater treatment; the role of Water Service Boards, Water Service Providers and County Governments in asset ownership, asset management, infrastructure development, maintenance and financing is highly contested; the role of the ministry of health and ministry of water in policy formulation and coordination and implementation of strategies cannot pass unchallenged – the engineers who do the planning, design and supervision of sanitation facilities are in the water ministry whereas the ministry of health has been given the lead role on matters of sanitation.

4.2 The future of AWSB in achieving Nairobi City's sanitation goals

The future of AWSB and its engagement with Nairobi City Water and Sewerage Company does not look very good. Even in the past, the relationship between AWSB and NCWSC has always been strained. The general feeling among NCWSC

management is that AWSB feels they are superior to NCWSC and they tend to bulldoze their way during project design and implementation. Even though the Water Act 2002 gave AWSB the mandate of asset ownership, the handover of assets from the former Nairobi City Council was not fully done and with devolved government, the City government has renewed its claim on the assets. Secondly there is a general feeling that AWSB should not continue to borrow money for water and sewerage infrastructure development and push the burden of paying the loans to NCWSC. On the other hand AWSB feels that NCWSC is badly managed; it has over-employed and productivity of staff is low. AWSB feels the water utility could be more profitable and hence more creditworthy if only it reduced its staff and pushed for increased productivity alongside other measures to control wasteful expenditure. AWSB argues that with better financial management, more resources would be available to expand sewerage facilities in the city. The NCWSC is supposed to be independent and free from political interference by the County Government. As the County government seeks to strengthen its claim on the assets, AWSB will have to focus on development of large cross-county water and sewerage projects. Most likely, the greater emphasis of AWSB on water will continue and fewer and fewer resources will target sewerage.

On its own, NCWSC feels they do not have sufficient funds for large infrastructure projects and they blame this on the low water tariffs which are regulated by WSRB. The burden of expanding sewerage seems not to be owned by either NCWSC or AWSB.

AWSB will take a long time to achieve their well meaning goals. This is due to financial and capacity constraints as well as the institutional challenges mentioned above. The area of operation of AWSB is very large, their budget is limited and they have a history of poor performance. The WSRB holds water services providers to account and water utilities are expected to monitor their performance and write quarterly reports to be submitted to WSRB. Apart from Kenya National Audit Office (KENAO) which does financial audits of all publicly funded bodies, there is no other body that regulates performance of AWSB. WSRB is supposed to regulate Water Service Boards but it is not clear how it does that apart from monitoring of the operation of agreements between Water Services Boards (WSBs) and Water Service Providers (WSPs). So it is highly likely that AWSB will fail to meet their goals and not be held accountable.

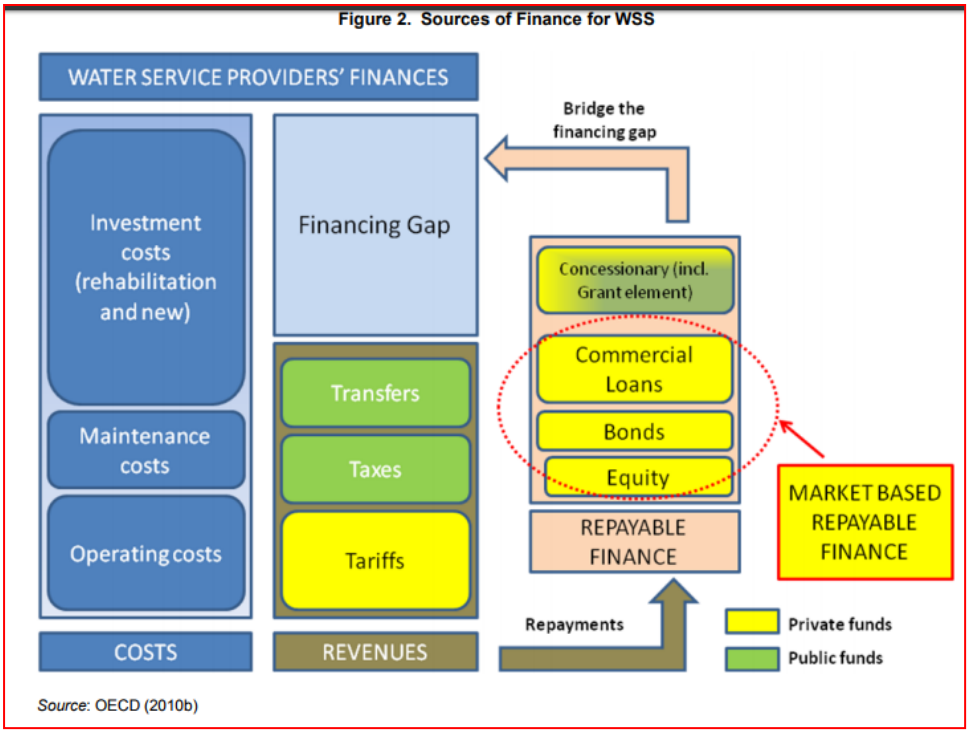
The greatest hindrance from the government side has been the leadership of the county. In Nairobi as well as in other Counties, financial governance has been very poor. Now that the county has a very optimistic governor, we can only hope that some of the sanitation challenges in the county will be resolved quickly by the county government but maybe not the AWSB.

