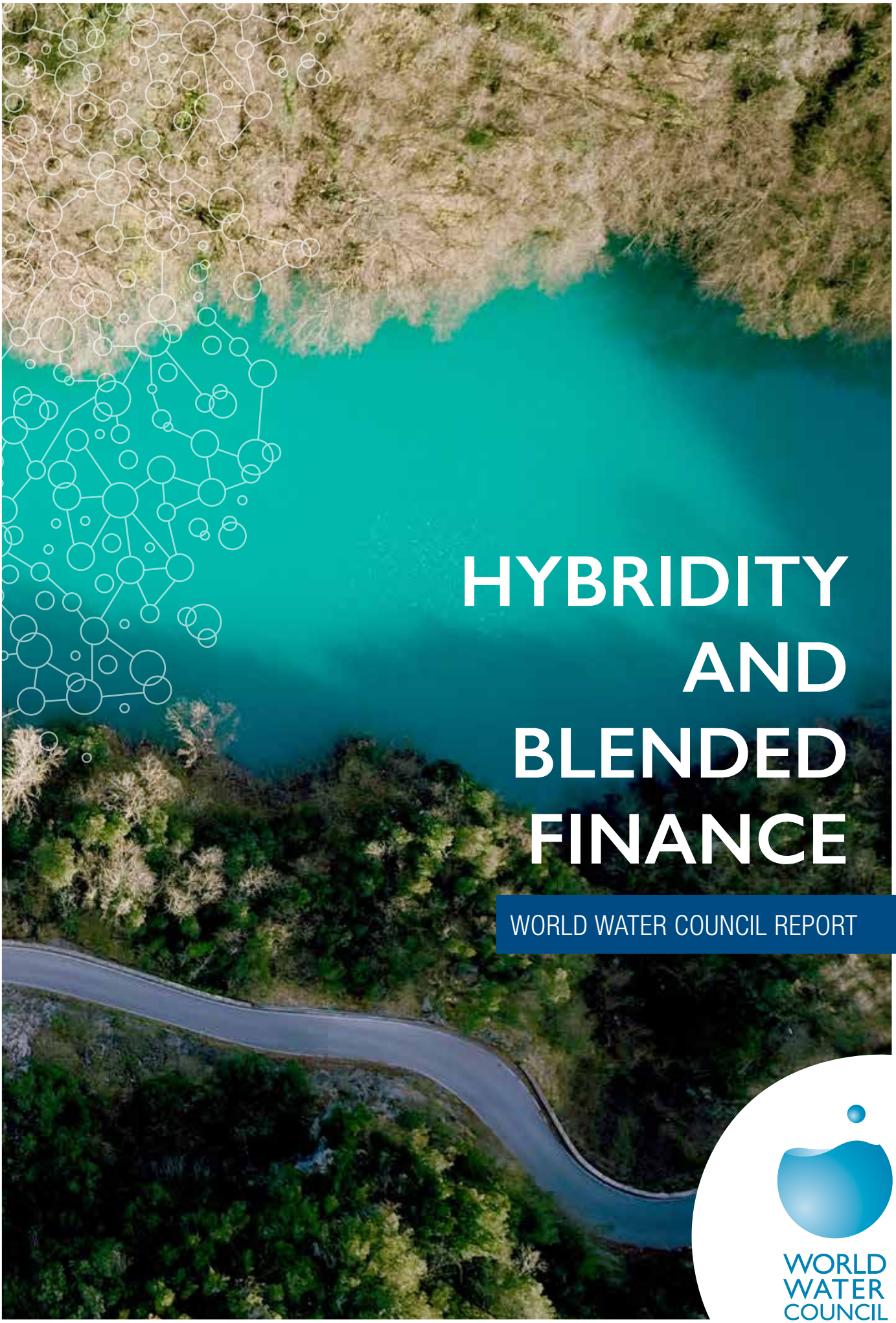

HYBRIDITY AND BLENDED FINANCE

WORLD WATER COUNCIL REPORT

WORLD WATER COUNCIL

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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HYBRIDITY AND BLENDED FINANCE

WORLD WATER COUNCIL REPORT

AUGUST 2018

Prepared by
Alex Money

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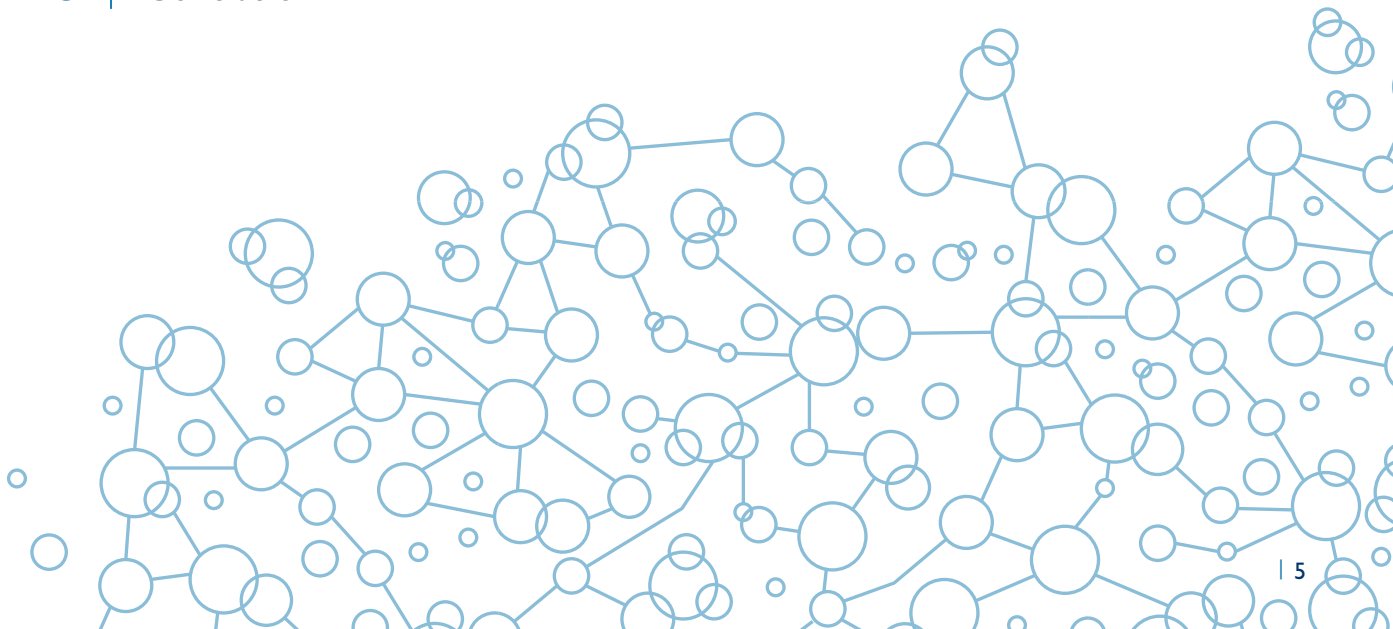

EXECUTIVE SUMMARY

The very real difficulties that low returns and high risks present for improving the bankability of water infrastructure projects are indisputable. Many of these difficulties are endemic to the sector, and some are intractable. However, this paper proposes that changes in how private corporations engage with the challenge of inadequate water infrastructure, coupled with recent financial innovations, can contribute to improved project returns and reduced risks. This is not being presented as a panacea to the challenges of bankability and infrastructure finance, but rather as an incremental and as yet underdeveloped approach that could contribute to bridging the gap.

