

TEN ACTIONS FOR FINANCING WATER INFRASTRUCTURE

WORLD WATER COUNCIL REPORT



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The World Water Council is an international multi-stakeholder platform organization, the founder and co-organizer of the World Water Forum. The Council's mission is to mobilize action on critical water issues at all levels, including the highest decision-making level, by engaging people in debate and challenging conventional thinking. The World Water Council, headquartered in Marseille, France, was created in 1996. It brings together over 300 member organizations from more than 50 different countries.

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TEN ACTIONS FOR FINANCING WATER INFRASTRUCTURE

WORLD WATER COUNCIL REPORT
FINANCING WATER INFRASTRUCTURE TASK FORCE
WORLD WATER COUNCIL

Prepared by
Alex Money

FOREWORD



The World Water Council, through its work with experts and long-standing partners, has always considered the issues related to financing water infrastructure as a high priority.

We are aware of the crucial role that infrastructure plays in minimizing risks of water scarcity, floods, climate exposure, water pollution and inadequate access to water supply and sanitation. Yet, we also know that there is not enough investment flowing towards water infrastructure to be able to bridge that gap.

Financing water infrastructure and closing the investment gap – between what is invested and what is required – should be a major global concern, as all countries are affected. It is a multi-faceted issue, which affects economic growth, food and energy security, and human and environmental health.

Benedito Braga
President
World Water Council

A handwritten signature in black ink that reads "Ben Braga". The signature is fluid and cursive.

Now more than ever, it is important to further promote concrete and operational recommendations at the highest level to improve the financial system effectiveness in mobilizing more capital towards investment in sustainable and resilient water infrastructure. Therefore, this Action Report aims at identifying the obstacles that are hindering investment in water infrastructure, finding solutions on how to overcome them and eventually unlocking the necessary funding to be able to achieve Sustainable Development Goal 6: Ensure availability and sustainable management of water and sanitation for all.



Investment needs for financing water infrastructure are colossal. And the current rate of investment will not allow us to achieve Sustainable Development Goal 6: “Ensure availability and sustainable management of water and sanitation for all.”

This difficult situation is amplified by new challenges brought on by climate change, population growth, agricultural activities, and energy production, among others.

Most actors involved in water know that financial flows, public or private, are strikingly insufficient to be able to reach a water-secure world. At the same time, significant amounts of capital are available on financial markets. Yet, they are not invested in water, but rather in telecommunications or technologies, which are considered to be more attractive investments.

The objective of the work of the World Water Council Task Force on Financing Water

Bernard Guirkinger
Chair of the Task Force on Financing Water Infrastructure

Infrastructure is precisely to better understand what barriers are preventing investments in water. Our goal is to make pragmatic and operational recommendations that will increase financial flows towards sustainable water infrastructure.

Overcoming water-related challenges would not only improve health and well-being, it would simply allow billions of people to improve their quality of life, gain access to education and work, all reaching towards sustainable development and growth.

Our work is far from over. The 8th World Water Forum in Brasilia, Brazil is but one step in the road towards mobilizing a significant international dynamic for financing water infrastructure and ensuring water security.

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This report was written by Dr. Alex Money, Programme Director at the Smith School of Enterprise and the Environment, University of Oxford; and consultant to the World Water Council for this work programme.

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Any errors, omissions, or subjective opinions are the author's alone.

INTRODUCTION

There is a large and growing body of evidence that underlines the strong causal relationship between water security and economic growth. Achieving water security requires appropriate investment in infrastructure, capacity building and project development. However, there is a big gap between current investment in these key areas, and the amount that is required if the UN Sustainable Development Goals (SDGs) are to be met by 2030.

Efforts to quantify this difference are more of an art than a science, but there is some consensus that the overall 'infrastructure gap' approximates US\$ 1 trillion per annum, of which water accounts for 15-30% (compared to a historic investment share of just 6%). A precise forecast is anyway unnecessary: what matters is whether the gap is being closed. Here, the indicators are discouraging. As things stand, the infrastructure that is necessary to make the SDGs achievable will not be financed; and what is more, changes to the status quo do not appear to be imminent.¹





AIM

The aim of this short report is to identify a series of actions that could help to bridge the financing gap for water infrastructure. The report considers both the supply side (i.e. the availability of suitable infrastructure projects) and the demand side (i.e. the availability of suitable infrastructure finance) of the equation. Our mandate allows us to travel at a slight tangent to the well-documented literature on project preparation and financing. We consider the barriers that remain in place despite the apparent abundance of cheap capital, and emphasise the operational and practical functions that innovation – in various forms – can deliver to help lower these barriers. Of course, we recognise that the challenges are complex, and that progress is already being made in various forms. As such, the recommendations we set out are incremental, and explicitly designed to build upon existing initiatives.



CONTEXT

Nearly 15 years have elapsed since the World Panel on Financing Water Infrastructure, chaired by Michel Camdessus, articulated the challenge. A task force was subsequently established, chaired by OECD Secretary General Angel Gurría, which published recommendations in 2006 that emphasised the need for innovative mechanisms that enhance local government access to financial resources. In 2015, a report was published by the High Level Panel on Financing Infrastructure for a Water-Secure World; an initiative of the World Water Council and the OECD. It focused, amongst other things, on multi-purpose infrastructure, an enabling environment, competition, innovation and efficiency. And last year the World Bank produced a paper for the High Level Panel on Water that called for a new sector financing paradigm based on greater collaboration between stakeholders. While these reports have been well received – and indeed have catalysed several other initiatives – many of the original challenges identified by the Camdessus panel focused on solutions involving government intervention. Less progress has been made on co-opting other actors, such as institutional investors, project developers, private sector enabling organisations, Development Finance Institutions (DFIs), research institutes and others. This wider engagement remains pre-requisite to achieving a scalar transformation in financing water infrastructure, and underpins the Council's motivation to produce this report.

STRUCTURE

We identify ten discrete issues that we associate with barriers to investment in water infrastructure. We recognise that some issues are more important than others; and moreover, that there are many other issues beyond the ten identified here that can play an important role in governing the finance of water infrastructure. Members of the Council's Taskforce identified several of these in their review of this paper, including the question of water as a common good; environmental and social safeguards; political instability; operational complexity; asymmetric time frames; strategic planning; regulation and the rule of law; institutional coordination; and governance. Each issue included in this paper is framed as an action; and summarised on one page with some contextual information, along with a recommendation.



The recommendations we make are for the most part directed right back at multi-stakeholder platform organisations such as our own. Most of the barriers we identify are already well known and understood. But there appears to be little consensus amongst the wider stakeholder community both on where to go from here, and also on how to get there. In identifying a set of occasionally provocative actions, we propose an outline roadmap of sorts. We do not anticipate unanimous agreement on the directions we suggest. But what we hope to generate is some critical input from the range of actors that we identify above. This input is both desirable and necessary in informing the next stage of our work. Our aim is to deliver a set of empirically grounded, scalable programmes that engage both public and private sector actors, principally by appealing to their rational self-interest.

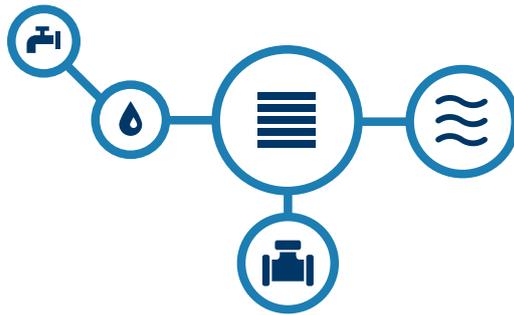
OUTPUTS

The first substantive outputs from this initiative – focused on two or three of the actions outlined in this paper – are scheduled to be presented at the 8th World Water Forum in Brasilia, in March 2018. Our timeframe is tight, but the challenge is commensurately urgent. We therefore warmly encourage you to contact us at the earliest opportunity with your comments. Your contribution will materially improve the quality of the work that we ultimately deliver.

THE ACTIONS

- 1 | Develop a Typology of Water Infrastructure Projects
- 2 | Develop a Typology of Water Infrastructure Investors
- 3 | Broaden the Attribution of Risk and Return
- 4 | Renew the Emphasis on Public Finance
- 5 | Exploit the Opportunities of Purposed Finance
- 6 | Optimise the Value of Development Finance
- 7 | Improve Project Selection and Development
- 8 | Distinguish between Capex and Opex
- 9 | Explore Hybridity and Blended Finance
- 10 | Revisit Tariffs, Taxes and Transfers (3Ts)

1



DEVELOP A TYPOLOGY OF WATER INFRASTRUCTURE PROJECTS

A typology of water infrastructure will help to align specific projects with the most *appropriate* funding available. Classifiers include **scale** (e.g. from watershed to street); **status** (e.g. greenfield or brownfield); **function** (e.g. water supply, waste water management); and **operating environment** (ownership, governance and regulation).

CONTEXT

The generalist literature around infrastructure financing often treats water infrastructure as a single, fungible entity, without providing consideration to the specific attributes of different types of project. Water infrastructure operates from the scale of the river basin or catchment through ‘buried infrastructure’ to the household tap. It covers upstream functions including pumping, diversion,

transportation, storage, treatment and distribution. Downstream functions such as sewerage, treatment and sanitation services are also heavily capital intensive. A distinction is sometimes made between water services and water functions, particularly when identifying and attributing economic value. However, from a financial investment perspective, other methods of categorisation may be more salient.

Water infrastructure is capital intensive, with finance necessary to cover upfront construction costs that are typically repaid over long periods. Projects as diverse as water supply and sanitation, flood protection, irrigation, reservoirs etc. embed different levels of capital intensity and repayment periods. They bear distinct credit, commercial and legal risks; and offer varied economic, financial and social return.

Generic descriptions of water infrastructure may lead to knowledge asymmetries between the supply side (governments, technical partners, developers) and the demand side (project financiers, investors). In practical terms, this may mean that developers are not as aware of the funding sources that might be particularly appropriate for a project; while investors do not have easy access to a project pipeline that most closely fits their requirements. Aligning specific projects with funding sources whose investment mandates match the project's attributes could reduce the frictional costs associated with project financing; accelerate the pace at which projects are funded; and increase the probability of projects finding appropriate funding.