There needs to be discussions on how AWSB, NCWSC and the national government will cooperate to ensure responsibilities are shared, finances are set aside and monitoring and evaluation is done if sanitation is to move forward. But this is not only for Nairobi but for all other urban centres in Kenya.

4.3 Innovative mechanisms to increase financing to sanitation

Some innovative financing mechanisms:

1. PPP - Contractual arrangements, including service contracts, management contracts, lease contracts, concession contracts, BOT (build, own, transfer) contracts. The Northern Collector Water Tunnel is one example of a water project that is being implemented as a PPP.
2. Commercial Loans - Water companies access commercial loans for infrastructure development. Because sewerage infrastructure doe not attract as much revenue as water infrastructure, it may be more difficult to develop a bankable sanitation proposal compared. The World Bank has developed a toolkit that can guide WSPs looking for commercial loans.
3. WSTF Results-Based Financing RBF - The projects to be implemented by the water utilities are pre-financed with commercial loans from domestic lenders in Kenya on market terms. These projects can be for construction/expansion of water and sewer networks to reach unserved consumers, rehabilitation/improvement of existing networks, water and/or sewer connections to households and public points, water and sewer treatment facilities. After completion of their projects, the water utilities are incentivised through applying one-off subsidies provided under the RBF sub-programmes for up to 60% under the World Bank's OBA and up to 50% under the KfW's AoD programmes. The challenge with this scheme is that utilities are more likely to utilize the loans for water services where costs can be recovered easily compared to sanitation services.
4. Microfinancing for household sanitation facilities: The centralized sewerage system covers only 30% of the area of Nairobi County and much less if one considers the metropolitan areas. The chances of expanding this system are low. The unserved areas will have to rely on on-site sanitation. Households find challenges in accessing financing for the recommended sanitation facilities. This encourages construction of low quality facilities that pollute the environment or even open defecation. There is need to establish a microfinance loan scheme that supports households to develop quality sanitation facilities. The same approach of results-based financing for water utilities could be used whereby individual households could apply for subsidies once their facilities are approved by public health or NEMA.
5. Household level sanitation services providers are few and not adequately regulated. They also have challenges accessing finances for business development. There is need to encourage more players in this space by providing capacity building, business loans and regulation of services provided to customers. Currently NEMA is supposed to visit all new building sites and approve sanitation facilities. But NEMA does not have enough staff to undertake these tasks. These sanitation service providers could be licensed and approved by NEMA or Ministry of Health and given mandate to offer services to their clients and facilitate their certification by NEMA.



6. The programme Upscaling Basic Sanitation for the Urban Poor (UBSUP) which is implemented by the Water Services Trust Fund and financed by the Bill and Melinda Gates Foundation, KfW and in kind contributions and technical support from GIZ has been running successfully from 2011. The goal of UBSUP is to improve the living conditions of the urban poor by offering access to sustainable plot level sanitation for up to 800,000 and to safe water for up to 200,000 residents of urban low income areas in Kenya. It works across the entire sanitation service chain. The project consists of a technical component (that provides capacity building, advisory services, monitoring and reporting, standardization) and a financial and up-scaling component that provides subsidies for plot level sanitation facilities. It also supports private sector to develop business around sanitation such as exhausting services. It works with the water service providers to develop decentralized treatment plants in urban areas. From the experiences of UBSUP we learn that small-scale private entrepreneurs have the capacity to actively participate in the provision of basic sanitation to the urban low income areas. UBSUP is a good approach but will need to be tweaked to fit Nairobi City which is a complex urban centre with a huge population therefore requiring huge investments to create significant impact. The budget for UBSUP (Euro 18.4 Million = Ksh 2.2 Billion from 2011 to 2018) is very small compared to what is needed to achieve the Vision 2030 sustainable development goals on sanitation. And most of the budget will be used in software not hardware. We can only hope to learn from the model.