We briefly describe the finance challenge that is contributing to the under-provision of water infrastructure in many countries across both the developed and developing world. We consider some of the reasons why so many projects in the water sector are considered 'unbankable', particularly in comparison to other infrastructure assets. The emphasis then shifts from describing the problems to proposing how a framework of hybridity can be part of the solution. Hybridity, in this context, refers to synthesising long-established practices of infrastructure finance with new and innovative approaches. The framework described integrates six discrete elements. First, we present an approach to stakeholder collaboration to create entities that can unlock new sources of infrastructure finance. We focus on the uniquely powerful role that private corporations can occupy as an enabling stakeholder, simply by acting out of rational self-interest. Second, we examine the new and expanding roles that impact investors can play in financing water infrastructure. Impact investments are explicitly associated with the intention to generate economic, social and environmental impact alongside a financial return. Third, we discuss innovations in blended finance; defined as the strategic use of development finance for the mobilisation of additional finance towards sustainable development. Fourth, we develop the argument that water infrastructure projects can be combined within a diversified portfolio to provide a blend of economic, financial, social and environmental returns. Fifth, we explore in practical terms how both financial and non-financial returns on a water infrastructure portfolio can be generated, combined, optimised, managed, monitored and disclosed to meet investor expectations. Finally, we discuss the mechanisms necessary to ensure the sustainability and resilience of this model, including tariffs, taxes and transfers. We propose that a 'fourth T' – transactions – represents an important source of regenerative capital that allows for further investment without having to secure additional funds from the financial markets.

This is a framing note, written with the aim of making a fresh and original contribution to the debate on water infrastructure financing. Although it lacks specificity and touches only superficially on the many substantive issues that would need to be addressed, the paper is regarded as a means to an end, rather than as an end in itself. The intention is to ultimately deliver more than a conceptual argument and to this end, researchers at Oxford University, in collaboration with several institutional shareholders, are developing a pilot implementation in one of the world's largest emerging markets, based on the framework presented here. Your critical response and feedback on this paper are actively solicited.

> Hybridity, in this context, refers to synthesising long-established practices of infrastructure finance with new and innovative approaches.

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 meaningful progress is to be made against the UN Sustainable Development Goals (SDGs). Efforts to quantify the investment gap are more of an art than a science, but there is some consensus that it approximates US$ 1 trillion per annum overall, of which water accounts for 15 – 30 % of the total. By comparison, water attracts just 6 % of the total investment that is being directed towards infrastructure assets. 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]

From a policy-facing perspective, there are economic, social and environmental dimensions to the difficulties associated with insufficient or low-quality investment in infrastructure. Citizens of most countries in the world consider it the responsibility of their governments to ensure that core infrastructure is fit for purpose. In many industrialised countries, water infrastructure is perceived as a public good, although decades of relative underinvestment are in many cases degrading the quality of service that this infrastructure delivers. Meanwhile in many of the less industrialised countries, the problems associated with underinvestment are being compounded by a perfect storm of population growth, increased urbanisation and climate variability; that is likely to exert immense and potentially catastrophic pressure on existing systems.

Much has already been written about the problems of inadequate water infrastructure, and the investment gap. There have been long periods of relative underinvestment in the infrastructure of many countries, but public sector balance sheets came under particular strain during the financial crisis of 2008-9, and the subsequent recession. While those conditions have ameliorated somewhat in the decade since, the narrative around water infrastructure has also evolved. There is now broad consensus that – at the global level, at least – the investment gap can only be bridged if public finance is augmented by capital flows from the private sector. The question as to how to attract private capital flows into water infrastructure projects has also been well explored, but to date remains inadequately answered. The reasons for this are both nuanced and context-sensitive, but one word – *bankability* – offers a synopsis of the problem. The term is commonly used by investors and project developers to describe the level of risk associated with achieving the anticipated financial return on a project. Where these risks are high, project bankability is low, and vice versa. The drivers of bankability vary from one project to another, but to generalise, the challenges can be grouped around securing a sufficiently attractive rate of return on a project to secure investment; and, around mitigating the many risks that a project might fail.

The rate of return that water infrastructure assets can sustainably generate depends on the income associated with those assets. Sources of income [2] are tariffs (user charges), taxes (government subsidies), and transfers (such as development assistance). There is extensive literature that discusses water pricing, the value of water, and the human right to water; and the objective here is not to engage in those debates. Rather, it is to simply highlight that for many reasons,

the water supply and service tariffs levied in many municipalities around the world do not cover the full economic cost of provision, particularly when operating, maintenance and replacement expenses are considered. As a result, water infrastructure projects often rely on public or private subsidies, and this can be a constraint on the achievable rate of return – and by extension, project bankability. Meanwhile project risks can be classified[3] 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. The impact of these risks on project viability obviously varies markedly and is a core determinant of bankability.

1 For example, see *Bridging Local Infrastructure Gaps*. MGI, July 2016

2 *Strategic financial planning for water supply and sanitation*, OECD, 2009

3 e.g. *Infrastructure Financing Instruments and Incentives*, OECD, 2015

THE FINANCE CHALLENGE

Over fifteen years have elapsed since the World Panel on Financing Water Infrastructure, chaired by Michel Camdessus, published *Financing Water for All*[4], a report describing the challenge. It set out some of the core reasons why water infrastructure projects struggle to raise finance. First, most projects require a high upfront investment, which is then repaid through small instalments over a long payback period. This profile is not attractive to many investors. Second, the water sector generally offers a low rate of return on investments, as the water tariffs charged to consumers are usually regulated. Third, international investors face foreign exchange risk, as the returns on their investment are usually generated in local currency. Fourth, there is an execution risk to the project, as local developers may lack the financial, technical or managerial capacity to oversee a complex project. Fifth, there is a risk of political pressure being placed on contracts and tariffs; while the regulatory framework may be weak or inconsistent. Sixth, investors may face a contractual risk, where projects that are long-term in nature, have to be entered into with limited initial information. To mitigate these risks, the Camdessus report identified seven categories of actors who needed to be engaged: central governments from both developed and developing countries, sub-sovereign bodies, community organisations and non-governmental organizations (NGOs), banks and private investors, aid donors, multilateral financial institutions, and members of the UN system and other international organisations.

The report also set out four areas that needed to be addressed as a priority:

i) a requirement for host governments to engage in strategic planning for the water sector,
ii) that existing financial facilities should be reused, replenished and enhanced,
iii) that the evaluation of new schemes and opportunities should be fast-tracked, and
iv) that necessary policy changes and reforms should be expedited.

The water financing landscape described by the Camdessus report in 2003 is instantly recognisable today. The risk attributes of water projects are much the same, while the actors identified as change agents remain highly salient. The four priority areas still feature consistently in policy recommendation documents. Local water authorities continue to rely on sub-sovereign entities to support the financing and implementation of improvements to collective water services. Their presence at the local level makes them well-placed to understand challenges in context and to make decisions quickly, but their capacity to act is often constrained by a lack of access to funds, and limited management skills. In terms of funding, limits on sub-sovereign borrowing are often imposed by central governments, who may be competing for funds from the same lenders. The mitigation policies recommended by the Camdessus report include the development of domestic borrowing markets for sub-sovereigns; the introduction of local ratings agencies; the use of specialised financial institutions as intermediaries; and the creation of joint-liability credit pools for sub-sovereigns.

Following the Camdessus report, the *Task Force on Financing Water For All*[5] was established, with a mandate to assess the status of water financing; the reasons behind current trends; examples of innovative financing options being explored and tested with local governments; and the future of financing for the water sector, particularly at the local government level. In their report published through the World Water Council (WWC), the task force focused on the financing needs of local governments, and investments in agricultural water management. Like the Camdessus report, its recommendations also emphasised developing local capital markets in order to reduce foreign exchange risk. Various other sources of financing were also discussed, including credit guarantees; leveraging development assistance; pooled bonds issued by municipality syndicates; credit services to sub-sovereign entities; and decentralised water funds. The report, published in

2006, ascribed particular importance to the development of action plans at municipal and district levels that incorporate targets on water services goals, associated financial expenditures and cost recovery mechanisms.

