

Project 1800

Results from a scoping process for a multi-stakeholder collaborative outcome model in water & sanitation:

**Towards a market network
for a water-secure world**

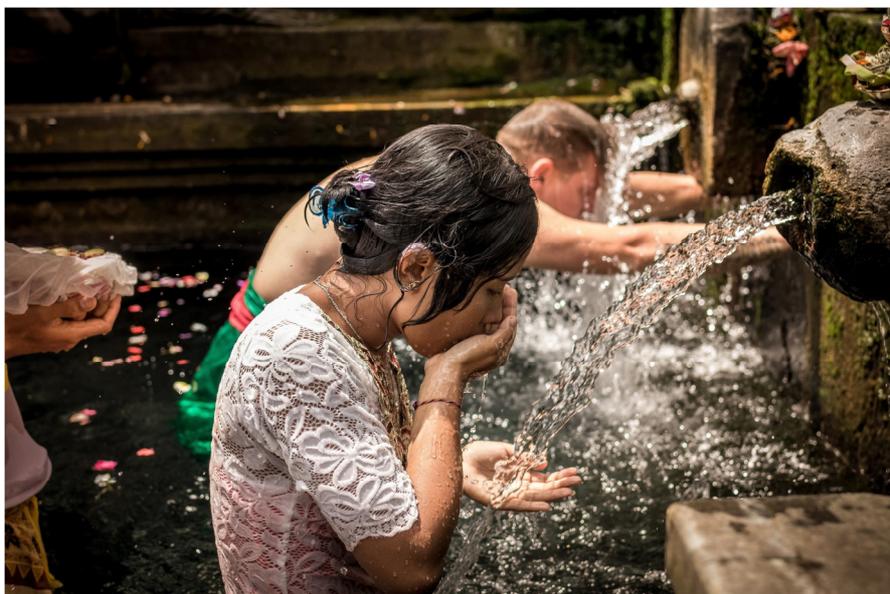


Photo by Artem Beliaikin on [Unsplash](#)

A report for the Swiss Agency for Development and Cooperation (SDC)
Final draft – 17 March 2018

Contents

EXECUTIVE SUMMARY	3
I. PROJECT REPORT.....	6
INTRODUCTION	7
1 THE CHALLENGE	10
2 THE OPPORTUNITY	14
3 APPROACH.....	17
4 METRICS.....	21
5 FINANCE	27
6 GOVERNANCE.....	32
7 SYSTEM DESIGN.....	36
8 CONCLUSION AND NEXT STEPS.....	46
II. PROJECT PLAN	49
1 Introduction	50
2 Sources of capital.....	50
3 Building the market network	52
4 Project partners.....	58
5 Timeline and budget.....	61
III. APPENDICES	64
A. Abbreviations & acronyms.....	65
B Glossary.....	66
C List of tables, figures and boxes	70
D. The Senegal River Basin.....	71
E. Design principles.....	77
F. Activities carried out under this phase	79
G. Participants at the extended stakeholder dinner	83
H. Immersion workshop participants	84
I. WASH indicators	88
J. Sample product: An exchange-traded fund (ETF)	91
K. Sample product: Aqua for All.....	94
L. Summary timeline	95

EXECUTIVE SUMMARY

The problem: there is not enough capital in the current paradigm to achieve the SDGs. This is likely to get worse.

Project 1800 is named after the estimated eighteen hundred children under five who die every day from a lack of basic WASH services. This makes it the biggest killer of children world-wide. This dire problem also makes it a clear moral imperative to address.

In economic terms, for us to reach target 6.1 and 6.2 of Sustainable Development Goal (SDG) 6 by 2030 means that the world will need around US\$1.7 trillion (with a margin of error of US\$1 trillion to US\$2.5 trillion). And this is for only one of 17 SDGs. Meanwhile, traditional sources of capital of grant and aid at a global level are strikingly insufficient. Only roughly US\$150bn can be expected to come from the Bretton Woods institutions, while global foundations provide another US\$150bn.

Both sources, however, have been flat and are now declining in real terms. Migration to Europe has cannibalised existing aid budgets. Meanwhile, in the USA, the Trump administration has made cuts to get re-elected. This is compounded by a 40% increase in social sector organisations over the past 10 years.

Individual country giving tends to be focused on domestic issues and generally, only a small part is dedicated to development cooperation. Add to this the fact that market valuations are the highest since 1900. A downturn is likely to have a dire impact on funding for development and social issues. Despite governments' expectations to the contrary, impact investment will also not "pick up the bill".

The bottom line is that to achieve the SDGs, between 5-10% of all annual global capital flows will need to be mobilised. The current funding paradigm will not achieve that aim. This means that we will fail to achieve the SDGs by a significant margin.

The solution: what if we turned the costs of inaction into an opportunity?

The cost of inaction in water and sanitation is estimated between US\$300 to US\$600 billion per year. This figure represents the damage ('negative externalities') that the society will have to bear if we are not able to redress the situation. Another way of looking at this is the annual cost of inaction to an economy. In the case of India, this amounts to 3% of its annual gross national product.

Perhaps the solution lies in thinking about these social costs in a different light. As *The Lancet* has noted, investments in water and sanitation are the most impactful public health investments that can be made, both in the economic and social sense. So, what if we viewed these negative externalities as future cash flows lost by society's stakeholders? Seen like this, social sector interventions could be perceived as investments to reduce externalities. These include the loss to stakeholders or, alternatively, missed future business opportunities ('positive externalities'). Looked at this globally, the potential return on investment becomes interesting. In other words: investing US\$140m per year until 2030 could create a minimum cash flow of \$300bn every year.

If this can be achieved, we would have created a market out of the social problem. Moreover, this would become a desirable investment opportunity for pension funds and investments by financial institutions. This could include the US\$1 trillion that sits on the balance sheets of global

foundations, 98% of which is unaligned with their social missions. Ultimately, one could even align the current US\$2 trillion (estimated to rise to \$17 trillion by 2050 according to the World Bank) in local currency pension funds in the developing world to realise the SDGs.

For the banking sector, this would represent a much larger market that would carry higher margin products. It would also mean that the quicker the social outcomes are achieved, the higher the financial return would be. Note that this model could be applied beyond water and sanitation to most social issues, such as education – according to research done by Accenture, Brookings and Total Impact Capital, a US\$1 investment in education in India generates US\$53 of future economic returns.

What lies at the heart of *Project 1800*?

Project 1800 is both a vision and a process to monetise social problems by transforming them into tradable market opportunities. It seeks to create a direct link, defined by the views of the actual consumers, between a social intervention and the overall value it has created for society as a whole. We must recognise that these social issues are systemic and thus need a systemic response. It is time to move beyond our bipolar vision of “for-profit” and “not-for-profit” to envision structures that have diverse stakeholders taking diverse risks and returns. Stakeholders need to be incentivised in multiple ways. These include capturing not only the value of innovation, but also the value of collaboration and scale in both manufacture and delivery.

We used the Senegal River Basin to root our case in reality. We then framed it as a ‘market network’ and tied it to technology. We placed communities at the centre of a granular and modular process, whereby individual innovation (which can be process, entrepreneurial or finance-related) is plugged and played, and then tracked and paid by the incremental impact it has on the negative externalities when the damage created is resolved.

The building blocks

Project 1800 convened 19 experts from around the globe in four work streams – legal, finance, metrics and technology – over five months, including a two-day design workshop. Led by the Arthur Wood and the team from Sphaera, the experts unanimously concluded that the vision was “doable”, thanks to four major innovations. The work to be done has been identified as follows:

1. **Metrics:** creating a standard social cost of capital, by noting the incremental impact of a social intervention on all externalities. Feedback is rooted in and priced by communities in a comparable and competitive way that is integrated with the SDGs.
2. **Finance:** develop a structure that captures and compliantly manages both economic return and value of the social intervention. A standardised structure where social equity (or blue equity) equals financial equity, thus becoming tradable and reflecting both the financial value of the intervention and the (almost real time) achievement of the social outcomes.
3. **Legal:** design a legal setting that identifies clear roles for each stakeholder and that ensures that the interests of the social stakeholders are inalienable. It:
 - a. *Aggregates partners:* a market network of collaborating partners, where for-profit, government and not-for-profit entities collaborate and where the value created in the value chain by all stakeholders is tracked and paid.