   Some lessons from UBSUP that can be applied to Nairobi:

   (i) There is willingness to pay for sanitation services even among the poor. This means that entrepreneurs could invest in pay-toilets in areas where these are rare.

   (ii) UBSUP works best through existing institutions. Water utilities like NCWSC could implement the project with the funding from WSTF.

(iii) There needs to be a national body that holds utilities to account. With the current setup of UBSUP, WSRB, NEMA and Public health are involved in promoting sanitation and hygiene, setting standards, monitoring.

(iv) The adoption of improved sanitation grows faster where an attempt is made to enforce regulations such as the Public Health act and the Physical Planning Act. This means a combination of incentives.

(v) A range of options for collection, transport, treatment and reuse of wastewater needs to be offered to fit the different socioeconomic and cultural conditions especially in complex urban settings such as Nairobi.

(vi) The challenge of acquiring land for decentralized wastewater treatment plants raises the cost of such facilities. Urban centres need to secure land in newly developed areas in advance before the costs escalate.

4.4 Policy and institutional changes needed to enhance sanitation financing

The KESHP 2016-2030 and the KESSF 2016-2020 have clearly articulated the institutional challenges that hampered the flow of finances to sanitation and proposed some changes to tackle some of these challenges. These changes include:

- The enactment of a National Environmental Health and Sanitation Bill
- The establishment of a National Environmental Sanitation Coordinating and Regulatory Authority (NESCRA).
- The establishment of a National Sanitation Fund (NASF) to mobilize sanitation funds from government, development partners and the private sector.

The PPP Policy 2011 articulates the government commitment to public-private-partnerships. The PPP Act 2013 provides for the participation of the private sector in financing the development and maintenance of infrastructure through concessions or other contractual arrangements and the establishment of institutions to guide and regulate this process.

The Water Act 2016 has also just come into force after a lengthy stakeholder driven consultative process. Under this Act, Water Service Providers may enter into a PPP arrangement with a private entity to carry out some or all of its functions.

In view of these very recent policy and institutional reforms, there are adequate measures in place to create an environment that allows increased financial flows to sanitation. What is needed now it to implement the actions that have been proposed in the policy documents and monitor how they impact on sanitation service delivery.

4.5 Chances that sanitation will receive more finances in the future

With the government's commitment to enhance public expenditure to sanitation to reach 0.9% of the GDP, it is highly likely that sanitation will receive more finances in the future. The PPP Policy and Act also pave the way for greater engagement of the private sector in bridging the financing gap. The SDG has introduced more stringent measures

towards monitoring and evaluation and these are likely to contribute to greater accountability in the use of financial resources. The proposed legal, regulatory and institutional arrangements are poised to inject new life into the sanitation space. There are also active programmes to make Kenya ODF by 2020.

Kenya's GDP in 2016 was USD 70.53 billion. If goal of setting aside the equivalent of 0.9% of GDP towards sanitation is met, that would be USB 0.63 billion or USD 633 million or KSh 63 Billion. Given that the budget required to achieve 2030 sanitation goals is Ksh 477 Billion in 15 years or Ksh 32 Billion per year, then the 2030 commitments would be achieved if the investment is raised to 0.9% of GDP. However there are many sectors that need additional government funding such as free primary and secondary education (free secondary education could cost up to Ksh 100 billion per year), agriculture (there is a AU led goal to commit 10% of GDP to agriculture and Kenya has not achieved this) and health. Given that the government scores more through free secondary education, agriculture and health than through sanitation, we will most likely see a scenario where these sectors receive more funds while sanitation receives less attention. Sanitation is housed in the health sector but this sector has very broad mandates and the role of improved sanitation in reducing the disease burden and improving productivity of other sectors has not been properly articulated. Within the Ministry of Health, the WASH department is very small.