In 2015, the report *Water: Fit to Finance?*[6] was published by the High-Level Panel on Financing Infrastructure for a Water-Secure World; an initiative of the WWC and the Organisation for Economic Co-operation and Development (OECD). The Panel's aim was "to stimulate a global dialogue on the role of major infrastructure in providing water security and identify the financial resources - and the means to generate them - for achieving water security globally." The report incorporated seven perspectives. First, it emphasised the relationship between water security and national economic growth, that goes beyond traditional measures of economic value. Second, the report highlighted the importance of multi-purpose infrastructure that is responsive to increased environmental and economic uncertainty. Third, it focused on the importance of an effective enabling environment where responsibilities are clearly allocated, stakeholders are properly engaged, and well-designed regulatory frameworks are in place. Fourth, the report discussed institutional and economic reforms that facilitate competition and innovation. Fifth, it highlighted the opportunity to improve the efficiency of investment in water infrastructure from project design and selection through to technical and operational enhancements. Sixth, the report discussed improving the alignment of financial risk and reward, principally through mitigation measures and guarantees. Finally, the report proposed that non-traditional sources of finance, along with climate funds and green bonds, must play a bigger role in the investment arena.

In 2016, 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. In *Financing Options for the 2030 Water Agenda*[7], the authors argued that the water sector has to realign itself around actions that improve creditworthiness; bring in private sector capital; improve the allocation of resources; and minimise capital requirements. The paper emphasised the requirement for greater collaboration amongst governments, development partners and the private sector. It also argued that governments should develop policies and incentives that improved efficiency and governance, the pricing environment, and blended finance; development partners should increase the use of credit guarantees and other instruments to crowd in commercial finance; while the private sector should engage more with the public sector to explore financing relationships and transactions. The paper made a series of recommendations. Many of these – raising tariffs, mobilising taxes, improving efficiency, developing regulatory organisations etc. – had featured in previous reports. However, some recommendations, for example using climate funds in the water sector and expanding household level finance, advanced the wider discussion on mobilising finance.

In 2017, the *Roundtable on Financing Water*[8] was established by the WWC, OECD and the Dutch Ministry of Infrastructure and Water Management as a "global multi-stakeholder platform for engagement, collaboration, and action built on open dialogue and exchange between key actors in the water and finance sectors."

It identified four key objectives:

i) diagnosing the barriers to and opportunities for securing finance;
ii) broadening the awareness of water security as a critical component of the SDGs;
iii) improving the understanding of policies and enabling conditions needed to address related challenges; and
iv) developing practical solutions for implementation.

It was designed as a multi-year initiative with regular meetings to engage a diversity of actors including governments, institutional investors, the private sector, international organisations, philanthropic foundations, academia and civil society. At the inaugural meeting in Paris, sessions focused on the gap between the economic and financial case for investing in water security; financiers' expectations of investments in water security; how the economic benefits of water security investments could be converted into financial returns; and how financing could be scaled up by improving risk-adjusted returns. The second meeting was held in Tel Aviv and focused on innovation, with sessions on

new water technologies and harnessing new sources of finance. Further thematic meetings are proposed.

In 2018 the WWC published *Ten Actions for Financing Water Infrastructure*[9], that revisited how barriers to finance could be lowered, and new sources of capital could be attracted to the sector. Written as a short call to action, proposals included developing a typology of infrastructure projects, along with a typology of infrastructure investors. The report argued that a project typology would help to align specific projects with the most appropriate funding available. Meanwhile an investor typology could be used to describe the different motivations of institutional investors, corporations, development financiers, philanthropists and others. Other issues raised in the report include broadening the attribution of risk and return, to include non-financial metrics.

In summary, several papers and reports have been commissioned over the past two decades, focused explicitly on the challenge of financing water infrastructure. In terms of the 'supply' of projects, attention has been directed on how to improve creditworthiness and bankability. Meanwhile regarding the 'demand' for projects, the focus has been on how to access and attract fresh sources of capital into the sector. Several policy-facing recommendations have been made, and most emphasise improvements to the enabling environment: better governance, higher water tariffs, using public funds to mobilise private sector investment, and so on. And while there has been some progress, the financing gap remains daunting. This should not be surprising – bankability involves some intractable challenges, as discussed – but nor should the current state of affairs be considered acceptable. The framework advanced in this paper builds directly on the various literature that precedes it and emphasises an incremental contribution to closing the gap. The value or otherwise of its arguments rest less in the conceptual discussion, and more in the capacity for practical implementation.

4 The Camdessus Report: https://goo.gl/hUKQdf

5 Task Force on Financing Water for All: https://goo.gl/Bakzig

6 Water: Fit to Finance?: https://goo.gl/rvnsUS

7 Financing options for the 2030 water agenda: https://goo.gl/nDLKAp

8 http://www.oecd.org/water/roundtable-on-financing-water.htm

9 http://www.worldwatercouncil.org/en/publications/ten-actions-financing-water-infrastructure

BRIDGING THE GAP

It is difficult to make a confident estimate as to the aggregate amount of investment needed in water infrastructure in order to keep pace with projected growth. The most cited data comes from the grey literature, such as the McKinsey Global Institute (MGI), who estimated in 2017 that an annual investment of US$ 500 billion in water infrastructure is required from 2017 through to 2035, representing an aggregate spending of US$ 9.1 trillion [10] based on a 'business as usual scenario', i.e. simply keeping pace with economic growth. Most of the investment is needed in the emerging markets, where the financing challenge is particularly acute. MGI noted that while most G20 countries cut back their spending on infrastructure during and after the global financial crisis of 2008, investment rates have subsequently picked up. For many smaller, developing economies, the lack of domestic savings constrains the capacity for endogenous responses, rendering investment flows highly sensitive to changes in global sentiment.

Given the quantum of investment required, there has been an increased focus from various quarters on the effectiveness and efficiency of infrastructure investment can be improved. MGI estimates that up to 38 % of spending is not efficient, due to bottlenecks, lack of innovation and market failures. They propose that required spending could be reduced by more than US$ 1 trillion per year, for effectively the same amount of infrastructure delivered. To derive these numbers, MGI 'diagnostically measured' the efficiency of infrastructure systems in twelve countries and extrapolated their analysis. The diagnostic measurement was based on an assessment of each country's infrastructure balance sheet; the effectiveness of their delivery systems; and the performance outcomes as measured by productivity, benchmarked to costs and international comparators. In measuring effectiveness, the analysis evaluated five areas: project selection, funding and finance, delivery, asset utilisation and maintenance, and governance. These were broken down into subcategories, such as whether a country's infrastructure strategy is closely linked to its socioeconomic objectives; or whether the procurement, tendering and contracting processes are sufficiently transparent.

We concur that these five areas are highly salient to bridging the infrastructure investment gap. For the rest of this paper, we pay particular attention to funding and finance – for three reasons. First, the innovation-based solutions in this area are perhaps the least intuitive, while the problems can appear to be the most difficult to address. Second, we present a model of innovation that includes, at its core, a fundamental change to the financing paradigm. Third, we anchor our discussion to the catalytic capacity for infrastructure to help deliver the SDGs – provided appropriate and sustainable financing mechanisms are in place.

10 Bridging Infrastructure Gaps: has the world made progress? MGI (2017). https://goo.gl/Ly9oo8

STAKEHOLDER COLLABORATION AND THE CONSTRUCTIVE CORPORATION

Of the US$ 2.5 trillion to US$ 3 trillion invested in infrastructure each year, the private sector accounts for US$1 trillion to US$ 1.5 trillion [11]. This is split between institutional investors, who commit capital as part of a broader portfolio, and corporations, which invest infrastructure as part of their strategic initiatives. Institutional investors account for an estimated 30 – 40 % of the total, while corporations account for the balance. Notwithstanding elements of overlap and double counting (for example, where institutional investors have equity and debt holdings in corporations, who use these proceeds to invest in infrastructure) it is clear that corporations – accounting for the majority of private sector investment in infrastructure – are fundamentally important actors in the financing landscape. However, the capacity and possible motivations for private corporations to invest beyond their own direct requirements and help to bridge the infrastructure gap has not been explored in detail.