There are various classifiers that might be applied to a typology, including scale, function and the operating environment. In addition, specialist funds may focus on the sustainability profile of a project, and the extent to which the infrastructure is 'natural', or 'green'. The proposed financing and ownership arrangements (e.g. Build, Operate, Transfer (BOT)/ Build, Own, Operate, Transfer (BOOT) etc.) may also be salient, as well as the broader governance and regulation framework.

RECOMMENDATION

Agree a codified typology of water infrastructure using multiple classification layers. Based on this typology, develop an open-source aggregation framework through which governments, technical partners and others can log and self-classify water infrastructure projects, subject to external validation and scrutiny.

2



DEVELOP A TYPOLOGY OF WATER INFRASTRUCTURE INVESTORS

A typology of investors will help to align specific projects with the most *accessible* financing that is available. Classifiers include **source** (e.g. public, private, concessionary); **risk and return appetite** (e.g. economic, social, financial); and **mandate** (e.g. time horizon, objectives, impact).

CONTEXT

Governments are and will remain pivotal investors (see 4, below) in water infrastructure for the foreseeable future; particularly within Emerging Markets and Developing Economies (EMDEs). However, given the pressure that some public sector balance sheets are under, there is an urgent need to better identify the projects that need government investment to be viable, and projects that can be financed

principally or solely from private capital. Improving the classification of infrastructure projects (see 1, above) helps to identify the most appropriate sources of finance. But it is just as important to identify the most accessible sources of finance, which is the purpose of a typology of investors. Used in conjunction with a project typology and risk framework, it can help decision makers identify and prioritise projects that are both

a) strategically imperative and b) unlikely to be financed without government support.

There is a big, blurred space between public and private investment that is occupied by entities including Multilateral Development Banks (MDBs) and Sovereign Wealth Funds (SWFs). These investors can make a material contribution to closing the infrastructure finance gap. In order to maximise this potential, their mandates and motivations must be understood clearly and incorporated transparently within the investor typology.

In terms of private sector investors, it is well noted that there is a lack of financial innovation in water infrastructure, including hybrid instruments (see 9, below), insurance products, and asset classes for institutional investors. Given the financing gap is acute in EMDEs, increasing these allocations is both necessary and desirable from both the demand and supply side: particularly as the long-term liabilities of pensions and insurance plans match the long-term asset profile of infrastructure.

That this has not happened partly reflects the heterogeneous attributes of commercial lenders, insurers, institutional investors

and others. Commercial banks, pension funds, insurance companies, mutual funds, hedge funds and others each have different performance objectives, risk tolerances, income preferences, time horizons, information resources, sector knowledge and so on. A typology that classifies these different sources of finance against their various mandates will help improve access to funding.

RECOMMENDATION

Build upon existing investor typologies using multiple classification layers. Based on this typology, develop an open-source aggregation framework through which investors can self-identify their mandates and preferences. The database should be supplemented by validated information on actual investments made.

3



BROADEN THE ATTRIBUTION OF RISK AND RETURN

The ‘bankability’ of a water infrastructure project is a function of its *perceived* risk and return. Infrastructure risk is commonly deconstructed into exposure and uncertainty, while measures of return are almost exclusively financial. However, the **counterfactual risk of *not* financing** infrastructure should form part of the evaluation process.

CONTEXT

Risks linked to investment in infrastructure projects are typically classified into political and regulatory risks; macroeconomic and business risks; and technical risks. Political and regulatory risks generally arise from government actions, the behaviour of government contracting agencies, or broader uncertainty associated with the policy environment. Macroeconomic and business risks arise from volatility

in economic variables such as inflation, interest rates and exchange rates, or shifts in the business cycle. Technical risks are related to the competence and skill required to manage the strategic and operating complexities of a project. Risks can also be classified in terms of a project’s lifecycle; from the development phase, through to the construction, operational and termination phases.

Some excellent literature has been recently produced on managing these risks. In terms of government actions, it is proposed that political risks might be reduced making credible and long-term commitments to public-private partnerships. Business risks could be mitigated through proactive use of fiscal and monetary instruments, while technical risks can be managed through robust vetting of operators and contractors. In terms of private sector actions, companies can either retain and manage risks through well-designed internal procedures, or can transfer risks through financial (e.g. insurance) or non-financial contracts (e.g. supply and purchase agreements).

However, another way to think about risk is from an outcomes perspective. Rather than the political, business and technical risks of delivering a project, ‘counterfactual risk’ can be classified by the economic, social and environmental consequences of non-delivery. By applying a robust and consistent methodology to evaluate counterfactual risk, project selection can be improved. In terms of finance, beyond direct returns on investment (e.g. from the income derived through water rates), the return benefits from improved water security could

be downscaled to a project-specific level, which could better align projects to different sources of capital (e.g. impact investors).

RECOMMENDATION

Research on risk and mitigation in delivering specific infrastructure projects should be supplemented by programmes to understand the economic, social and environmental risks of non-delivery. This analysis should be aligned with the returns on investment derived from improved water security; and connected to existing research in this area.

4



RENEW THE EMPHASIS ON PUBLIC FINANCE

SDG 6 will not be achieved without **predictable** and **dedicated** flows from the *public sector* towards meeting the financing requirements of water infrastructure. Delivering universal and equitable access to safe and affordable drinking water for all by 2030 requires a re-affirmation of the centrality of public financing for the next decade.

CONTEXT

Traditionally, infrastructure investments have been financed by both the public and private sector. In recent decades, a consensus has emerged regarding public sector indebtedness that has helped to bolster the narrative that alternative sources of financing infrastructure are both necessary and desirable. This narrative has become more strident in the era of fiscal austerity and balance sheet recapitalisation that has followed the credit crisis of 2008-9.

However, in the aftermath of that crisis, the share of infrastructure spending by the public sector actually went up, due to the flight of risk-averse private sector capital. This function of ‘automatic stabilisation’ helps to mitigate the social and economic consequences of a recession. Moreover, public finance accounts for the majority of infrastructure investment in the emerging markets today, and will continue to do so for the foreseeable future. In addition to

annual budgetary flows, public finance is increasingly flowing to infrastructure assets via SWFs; where assets under management have more than doubled in the last decade to over US\$6.5 trillion, and the proportion of SWFs investing in infrastructure has increased steadily, to 62%.

Although it may not be a 'pure' public good, many people may benefit from water infrastructure without directly having to pay for it, while their use of this infrastructure does not prevent others from doing so. This combination of attributes is generally only present in publicly funded infrastructure. What is more, these attributes are fundamental to the concept of universality that is embedded in SDG 6. It is therefore difficult to see how this goal will be met, unless public finance occupies a central role.

Economic volatility, the rise of SWFs and the urgency of the SDGs therefore combine in a renewed emphasis on the public sector in financing water infrastructure. Governments are also the core unit of accountability and delivery needed to downscale from general discussion of the infrastructure gap, to the specific needs of a national population.

RECOMMENDATION

Re-emphasise the importance of allocative efficiency in public finance, in delivering universal access to water and sanitation, for example by benchmarking national projects against the eight targets of SDG 6. Refresh measures of accountability and impact to reflect global best-in-class approaches from the public and private sector.

5



EXPLOIT THE OPPORTUNITIES OF PURPOSED FINANCE

Exploiting the expanding universe of *specially purposed finance* is key to bridging the infrastructure gap. Emerging opportunities emphasise low carbon, climate resilient sustainable growth. They include **climate finance** (e.g. green bonds); **corporate investment** (e.g. sustainability bonds); and **regional initiatives** (e.g. China's One Belt, One Road).

CONTEXT

At COP 21 in Paris, countries committed to mobilising no less than US\$ 100 billion per annum in climate finance from 2025. The Green Climate Fund (GCF), the de facto mechanism for aggregating and disbursing this investment, currently has over US\$ 10 billion in assets. The relationship between water infrastructure and climate change mitigation and adaptation does not need to be rehearsed here, but the GCF could –

and should – represent an important source of incremental financing for the sector. Meanwhile the global green bond market has grown ten-fold over the past five years, with issuance in 2017 likely to exceed US\$ 130 billion. The investment case for 'nature-based' water infrastructure (see 1, above) is strong, and growing. The requirement now is to identify appropriate opportunities.

Corporate sustainability investment is a nascent area that has its origins in corporate social responsibility, and responsible investment. In order to manage environmental risk and enhance their social licence to operate, companies are increasingly engaging with suppliers, customers and policymakers in markets where they rely on water infrastructure. As their understanding of the risks they face from inadequate water infrastructure improves, companies are considering more innovative approaches to the financing challenge.

Regional initiatives to boost economic growth and trade often include an element of infrastructure financing. The most prominent current example is China's One Belt, One Road (OBOR) initiative to develop new overland and maritime trading routes: the scale is ambitious, with an estimated US\$900 billion of projects already planned or underway. Even where these projects are not directed specifically towards the water sector, the flow of funds lowers investment costs by freeing up otherwise committed capital. Strategic alignment of water infrastructure projects with purposed, regional initiatives such as OBOR provides another avenue to close the financing gap.

RECOMMENDATION

Apply a coordinated and lateral perspective to water infrastructure investment, by exploiting the expanding universe of specially purposed financing. Climate bonds, corporate sustainability investment and regional economic initiatives provide new and largely untapped sources of capital.

6



OPTIMISE THE VALUE OF DEVELOPMENT FINANCE

Development finance can play a unique role in *convening* investors and financiers to collaborate on complex projects that would otherwise be out of scope for any single financing institution. By coordinating **preparation, structuring and implementation**, DFIs can materially improve the pipeline of bankable projects.

CONTEXT

Three of the major barriers to private investment in infrastructure are: i) a weak pipeline of viable projects; ii) a perception that the risk is too high; and iii) emerging market infrastructure is not universally understood as an asset class. To improve the pipeline of projects, MDBs are increasingly working in partnership with governments and private sector financiers. For example, the Global

Infrastructure Facility (GIF) provides grants to governments to fund early-stage project scoping. The grants, typically in the order of several thousand dollars, do not need to be repaid. The GIF also provides up to several million dollars to fund full Project Preparation and Structuring Activities (PPSA). As PPSA costs must normally be repaid, it can act as a deterrent to project development. However, the GIF bears full

PPSA failure risk, offsetting this by making funding conditional on the deployment of its own technical team who (in principle) can leverage global best practice to maximise the chances of success.