Evaluating the cost-benefit of investing in sanitation may help. One could for instance assess the return on investment for sanitation facilities and use this information to appeal to the decision makers.

4.6 Potential areas of intervention

- Given the growth of the sewerage coverage from 33% to 45% over last 10 years, it looks that the growth in sewerage coverage will stagnate at around 50% due to challenges such as financing, lack of land to build new infrastructure to reach new areas of settlement and lack of momentum to overhaul existing sewerage network. It is therefore imperative that any intervention focuses on the 50% of the population that will be living and doing business in the unsewered areas of the city and its environs. There is need to promote business opportunities towards provision of quality sanitation services in these areas. Support towards regulation and enforcement and high engineering standards for sanitation facilities is also needed. These services also need to be cost effective. There should be a focus on environmental protection, recovery of nutrients for agriculture, recovery of bioenergy, recovery of water, and minimal use of water for sanitation. Nairobi is going to be facing a serious water crisis going forward due to population increase and weather extremes.
- The reporting of the performance of the water and sewerage companies has been improving since the first WASREB report in 2008 and the most recent one in 2016. These reports are available at http://www.wasreb.go.ke/impact-reports. We note that the reporting on sanitation or sewerage services is weak. It is difficult to establish how the sewerage arm is performing and impossible to delink it from the water services. If these companies have to continue under names 'water and sewerage', there is need to develop performance indicators for the sewerage arm of their mandate and to ensure companies start

collecting the relevant data and report on it. We also note that earlier reports did not report on revenue collected and this has now become standard practice in recent reports. Perhaps it is possible to separate revenue and expenditure from water and sewerage services as well going forward. It should also be clear whether utility companies should report on sewerage and sanitation or sewerage only and how to define these two terms and establish who bears responsibility for them. It is clear that sanitation will be handled by other institutions as well.

- All organizations, both government and civil society, contributing towards sanitation need to have clear guidelines on reporting on their performance so that all efforts towards improving sanitation can be monitored and progress towards national goals seen. This is also an area where WWC can help.