We argue that corporations of the future can, will and must play a significantly expanded role in financing infrastructure for sustainable development. We propose that new models of collaboration will emerge to integrate the rational and self-interested motivations of corporations with innovative models of financing and emerging sources of investment capital. Underpinning this collaboration is the common objective – of improved water infrastructure – that is shared by a diverse range of actors including corporations, development banks, municipalities and sub-sovereign authorities, philanthropic foundations and others (Figure 1):

In common with development banks and philanthropic foundations – and in contrast to many sub-sovereign authorities such as municipalities - private corporations often have good access to low-cost capital for investment in infrastructure. Corporations may also have unique access to manufactured capital through their local operational presence. For their part, sub-sovereigns may have unique access to social capital, given their function at the community level. Indeed, we suggest that different stakeholders have comparative advantage in accessing types of financial, manufactured, social and human capital. As no single actor occupies monopolistic access to the capitals described, it can make sense to collaborate, where such collaboration leads to a better outcome than any actor could achieve acting unilaterally. In this case, the better outcome is improved water infrastructure, which benefits each stakeholder, albeit in different ways. The key point is that the outcome is only achieved by leveraging access to different capitals through stakeholder collaboration. A core argument of this paper is that the water infrastructure financing challenge will not be met by simply raising more investment capital. Equally important are executional factors, such as whether a country's infrastructure strategy is connected to its socio-economic objectives, or whether the models for procurement, tendering and contracting are sufficiently transparent. These factors combine to determine the bankability of specific projects, which in turn drives the investment case. Our argument is that models of stakeholder collaboration that align the interests of different actors are more likely to deliver the desired outcomes on a sustainable basis – but that these models generally require a catalyst. We propose that private corporations are the best positioned of all stakeholders to act as change agents. The economic and social rationale for corporate engagement is well established in the literature on water stewardship and is not rehearsed here. Instead we highlight the institutional capacity of private corporations to participate in multi-

stakeholder relationships, and the experience of many companies who are involved in various alliances around water stewardship.

Of course, the idea of collaboration is hardly new, and the chequered history of public-private-partnerships (PPPs) draws on a similar rationale. The fundamental difference proposed here is that corporations operating in sectors such as foods, beverages, apparel etc. – for whom improved water infrastructure is highly desirable, but for whom delivering this improvement is not their *raison d'être* – are for the first time highly motivated to play a catalytic role in forging these new collaborative relationships. This change is due to a complex intersection of factors including the rising perception of water scarcity as a business risk [12]; variability and uncertainty associated with climate change; regulatory pressure; and the rapid growth of consumer markets in water-stressed regions. Concurrent with these developments, management scholars have highlighted a progressive change in how many corporations perceive their purpose, evolving from shareholder value maximisation, to something more aligned to responsible citizenship. For example, if the 'purposeful corporation' [13] is to prosper over time, every company needs to not only deliver financial performance, but must also show how it makes a positive contribution to society. Without a sense of purpose, a company risks losing its license to operate from key stakeholders. Support for this argument can be found in growing importance that investors place on the environmental, social and governance attributes of the companies that they own. And while forms of collective action – or 'corporate water stewardship' - have existed for some time, the widening infrastructure gap has highlighted the limitations of the status quo. As companies face increasingly ambitious sustainability targets, fresh impetus is being injected into finding a better way forward. We argue that these changes could provide critical momentum to the evolving models of stakeholder engagement described here.

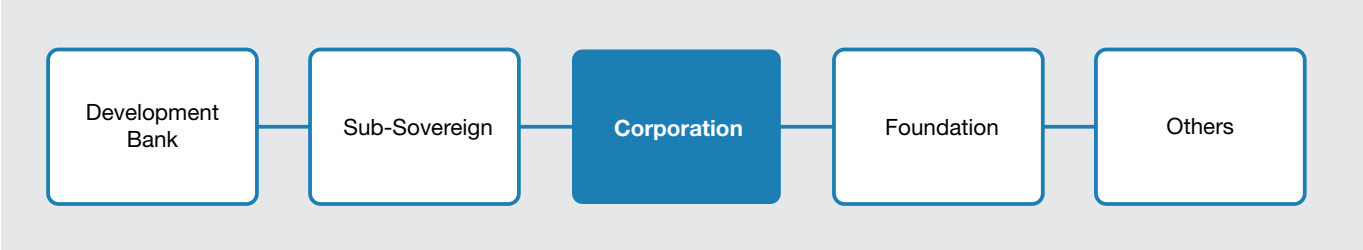

Figure 1. Stakeholder collaboration to leverage capitals

11 Financing Change: how to mobilise private sector financing for sustainable infrastructure. MGI (2016). https://goo.gl/z5ZHp6

12 see e.g. WEF Global Risks Report 2018. http://reports.weforum.org/global-risks-2018/

13 Reinventing the corporation – Mayer, C. (2016). https://goo.gl/nzyT4d

HYBRIDITY AND BLENDED FINANCE

Blended finance is defined by the OECD as the "strategic use of development finance for the mobilisation of additional finance towards sustainable development in developing countries" [14]. This is a useful definition as it introduces 'additional finance' as private finance that does not have an explicit development purpose; and 'development finance' as both public and private finance that is being deployed with a development mandate. As the OECD states, this framing distinguishes finance by purpose rather than by source, and highlights blending in terms of development and commercial finance, rather than public and private actors. Interest in blended finance appears to be growing strongly. Between 2000 and 2016, donor governments set up 167 dedicated facilities that pool public financing for blending, and the number of new facilities grew every year.

Meanwhile impact investment can be defined as investments made into companies, organisations and funds with the intention to generate an economic and social impact alongside a financial return [15]. Impact investments can be made in both developing and developed countries and can target a range of returns from below-market to market rate, depending on the investors' strategic objectives. That is, an impact investor may be willing to accept a financial return that is lower than what they would expect to get from other investment opportunities in the market, because the economic and social impact associated with this investment is sufficient compensation for this. Impact investment is a growth area: a biennial review of investment strategies [16] indicates that funds with responsible investment strategies (a proxy for interest in impact investment) managed US$ 22.9 trillion of assets in 2016, an increase of 25 % from 2014.

We believe that the growth in the size and influence of both blended finance and impact investment presents a significant opportunity to close the water infrastructure financing gap. By combining development finance with institutional investment, capital can be secured at a lower cost, making it a viable source of funding for projects which generate a lower financial return, but also produce a positive economic and social impact. However, for this funding to be unlocked, the appropriate enabling conditions need to be created. We suggest that one solution could be the establishment of a special purpose vehicle (SPV), where the proceeds from any capital raising can be held, before being disbursed. The SPV could also facilitate the payment of investment returns, such as interest and capital repayment. Figure 2 sets out a model for blending impact investment with other sources of finance.

In order to access the capital markets, a borrower needs to demonstrate their credit-worthiness. One of the biggest impediments at present to financing water infrastructure projects is that many of the project sponsors – such as municipalities or other sub-sovereign entities – are not deemed to be a good credit risk. This may be despite many of the projects themselves being intrinsically bankable. After all, the willingness to pay for improved water supply and services amongst even the least affluent communities, subject to affordability constraints, is established in the literature. However, projects rely on their sponsors for funding. The creditworthiness of a publicly owned water utility company in a country with a poor record of servicing sovereign debt may be higher if that utility was privately owned.

By creating an SPV and injecting that vehicle with financial and other capitals secured through the stakeholder collaboration model described previously, we propose that a creditworthy entity could be established with direct access to the capital markets. Perhaps more controversially, we argue that this arrangement could be viable in many environments where political, regulatory, macroeconomic and business risks have historically precluded this access. Capital injected into the SPV can be pledged to lenders as collateral, to partially protect them from 'first losses' that they might otherwise risk incurring on their investments. The proceeds received

from lenders can then be made available to sponsors for projects that meet their investment criteria. One success metric for the innovation is whether it results in sponsors, such as municipalities, being able to access funding for specific projects on better terms than they would otherwise be able to achieve. If so, and provided the project delivers against the investment criteria, the sponsor should be able improve their perceived creditworthiness over time, allowing it to access the capital markets directly (i.e. without the SPV as intermediary) in the future.