MDBs can also co-ordinate facilities to provide technical partners with first-loss cover on e.g. construction, regulatory, debt servicing and foreign exchange risks. In addition, MDBs are in the position to provide conditional refinancing options that reduce the capital requirement burden on commercial financiers considering long term infrastructure loans. Other capabilities that could be developed include tools for project assessment, an asset recycling program and financial benchmarks for investors, such as emerging markets infrastructure debt index.

Through these key functions of convening and co-ordination, MDBs can play a catalytic role in mobilising private investment into water infrastructure. These functions leverage the unique strengths of MDBs, whose advisory partners include pension funds, SWFs, insurance companies, fund managers, commercial banks and other financial institutions. By making relatively small grants MDBs can

remove the disincentive to developing project pipelines, and in making PPSA funding conditional, there is the scope, at least, to crowd in best practice and build capacity.

RECOMMENDATION

Development finance institutions are uniquely positioned to help strengthen infrastructure project pipelines, mitigate risk, and improve the visibility of emerging market infrastructure as an asset class. Technical partners should leverage their expertise in project identification, selection and preparation to help DFIs close the bankability gap, and optimise the value of development finance.



IMPROVE PROJECT SELECTION AND DEVELOPMENT

The infrastructure gap can be partially bridged *without additional finance*. Focus areas include **upstream development** (pipeline building); **project selection** (portfolio optimisation); **programme delivery** (investments in design and planning); and **asset utilisation** (getting more out of existing projects).

CONTEXT

One obvious way to reduce the quantum of funding needed for infrastructure spending is to improve the productivity of the money being spent. Developing an upstream pipeline of prospective new projects is key to creating choice and improving selection. By working with MDBs, technical partners and others (see 6, above), governments can widen and deepen the pool of prospective projects for evaluation.

However, an effective downstream process is still necessary. Research suggests many countries apply suboptimal process to select, build and operate infrastructure, with poor decisions being made on project selection due to inaccurate forecasting and weak planning.

However, by revisiting the process of project selection, infrastructure portfolios

can be optimised. At its simplest, this might involve comparing the all-in costs (i.e. including social and environmental factors) of a programme to reduce unaccounted-for water (through leakage reduction); with a programme to reduce non-revenue water (through improved metering); and with a programme to increase capacity (by building a new reservoir). The process clearly requires robust selection criteria and high-quality evaluation tools; but most important is a transparent governance system that ensures decisions are made on the merits, rather than through capture by special interests.

Many projects do not benefit from the upfront investment in planning and design. Perceived high costs are a common deterrent, notwithstanding the multiple return on this investment that can be achieved by avoiding design changes during the construction phase. Good planning delivers better governance, helping authorities to more effectively manage contractors, and to dynamically monitor actual costs against expectations. Within the water sector, asset utilisation might be enhanced e.g. through selecting multi-purpose infrastructure projects that deliver a combination of energy, water supply and

waste water services; support agriculture and fisheries; and provide amenity value. Other approaches include investing in maintenance Operating Expenditures (Opex) (e.g. replacing Pressure Reducing Valves) and implementing demand management (e.g. incorporating Internet of Things (IoT) with Supervisory Control and Data Acquisition systems)

RECOMMENDATION

Focus on non-financial options to close the infrastructure gap, by improving the productivity of spending. Emphasis on 'big ticket' investments in project pipeline, selection and planning tools that deliver high return on investment. Downstream focus on asset utilisation, maintenance Opex and demand management.

8



DISTINGUISH BETWEEN CAPEX AND OPEX

In developed markets, *investors are often enthusiastic about operating assets, but wary of the construction risk in greenfield projects.* Meanwhile in EMDEs funding to **build new capacity** is often much easier to source than funding for **operating expenditure**. Securing sustainable finance for both Capital Expenditures (Capex) and Opex is vital to closing the funding gap.

CONTEXT

The global infrastructure deficit masks different challenges between the developed and the developing world. In richer countries, politicians have scrapped smaller projects while pushing ahead with huge, high profile programmes that provide visibility around the electoral cycle. Related barriers include prioritising tactics over strategy as function of political pragmatism or consensus building. But infrastructure

Capex investment in developed countries is particularly afflicted by both weak public sector balance sheets following the financial crisis; and the reluctance of private investors to commit Capex to greenfield projects, which carry construction risks. However, these investors are happy to invest in assets that require capital for expansion or maintenance.

In contrast, the investment mandates for infrastructure in EMDEs heavily favours greenfield Capex over funding for maintenance or Opex. Indeed, infrastructure in the developed world is more likely to be sufficient for the population; while in EMDEs there is often simply not enough infrastructure. But the difference is also down to how infrastructure projects are selected and financed. In rich and poor countries alike, high profile Capex projects are often more ‘investable’ than incremental maintenance, or the extension of existing infrastructure. But unlike in most advanced economies where tariffs are more likely to be cost reflective, EMDEs infrastructure faces a higher risk of falling into disrepair. Poorly maintained assets eventually fall into disuse.

Without adequate cost recovery, planning or monitoring, scarce resources are often spent on building fresh capacity to replace what has failed, instead of using a fraction of these funds for maintenance and repairs. Often these decisions are deliberate and may reflect the mandates of some development finance institutions, where paying for maintenance is eschewed on the grounds that infrastructure should be ‘self-sustaining’.

The simple but key issue here is that Capex and Opex have fundamentally different attributes, and that both need access to sustainable financial flows if infrastructure assets are to be maintained and enhanced. Investment in maintenance expenditure typically has lower visibility, but unless the requirements are understood and sustainably met, the infrastructure gap will never be closed.

RECOMMENDATION

Consult with developers, operators, investors and others on the benefits of a country register of water infrastructure projects. When identifying projects in the upstream window, include existing infrastructure where there is a requirement for additional maintenance investment to ensure sustainability.

9



EXPLORE HYBRIDITY AND BLENDED FINANCE

Blended finance has grown in prominence within the *sustainable development* arena, although empirical data on its use is still limited. New, **hybrid models** of financing infrastructure that are increasingly used by the **private sector** provide some visibility into how blended finance funds and facilities can be deployed effectively.

CONTEXT

Blended finance is “the strategic use of development finance for the mobilisation of additional finance towards the SDGs in developing countries” and should play a key role in bridging the water infrastructure gap. This catalytic role requires innovation that is more commonly found in the private sector. Two examples of this are described below. They do not have a development focus, but demonstrate an alignment of interest that

should arguably be present in any well-structured blended finance facility.

In 2014, the Blackstone Group, a private equity firm, established a new water investment company. Its objective is to provide leverage finance for companies who wish to develop desalination facilities and large-scale waste water treatment for their industrial customers; and to

identify, develop, finance, construct and operate large scale independent water development projects globally. In 2015 a deal was announced to develop a facility focused on storage and residual water treatment projects for a large petrochemical company. This model blends external finance from private equity funds with companies' own balance sheets (mitigating policy risk), and combines this with their access to customers (mitigating business risk), and the know-how to build the right infrastructure (mitigating technical risk).

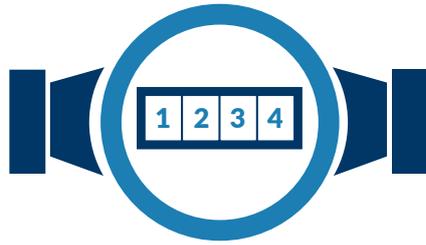
Industrial services outsourcing is a fast-growing area of water infrastructure, as regulations on waste water discharge become more stringent. Traditionally, such projects would be developed under a BOOT model, financed by a combination of the operator's balance sheet, and operating leases. However, the growth in recent years of hybrid instruments is leading to new models of financing infrastructure for outsourced industrial services. It allows the service provider to co-invest with a fund in a special purpose vehicle, replacing debt with equity. The provider earns revenues from the operation and maintenance services that it provides to the industrial client. The capital cost of provision has been shared

with the investment fund, placing less debt on the operator's balance sheet, and increasing its return on capital. As an equity investor in the Special Purpose Vehicle, the fund earns an income from its share of the service provider's profit.

RECOMMENDATION

Supplement research underway on principles and policy insights for blended finance, with analysis of the new hybrid models being developed by the private sector that mobilise capital for investment in water infrastructure at higher risk adjusted returns. Establish if and how these innovations could apply to blended development finance.

10



REVISIT TARIFFS, TAXES AND TRANSFERS (3TS)

More *funding can be unlocked* by revisiting **tariff** structures (e.g. based on user volumes or social tariffs); by hypothecated **taxes** (e.g. on property values enhanced by new infrastructure); and by financial **transfers** (e.g. to fund infrastructure that contributes to reduced global carbon emissions or to mitigate climate change).

CONTEXT

The 3Ts concept was developed by the OECD Horizontal Water Programme to help categorise taxes, tariffs and transfers (mainly development assistance) as a source of finance with different attributes to private capital or concessionary finance, which typically requires a yield and/ or repayment of principal. This useful distinction merits being reprised in the context of financing the water infrastructure gap.

Regarding tariffs, parallel streams of research are underway that explore that explore both the value and price of water. Here, it serves to highlight that if suitably applied, tariffs can serve as a highly effective tool for demand management, helping to improve the productivity of existing infrastructure (see 7, above). Technological innovations, including the IoT, mobile payments and smart metering, can

facilitate rising block tariffs and dynamic peak pricing for bulk volume users, while simultaneously enhancing access and equity through social tariffs.

Hypothecated taxes can also be used to cover infrastructure investment in a progressive way, by aligning the cost of provision with its beneficiaries. An example of this comes from a programme by Lydec, a subsidiary of Suez Environnement, in Casablanca, Morocco. Property developers are required to make a variable contribution to the costs involved in providing their properties with water supply and services, depending on the type of development (social housing, villas, hotels, industrial etc.) The contribution is made through a share of the property value at the point of sale, ranging from 0.7% for social housing through to 1.3% for high end accommodation.

In terms of financial transfers, this is to reiterate that traditional North-South transfers by development finance is increasingly being supplemented by new sources of purposed funding as identified earlier (see 5, above). This trend is likely to accelerate in coming years, particularly as the GCF ramps up to its target

disbursement of US\$ 100bn per annum by 2025.

RECOMMENDATION

Develop integrative targets that incorporate demand management, maintenance, asset utilisation, sustainable access and equity. Benchmark performance against global best-in-class approaches.