- b. *Aggregates capital*:
 - a standard tradable blue equity that trades the achievement of the systems outcome and that is compliant to manufacture and to distribute and
 - the (tactical) ability to plug and play other financial impact tools on a cost-effective platform
 - c. *Aggregates process*: an umbrella entity with an embedded social mission that provides the “plug and play” tools to marry capital with the partners who wish to drive systems solutions. The entity provides a cost-effective, adaptable and open technology infrastructure that can be expanded to include other social issues.
4. **Technology**: applying the same technologies that have rationalised other sectors of the economy (cloud, mobile, distributed ledger technology) to the development sector.

Conclusion

This document seeks to demonstrate that, to collectively fulfil the promise the SDGs, we have to change the way we are operating. We need to create inter-, intra- and cross-country collaboration and scaling mechanisms that are driven by the same factors like the ones that create market efficiencies. And, critically, we need to make communities equitable participants in the economic value and upside that social interventions create for society. This will benefit both the social sector, which will get paid for its economic & social role; and the corporate and banking sector. Or in other words, build win-win partnerships through creating market demand out of social need.

I. PROJECT REPORT

INTRODUCTION

By 2030, over 40% of the world's population will be living in severely water-stressed river basins.¹

According to the Swiss Agency for Development and Cooperation (SDC), more than 3.4 billion people lack access to safe water today,² making it a truly global, urgent issue with serious implications for people living at the 'base of the pyramid' (BoP). In particular, this concerns rural livelihoods, food and energy production, supporting economic growth, and ensuring the integrity of ecosystems.

The implications for global health, economics and security are profound and well understood: After climate change, water, sanitation and hygiene (WASH) generates the highest 'negative externalities', estimated conservatively between US\$300 billion and US\$600 billion annually.³

Switzerland is committed to accelerating progress towards achieving Sustainable Development Goal (SDG) 6, "Ensure Access to Water and Sanitation for All".⁴ Among others, it is emphasising innovative approaches for service delivery, sustainable financing, private sector involvement and basin-level governance.⁵

Given an estimated funding need of US\$1.5+ trillion to address SDG 6,⁶ Switzerland's leadership is as timely as it is welcome. It is clear that novel, replicable and scalable approaches to governance, policy, advocacy and funding are required if we are to successfully intervene in what is arguably one of the greatest existential threats to human survival.

Project 1800 seeks to resolve the tension between the moral imperative to achieve the Sustainable Development Goals by 2030 and the inability of existing mechanisms to do so. Its basic premise is:

The analytical, financial, legal and technological tools now exist to effectively monetise the externalities of WASH to create a people-centred, outcomes-driven, multi-stakeholder framework for facilitating the scale of collaboration required for achieving SDG 6.

¹ Federal Department of Foreign Affairs / Swiss Agency for Development and Cooperation (SDC). Global Programme Water: Strategic Framework 2017-2020. Bern, 2017. p. 5.

² Ibid.

³ Hutton Guy (2012). Global costs and benefits of drinking-water supply and sanitation interventions to reach the MDG target and universal coverage. Department for Protection of the Human Environment, World Health Organisation. WHO/HSE/WSH/12.01. 67 pages.

⁴ <http://www.un.org/sustainabledevelopment/water-and-sanitation/>, accessed 18 February 2018.

⁵ Federal Department of Foreign Affairs / Swiss Agency for Development and Cooperation (SDC). Global Programme Water: Strategic Framework 2017-2020. Bern, 2017. pp.13.

⁶ Leigland, James; Tremolet, Sophie; Ikeda, John. 2016. Achieving Universal Access to Water and Sanitation by 2030: The Role of Blended Finance. World Bank, Washington, DC. available at: <https://openknowledge.worldbank.org/handle/10986/25111>.

Project 1800 is named as homage to the 1,800 children under five who perish each day because they do not have access to basic WASH services.⁷

In this report, we develop this framework, using a series of design principles that put citizens at the centre and that build on the recommendations from expert consultations and a design workshop held at the Château de Bossey from 14-15 December 2017.

We do this in the context of the Senegal River Basin (SRB) in western Africa. The SRB provides a major, ecologically defined example, given the combination of WASH needs in local communities; the number and diversity of local, regional, national, and international development actors in the basin and the interest from governments, (social) entrepreneurs as well as private funders and investors (hereafter referred to as 'stakeholders').

In the following sections, we demonstrate:

- How we generate data on outcomes that make it possible to monetise externalities, both positive and negative ([Section 4](#)).
- How we create a financial model that makes these externalities tradable and provides incentives to stakeholders to coordinate their actions around outcomes ([Section 5](#)).
- How we create a legal and governance framework that places the community and social stakeholders in the middle, and organises and rewards all stakeholders ([Section 6](#)) and
- How we build a digital and financial infrastructure to make the operation of the framework cost-efficient ([Section 7](#)).

Building a sophisticated platform capable of serving the needs of a wide range of stakeholders has required listening to the needs of not only the SDC, but of a consortium of organisations implicated in the SRB. We know that such a system needs the support of legal, financial and technical mechanisms that will help each person engaged to clearly see "what's in it for them."

We call this system a **market network**,⁸ an open, modular, distributed framework designed for accessible participation and engagement from a range of dispersed actors, including those referred to as 'beneficiaries'.

This market network combines:

- the incentives and mechanisms for collaboration at the scale and stability required for attracting mainstream finance;
- a methodology for measuring and valuing the delta of improvement over baseline conditions in the WASH sector;
- a system for allowing the contributions of various players to be captured, valued and rewarded and

⁷ <https://www.unicefusa.org/press/releases/world-water-day-children-dying-because-unsafe-water-and-poor-sanitation/8221>, accessed 16 February 2018.

⁸ The term 'market network' was coined by James Currier to refer to next generation platforms that combine aspects of market places, social networks and workflow management; see: Techcrunch, 27 June 2015, available at <https://techcrunch.com/2015/06/27/from-social-to-market-networks/>. For more on how we developed the concept of market networks to the work of creating social outcomes, see Burgess et al. 2018. Billions to Trillions. San Francisco, Portland, Geneva. Available at <https://sphaera.world/billions-to-trillions/>.

- a governance that ensures that the interests of all participants are reflected appropriately to attain the social mission.

The market network is designed to be open, making it adaptable to the requirements of multiple stakeholders in multiple contexts as well as to future developments. We believe this will make the framework applicable to other SDGs.

As is inevitable when describing complex novel approaches, we introduce several new concepts and ideas along the way. We have endeavoured to define these when they first occur. Also included is a list of abbreviations and acronyms ([Appendix A](#)), a glossary that defines technical terms used throughout the report ([Appendix B](#)) as well as a list of tables, figures and boxes ([Appendix C](#)).

Note that *Project 1800* models the very behaviour this report recommends, that of a multi-stakeholder project, with differing contributions and differing expectations of a return to its members. As such, the international project team, in partnership with recognised experts in their field and on-the-ground actors in the SRB is the core of a broader consortium that will collaborate on the global infrastructure required to successfully address SDG 6.

We would like to explicitly refer to the systems thinking approach already in evidence at SDC, which has identified water as a key lever of national and global security. The *Blue Peace Initiative* outlines the commitment of Switzerland to a shared political vision that takes into account specific terms of data sharing, supply and demand management, measures for saving water, water treatment and distribution channels.⁹ This is framed in the context of the ‘cost of conflict’ and the idea that water and sanitation, when delivered successfully and impact is real, are a tool of diplomacy. It corresponds to the logic that informs our thinking about the value of externalities.

We are inspired by this work and thank SDC for the opportunity to do so. Also, this document would not have been possible without the generous *pro bono* contributions from Jacqueline Barendse, Tom Brunner, Renaud de Watteville, Badara Diom, Sjeff Ernes, Fredrik Galtung, Edward (Ed) Girardet, Michael Green, Guy Hutton, Clémence Langone, Olivier Magnin, Cantwell F. (Chuck) Muckenfuss III and Marc Owens. They have helped us keep the costs small, while achieving a major advance in conceptualising the legal, financial, analytical and technical mechanisms that will need to work in concert to achieve breakthrough WASH outcomes.