In Figure 2, we identify three different types of fixed-income investors for stylistic purposes – in practice there are a broad spectrum of investors in the market, targeting a range of risk and return objectives. We also distinguish between fixed-income (bonds and other debt instruments) and equity investments for simplicity. Here, we define impact investors as those most willing to accept a financial return that is below the market rate, provided the social or environmental impact associated with the investment meets their criteria. Opportunistic investors are defined as those who are interested in impact, but to a lesser extent, and therefore require a higher rate of return than pure impact investors, although still below the market rate. Mainstream investors are defined as those who are not explicitly focused on impact, but who target a market rate of return, adjusted for the associated risk. That is, they demand a higher return for investments that they deem high-risk and will accept a lower return on investments that they consider low risk. Mainstream investors account for the vast majority of capital that is available for deployment. Their engagement is desirable in the short term, but vital in the long term. While it may be possible to raise funds for a limited number of projects simply by relying on impact investors, the scale of the funding challenge means that unless mainstream investment capital is mobilised, then this approach can make a marginal contribution, at best, to bridging the funding gap.

By providing a differentiated proposition to impact, opportunist and mainstream investors, we argue that it is possible to raise investment funds from all three investor types at below-market rates, provided that there are investable projects available that meet the impact criteria. Investments commitments from impact investors reduce the financial risk for opportunist investors, for any given level of return. That is, an investment opportunity becomes more attractive when others are taking on an elevated level of risk. Impact investors accept the risk of first loss – another way of describing a below market rate of return – providing some protection to opportunist investors. Similarly, investment is de-risked for mainstream investors, because opportunist investors have accepted the risk of 'second loss'; that is, losses that go beyond the capacity of impact investors. As further losses are less likely to be manifest, the risk of bearing them will be lower, provided first and second losses have been covered by other investors. Therefore, the mainstream investor should be willing to accept a lower rate of return on their capital than they would if these protections were not available. The first loss model described here is similar to policies that are ubiquitous in the property insurance industry, where the sum insured is less than the value of the property, but the insurer undertakes to pay claims to the sum insured, without application of average [17].

Structuring an investment proposal in this format requires time and preparation, as for each tranche of investor, contractual agreement needs to be reached on performance benchmarks and loss acceptance. However, in most financial markets there are various instruments in use that have been designed for similar purposes of risk attribution, and so some standards exist that can be adapted for purpose. Of note is that many developing countries with large infrastructure finance gaps actually have well-established and sophisticated capital markets with the technical and human capacity to introduce instruments of this type. We describe the tranches as senior, mezzanine and junior, consistent with the language of the debt capital markets. Senior debt is the lowest risk and must be repaid first. Mezzanine and junior debt are subordinate and incorporate a progressively higher rate of risk.

The relationship between water and climate change is discussed elsewhere in the literature, so here we simply highlight the potential of climate finance as a source of capital for water infrastructure. At the Copenhagen Accord in 2010, a target was established of mobilising

US$ 100 billion per year by 2020 by developed countries for developing countries. A Green Climate Fund was subsequently established, and at the Paris Agreement in 2015, the target was reinforced, with the goal to raise the amount further after 2025. While it remains to be seen how close the quantum of climate finance raised gets to these targets, it is already apparent that additional mechanisms will be needed to downscale this capital into projects that deliver impact consistent with the Paris targets and the SDGs. This presents a supportive opportunity.

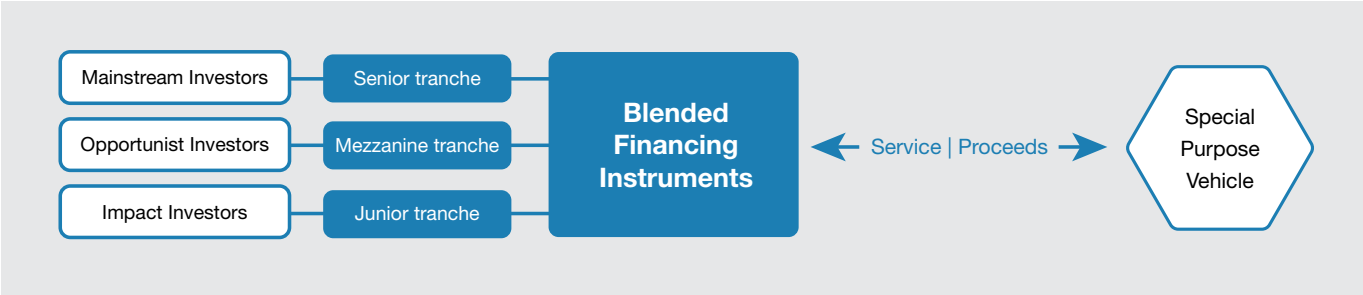

Figure 2. Accessing the capital markets

14 Making blended finance work for the sustainable development goals. OECD (2018). https://goo.gl/6hN8YK

15 Global Impact Investing Network. https://goo.gl/Wv8hUJ

16 Global Sustainable Investment Review (2016). https://goo.gl/1QTwSt

17 For a description of first-loss insurance policies, see: https://goo.gl/v8Att7

BLENDED RETURNS ON INVESTMENTS IN INFRASTRUCTURE

With funds available for investment, it is necessary to qualify which projects meet the criteria of investors. This may involve using established standards similar to those developed by the Climate Bonds Initiative (CBI), which consists of a certification process that is guided by a taxonomy of qualifying projects. To date, the most sophisticated standards have been developed for projects that deliver reductions in net greenhouse gas (GHG) emissions. However, this is a nascent space, and new standards are being developed that target a wider range of objectives than reduced emissions. In early 2018 the CBI launched its Water Infrastructure Criteria [18], setting out the requirements that water infrastructure projects need to meet in order to be eligible for inclusion in a certified climate bond. The criteria cover both built and nature-based infrastructure, and are focused on GHGs, with mitigation, adaptation and resilience components. It is likely that further standards for water infrastructure assets will emerge that cover a broader set of impact criteria, including economic, social and environmental returns on investment (ROI), in addition to financial performance (Figure 3).

The point to emphasise here is that different projects will have different return attributes, as benchmarked against these criteria. At the portfolio level, i.e. when assessing the overall impact of several projects, it is the aggregate return on investment that is the most salient data. So, it may be that one project has a high social return on investment – measured, for example against metrics of health, wellbeing, education or gender equality – but has a low financial return on investment. Meanwhile another project may offer high financial returns but contributes less to the other impact criteria. Both projects may be investable, if the aggregate returns on investment meet the threshold required by the investors. This model of diversification to capture multiple returns takes its inspiration from modern portfolio theory [19], which proposes that the risks associated from holding a single stock can be reduced by holding multiple stocks, whose performance are not closely correlated to each other. The analogy is illustrative rather than exact, not least because the methodologies to measure the impact performance of water infrastructure assets are still fairly undeveloped. However, it serves to highlight the benefits to investors of financing a diversified basket of projects, both from a reduced risk and optimal return basis.

The portfolio approach embeds flexibility in project selection at various levels. Both publicly and privately-owned projects are in scope, as are built ('grey') or natural ('green') capital projects. Impact is measured in terms of outcomes, and emphasises the service delivered by infrastructure, rather than the infrastructure asset itself; so projects that focus on models for maintaining of rehabilitating existing infrastructure could also be eligible for investment. Other opportunities may leverage innovations such as water funds, where it is a more efficient use of capital to co-invest in an existing vehicle for a given project. Project selection may be optimised to factor in the political, regulatory, macroeconomic or business environment of specific regions, countries or cities. The framework is designed to be agnostic as to which projects are investment candidates, provided they meet the criteria.

Financial ROI is highlighted because it is important to reiterate that this model for financing water infrastructure is not a charitable endeavour. Other, simpler platforms already exist for that purpose. Rather this a model to generate financing for water infrastructure from a diversified set of investors, at the lowest sustainable cost of capital possible, across the broadest range of feasible projects. In addition to economic, social and environmental impact, investors will require the portfolio of projects to deliver some level of financial return, even if it is below market rates.

One way in which this could be structured involves the investors getting their principal – or initial capital - repaid to them over the duration of the bond, but the effective interest that is earned on that principal may be negligible or even negative. By way of illustration, consider a 'vanilla' (i.e. generic) bond for US$ 100,000 that matures in 20 years and pays a fixed coupon of US$8,000 at the end of each year. If the principal was then repaid at the end of the period, then in nominal terms (i.e. not adjusted for inflation), the bond has an 8 %, yield.