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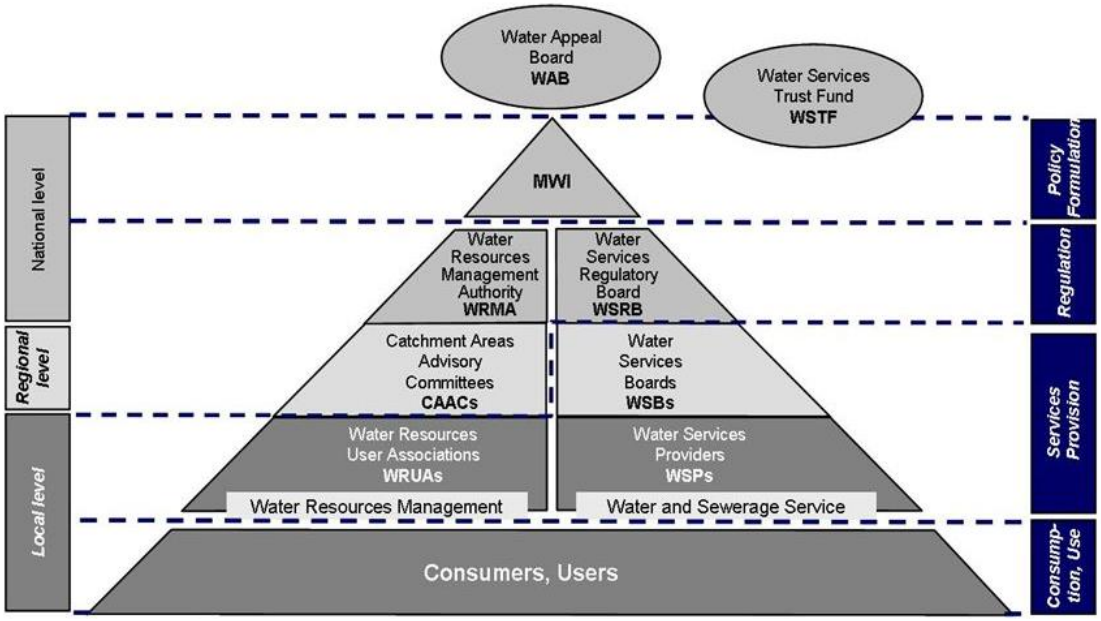
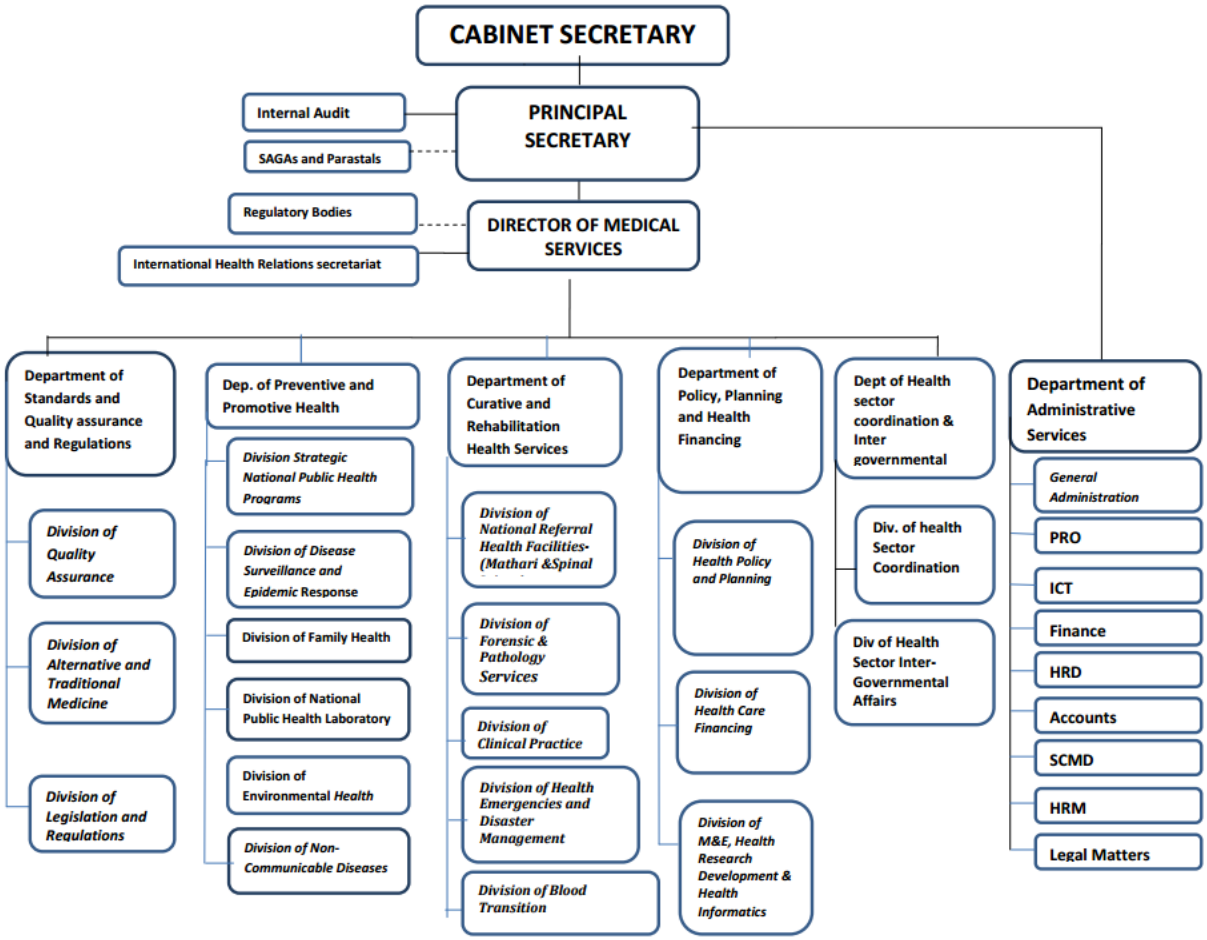
APPENDICES

Appendix 1: Institutional framework of the water sector under the Water Act 2002



Appendix 2: Organogram of the Ministry of Health at the National Government



Appendix 3: Organogram of the Ministry of Health at the Nairobi County Government