The authors (in alphabetical order, by last name):

Cameron Burgess, Violette Ruppanner, Astrid Scholz, Audrey Selian, Arthur Wood; with generous contributions from Linzi Fidelin, Guy Hutton and William C. (Bill) Kelly

Edited by Ed Girardet and Violette Ruppanner

Portland (OR) | Geneva | Lausanne | In the air | Brasília • 17 March 2018

⁹ Global Brief, 1/2014, Directorate Global Cooperation, Water for Peace. Link: https://www.eda.admin.ch/dam/deza/en/documents/publikationen/briefing-papers/global-brief-2014-01-wasser-frieden_EN.pdf.

1 THE CHALLENGE

In September 2015, the United Nations made 17 promises to the world, the Sustainable Development Goals (SDGs).¹⁰ Among them was the promise to provide access to clean water and safe sanitation that is affordable and managed sustainably to all people on this planet: SDG 6.

Table 1: Sustainable Development Goal Nr 6 - key targets and indicators¹¹

Target	Indicator
6.1 By 2030, achieve universal and equitable access to safe and affordable drinking water for all	6.1.1 Proportion of population using safely managed drinking water services
6.2 By 2030, achieve access to adequate and equitable sanitation and hygiene for all and end open defecation, paying special attention to the needs of women and girls and those in vulnerable situations	6.2.1 Proportion of population using safely managed sanitation services, including a hand-washing facility with soap and water
6.3 By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally	6.3.1 Proportion of wastewater safely treated 6.3.2 Proportion of bodies of water with good ambient water quality
6.4 By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity	6.4.1 Change in water-use efficiency over time 6.4.2 Level of water stress: freshwater withdrawal as a proportion of available freshwater resources
6.5 By 2030, implement integrated water resources management at all levels, including through transboundary cooperation as appropriate	6.5.1 Degree of integrated water resources management implementation (0-100) 6.5.2 Proportion of transboundary basin area with an operational arrangement for water cooperation
6.6 By 2020, protect and restore water-related ecosystems, including mountains, forests, wetlands, rivers, aquifers and lakes	6.6.1 Change in the extent of water-related ecosystems over time
6.A By 2030, expand international cooperation and capacity-building support to developing countries in water- and sanitation-related activities and programmes, including water harvesting, desalination, water efficiency, wastewater treatment, recycling and reuse technologies	6.A.1 Amount of water- and sanitation-related official development assistance that is part of a government-coordinated spending plan
6.B Support and strengthen the participation of local communities in improving water and sanitation management	6.B.1 Proportion of local administrative units with established and operational policies and procedures for participation of local communities in water and sanitation management

¹⁰ <https://sustainabledevelopment.un.org/about>.

¹¹ Source: <https://sustainabledevelopment.un.org/sdg6>.

However, the GLASS 2017 report notes that one of the greatest barriers to achieving this promise is a huge financing gap. Just to meet the targets of this SDG, capital financing would need to triple to US\$ 114 billion per annum (or US\$ 1.5+ trillion in total from 2018 onwards), to which operating and maintenance costs would have to be added.¹²

The first challenge of *Project 1800*: How to bridge the US\$1.5+ trillion SDG 6 funding gap?

The GLASS 2017 report also highlights that the WASH sector is highly fragmented.¹³ Numerous government entities, organisations, platforms, events and individuals are currently seeking to solve this complex and critical (or ‘wicked’) problem. These include:

- The water activities of UN agencies have been coordinated since 1977, when the Intersecretariat Group for Water Resources was formed, the predecessor of today’s UN Water. The latter coordinates over 30 UN organisations involved with water and sanitation programmes.¹⁴
- Sanitation and Water for All (SWA) is a global partnership platform bringing together 200 partners from donor and recipient country governments, private sector and civil society organisations, external support agencies, research and learning institutions plus other development actors. It organised its first High Level Meeting in 2010. Five such meetings have taken place since.¹⁵
- Every year since 1991, the Stockholm International Water Institute (SIWI) has organised the World Water Week, bringing together scientists, policy makers as well as private sector and civil society actors.¹⁶
- Every third year since 1997, the World Water Council (WWC) has organised the World Water Forum, the world’s largest water-related event, to do the same.¹⁷
- Networks such as the Sustainable Sanitation Alliance (SuSanA) and The Water Network connect tens of thousands of WASH practitioners and entrepreneurs from around the world in online forums and platforms.

The overall problem, however, is hardly resolved despite these and thousands of other world-wide platforms and events seeking “to work together to catalyse political leadership and action, improve accountability and use scarce resources more effectively...” Many aim “to ‘deliver as one’ in response to water related challenges”; “to coordinate, exchange and learn” and “to focus on new thinking and positive action toward water-related challenges”.

¹² Hutton G, Varughese M (2016). Costs of meeting the 2030 Sustainable Development Agenda targets on drinking water, sanitation and hygiene. World Bank, Water and Sanitation Program: Washington DC.

¹³ UN-Water global analysis and assessment of sanitation and drinking-water (GLAAS) 2017 report: financing universal water, sanitation and hygiene under the sustainable development goals. Geneva: World Health Organisation; 2017. Licence: CC BY-NC-SA 3.0 IGO, p. iv, p. 2, 4, 6, 45.

¹⁴ <http://www.unwater.org/about-unwater/>.

¹⁵ <http://sanitationandwaterforall.org/about/>, <http://sanitationandwaterforall.org/news/milestone-weve-reached-200-partners/>.

¹⁶ <http://www.worldwaterweek.org/about/#WorldWaterWeek>.

¹⁷ <http://www.worldwaterforum8.org/en/frequently-asked-questions>.

On the contrary, the world-wide problem only seems to grow bigger:

- Since 2012, water has been referred as one of the top five global risks in terms of impact in the annual Global Risks Report of World Economic Forum.¹⁸
- In 2016, researchers from the Netherlands challenged the assumption that large-scale water shortages are for future generations. They demonstrated that about two-thirds of Earth's population, that is 3.97 billion people, already experience severe water scarcity¹⁹ at some point during the year. About half, 1.78 billion, experience severe water scarcity for at least six months every year.²⁰
- In 2018, Cape Town might become the first in a series of major cities to run out of drinking water. According to the BBC, the others are São Paulo, Bangalore, Beijing, Cairo, Jakarta, Moscow, Istanbul, Mexico City, London, Tokyo and Miami.²¹

The second challenge of *Project 1800*: How to overcome fragmentation and achieve a much greater level of cohesion, collaboration, efficiency and scale?

In reality, both challenges are not limited to the WASH sector. They concern most, if not all of the development industry. Its organisations and people work in silos. Collaboration is not rewarded. Instead, novelty is valued over utility, competition over collaboration and financial return over positive impact (or the equally damaging opposite). Thus, many efforts are replicated and there is unnecessary, if not wasteful and destructive, competition. These common inefficiencies have been estimated at upwards of US\$100 billion.²²

Another major challenge of the development sector is that there are no royalty, annuity or other on-going revenue payments. Social innovators rarely benefit financially from the value they create. Every non-profit and social enterprise must absorb its own research and development (R&D) costs, with little or no hope of protecting its intellectual property. Nor do these actors receive system-level rewards for discovering cost-effective solutions for the people they serve, even if impact metrics validate their work. Despite recognising WASH as a systems issue, the dominant financing mechanisms result in a focus on innovation over collaboration and scale.

Today, under the auspices of a wide range of organisational and academic programming, numerous individual innovations are produced. But what works is not catalogued and analysed effectively. Nor are successful innovations deployed in a coordinated and aggregated fashion.

Hence, true collaboration, is rarely achieved; true scale even less so.

¹⁸ <http://reports.weforum.org/global-risks-2017/the-matrix-of-top-5-risks-from-2007-to-2017/>.

¹⁹ Defined as demand that is more than double the available supply.

²⁰ Mekonnen M. and Hoekstra A. 2016. Four billion people facing severe water scarcity. *Science Advances*, 12 Feb 2016: Vol. 2, no. 2, available at <http://advances.sciencemag.org/content/2/2/e1500323.full>.

²¹ <http://www.bbc.com/news/world-42982959>.

²² Bradley et al. 2003. The Nonprofit Sector's US\$100 Billion Opportunity. *Harvard Business Review*. May 2003. Available at <https://hbr.org/2003/05/the-nonprofit-sectors-100-billion-opportunity>.