An alternative arrangement could be where, rather than the principal being repaid in full at the end of the period, instead it was being paid down in regular instalments as part of the coupon. Such instruments, often called amortising bonds, are similar to the configuration of many residential mortgages, and reduce the credit risk of the loan because it is repaid over time, rather than as a lump sum on maturity.

Assuming the same amount of borrowing and coupon payments as described for the vanilla bond above, in nominal terms an amortising bond would result in the original investment being recovered and interest income of US$ 60,000 being received. This might appear to imply an interest rate of 3 % over the period, which could still be an attractive return on a risk adjusted basis. However, this is not an appropriate calculation, because it ignores the time value of money. The coupon received at the end of the first year is worth more to the investor than the same coupon received at the end of the twentieth year, because it can be reinvested for the intervening nineteen years. To adjust for this, we can calculate an internal rate of return (IRR), which is the discount rate that makes the net present value of all cash flows, whenever they were received, equal to zero. The calculation is iterative, and based on the illustration above, the IRR of this investment is in fact negative, at around - 2.1 %. To achieve an IRR of zero, the annual coupon would need to be more than $9,000. To achieve an IRR of 3 %, the annual coupon would be nearly $11,000. And to achieve an 8 % IRR, the annual coupon on an amortising bond of US$100,000 would need to be $14,000.

As this simple example demonstrates, internal rates of return are highly sensitive to the amount and timing of cash flows. A core proposition of this model is that it is attractive to a heterogenous set of investors who are willing to accept different rates of financial return, and to be compensated for this by the portfolio delivering impact performance.

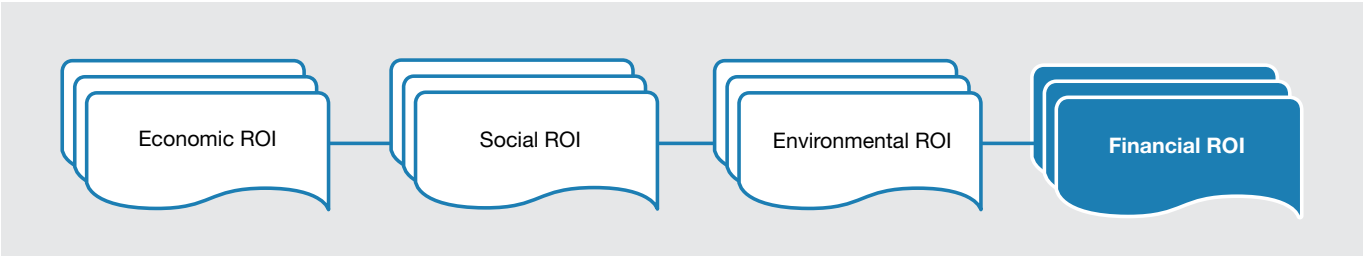

Figure 3: Investment returns across multiple criteria

18 https://standard.climatebonds.net/sector/water

19 See e.g. Elton et al., *Modern portfolio theory and investment analysis.* Wiley (2009)

WATER INFRASTRUCTURE PORTFOLIO MANAGEMENT

We have described thus far the models of stakeholder collaboration required to mobilise the capitals to create a creditworthy SPV, that can raise finance from impact, opportunist and mainstream investors, and blend this commercial finance with development finance to unlock capital for investment in water infrastructure projects that deliver a combination of economic, social, environmental and financial returns, that are consistent with the requirements of those investors. To implement this framework in practice, a portfolio management layer is necessary (Figure 4).

Portfolio management in the context of multiple and discrete projects can be defined as the selection, prioritisation and control of projects and programmes in line with the manager's strategic objectives and their capacity to deliver[20]. The responsibility of the portfolio manager includes assessing whether the right projects are being selected to deliver the strategic investment objectives, subject to risk, resource constraints and affordability. Other considerations include assessing whether project managers are delivering these objectives effectively and efficiently; and whether the full potential benefits of the investment are being realised. The benefits of a portfolio approach include maintaining a balanced and strategically aligned portfolio in the context of changing conditions; and improving the returns from projects through a portfolio-wide view of risk, dependencies, and scheduling. A clearly articulated strategy, along with a robust governance structure, helps to provide the capacity and commitment that is necessary for the portfolio manager to deliver against investment objectives.

The infrastructure portfolio manager is responsible for selecting the projects for investment and performs four key roles. Firstly, projects need to be selected and then optimised against their risk and return attributes. The purpose of the optimisation is to select a portfolio of projects that are suitably diversified both to lower risk, e.g. by spreading the investment across a number of projects; and also, to enhance return, e.g. by choosing projects that are expected to deliver a combination of economic, social and environmental impact, as well as financial performance. After projects have been selected, their performance against these benchmarks of return need to be measured, the second functional role of the manager. While financial return on investment is relatively straightforward, measuring economic, social or environmental returns on a consistent basis across different projects can be more problematic. Various methodological approaches are being developed to try and bring consistency and robustness to this process. Thirdly, the portfolio manager needs to ensure that projects maintain compliance with any guidelines or conditions of investment. Sanctions for non-compliance will vary between projects, but might include delaying disbursements, or even disinvesting from a project. Finally, the portfolio manager is required to intermediate the performance information from the range of projects into a consolidated format that is meaningful and relevant to investors, and then report this information on a regular basis.

20 Association for Project Management, UK. https://goo.gl/Vf1QYn

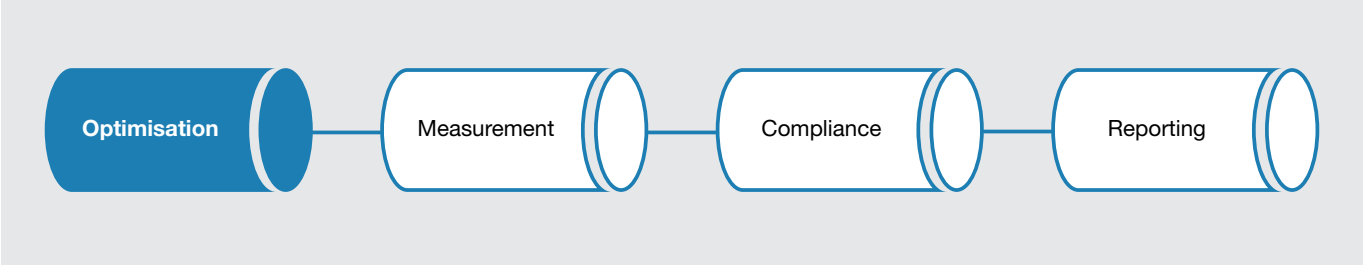

Figure 4: Infrastructure portfolio management

HYBRID INCOME

To generate return sustainably over a multi-year investment timeframe, the portfolio must generate income, both to meet the operating and maintenance expenditures required, as well as to contribute to overall financial performance. The OECD defines three basic sources of revenue available to water supply and sanitation: tariffs, taxes and transfers (the 3Ts). It notes that most developing countries tend to draw heavily on transfers from overseas development assistance and philanthropy, while in developed countries revenues are more usually raised from tariffs, along with earmarked taxes. Developing a cost recovery strategy requires an appropriate combination of these sources of revenue. The analysis is typically conducted at a country-level scale. Our framework proposes combining these revenue sources at the scale of a diversified project portfolio, that may span multiple countries, and embeds the capacity for operating and maintenance expenditure for some projects to be cross-subsidised at the portfolio management level, from the net income generated by other projects. In addition to tariffs, taxes and transfers, we introduce a fourth element of transactions (Figure 5).

Transactions become relevant in circumstances where assets in a portfolio are acquired by third parties. For example, a syndicate of private companies might acquire a waste water treatment plant to direct further investment. A municipality might acquire grey (built) assets to meet rapid growth in user demand. A water fund might acquire natural capital assets such as wetlands as part of its development plans. There may also be acquisition interest from financial investors seeking stable returns. It may be also be that third parties acquire stakes in projects, rather than take full ownership. Various permutations are possible, and while it is impossible to be definitive on these outcomes in the context of this paper, there are many precedents in the sector where ownership is transferred during the life of the assets.