REFERENCES

- 1 For example, see *Bridging Local Infrastructure Gaps*. MGI, July 2016
- 2 The Camdessus Report: <https://goo.gl/hUKQdf>
- 3 Task Force on Financing Water for All: <https://goo.gl/Bakzig>
- 4 Water: Fit to Finance?: <https://goo.gl/rvnsUS>
- 5 Financing options for the 2030 water agenda: <https://goo.gl/nDLKAp>
- 6 e.g. *Infrastructure Financing Instruments and Incentives*, OECD, 2015
- 7 e.g. *Securing Water, Sustaining Growth*, OECD/ GWP, 2015
- 8 2016 Prequin Sovereign Wealth Fund Review: <https://goo.gl/yV9DCv>
- 9 Green Climate Fund: <https://goo.gl/i7EByY>
- 10 Climate Bonds Initiative, Q2 2017
- 11 Fitch Ratings, 2017: <https://goo.gl/1dk1hv>
- 12 *Making Infrastructure Rewarding*, World Bank, 2016
- 13 *How to save \$1 trillion a year*, MGI
- 14 *Making Blended Finance work for the SDGs*, OECD (forthcoming)
- 15 *Strategic financial planning for water supply and sanitation*, OECD, 2009
- 16 *Water and Cities – Ensuring Sustainable Futures*, OECD, 2015

ABBREVIATIONS

BOOT	Build, Own, Operate Transfer	IoT	Internet of Things
BOT	Build, Operate, Transfer	MDB	Multilateral Development Bank
Capex	Capital Expenditures	OBOR	One Belt, One Road
DFI	Development Finance Institution	Opex	Operating Expenditures
EMDE	Emerging Markets and Developing Economies	PPSA	Project Preparation and Structuring Activities
GCF	Green Climate Fund	SDG	Sustainable Development Goal
GIF	Global Infrastructure Facility	SWF	Sovereign Wealth Fund

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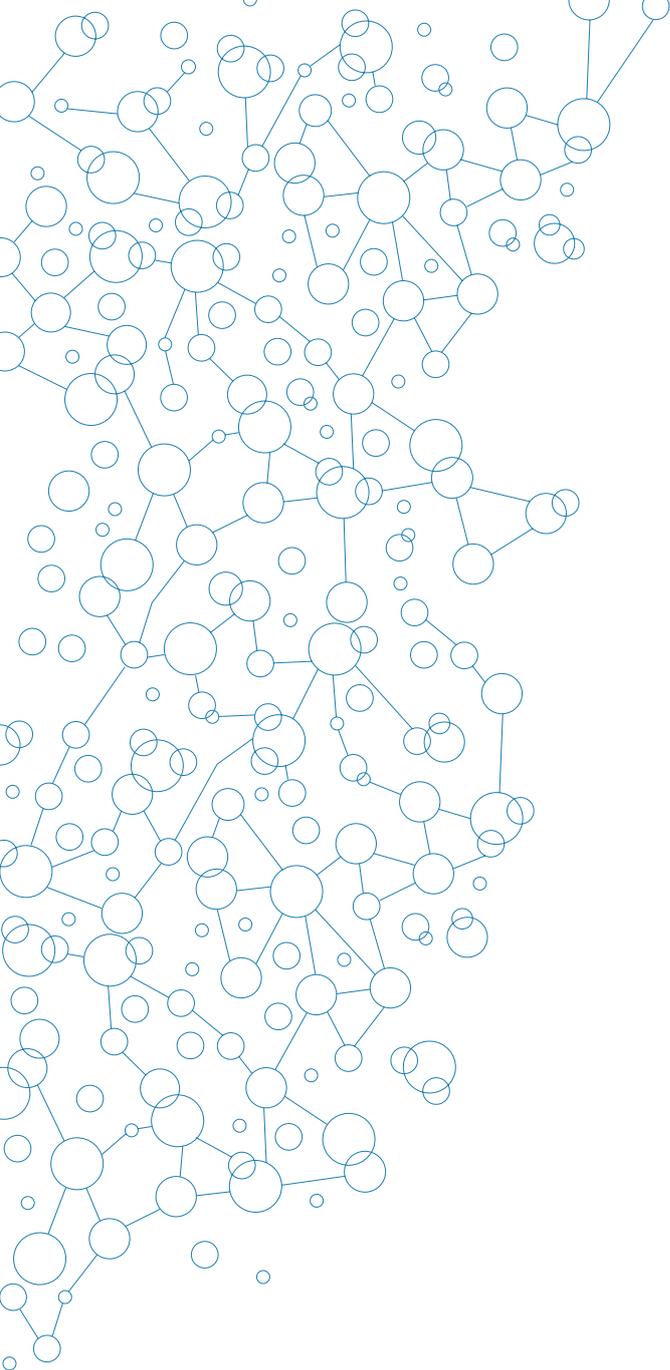
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A Typology of Water Infrastructure Investors

Task Force on Financing Water Infrastructure
World Water Council



Draft Working Document
March 2018

A TYPOLOGY OF WATER INFRASTRUCTURE INVESTORS

Background:

This working document was prepared in the framework of the Task Force on Financing Water Infrastructure of the World Water Council. It is based on the actions identified in the report Ten Actions for Financing Water Infrastructure, published by the World Water Council in March 2018. This working document will be presented at the 8th World Water Forum in Brasilia, Brazil to gather comments and feedback from a wide range of stakeholders during the Forum and beyond. If you wish to contribute, we invite you to contact the World Water Council at m.khemiri@worldwatercouncil.org

Summary:

We propose that the challenge of making water infrastructure projects 'bankable' could be partially addressed through a better understanding of investor types. Here we propose a typology comprising institutional investors, corporations, development financiers and philanthropists. We describe how a typological approach could help unlock new capital through mechanisms such as blended finance, investor and corporate engagement, and impact investment. We propose a classification that is based on the *mandate, motivation, materiality, mobility and momentum* of different types of investors.

Overview

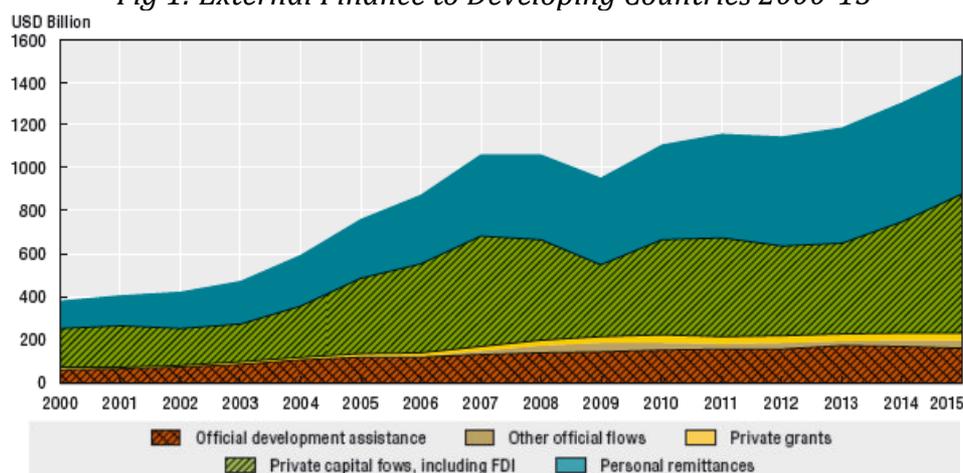
The public sector is, and will remain, a pivotal investor in water infrastructure, especially in the developing world. Many of the assets that underpin the delivery of water resources and services to consumers exhibit the characteristics of a public good. However, in the decade since the global financial crisis, it has become evident that public sector balance sheets do not have capacity to meet the infrastructure requirements of a growing, urbanising, and increasingly consumptive global population. More capital from the private sector will therefore be necessary if this ‘infrastructure gap’ is to be closed.

The encouraging news is that this capital is available. The OECD estimates that institutional investors in member countries alone will hold US\$ 120 trillion of financial assets by 2019. The less encouraging news is that, at present, this capital is not particularly accessible. Pension funds currently only invest 1% of their assets into infrastructure as an asset class, and the majority of this is in the renewable energy and transport sectors. For a range of reasons, it has proven difficult to get private sector capital to flow at scale into water infrastructure. In response to this challenge, the World Water Council established a task force to investigate what practical measures could be taken to lower the barriers to financing water infrastructure, and to unlock new sources of capital investment. A positioning document¹ was published that identified a series of actions, including developing a typology of water infrastructure investors. This white paper sets out the rationale for the typology.

The challenge of bankability

External financial inflows to developing countries have trebled in the last fifteen years, driven by private capital² (Fig 1):

Fig 1: External Finance to Developing Countries 2000-15



Source: OECD

¹ Ten Actions for Financing Water Infrastructure, WWC (2018)

² Making Blended Finance Work for the SDGs, OECD (2017)

This increase in capital inflows from the private sector may indicate a growing appetite to invest in infrastructure assets in the developing world. However, there are (well-rehearsed) arguments to the effect that such flows will only occur at scale if there is an appropriate enabling environment in place³. The lack of 'bankable' project pipelines is a challenge in both the developed and developing world. High development and transaction costs often preclude project preparation, while business funding models that are not sustainable generally deliver inadequate risk-adjusted returns. While regulatory and institutional intervention in many countries could help make the asset class more attractive to private investors (and deepen domestic capital markets), global regulatory guidelines such as Basel III can have the effect of reducing the capital available for investment into infrastructure projects.

Perceptions of project risk are frequently cited in the literature as a major deterrent to infrastructure investment. Our previous white paper on project typologies deconstructed risk into the four components of project development risk, off-taker risk, political and regulatory risk and currency risk, each with different project-specific and market-specific attributes. Frequently however these component risks are not deconstructed or systematically evaluated – leaving them as a poorly understood amalgam.

In terms of returns on investment, many projects are frequently stymied by business models that prove to be unviable in an operating context. For example, a recent study by the consultants McKinsey estimated that up to 70% of water provided by utilities in sub-Saharan Africa is leaked, unmetered, or stolen⁴; leaving an unsustainably small revenue base to fund capital or operational expenses. In the absence of a public-sector owner who can underwrite the losses, these utilities end up becoming insolvent, with investors being wiped out.

In summary high development costs, regulatory constraints, poorly understood risks, and inadequate returns on investments are some of the key reasons why such few infrastructure projects are considered bankable. This paper does not attempt to propose a wholesale fix for these problems. Instead, we argue that another approach to improving project bankability would be to reduce the information asymmetries between project developers and investors, thereby lowering transactional costs. A good first step would be to increase the clarity on who these prospective investors might be.