Against this background, not only do existing financing mechanisms for development create a misalignment of incentives. They also lead to an insufficient proportion of available funding if we are to reach the SDGs by 2030:

- Official development assistance (around US\$150 billion per year) is coming under pressure from the financial liabilities attached to two potential population ‘tsunamis’: young people in the ‘developing’ world and the aging population in the ‘developed’ world.
- Philanthropic money is one of the most underused types of capital on the planet. Despite owning assets of over US\$1 trillion globally, philanthropic organisations deploy, after frictional costs, only an estimated 1-2% per annum of their available capital in ways that support their mission.
- While the impact investing market has grown to over US\$75 billion, it has institutional arrangements that create its own inefficiencies. Given the prevailing focus on venture capital, it puts bankers at the centre of transactions. The latter delegate the risks to the social sector and the affected communities. Such capital also thrives on asymmetries of information and access.²³
- In the corporate sector, senior management generally understands the strategic framework of the SDGs. But at the tactical level, where budgets are usually held, it is constrained by siloed views.

Among UN agencies and other development players, there is much hope that private capital will participate in filling the SDG financing gap. There is indeed an estimated US\$218 trillion of private capital available in global financial markets to bridge this funding gap.²⁴ However, because the social impact market is unstructured, unstable and illiquid, asset managers have no easy ways to participate in funding solutions to difficult problems, such as SDG 6 and others.

Figure 1: Achieving the SDGs requires old and new sources of financing.²⁵



²³ We elaborate on these trends in Burgess et al. 2018. Op. cit.

²⁴ Schmidt-Traub, G and J. Sachs. 2015. Financing Sustainable Development: Implementing the SDGs through Effective Investment Strategies and Partnerships. Working Paper. 8 April 2015. p. 22. Available at: <http://unsdsn.org/wp-content/uploads/2015/04/150408-SDSN-Financing-Sustainable-Development-Paper.pdf>.

²⁵ Photo source: <https://pixabay.com/en/money-money-tower-coins-euro-2180330/>

2 THE OPPORTUNITY

2.1 Why water, sanitation and hygiene?

Against such institutional and financial challenges in the development space, the sector of water, sanitation and hygiene sector (WASH) emerges as a leading candidate for piloting a new model to scale innovation and collaboration. And, more critically, to mobilise private finance in support of it:

1. After climate, WASH has the highest negative externalities, estimated conservatively at between US\$300bn and US\$600bn annually.²⁶
2. Unlike other international development sectors, the major players — WHO, UNICEF, World Bank, WSP — have reached a consensus about the cost of these externalities, providing the basis for a clear metrics framework.
3. Water and sanitation are crucial to public health.²⁷They also affect a wide range of people and issues, including children, women, education, health, environment and economic development.
4. If not addressed properly, WASH issues could lead to major political instability.

Figure 2: Every day, 1800 children die from diseases caused by poor WASH.²⁸



These characteristics become apparent when we consider a particular ecosystem, such as the Senegal River Basin. These can help us develop a viable framework for addressing them.

²⁶ Hutton Guy (2012). WHO/HSE/WSH/12.01. Op. cit.

²⁷ Brewer, Tim and Yolana Pringle. 2015. "Beyond Bazalgette: 150 years of Sanitation". The Lancet. Vol 386, No 9989, pp. 128-29. 11 July 2015.

²⁸ Photo source: iStock, Heidi Sheppard (ID 483590577), purchased by Strategos on behalf of the Swiss Bluetec Bridge in November 2011.

2.2 The Senegal River Basin

Based on SDC's guidance, we are using the Senegal River Basin (SRB) to illustrate how the proposed framework could be applied on the ground. As an ecologically-defined region, the SRB goes beyond national boundaries: it is shared by Guinea, Mali, Mauritania and Senegal. While the political, legal, economic, environmental and social situations of the four countries differ, all of them rank among the 20 economically-poorest countries in the world.

These four countries have a total population of 35 million inhabitants, of whom 12 million live in or around the river basin. Local governments in the SRB include some 13 sub-national regions, over 50 departments and nearly 400 communes. The region is experiencing persistent challenges with drought cycles and food shortages. It is also highly vulnerable to climate change.

The SRB occupies a total area of 289,000 km². It includes three main regions—the upper basin, valley and delta—with each region clearly characterized by distinct environmental conditions.

Figure 3: Map of the Senegal River Basin²⁹



The SRB is governed by an international treaty among the four countries. The *Organisation pour la Mise en Valeur du fleuve Sénégal* (OMVS - in English Senegal River Basin Development Authority) was established in 1972 “to implement an integrated and concerted management program of water resources and ecosystems for a sustainable development of the basin.”³⁰

The challenges faced by the people living in the SRB are both natural and man-made. They include:

²⁹ Source: http://www.un.org/waterforlifedecade/water_cooperation_2013/senegal_river.shtml.

³⁰ See <http://www.portail-omvs.org/en/presentation/objectives/objectives>, accessed 19 February 2018.

- variable rainfall, often provoking droughts and floods
- scarce water resources and competing uses
- an environment that is degrading (both deforestation and erosion)
- inadequate land tenure in the Valley
- water weeds and waterborne diseases in the Delta
- lack of public awareness and outreach

In addition to the OMVS as well as national and local governments, many private and public organisations are working in the SRB to improve the well-being of local populations in the basin and to make ecosystems more resilient. These include:³¹

- Swiss non-governmental organisations (NGOs) doing development work in the basin, such as the aid organisation of the *Swiss Protestant Churches (HEKS/EPER)* and the Swiss branch of *Médecins sans frontières (MSF Suisse)*
- UN agencies such as *UNICEF*
- Local NGOs such as *ENDA-EAU*
- Bilateral donor agencies such as *USAID*
- Private foreign or local corporate actors such as *Swiss Fresh Water* and Senegal's water company, *Sénégalaise des Eaux (SDE)*
- Philanthropic actors such as the *Bill and Melinda Gates Foundation*
- Programs of the World Bank and other multilateral institutions, such as *PGIRE II*
- Inter-governmental organisations such as the *Global Water Partnership (GWP)*, and
- WASH programs of international civil society bodies, such as *WaterAID* and *Community-Led Total Sanitation (CLTS)*.

To illustrate our cases, we will use the SRB, first in each of the elements and then for the whole system design. We do this with the limitation that during this phase, we did not interview any of these actors extensively, except for *Swiss Fresh Water* and its local partner. Neither did we do any fieldwork. As such, the SRB case intends to give an outline for how multiple stakeholder interests could interact in the proposed framework. It is not meant as a detailed recommendation for implementation. [Appendix D](#) provides more details on the Senegal River Basin.

³¹ This list is by no means exhaustive.

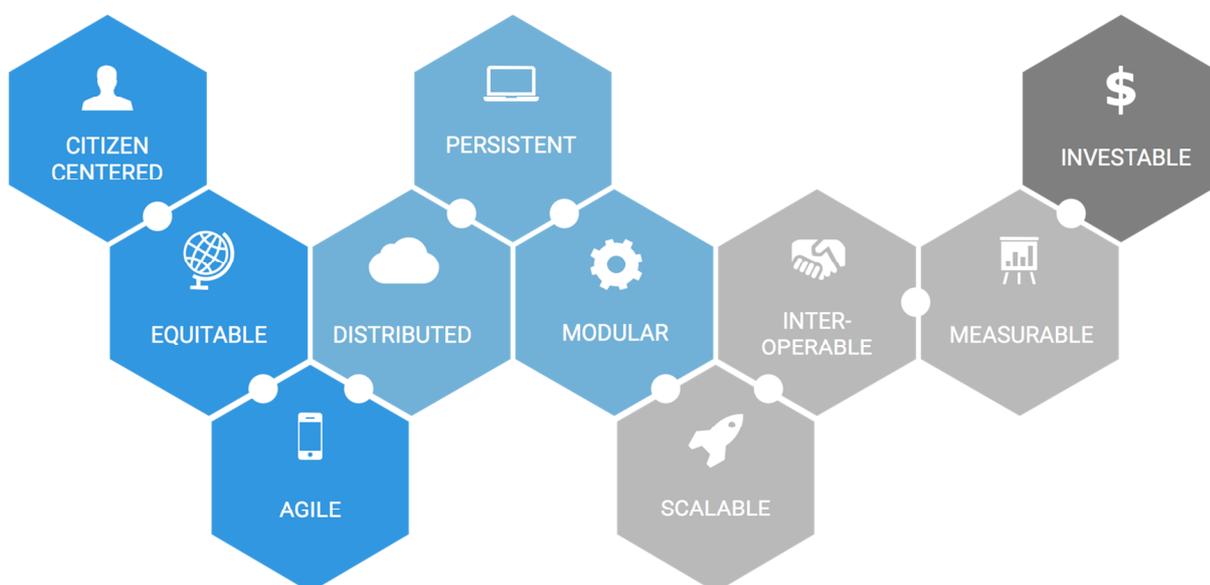
3 APPROACH

3.1 Guiding principles

Overall, there are 10 guiding (or ‘design’) principles that *Project 1800* is using because we consider them essential for this work. These principles, illustrated in Figure 4, are used to develop the framework to address the challenges mentioned in [Section 2](#) and to inform how it will evolve.