We suggest that the counterparty to such transactions would be the portfolio manager, who has a fiduciary duty to the investors in the fund. Any decision would need to consider the implications to the risk and return attributes of the entire portfolio, rather than being simply about the specific asset. The manager would need to evaluate how the transaction would affect both financial and non-financial performance of the residual portfolio. If this evaluation was effective in practice, it raises the prospect of a more integrated approach to the management of outcomes. That could help align decision making more closely with the issues around project selection, delivery, asset utilisation and maintenance, and governance; discussed earlier. From an income perspective, a transaction involves an injection of capital, which could be deployed in various ways. For instance, the portfolio manager could reinvest in other projects. Alternatively, the funds could be transferred back to the SPV, and used to enhance the returns paid to investors. Or, the funds could be used as shareholder capital within the SPV, allowing part of the existing capital to be returned to the original providers. Equally, all of these methods might be deployed, depending on conditions precedent. In summary, we propose an enhancement to the 3Ts framework that incorporates transaction activity at the portfolio level.

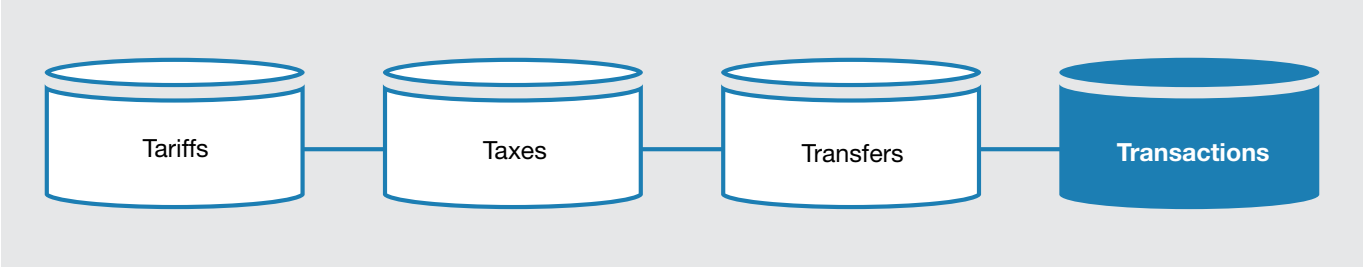

Figure 5: Sources of finance for water infrastructure project portfolio

SYNTHESIS

A representation of the integrated framework proposed herein is presented in (Figure 6). It comprises the five 'layers', as described in this paper. A singular feature of this model is that the functional attributes of the underlying components are already well developed and applied in various contexts. For example, collaborations involving public-private partnerships are a staple of infrastructure finance, as are instruments that reallocate risk and return to suit investor preferences. The management layer is based on the basic attributes of project portfolio management, while, diversification and divestment are widely used strategies to enhance risk adjusted returns. The innovation proposed is therefore less about execution at the component level, and more about hybridity through bringing together established practices in new ways. That said, we believe that there are areas in which the application of this model could yield fresh and important insights, both to the literature and to the field. For example, at the impact layer, there is still much work to be done around measuring and managing various forms of impact; particularly on a comparative basis. Theorising will only take things so far: ultimately this is about application.

This paper has described the financing challenge as a gap to be bridged. What has been proposed in response is a conceptual model; but the problem that needs to be addressed is certainly not an abstract one. Our research is currently focused on implementing this framework within specific countries, as a way of learning by doing. Country selection incorporates various criteria, including: materiality of impact; calibre of institutional actors; sophistication of financial markets; and nature and extent of the water infrastructure challenge. A pilot is being currently developed in one of the world's biggest emerging markets, whose socioeconomic and environmental significance is reflected in the strong presence of national and international organisations variously engaged with water infrastructure. The country has deep and liquid financial markets and is a global pioneer of green bond issuance. Notwithstanding its prominence and significance, inadequate water infrastructure is a clear and present challenge for the country, and a major constraint on sustainable development. This makes it an interesting candidate for a pilot, and early field research – involving detailed engagement with development banks, municipalities, corporations, philanthropists, investors, banks, project managers, and other stakeholders – has been promising.

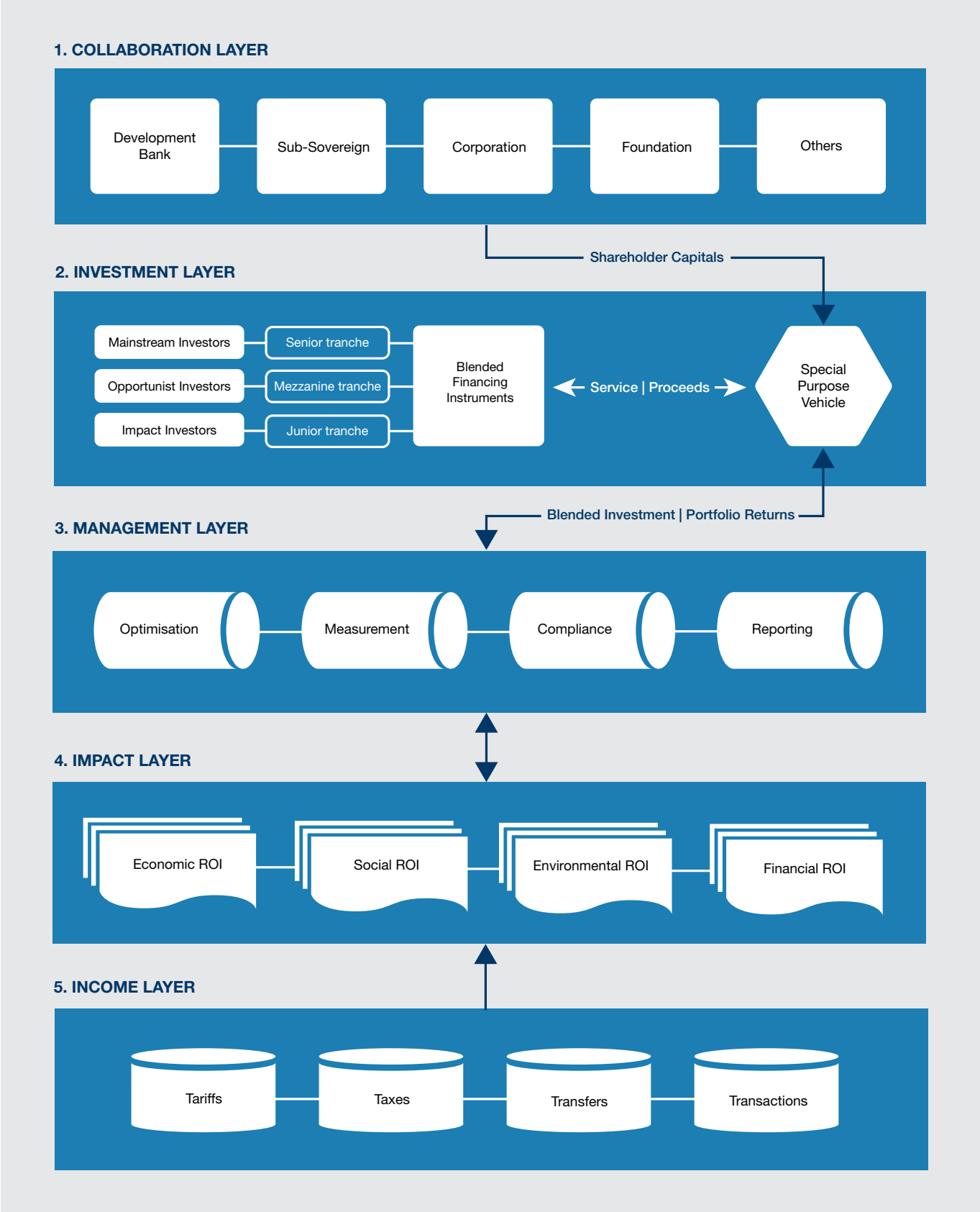

Figure 6: A framework for financing water infrastructure

SCALING THE MODEL

The financing challenge will only be met by solutions that work at scale. In practice, this means that models need to be adaptive to different social, economic, political, institutional and regulatory frameworks. We describe the capacity of this model to scale (Figure 7):

We believe that the core elements required to deliver scale in this model are innovation, competition and diversification. Innovation at the financing level requires flexibility in terms of how different stakeholders collaborate; the capitals that are committed to the SPVs; the blended finance instruments used; the risk and return objectives that are established; the measurements of impact that are applied; and so on. There are many components and sub-components to these relationships, and the different configurations are reflected through the range of SPVs that may be established. It may be that there are single, country-level SPVs; several SPVs established within a country; or a single SPV operating across a number of countries.