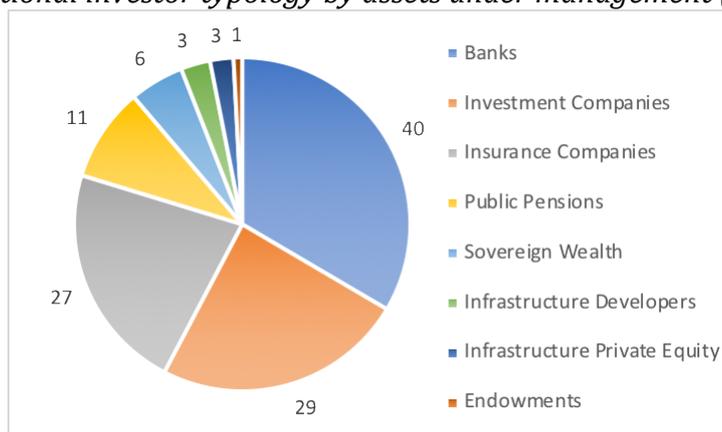
Institutional investors

McKinsey and Co estimate that of the US\$2.5 to US\$3 trillion spent on infrastructure each year, around 30-40% comes from the private sector; principally institutional investors and corporations. They offer a typology of institutional investors based on defining eight groups (Fig 2):

³ Financing Change, McKinsey (2016)

⁴ Financing Change, McKinsey (2016)

Fig 2: Institutional investor typology by assets under management (US\$ tn), 2016



Source: author, McKinsey & Co

Investment in infrastructure is usually through debt (loans), equity (shares), or a combination thereof. As Fig 2 shows, with US\$40 trillion of assets under management, bank loans are the most significant source of private sector finance to infrastructure projects. In descending order of assets thereafter are investment companies, insurance companies and public pension funds. They collectively account for nearly US\$ 70 trillion of investment capital, which is around one-third of the total institutional assets under management. These three sources share the objective of achieving yields that either match their liabilities (such as insurance claims or pension payments), or the returns that investors require. Sovereign wealth funds account for US\$6 trillion of assets and may have strategic objectives that accommodate investments with lower yields. Finally, infrastructure developers and private equity funds often invest at an earlier stage of the project, where risks are higher. They typically take an equity position and target a higher return on investment to compensate for the additional risk.

Corporate investors

McKinsey's typology of institutional investors accounts for around two-fifths of private sector infrastructure investment per annum. The balancing 60%, representing over US\$1 trillion of private sector investment in infrastructure is largely accounted for by the corporate sector. Companies, including large multinational organisations, invest in infrastructure principally for directly operational reasons. Most investments are deployed within their 'fence line', i.e. on production facilities that they own or control. In recent years however, new initiatives such as corporate water stewardship have increased the quantum of corporate spending on infrastructure beyond the fence line, although these investments are still typically concentrated within a vertically integrated supply chain.

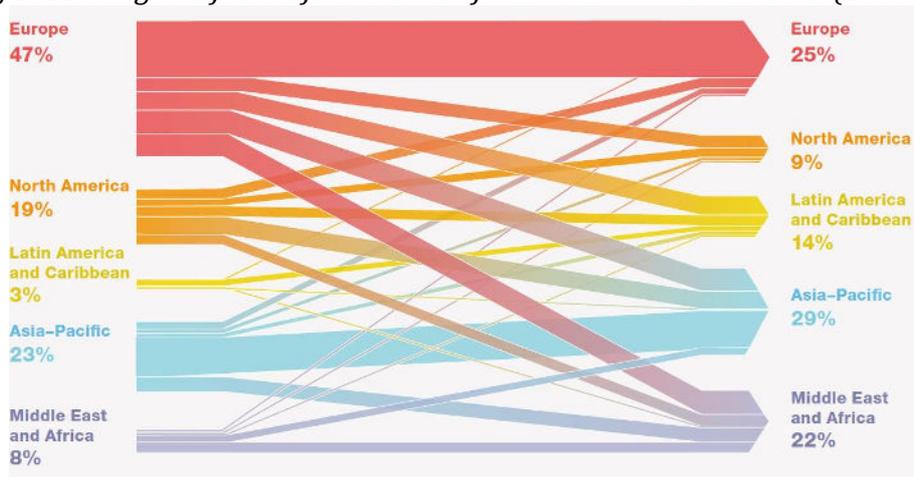
Typologies that include corporations as investors in water infrastructure are relatively undeveloped, perhaps because the data is difficult to come by. Unlike most institutional investors, corporations have few obligations to disclose what investments they make in infrastructure, particularly when they are investing in their own production capacity. However, we argue that corporations are likely to become much more significant as investors in the next few years, as the implications of the infrastructure gap start being felt on company revenues and profits.

Without adequate infrastructure to make and sell products to consumers in local markets, businesses will not be able to fully tap latent demand. Large corporations that are listed on stock exchanges often have access to the international capital markets and can borrow money at much lower rates of interest than state-owned utilities in many developing countries. For infrastructure projects where mutual benefits accrue to both the utility and the corporation, there is even the potential for corporations to arbitrage variations in the cost of capital by borrowing money at low rates on the international markets, and then investing in the debt of local infrastructure projects.

Beyond these financial opportunities, corporations may also be able to leverage their internal resources and knowledge networks to evaluate risk and return more adeptly than many institutional investors. In doing so, they may identify new opportunities to invest in projects that would otherwise not have been developed.

Multi-national corporations operating in local markets may have even more advantage over traditional infrastructure investors. Institutional investors tend to exhibit ‘home bias’, in that they prefer to invest in the region that they are most familiar with. McKinsey research suggests that over 40% of foreign direct investment in new infrastructure flows to the region where the investor is based (Fig 3):

Fig 3: FDI in greenfield infrastructure from source to destination (2000-15)



Source: McKinsey & Co

Corporations with a local presence in multiple markets are well positioned to avoid home bias. Their understanding of domestic market conditions has been honed by the operational experience of transacting business in these countries, often for decades or longer. This insight helps to optimise capital allocation based on the standalone merits of each opportunity.

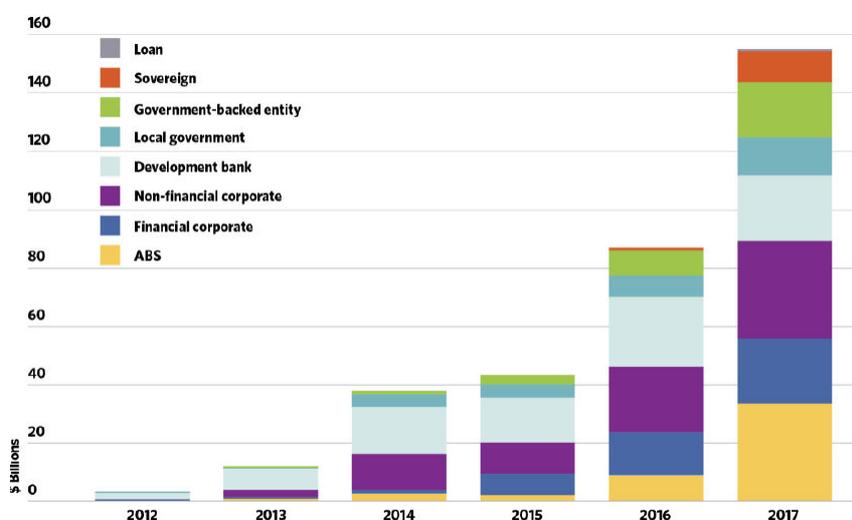
By contrast, over 60% of total spending on infrastructure by institutional investors in the last decade has been into high income countries, which account for just 20% of the global population. Meanwhile lower-middle income countries, which account for 40% of the global population, have received just 5% of total institutional investment. For many global corporations who sell to local consumers, the lower-middle income countries present the greatest strategic opportunity over the medium term, and this may provide the justification to invest in local infrastructure, provided the opportunities to do so exist.

Institutional and corporate investment

There are some important intersections between institutional and corporate investment that we believe are likely to grow dramatically in significance. Institutional investors can hold shares in corporations, and as beneficial owners then have exposure to the infrastructure investments that the corporations make. It may be that over time, corporations develop a comparative advantage over institutional investors; for example, in opportunities outside their home market, or in lower-middle income countries. In these circumstances investors may seek to increase their exposure to corporations as a proxy for access to infrastructure projects.

There are various financial instruments beyond simple shareholdings that can facilitate and optimise such exposure. In the last five years, corporate green bond issuance has soared [Fig 4], driven by a strong appetite from investors. The proceeds from such issues are usually earmarked for specific uses, such as sustainable infrastructure. Other instruments such as loan syndication, debt subordination and asset securitisation could help to increase corporate investment in water infrastructure by optimising the amount of debt on companies' balance sheets. Financial innovations that allow risks to be tranching and parcelled did not earn the best publicity following the global financial crisis. However, used appropriately they create options that give institutional investors with differing risk appetites the opportunity to get exposure to the infrastructure asset class.

Fig 4: Green bond issuance 2012-17, US\$ bn



Source: Climate Bonds Initiative

Development finance and blending

Separate to the private capital flows of institutional and corporate investors, development finance plays a significant role in mobilising infrastructure investment. Of particular interest are public sector multilateral development banks (MDBs), and private sector development finance institutions (DFIs). MDBs typically provide debt in the form of concessional loans (i.e. on terms that are more attractive to the borrower than

commercial loans) to public sector institutions; while DFIs provide finance to the private sector through a mixture of equity, loans and guarantees.

It has been proposed that development finance can and should play a much bigger catalytic role in ‘crowding in’ private sector capital to water infrastructure, though the use of instruments and structural mechanisms that reduce the risk and enhance the return of these investments. This concept of ‘blending’ development and private finance is not new, but it is receiving fresh impetus as the need to engage the private sector becomes more pressing. A recent survey by the OECD found that 17 out of 23 members of their powerful Development Assistance Committee (DAC) are engaging in blended finance; but just 10 report having well-established programmes that have been in place for a number of years⁵. This suggests that as blended finance matures, there is considerable scope for governments to engage further. We argue that blended finance has a fundamentally important role to play in financing water infrastructure. It is not possible to do justice to the topic within a few paragraphs, so we intend to revisit blending in a forthcoming white paper.