These principles, while philosophical in nature, have a direct bearing on the way in which an SDG 6 market network is built, deployed and governed. They inform the legal, financial and technical structures defined in the market network described below, and serve as standards against which we continually evaluate the performance of that network.

Figure 4: Ten design principles inform the work of Project 1800



These 10 design principles are explained in more detail in [Appendix E](#).

In addition to incorporating the philosophical principles mentioned above, the case of the SRB provides specific functional requirements that will have to be added to develop the framework. These functional requirements flow out of our discovery process, which is described in more detail in [Section 3](#), and which focus on the metrics, financial and legal mechanisms that we further elaborate on in [Sections 4, 5 and 6](#), and integrate in [Section 7](#).

3.2 Putting citizens at the centre for better WASH outcomes

This then puts the individual citizens at the centre of the system designed for achieving better WASH outcomes.³² Citizens live in communities. They interact with and are part of governments,

³² Here, we are not referring to the political dimension of citizenship. By citizen, here we mean all members living in a community. These can be native inhabitants, immigrants, refugees, outsiders, minorities,

markets and civil society. They bring their physical, intellectual and other forms of capital to bear on different functions and mechanisms that create outcomes within the SDG 6 market. Figure 5 shows how the market network is structured to achieve this end.

Figure 5: A citizen-centric model for creating an SDG 6 market network



This model contains seven primary elements. From the centre out, these are:

1. **Citizens:** every human individual interacting with the system
2. **Communities:** comprising (social, geographical and political) citizens
3. **Capital:** financial, material, intellectual, human and natural capital
4. **Sectors:** government, business, civil society
5. **Functions:** financing, convening, educating, catalysing, implementing, measuring, insuring, publishing, researching, commercialising, advocating, governing
6. **Mechanisms:** through which these functions operate
7. **Markets:** in this case, individual and collective markets represented by the SDGs

While SDG 6 is the focus of *Project 1800*, this model makes it possible to construct market networks for any of the 17 UN goals. We detail the specific configuration of the market network for SDG 6 through the lens of the SRB in [Section 7](#) below.

To apply these principles in the context of the SRB means working closely with people and communities on the ground throughout the entire lifecycle of designing, deploying, monitoring and financing interventions as well as receiving payment for outcomes. The information infrastructure developed to collect data and feedback as well as to track the relative contributions of multiple

stakeholders will be designed for local bandwidth and technology usage conditions so that local citizens can participate effectively.

3.3 Process

This scoping phase for *Project 1800* included many different activities to form gradually a picture of the whole. The work was organised into four major work streams, on which we expand in the next sections. The participants in each work stream are listed in Table 2.

Table 2: Work streams and their participants

Work stream	Participants
Metrics	Fredrik Galtung, Michael Green, Guy Hutton, Violette Ruppanner, Arthur Wood
Finance	Jacqueline Barendse, Sjef Ernes, Audrey Selian, Arthur Wood
Legal	Bill Kelly, Chuck Muckenfuss, Marc Owens, Tom Brunner, Arthur Wood
Communications	Edward (Ed) Giradet, Violette Ruppanner

Linzi Fidelin and Violette Ruppanner ensured project management.

The activities are summarized in [Appendix F](#), except for the immersion workshop, described in more detail below.

This two-day workshop, held from 14 to 15 December 2017 in the Château de Bossey near Bogey-Bossey (Switzerland), was an important moment of *Project 1800*. Nineteen experts participated: development practitioners and water entrepreneurs from Switzerland and Senegal as well as technical experts with backgrounds in economics, monitoring and evaluation, finance, law and digital technologies. SDC was represented directly through Pierre Kistler (day 1) and indirectly through Violette Ruppanner and Olivier Magnin (day 2). The UN was represented through Guy Hutton, its metrics expert. For the full list of the participants in the workshop, including short bios, please refer to [Appendix H](#).

The market network model was used to frame the second day of the immersion workshop. Participants were guided through a comprehensive design thinking exercise. They were invited to consider how best to apply these principles and the market network model, in the context of the Senegal River Basin.

Box 1: Design thinking³³

Design thinking is a process to solve problems creatively. It “utilizes elements from the designer's toolkit, like empathy and experimentation, to arrive at innovative solutions.” In this way, decisions are made based on what (future) customers really want, instead of relying on historical data or making risky bets based on instinct rather than evidence.

Each team had an expert from finance, legal, metrics and implementation. The exercise was designed to ensure that the three teams consider all aspects of a market network. The nature of the financial instruments, legal forms, governance and metrics required to ensure success were emphasised. The practical aspects of design were tested against one another whenever this was possible, based on the feedback from participants who work in Senegal. To conclude the exercise, the team presented different configurations of a design solution. The outputs collected inform the SDG 6 market network described in [Section 7](#).

³³ Source: <https://www.ideo.com/pages/design-thinking>

4 METRICS

To be able to select and prioritise investments, one must understand and be able to quantify the social, environmental and economic benefits of social and development interventions.

As a baseline, the WASH sector is blessed with a broad consensus on what constitutes appropriate WASH service levels in different rural and urban contexts. The cost of inaction and the socio-economic benefits of WASH interventions respectively also have been calculated at a relatively detailed level. These externalities are conservatively estimated at over US\$300 billion per year just considering health benefits and time savings.³⁴

To better illustrate this, we moved the financing prism beyond a purely WASH focus to capture the full social and economic impact of such an intervention. When a WASH intervention creates positive outcomes, such as access to safe water, it reduces negative externalities (for example, time lost due to sickness) or creates positive externalities (better school attendance). This means that the intervention can, in principle, be tied to the financial upside generated for governments, corporations and other parties, who have an interest in healthy and educated citizens.

The first step in monetising externalities, therefore, requires answering the question:

How do we measure outcomes and link them to known externalities?

To make the connection between specific WASH interventions, their outcomes and their value linked to reduced negative externalities, we foresee the following three steps:

4.1 A phased impact assessment

In *Project 1800*, with the focus on water, sanitation and hygiene (WASH) interventions, the impacts of any intervention need to be assessed at three successive stages:

1. Planning
2. Execution
3. Evaluation and dissemination

4.1.1 The planning stage: estimating the costs and benefits

It is necessary to estimate the value of different intervention **options** to assess:

1. where overall benefits exceed the intervention costs, and which one bring the greatest return and/or the greatest benefit-cost ratio;
2. the financing options, in terms of which citizens can pay, and which ones need financial support;
3. Which benefits can be monetised and measured over time for the next phase of measurement.

³⁴ Hutton Guy (2012). WHO/HSE/WSH/12.01. Op. cit.

In the citizen-centric model that we propose, the options are informed by community needs, especially those at the BoP. Economic and financial analyses are well established techniques to quantify and compare the major costs and benefits associated with development interventions.

Economic analysis is broader than financial analysis as it captures social, environmental and productive values that do not have direct financial consequences. This includes, for example, putting a value on premature deaths avoided, reduced pollution loads on water bodies and social values that might not have direct financial consequences. Hence, economic analysis is fundamental for social impact investors interested in the complete and long-term picture of how a WASH intervention benefits households and societies more broadly.