In terms of the competition layer, for this model to operate at scale, good execution at the project management level is critical. A broad range of skills and competencies are required to align different investor objectives with projects that deliver the necessary economic, social, environmental and financial returns on investment. Engaging a selection of portfolio managers with complementary domain expertise would significantly improve execution capability, particularly as the universe of potential projects expands. This approach also reduces the risk of rent seeking, as managers operate in a competitive environment where their performance against investment objectives can be measured and benchmarked. Managers that consistently perform better than the benchmark would likely receive a greater share of the investment pool to manage, while consistently underperforming managers would likely see their share of the pool being reduced. This approach to performance measurement – aligned with appropriate incentives, is commonly used in the investment management industry. It also offers the prospect of improved transparency and governance at the project level.

The diversification layer simply reflects the reality that water supply and sanitation is complex. The literature is replete with examples of this complexity, but it will suffice to note here that the financing challenges are local, context-dependent and sensitive to the policy environment. For many reasons, including how water is priced, it is difficult to conceive of a templated set of water projects that can be re-purposed for widely differing contexts. By contrast, in the renewable energy sector, it is exactly this sort of scalable replication that is contributing to lowered costs and accelerated rollout. However, by acknowledging from the outset that water infrastructure projects will likely be bespoke, we think that it should still be possible to develop diversified portfolios where the complementarity of projects can be optimised to generate strategically determined outcomes.

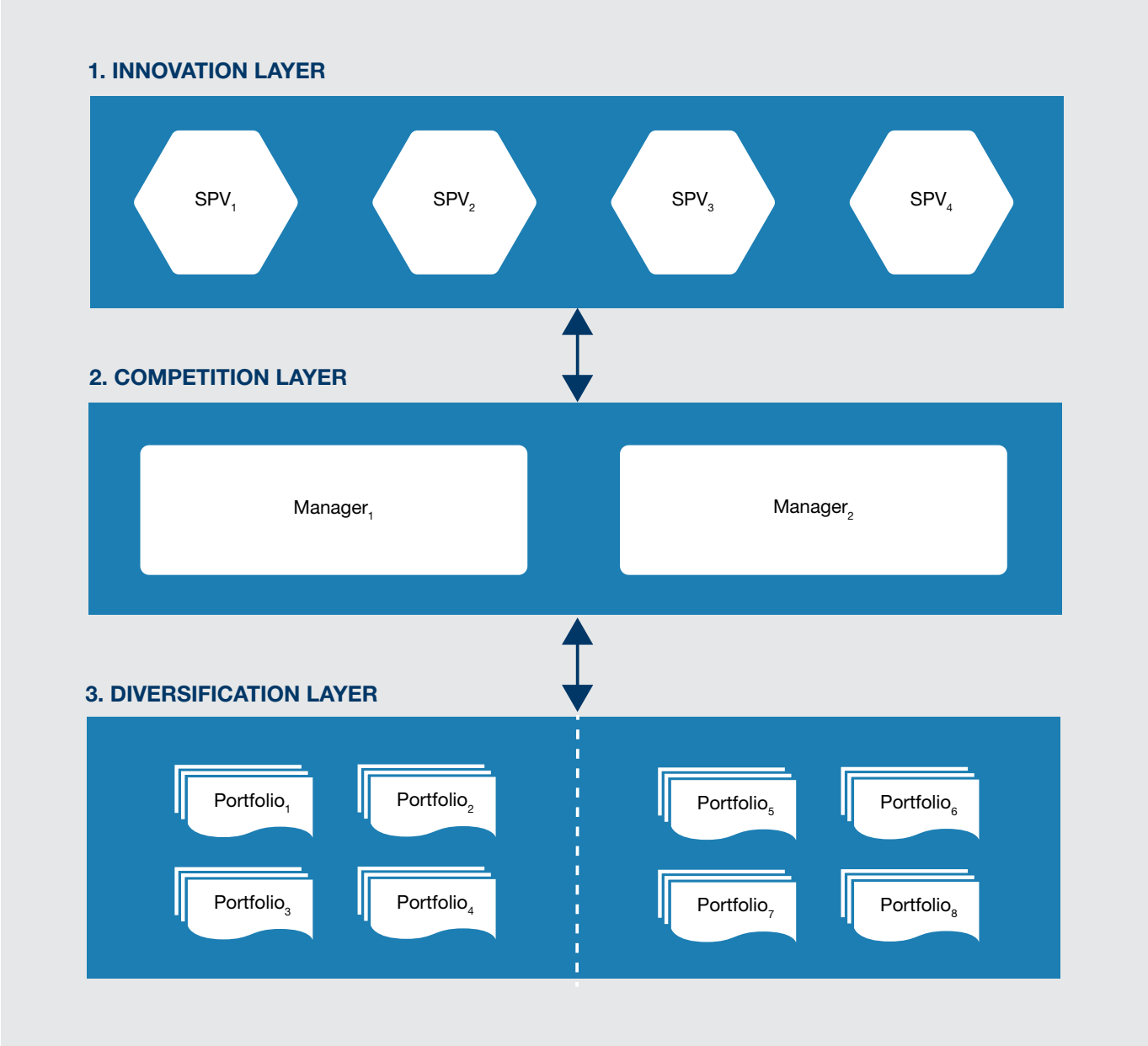

Figure 7: Financing water infrastructure at scale

CONCLUSION

This paper has framed the water infrastructure financing challenge within a historic context and has focused on efforts that have been made to bridge the gap between current rates of investment, and the investment needed to ensure that infrastructure is fit for purpose in the twenty-first century. A framework for financing water infrastructure that places the private corporation as a core stakeholder and change agent was presented here. Frameworks of this sort can help address the fundamental challenge of project bankability, by tapping into recent innovations in the financial markets, a resurgence of interest in blending finance, and the rapid growth of impact investment funds. In applying a blended approach to project selection as well as financing, we have described how a portfolio of projects can deliver economic, social, environmental and financial returns that are consistent with the requirements of mainstream and impact investors. The model relies on effective execution through portfolio management, and on developing sources of income that have not traditionally been associated with the sector. The functional attributes of the underlying components in the model are already well developed and applied in various contexts; and current research is focused on applying the overall framework at a country level. A key consideration is scalability, and this requires innovation, competition and diversification.

When it comes to the practical application of any framework, the devil is in the detail. This is a framing note written with the aim of making a fresh and original contribution to the debate on water infrastructure financing. Although it lacks specificity and touches only superficially on the many substantive issues that would need to be addressed, the paper is regarded as a means to an end, rather than as an end in itself. The intention is to ultimately deliver more than a conceptual argument and to this end, researchers at Oxford University, in collaboration with several institutional shareholders, are developing a pilot implementation in one of the world's largest emerging markets, based on the framework presented here. Your critical response and feedback on this paper are actively solicited.

WORLD WATER COUNCIL

World Water Council
Espace Gaymard
2-4 Place d'Arvieux
13002 Marseille - France

Phone : +33 (0)4 91 99 41 00
Fax : +33 (0)4 91 99 41 01
wwc@worldwatercouncil.org

worldwatercouncil.org
facebook.com/worldwatercouncil
twitter.com/wwatercouncil
linkedin.com/world-water-council