Philanthropy

Capital flows from global private philanthropic foundations are estimated at over US\$ 8 billion per annum⁶. The majority of these flows were targeted at the health sector. The correlations between improved water security and better health outcomes are well established in the literature, and so the narrative that philanthropic capital should help fund water infrastructure deserves to be much better developed. Foundational philanthropic capital is often more patient, more risk tolerant, and more receptive to non-financial return than institutional investment.

Data on non-foundational philanthropy (including from family offices, personal donations, crowdfunding etc.) is patchy but anecdotal evidence suggests that this is rapidly becoming a material source of capital. For example, the UK philanthropic crowdfunding website *just-giving*, claims that over US\$4 billion has been raised through its platform since it was established in 2001. Moreover, it has over 20 million registered users⁷. A plethora of such sites have emerged in the recent years, predominantly in the global North. Personal remittances to developing countries are soaring [Fig 1] and we think it is only a matter of time before a dominant and disruptive alternative to *just-giving* emerges in and for the global South.

While it may appear somewhat premature to include philanthropy within a typology of water infrastructure investors, there may be a significant alignment of objectives between project developers and the providers of philanthropic capital. As we discuss in our white paper on project typologies, the SDGs are an effective framework to contextualise non-financial return. Twelve of the seventeen goals are underpinned by the quantity and quality of infrastructure investment⁸. It is at least conceivable that in time,

⁵ Making Blended Finance Work for the SDGs, OECD (2017)

⁶ Global Private Philanthropy for Development, OECD (2017)

⁷ <https://www.justgiving.com/about-us/media-centre/media-faq> (March 2018)

⁸ International Institute for Sustainable Development (2015)

crowdfunding campaigns targeting specific SDGs could mobilise foundational and non-foundational philanthropic capital into water infrastructure.

Impact investors

Impact investment describes capital allocated with the explicit intention to generate social and environmental impact alongside a financial return. This allocation can be made by institutional investors, corporations, development finance organisations, philanthropists – indeed any entity. Just 200 institutional investors collectively manage over US\$115bn of assets mandated for impact investment, according to a recent survey⁹, and in 2016 they invested US\$28bn of these funds in around 8,000 deals. The data is still not of the quality to be definitive, but the same survey suggests the majority of these impact investors intend to align their allocations to specific SDG objectives. At the least, impact investment provides a useful lens to better understand how investors evaluate non-financial return. In time, this could become an important channel for unlocking new sources of finance for water infrastructure projects.

A typology of investors

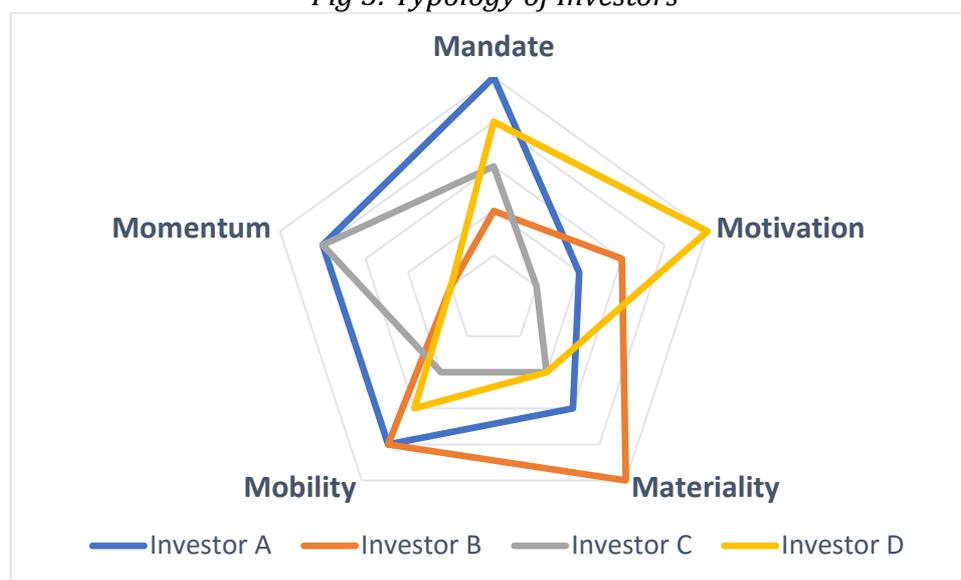
We propose a model of classification that is based on the *mandate, motivation, materiality, mobility and momentum* of different types of investors.

- **Mandate** describes their terms of reference, such as what assets they can invest in; over what timeframes; against what return benchmarks; with what risk appetite; in which countries, and so on. Mandates prescribe the nature and extent of investor engagement.
- **Motivation** describes their propensity to invest in water infrastructure. For example, the extent to which they identify as impact investors; or if they are a corporation, the extent to which their business is at risk from poor infrastructure.
- **Materiality** describes both the amount they have available to invest, as measured by assets under management; but also, their influence in triggering changes in the behaviour of other investors, through blended finance for example.
- **Mobility** describes their executional capability. Do they have fresh capital to deploy or are they ‘fully invested’ i.e. would need to sell some existing holdings or raise funds before they could invest. Also, investors such as sovereign wealth funds may need to follow institutionally ponderous processes.
- **Momentum** describes their track record or progress with investments of this type. For example, an investor who has made investments in the water infrastructure asset class in the past is likely to be better positioned to make decisions on opportunities in the future, compared to a novice investor.

⁹ Global Impact Investing Network (2017)

We consolidate these attributes through a stylised example in Fig 5:

Fig 5: Typology of Investors



Source: author

The framework is extensible, in that it allows a comparison at different scales. Just by way of example, we suggest that Investors A through D could potentially represent:

- i) individual investors of a single type (e.g. different sovereign wealth funds)
- ii) consolidated investors of a single type, (e.g. SWFs, banks)
- iii) individual investors of different types (e.g. SWF, MDB, DFI, private equity)
- iv) hybrid investors of different types (e.g. a corporation and a bank working in concert, a DFI blending finance from a philanthropic foundation, etc.)

Various other combinations are obviously also possible. The examples here are purely illustrative.

Next steps

In our framing paper¹⁰ we set out ten discrete issues that we associated with barriers to investment in water infrastructure. The absence of an adequate typology of investors was one of those issues, and the purpose of this paper is to set the terms of reference for discussion, debate and engagement with informed stakeholders.

In our view, the value or otherwise of this typology will eventually boil down to three questions. First, does it help to lower the knowledge asymmetries that exist between projects and investors? Second, are there sustainable models to collect the information necessary, and to keep it up to date? Third, exactly what are the improved outcomes that can be credibly be attributed to using the framework?

¹⁰ Ten Actions for Financing Water Infrastructure, WWC (2018)

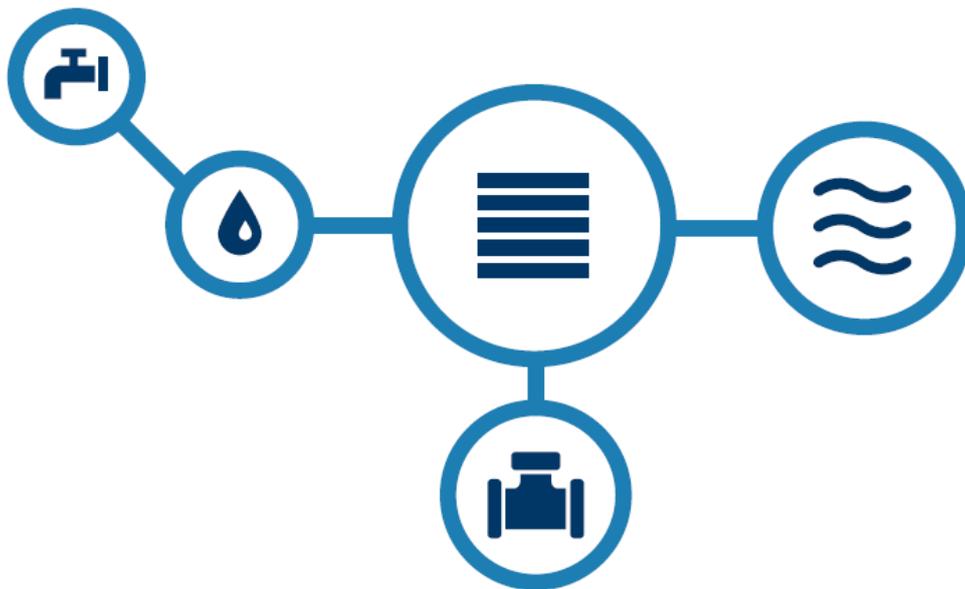
If the principal output of this research is another set of worthy and uncontroversial recommendations, it will be obvious that we have failed to answer these questions. This is not, of course, to claim that recommendations are unimportant. However, we feel our incremental contribution to the excellent recommendations already published in this field would be small. Instead, we want to advance best practice around getting water infrastructure financed. We take an applied approach and seek to engage an extensive network of stakeholders. Critical and constructive comments from all parties are welcome and desired. These inputs will determine if and how we can convert conceptual frameworks into an applied programme of change.

When it comes to financing sustainable water infrastructure, the scale of the challenge leaves no room for complacency. But nor can pessimism be justified. Over two billion souls still lack access to adequate water supply and sanitation due to insufficient infrastructure. We have to fix the financing gap.



A Typology of Water Infrastructure Projects

Task Force on Financing Water Infrastructure
World Water Council



Draft Working Document
March 2018

A TYPOLOGY OF WATER INFRASTRUCTURE PROJECTS

Background:

This working document was prepared in the framework of the Task Force on Financing Water Infrastructure of the World Water Council. It is based on the actions identified in the report Ten Actions for Financing Water Infrastructure, published by the World Water Council in March 2018. This working document will be presented at the 8th World Water Forum in Brasilia, Brazil to gather comments and feedback from a wide range of stakeholders during the Forum and beyond. If you wish to contribute, we invite you to contact the World Water Council at m.khemiri@worldwatercouncil.org

Summary:

Water infrastructure projects could be made more 'bankable' by improving how their investment case is made. We propose a typology of water projects that aims to reduce the information asymmetries that exist between projects and finance. Through an outcomes-based approach to evaluate risk and return, the framework draws on models that are increasingly being used to measure progress against the Sustainable Development Goals. We propose a classification that is adaptive to the varying expectations of project investors, based on the *scope, system, structure, security and sustainability* of different projects.