Previous studies have identified the main costs and benefits associated with water and sanitation interventions at global³⁵ and country³⁶ levels. The two most widely evaluated economic impacts are health and time saving benefits. Other benefits include reduced water pollution and their impact on fisheries and other environmental aspects,^{37,38} resource reuse³⁹ and social consequences.⁴⁰

4.1.2 The execution phase: monitoring the intervention

This phase includes more detailed monitoring of the observed outcomes and impacts at the sites where the intervention is taking place, again centring on communities where interventions are implemented. This entails:

1. A baseline survey to validate the values used in the planning phase 1 for specific populations with the interventions, based on a mixture of quantitative and qualitative indicators.
2. Continuous monitoring of the intervention sites as a basis to determine payments to implementers and financiers, and for ensuring that the intervention is implemented in a manner with maximum benefit. Monitoring continues until it is decided to end this phase. To ensure sustainability, this can last several years after the initial intervention.
3. Critically, this data is sourced directly from the community, establishing beneficiaries as citizens with power.

The monitoring by the community is supported by and reported on an application (app) that can be used on smartphones, tablets and computers. This allows adapting to different levels of literacy, degree of smartphone penetration and local languages.

³⁵ Hutton Guy (2012). WHO/HSE/WSH/12.01. Op. cit.

³⁶ Hutton G, Rodriguez U-P, Winara A, Nguyen VA, Kov P, Chuan L, Blackett I, Weitz A (2014). Economic efficiency of sanitation interventions in Southeast Asia. *Journal of Water, Sanitation and Hygiene in Development* 4(1): 23-36.

³⁷ Kerstens S, Hutton G, Firmansyah I, Leusbrock I, Zeeman G (2016). An integrated approach to evaluate benefits and costs of wastewater and solid waste management to improve the living environment: the Citarum river in West Java, Indonesia. *Journal of Environmental Protection* 7: 1439-1465.

³⁸ Hutton G, Rodriguez UE, Napitupulu L, Thang P, Kov P (2008). Economic impacts of sanitation in Southeast Asia. World Bank, Water and Sanitation Program. 144 pages.

³⁹ Wastewater: Economic Asset in an Urbanizing World (2015). Editors: Drechsel P, Qadir M, Wichelns D (Eds.). IWMI: Colombo.

⁴⁰ Hutton G, Odhiambo F, Osbert N, Kumar A, Patil S (2018). Financial and economic impacts of the Swachh Bharat Mission (Clean India Mission). UNICEF and Ministry of Drinking Water and Sanitation, India.

Training and supporting citizens to monitor WASH interventions using smartphones to record key indicators creates a near real-time feedback loop on the outcomes generated by such interventions. These indicators form the basis of community-led activities to address and fix any problems with the WASH intervention. They also can be aggregated to assess how projects in a particular region are performing. A list of potential indicators is provided in [Appendix I](#).

Note that this citizen-centred, near real-time feedback departs significantly from current monitoring and evaluation (M&E) practices prevalent in international development. The techniques outlined here already have been tested with nearly 10,000 community monitors across a dozen countries in Africa, Asia and the Middle East. Among them, they have monitored nearly 800 projects, including in WASH, with a combined value of over US\$1 billion, and achieving a 'fix rate' of 50%.⁴¹

The **fix rate** is an important innovation to measure impact and outcomes of development projects. It uses community-based feedback to get to quantitatively assess a problem that was fixed by an intervention. Importantly, fix rates can be observed to increase over time. Since the rate itself is agnostic about the underlying sector or type of intervention, it creates a 'likes-to-likes' measure for comparing development projects across sectors.⁴² This is a significant improvement on the piecemeal and anecdote-based evidence that is pervasive in development.

4.1.3 The evaluation and dissemination phase

This phase includes:

1. assessing the final costs and benefits after the intervention and
2. linking them with related indicators in the Social Progress Index (SPI) to indicate the overall (macroeconomic) development impacts the intervention has had.

The costs and benefits of the intervention can be measured using established economic techniques. In addition, the SPI is used to situate the impacts of the WASH outcomes in a broader context of human well-being.

The **Social Progress Index** is a holistic measurement tool. It complements traditional indicators such as economic growth and unemployment, as it measures the things people really care about: health, literacy, freedom and safety.⁴³ The index is **actionable**, meaning that every component of the index represents an area where stakeholders can take concrete steps based on what the data tells them. It only includes **social and environmental factors**. This makes it possible to compare social and economic performance side-by-side and to delve into the relationship between the two. It only measures **outcomes** to ensure that it captures the actual experiences of everyday people.

The SPI can be applied on any scale to create, for example, actionable subnational indexes. While the basic framework and definition of success do not change, stakeholders have the freedom to

⁴¹ Fredrik Galtung, communication with authors, 22 February 2018.

⁴² For more detail on the fix rate, please see <https://sunlightfoundation.com/2013/05/16/the-fix-rate-integrity-actions-new-transparency-and-accountability-impact-metric/> and references therein.

⁴³ Stern, Scott; Amy Wares and Tamer Epner. 2017. Social Progress Index Methodological Report. 40pp. Available at <http://www.socialprogressimperative.org/wp-content/uploads/2017/06/English-2017-Social-Progress-Index-Methodology-Report.pdf>.

define what social progress looks like in their community. To date, 24 Social Progress Indexes have been constructed, covering 2.4 billion people across 38 countries.

The SPI can thus be adapted to the WASH context as part of a subsequent phase of *Project 1800*. This will be important to ensure that the variables and summary statistics are aligned among the three phases to ensure consistency between the economic analysis, the community monitoring and the SPI.

A key moment of the project is the decision on which specific WASH interventions will be implemented as these will have implications for cost-benefit measurements and financing mechanisms.

Combining these three metric interventions creates a measurement process that is driven by community feedback. Not only can it be considered **holistic**, as it captures all the value of the impacts from a WASH intervention, but it also creates a measurement process that becomes comparative and competitive – from project to region to national – if one can identify the incremental change for each unit of money invested.

A key element of any subsequent phase will be to refine and scale these three elements of how we measure impact. The operational systems for incorporating this measurement approach into the overall system design also will need to be developed.

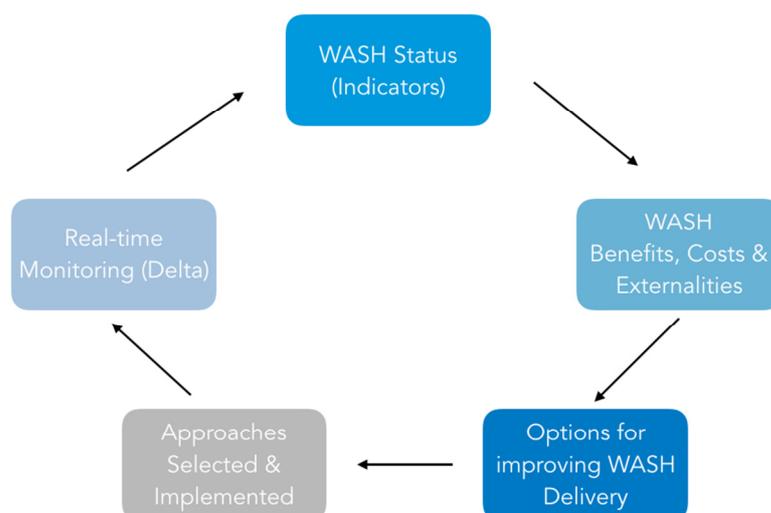
4.2 Specifying the Delta (Δ) of Improvement

Working with such broad objective data sets gives us a comparative and competitive framework in which to measure and assess all impact on externalities, in WASH and beyond. Using the above phased approach, the incremental change (the ‘Delta of Improvement’) resulting from a specific WASH intervention, or suite of such interventions, becomes visible and measurable.

It is this incremental change or **Delta of Improvement** that will trigger an outcome payment. This becomes the key ingredient for the innovative finance approach described in the next section.

Divided by the money needed to reduce a negative economic impact, the total “true” costs of negative externalities gives us a measure of the ‘social cost’ of capital for a given development issue. It also provides the amount of ‘contingent payments’ (i.e. promise to pay) that would be triggered by achieving those outcomes. In essence, the Delta of Improvement becomes a common, universal and comparative unit of impact valuation and accounting. This is a significant departure from the current sectorial approach to measuring impact.

Figure 6: Data-driven design of interventions and tracking of outcomes



This measurement process combines deep analysis, contextual understanding and innovative interactive approaches. Taken together, it creates an interactive analytical framework that enables new financing mechanisms.

4.3 Measuring impacts in the Senegal River Basin

In the Senegal River Basin (SRB), previous evaluations have shown that poor sanitation leads to significant negative economic impacts. These are valued at US\$ 313 million per year (2012) for Senegal only.⁴⁴ According to another source, it would cost Senegal US\$ 43 million per year in capital costs to achieve improved sanitation for all households.⁴⁵

Similar statistics are available for some of the other countries in the SRB and where not, they could be generated fairly easily. Note that UNICEF is currently conducting financing studies in several West African countries, including Senegal and Guinea. Their focus is to identify new sources of financing for WASH. This includes help to establish the Blue Fund in Senegal. This fund would pool resources from various sources, including an earmarked tax, pension funds and grants. Its main objective would be to fund water access for the poor. It is not expected to start until 2019.

First, the specific WASH interventions need to be selected by the client and stakeholders involved before the economic and financial numbers can be generated to quantify the overall costs and benefits of WASH. For example, is it WASH for schools, WASH for communities or only sanitation for communities?

Second, the most important costs and benefits that can be monetised need to be agreed for assessment. Aspects that cannot easily be monetised but are important to reflect, such as specific

⁴⁴ Hickling S, Hutton G (2014). Economics of inadequate sanitation in Africa. Chapter 4 in "Sanitation and hygiene in Africa: where do we stand. Analysis from the AfricaSan conference, Kigali, Rwanda". Edited by Cross P and Coombes Y. IWA Publishing, London, UK.

⁴⁵ Hutton G, Varughese M (2016).

social and environmental consequences of improved WASH, should be included in assessments whenever possible.

Third, an economic analysis needs to be conducted for the selected area, whether it is the entire basin, the Senegal part of the basin, a country (i.e. beyond one river basin) or an administrative area such as a province or district. This would be a desk study based on an understanding of the policy context and a review of the experiences of different stakeholders in implementing the selected interventions. Also, a consultation would be required on the optimal ways of implementing the selected WASH interventions under *Project 1800* to give realistic cost and benefit figures.

Fourth, the analysis would then be used to inform the decisions about the next phase of project implementation, such as which interventions, localities and stakeholders as well as which financing modalities and sources to work with.

5 FINANCE

Building on the ability to measure incremental contributions and link them to a desired outcome as outlined in the previous section, we can answer the second question central to creating a multi-stakeholder collaborative outcome model:

How do we make externalities tradable and provide incentives to stakeholders to coordinate their actions around desired outcomes?

At its core, *Project 1800* seeks to harness three specific forces to mobilise large pools of private capital to achieve SDG 6: innovation, economies of scale and collaboration. As diagnosed in [Section 1](#), the development industry is highly fragmented. Crucial mechanisms for cross-subsidising financial and social returns of interventions are missing.

To achieve outcomes at a scale that matters requires a set-up that rises above fragmentation and bilateral transactions between funders and implementers. Instead, it should enable multiple stakeholders to take different and differing economic, financial and social returns. By making risk and return fungible, we create a systems approach, where economic and social return cross-subsidise each other. Such cross-subsidisation is what lies at the heart of the multi-stakeholder outcome model.

5.1 Turning impact into a financial product that can be traded

Project 1800 proposes to build an infrastructure that is capable of mobilising and directing both private and public capital flows towards realising the goal of universal access to safe and affordable water and sanitation. The rest, in terms of who engages in financing, who is involved in 'packaging' and branding and who implements a specific set of interventions, is left to market dynamics. This not only allows articulating a universal measure 'cost of social capital', but will become the means by which to translate and replicate such capital across sectors and geographies. Note that if successful, this infrastructure could be replicated to serve other SDGs.

The premise of this work is two-fold:

1. Where there is an externality that can be translated into a current or future cash flow, there exists an opportunity to create a financial product to eliminate the negative or to bring about the positive externality.
2. The value and potential upside or profit from such a product needs to be aligned with the interests of the citizen and the communities concerned.

This is made possible thanks to the following types of innovation:

- **Technology:** the use of contingent smart contracts, tracked on a distributed ledger (see [Section 7](#)), as well as the use of smartphones and related technology to create real-time feedback loops on the performance of interventions ([Section 4](#)).
- **Legal:** a new legislation in the U.S. now allows one to ring-fence (i.e. to earmark money for a specific purpose) and to pay different stakeholders in different ways during the life cycle

of a financial product. In many other jurisdictions, including Switzerland, contract law can be used to achieve the same effect ([Section 6](#)).

- **Financial:** it is possible to adapt existing instruments to create a financial product that (a) captures not only financial, but also economic and social benefits and (b) complies with contemporary regulatory requirements, both in terms of ‘manufacturing’ and selling it ([Section 5](#))
- **Metrics:** Payments are triggered whenever measurable improvements have been achieved (the ‘Delta of Improvement’, [Section 4](#)).

Both payments and measures will be inscribed on the distributed ledger. We call this new product ‘social’ equity or, in the context of WASH, ‘blue’ equity.

5.2 Blue equity

The notion of ‘social’ or ‘**blue equity**’ is rooted in our understanding of value. Holding equity or participating otherwise in a structure requires one to engage in an exercise of converting or translating the value of an asset, whatever it may be, into a unit that can be owned and thus bought, sold, and otherwise traded. Traditionally, only the owners of and investors in the structure participate financially in its outcome.

In a social or blue equity structure, all stakeholders, including citizens and social actors – not only those who provide financial means – become shareholders and participate financially in the outcome. This effectively reconciles the social justice and financial meaning of the term ‘equity’.

A blue equity product is structured in a way that (a) it captures both the financial return and the monetised social return and (b) incentivises collaboration and scale on a timeline. In other words, the quicker the social impact (the Delta of Improvement) is achieved, the higher the internal rate of return (IRR). This temporal aspect of ‘urgency’ is a relatively underused tool in development finance. It also means that the greater the Delta of Improvement, the higher the IRR. Indeed, the more fragmented and inefficient a market, the higher is the potential for return, both social and economic.

In the present phase, we seek to create a ‘quasi equity’ product, whereby performance is tied rigorously to the achievement of social outcomes by multiple stakeholders, and is driven by the community. This makes a specific social problem a tradable market opportunity. From a distribution perspective, this provides replicable scale for banks on a clear platform as it gives them the opportunity to align the US\$1 trillion of global foundation funds with the missions of the latter. It also helps to build a standard, non-correlated new investment class for traditional investment portfolios, whose performance is defined by the achievement of the social outcome: the quicker the improvement, the higher the return.

As mentioned throughout this document, the social mission must be hard-wired and turned into a non-negotiable priority of engagement for all involved. This is done by designing a pricing framework and process that puts the interest of the community and social stakeholders at the centre and by making them actual part equity owners. This will ensure that they will benefit from the upside created by their participation and engagement.

Critically, this creates benefits for all stakeholders, including ‘for profit’ interests, as it:

- addresses a clear market failure or lack of market mechanism between who pays and who consumes social goods;
- aligns incentives to collaboration and scale;
- makes social R&D more replicable and reduces the unit cost of innovation;
- creates transparency for all stakeholders as to how a subsidy can be applied and
- creates a cost-effective architecture and process to assess other impact investment tools.

Table 3 summarises the issues addressed (the “what”), the proposed intervention (the “how”), and the resulting financial innovation in service of better WASH outcomes.