Overview

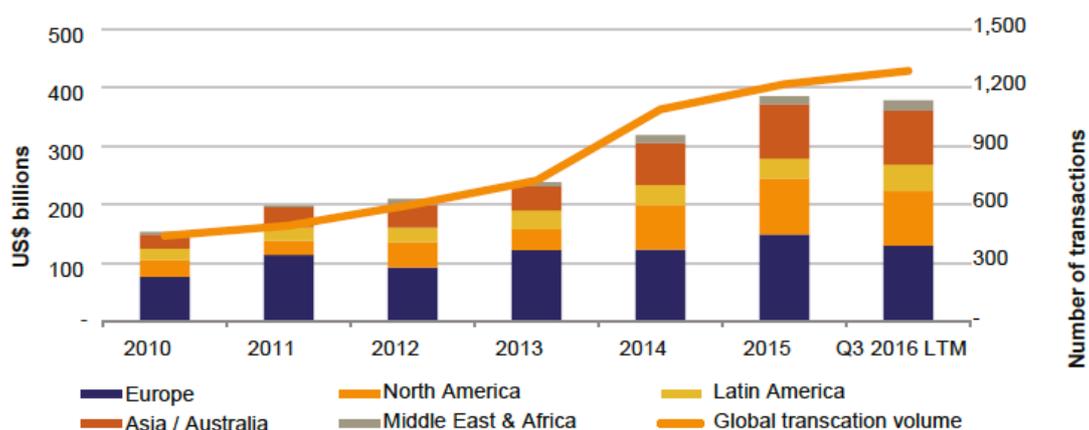
There is broad consensus that it will be impossible to achieve the targets of SDG 6 unless there is a step change in the quantum of investment in water infrastructure, particularly across the developing world. Estimates of the gap between current levels of investment compared to what is necessary to meet the goals, range between \$150bn and \$300bn per annum. These are big numbers by any measure, particularly as the gap does not appear to be closing. A lot of time and effort has already been expended by various organisations to evaluate the impediments to funding water infrastructure. This work has helped to yield a much better understanding of the problem, and indeed has led to improvements in many areas. However, for three in ten people worldwide – over two billion souls - the quality of access to water supply and services still remains woefully inadequate¹. From the perspective of the SDGs, which emphasise the requirement of universality (‘leaving no one behind’), this sober fact has a particular resonance.

Recognising the important role that finance and investment should play as part of the solution, the World Water Council established a task force to investigate what practical measures could be taken to lower the barriers to financing water infrastructure, and to unlock new sources of capital investment. A positioning document² was published that identified a series of actions, including developing a typology of water infrastructure projects. This white paper sets out the rationale for the typology.

Water’s share of infrastructure investment

Recent underlying trends around infrastructure investment as an asset class are positive. Since the global financial crisis, there has been a sharp rise in the volume and value of infrastructure transactions³ across most parts of the world [Fig 1].

Fig 1: Global Infrastructure Transaction Activity



Source: Infradeals

¹ Progress on drinking water, sanitation and hygiene, JMP (2017)

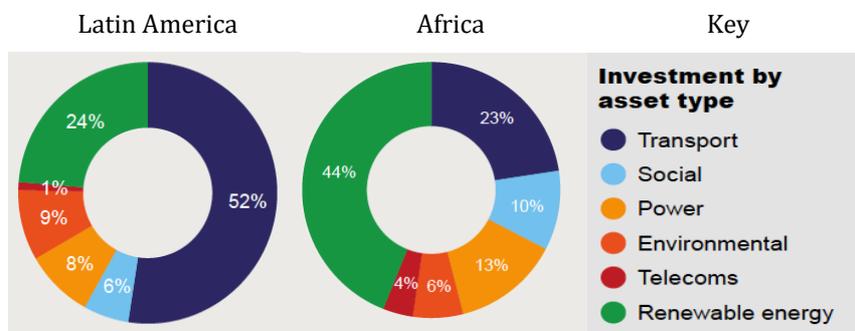
² Ten Actions for Financing Water Infrastructure, WWC (2018)

³ Global Infrastructure Investment, PwC (2017)

But if this is indicative of a renaissance in infrastructure as an investable asset, there remains a high risk that water will miss out. The sector has long been plagued by the perception that investment returns on a risk-adjusted basis are low. The water industry is capital intensive, and the underlying physical assets require continual monitoring, regular maintenance, periodic repair and occasional replacement. Charges to consumers for water supply and services are usually regulated by government, and the rates are often set below the full economic replacement cost of the underlying assets. The governance and political economy of water and sanitation services are also highly context-dependent. Analysis of how this issue contributes to project delays and policy uncertainty has generally focused on the developing world, but the sensitivities are universal. For example in the United Kingdom, generally considered a bastion of economic and policy liberalism, there is every prospect that a new government would attempt to re-nationalise the country's water utilities.

Anecdotal evidence suggests that the water sector is indeed receiving a smaller allocation of incremental investment, relative to its share of total infrastructure. In the USA, the overall share of federal spending on transport infrastructure has remained broadly steady over the last 40 years. However, government spending on water infrastructure decreased from US\$ 76 per person in 1977, to just US\$ 11 per person in 2014, according to the Congressional Budget Office⁴. Meanwhile, in Latin America and Africa it is the transport and renewable energy sectors that account for over two-thirds of private sector investment in infrastructure [Fig 2]. Non-public investments in water projects are sometimes not even material enough to warrant their own asset classification⁵, as the charts below indicate.

Fig 2: Non-Public Sector Investments by Asset Type: Latin America and Africa



Source: PwC

The investment case for water projects

We suggest that one of the ways in which the water sector could access a greater share of private sector capital is by improving how the 'supply side' (e.g. project developers) makes its investment case to the 'demand side' (e.g. project investors). In order for this investment case to be made effectively, we believe that there is the need to develop and use a typological framework of projects that recognises the heterogeneity of water infrastructure as an asset class.

⁴ The Economic Benefits of Investing in Water Infrastructure, Value of Water Campaign (2017)

⁵ Global Infrastructure Investment, PwC (2017)

At present, water infrastructure is usually characterised in the policy-facing literature as a unitary 'thing'. This approach effectively reduces the investment gap to a common set of problems that simply require a generic solution. In reality, the opportunities and challenges of financing water infrastructure need to be understood from the project level, as that is the unit of account for investment. We believe that without a project-level typology, knowledge asymmetries between the supply side and the demand side are inevitable.

These asymmetries can create a form of market failure where unsuitable or inappropriate sources of finance are pursued to fund projects, while investors whose objectives are better aligned with the projects are either not identified or not approached. We suggest that by aligning projects with their most appropriate funding sources, it could be possible to reduce the frictional costs associated with project financing. This should help to accelerate the pace at which projects are funded; which in turn could increase the probability of a broader spectrum of water infrastructure projects finding appropriate funding.

Classifying water projects

Traditional classifications of water infrastructure include scale, status, function, operating environment and ownership model. As we have described in our positioning paper, infrastructure exists at every scale, from the river basin or catchment, to networks of pipes, to the household tap. Scale is typically correlated with capital commitment and project complexity. Frequently it is also material to the attributes of a project. Large scale projects such as flood defence usually exhibit the non-rivalrous and non-excludable characteristics associated with a public good, with ownership correspondingly within the public sector. Small scale projects such as water kiosks are more likely to operate as private enterprises and present a different profile as an investment prospect.

Classification by function typically covers upstream components including pumping, diversion, transportation, storage, treatment and distribution. Downstream functions include sewerage, treatment and sanitation services. There are distinctions to be made between water services and water functions, particularly when identifying and attributing economic value. Projects as diverse as water supply and sanitation, flood protection, irrigation and reservoirs embed different levels of capital intensity and repayment periods. They bear distinct credit, commercial and legal risks; and offer varied economic, financial and social return.

The operating environment for water infrastructure varies widely between (and often within) countries. At the sector level, the ownership of water utilities, regulatory and governance arrangements, municipal water provision and NGO activities are some of the many issues that influence the bankability of water projects. At the country level, factors such as tax rates, development allowances, devolution to local government, sovereign creditworthiness and so on are all important aspects of the operating environment.

There is extensive and excellent literature already available on these classifications, and our objective here is not to reinvent the wheel⁶. Instead we propose that the value of

⁶ See e.g. Private Sector Participation in Water Infrastructure, OECD (2009)

classifications in getting infrastructure financed could be enhanced by embedding them within a project typology that recognises the heterogeneity of the asset class and helps to reduce information asymmetries. The aim of our approach is to improve how the supply side makes its investment case to the demand side. Our contribution comes through applying a novel approach to evaluating project risk and return.

Project risk

Private sector investment in infrastructure projects are governed by the perceived risk and return attributes⁷ of those projects. The practitioner literature around financing infrastructure consistently emphasises the importance of *de-risking* projects in order to make them bankable. Infrastructure risk can be an amorphous concept, but we suggest that it can be helpful to decompose risk into four components: project development, off-taker, political and regulatory, and currency risk. Of these, political and regulatory risk and currency risk will be familiar as ‘top-down’, country level measures. The other two risk components are ‘bottom-up’, or project level measures. Project development incorporates the risk of a project’s delay or failure due to technical, operational, environmental, governance or other factors. Off-taker risk is more commonly associated with the energy sector, but it refers to the credit-worthiness of the entity who pays for the project – which may be a government, a utility, or indeed consumers.

Variations of this risk decomposition include a taxonomy developed by the OECD that combines top-down risk attributes such as political and macroeconomic risk, with bottom-up attributes such as the project lifecycle phase, and technical risks of implementation (Fig 3).

Fig 3: Risks linked to infrastructure assets over the project lifecycle

Risk Categories	Development Phase	Construction Phase	Operation Phase	Termination Phase
Political and regulatory	Environmental review	Cancellation of permits	Change in tariff regulation	Contract duration
	Rise in pre-construction costs (longer permitting process)	Contract renegotiation		Decommission
				Asset transfer
	Currency convertibility			
	Change in taxation			
	Social acceptance			
	Change in regulatory or legal environment			
Enforceability of contracts, collateral and security				
Macroeconomic and business	Prefunding	Default of counterparty		
	Financing availability		Refinancing risk	
			Liquidity	
			Volatility of demand/market risk	
	Inflation			
	Real interest rates			
Exchange rate fluctuation				
Technical	Governance and management of the project			Termination value different from expected
	Environmental			
	Project feasibility	Construction delays and cost overruns	Qualitative deficit of the physical structure/ service	
	Archaeological			
	Technology and obsolescence			
	Force majeure			

Source: OECD (2015)

⁷ The Oxford Guide to Financial Modelling (2014)

The OECD taxonomy works well at a conceptual level, though it was not explicitly designed to evaluate project risk in practice. But we believe there is a strong case to be made for an applied typology that enables investors to identify, evaluate and compare project-specific risk. A good starting point would be to unpack project development and off-taker risk into a series of constituent elements. Here again, there is some excellent literature⁸ to draw upon, without reinventing the wheel. Incorporating this bottom-up risk typology with the traditional country-level measures of economic and political risk would give a more textured perspective on the heterogeneity of the water infrastructure asset class.

This may seem like a challenging undertaking. Measurement of risk is subjective, and the approach is sensitive to the critical observation that ‘the devil is always in the detail’. But there is inspiration to draw from the energy sector, where the rapid growth of investment in renewables has prompted the development of iterative models to address project risk. As methodological approaches become familiar, best practices will emerge, and over time, it is likely that new datasets will develop. This is important: according to a recent report from the OECD⁹, improving the availability and quality of data could transform the prospects of infrastructure financing. One of the most commonly cited reasons for the dearth of bankable infrastructure projects is the lack of comparable data. A typology that incorporates project-specific risk could potentially help to bridge this knowledge gap.

Project return

In contrast to infrastructure risk, which features extensively in the literature, comparatively little is written about the return to investors on infrastructure investment. In generic terms, returns accrue to countries through gains in productivity, economic growth, trade, connectivity and inclusion. In specific terms, returns accrue to investors through the economic rents or cash flows that are generated through the use of this infrastructure. Examples of these rents include road tolls, electricity tariffs and water rates. For assets that have the attributes of public goods, these returns are usually only indirectly monetised, for example through municipal charges and airport departure taxes. In countries where installed infrastructure is predominantly a public good, the state is typically the largest investor.

For private sector investors, then, financial return has traditionally been the only metric that appears to matter. On this basis, it is not difficult to see why water infrastructure does not attract a larger share of capital. Unlike for most other scarce resources, there is a non-linear relationship between the value of water and its price. Returns on investment for what is substantively the same end product therefore vary widely, based on a complex matrix of social, cultural, political and economic drivers that exhibit inconsistent dynamics over both time and space.

While it is beyond the ambitions of this paper to solve the perennial water pricing conundrum, we believe that there is an argument to be made for a typology of water infrastructure that incorporates a broader perspective on measures of return. Indeed, we

⁸ See e.g. *Managing Cost Risk and Uncertainty in Infrastructure Projects*, IRG (2013)

⁹ *Breaking Silos: An agenda for G20*, OECD (2017)

propose that many private sector investors increasingly have a mandate that extends beyond purely financial returns on infrastructure investment. We expand on this idea in our second white paper, but for our purposes here, we simply suggest that non-financial returns can be attractive to investors in the private.

Whereas we decomposed risk into four components, we apply a different lens to non-financial return. This image [Fig 4] of the 17 Sustainable Development Goals has perhaps inevitably already featured in so many reports that we include it here with some trepidation. But the SDGs are invaluable in contextualising the concept of non-financial return that we propose.



Source: United Nations

The SDGs provide an ‘out of the box’ framework to evaluate and compare returns on water infrastructure investment, at all levels of scale from country down to single project. While SDG 9 (industry, innovation and infrastructure) is the most obviously connected, fully twelve of the seventeen goals are underpinned by the quantity and quality of infrastructure investment¹⁰. And while it is fairly intuitive to explain how and why improved water infrastructure should in principle contribute to reduced poverty, better health, less inequality, decent work, sustainable cities, and so on – the SDGs provide a framework to empirically test and validate these hypotheses.

A positive network effect is being generated as academic institutions, NGOs, governments and corporations variously direct their collective energies towards these goals. For the water sector this is particularly important, it provides a framework to assess the outside contribution that investment in infrastructure could make. Critically, this contribution extends significantly beyond SDG 6. We argue that it is both necessary and desirable to re-frame the value proposition around non-financial returns on water infrastructure investment if the SDGs are to have a realistic chance of being met.

As to the question of which investors beyond the public sector are interested in such returns – the list is growing. The commitments from COP 21 alone on climate finance imply that US\$ 100 billion per annum of additional investment will eventually come on stream. In the near term, impact funds, sovereign wealth funds, DFIs and other investors with mandates beyond non-financial returns are already well established. A nascent but rapidly growing segment is the corporate sector, where investment in sustainable

¹⁰ International Institute for Sustainable Development (2015)

infrastructure may be an attractive option for reducing Scope 3 emissions, for example. Moreover, financial innovation such as green bonds are accelerating change.

We consider the role of investors in more detail in our second white paper, but in short, there are new and emerging investors for whom water infrastructure may be (or become) an attractive asset class. But as these are largely not the same investors who have traditionally funded water infrastructure, there are likely to be knowledge asymmetries on both the demand side and the supply side. A typology of infrastructure projects could lower these asymmetries and make water infrastructure more accessible as an asset class to.

A typology of infrastructure projects

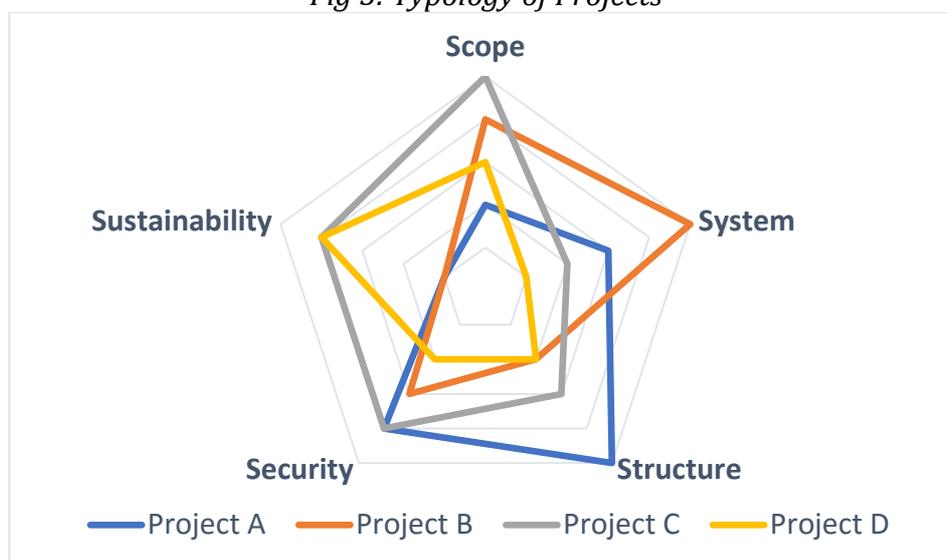
We propose a model of classification that is based on the *scope, system, structure, security and sustainability* of different types of projects. Each element is underpinned by a set of common questions, which are summarised in general terms below. The questions are in development and will be validated through stakeholder review.

- **Scope** incorporates a range of traditional classifiers described above, including the size and scale of a project, i.e. likely levels of capital commitment, project complexity and government involvement; and its stage in the lifecycle, i.e. from development through to termination.
- **System** incorporates the operating environment for the project, including the role of the public sector in provision, governance and regulatory arrangements, environmental standards, fiscal arrangements, access to local capital, sovereign creditworthiness, devolution and so on.
- **Structure** incorporates project-specific attributes such as ownership arrangements and models of operation, levels of equity and debt, project guarantees, private sector participation, access to financial instruments including green bonds and blended finance.
- **Security** incorporates measures of risk including project development risk, off-taker risk, political and regulatory risk, and currency risk. Includes enforceability of contracts, risk of construction delays and cost overruns, volatility of demand, counterparty and liquidity risk and so on.
- **Sustainability** incorporates measures of return including financial and non-financial return. Framing could include how the project contributes to the SDGs including reduced poverty, better health, less inequality, decent work, industry and innovation, sustainable cities, and so on

Different projects would score differently on each of these measures, not just because of the individual project's attributes, but also because of the different expectations of each scorer. The typology is adaptive to both dynamics. Its purpose is not to create a universal scorecard of all projects – but instead to create a common basis of comparison for investors to evaluate different projects.

We consolidate these attributes through a stylised example in Fig 5:

Fig 5: Typology of Projects



Source: author

The framework is extensible, in that it allows a comparison at different scales. Just by way of example, we suggest that Projects A through D could potentially represent:

- i) individual projects of a single functional type (e.g. treatment plants)
- ii) consolidated projects across different countries
- iii) current projects across an investor's portfolio
- iv) projects applying for purposed finance (e.g. green finance, blending)

Various other combinations are obviously also possible. The examples here are purely illustrative.

Next steps

In our framing paper¹¹ we set out ten discrete issues that we associated with barriers to investment in water infrastructure. The absence of an adequate typology of projects was one of those issues, and the purpose of this paper is to set the terms of reference for discussion, debate and engagement with informed stakeholders.

In our view, the value or otherwise of this typology will eventually boil down to three questions. First, does it help to lower the knowledge asymmetries that exist between projects and investors? Second, are there sustainable models to collect the information necessary, and to keep it up to date? Third, exactly what are the improved outcomes that can be credibly be attributed to using the framework?

¹¹ Ten Actions for Financing Water Infrastructure, WWC (2018)

If the principal output of this research is another set of worthy and uncontroversial recommendations, it will be obvious that we have failed to answer these questions. This is not, of course, to claim that recommendations are unimportant. However, we feel our incremental contribution to the excellent recommendations already published in this field would be small. Instead, we want to advance best practice around getting water infrastructure financed. We take an applied approach and seek to engage an extensive network of stakeholders. Critical and constructive comments from all parties are welcome and desired. These inputs will determine if and how we can convert conceptual frameworks into an applied programme of change.

When it comes to financing sustainable water infrastructure, the scale of the challenge leaves no room for complacency. But nor can pessimism be justified. Over two billion souls still lack access to adequate water supply and sanitation due to insufficient infrastructure. We have to fix the financing gap.