Table 3: Building blocks of social equity

Issue	Intervention	Result
Development is a systems issue with multiple funders and stakeholders	The use of a limited liability company (LLC) or partnership (LLP) structure (these are standard international legal structures that include a social element)	Creates clean cross-subsidisation between economic and social mission, allowing multiple players to take different economic and social returns either as funders or those who are funded
Align economic and social impact and incentives	Iteration of the Social Impact Bond (SIB)	Creates a frame where the quicker the social outcome achieved by collaborating or scaling, the higher the return
Place the social stakeholder at the centre of the process	The community-driven feedback loop provides real-time data on the performance of the intervention. It thus provides a market signal on the performance of the security, whose price will fluctuate with the impact of the intervention.	Addresses the fundamental disconnect in the development marketplace, where those that consume are different from those that pay
Create a frame for multiple contingent payers – other than just government	Legal structure allows multiple contingent payers	Expands traditional SIB from dependency on government contingent payments to corporate and philanthropic actors
Create a tradable equity	Securitize the contingent offers to pay. This is done by taking the future payment and giving it a financial value today. Hence, what is the markets or bankers view that those contingent payment will be triggered - another way of thinking about this would be the pricing of an option	This creates a quasi-equity that will trade as a function of the achievement of the social outcome. Creating potentially a liquid secondary market for social investment - priced directly from the community
Ensure different stakeholders can take different economic social return	Different classes of equity or warrants-holders based on the LLC / LLP frame (see Section 6) The same concept can be most clearly seen in blended value models where a DFI or foundation Takes a lower return that would be predicated	Triggered by the achievement of the social metric, this can create a multiplicity of economic and social returns; indeed this could also align stakeholders who do not want to change

	by market return. At a more sophisticated level, this is what a collateral debt obligation (CDO) does	
Create a framework that allows a compliant distribution mechanism	The structure is effectively standard equity applicable to a range of Investors and can be “wrapped” in standard ways	Phase 1 - We may wish to consider a private placement Phase 2 - Consider an exchange-traded fund (ETF) with a contingent return frame attached - this would provide: <ol style="list-style-type: none"> 1. A standard fund to manage the constituent stakeholders and the economic and financial returns 2. An attached contingent payment mechanism that monetises the social impact achieved An ETF logically trades as a function of both elements. It could be structured within a range of tax wrappers for global distribution.
OPTIONAL UPGRADES		
1. Product development	The creation of a cash flow for social outcome married to an LLC framework offers the opportunity for a range of more sophisticated and/or standardised capital market tools to be eventually developed	Example: Structures such as Convertibles or Liquid Yield Notes, which would allow foundations to take different returns dependent on future unknown outcomes could be created - i.e. if it is successful, it converts to a normal investment for the foundation as a core investment. Or if it is socially effective but marginal in financial terms, it can be converted to a grant. This could change the marginal cost of capital of the whole structure, yet achieving the social outcome
2. Aligning contingent investments	Create a WASH-focused donor advised fund (DAF) to manage the contingent payment framework	This would create a DAF focused on for-profit WASH investment, yet taking on a contingent liability. Ensures outcomes are tax efficient and aligned. Opens up margin for a private bank and tax efficiency and engagement for clients

The proposed structure allows for the compliant delivery into asset management structures and ensures that the product is marketed in the context of a clear framework. The benefits of this product for those who are engaged with objectives of financial return lie in both:

1. The **measurable impact** created as a function of the financing (i.e. where causality is controlled for); and
2. The fact that **emerging market risk** of specific social players can be **mitigated** by first stop loss and other grant-based mechanisms, which, if leveraged correctly, can contribute to

market viability over the long-term. In other words, government and philanthropy play a key role in 'priming the pump' in new emerging markets.⁴⁶

5.3 A standard manufacturing platform for any impact investment process

What makes blue equity interesting is that we are crossing the threshold from the qualitative to the quantitative in a systematic way. Also, it creates a range of non-correlated investment classes. In essence, what we hear about the 'trade-off' of financial return for social impact in the impact investment universe becomes obviated. Every on-the-ground intervention that contributes to a positive outcome, which is also synonymous with reducing a negative externality, has its price or value when viewed from a systemic vantage point.

Furthermore, blue equity is a product that can be applied to any issue. It is fungible in the sense that the various types of liquidity available across a wide spectrum of aligned funders creates the means by which 'units' of input (whether they are one-off, programmatic, for-profit, not-for-profit, entrepreneurial or led by municipality or others) are made tradable. Such a financial instrument can be set up and transacted upon like any other 'standard' equity, but whose performance reflects the achievement of social outcomes.

In fact, multiple-impact investment tools (e.g. Artha Network, Social Equity Fund) could become users of the infrastructure. Indeed, it provides a standard process to research, assess and implement a financial tool (for an example, see [Appendix K – Aqua for All](#)).

Given the standardisation, this may ultimately provide better portfolio risk management and lower levels of risk to stakeholders such as SDC. It also could be used to objectively compare the efficiency of capital deployed to a social issue and as a framework for identifying how government subsidies can be applied to draw in commercial capital through blended value models.

Finally, using community feedback mechanisms to price a security and linking it to the needs of the contingent payers who provide cash as a function of the positive outcomes they desire creates a three-way check against corruption by the:

1. community (who has a greater incentive to have good WASH services)
2. contingent payer (unless it is working, one does not pay) and
3. financial regulator (as a function of being a standard equity with relevant reporting requirements and transparency)

⁴⁶ As per the seminal piece published by Omidyar Network and the Stanford Social Innovation Review in 2012: <https://www.omidyar.com/insights/priming-pump-case-sector-based-approach-impact-investing>.

6 GOVERNANCE

Now that we have laid out a financial mechanism for incentivising multiple stakeholders to collaborate to create WASH outcomes, the next question is:

What is the optimal legal and governance framework for organising all stakeholders and raising investing capital?

In answering this question, we use several legal innovations that allow us to anchor the social mission in corporate entities at the global, regional / sectorial, and local scales required to reach desired outcomes in WASH. This makes it possible to bring together the wider range of stakeholders and to aggregate capital and process. And finally, this allows one to address potential conflicts of interest.

6.1 Stakeholders

Table 4 articulates the specific and differentiated roles played by different types of organisations.

Table 4: Different types and roles of stakeholders

	Type	Description	Role
Aggregation of process Broker between partners and money, matching the required capability to market need	Umbrella organisation ⁴⁷	A public benefit structure or a foundation that provides the integrated digital infrastructure and financial tools for all stakeholders	Assures mission-lock of sponsored funds; integrity assurance; guarding against corruption and conflicts of interest; regulatory compliance and audit; data standards, harmonisation & analytics; R&D and investment into digital infrastructure; administration of distributed ledger
	Advisory	Umbrella organisation stakeholders & shareholders advisory committee	Provides guidance and advice around social mission
	Metrics facilitators	Entities such as Social Progress Imperative, Integrity Action and UNICEF that provide related services	Standards, monitoring and evaluation
	Service providers	Platform service businesses (e.g. Sphaera or Induct)	Data mobilisation and user experience (UX) design
		Intermediaries	Matchmaking of investors and projects
Consultants	Technical, legal, business services		

⁴⁷ See <https://definitions.uslegal.com/u/umbrella-organization/>, accessed 20 February 2018.

			for success of interventions
Aggregation of partners (clients) Partners are the organisations that are convened to act on an issue	Implementation	For-profit social enterprises	Recipients of capital investment, implementation, shareholders or recipients of success payments
		Not-for-profit implementers (e.g. NGOs)	Recipients of capital investment, implementation, shareholders or recipients of success payments
		Multi-stakeholder initiatives or networked or collective impact organisations (e.g. Swiss Water Partnership, WSSCC, IFRC)	Recipients of capital investments, implementation, shareholder or recipients of success payments
		Local governments	Recipients of capital investment or parallel activities, implementation, shareholders or recipients of success payments
		Local communities	Recipients of capital investment or parallel activities, implementation, shareholders or recipients of success payments
		Citizens	Advice, feedback, monitoring, possible financial participation in success payments
Aggregation of capital	Sources of finance	Regional / sectorial sponsored special purpose vehicle (SPV) - a sponsored fund organised by an important institution(s) in the field and imbued with a mission lock; form an entity similar to a U.S. limited liability company (LLC), but likely formed in Europe, including fund manager ('managing member')	Raising and investing capital; monitoring investments; paying returns to investors and financial incentives to providers; the intermediary and coordinator of projects, funds, metrics and payments for a given use case
		Investors with differing and different returns, (in jargon: class A, B, etc.), or blended value structures	Investing capital in the sponsored fund on various terms, including subordinated terms for some investors
		Contingent payers (philanthropy, corporates, governments - local, regional, national)	Making success payments to the SPV
		Other asset classes / solutions (for example Artha Network)	Provide further financial solutions for clients
		Grant makers	Giving away risk capital for capacity building or to price out risk

6.2 Structure

We envisage a governance structure that has multiple levels, starting with an umbrella organisation that would steward the proposed financial, legal and technical infrastructure. Regional and/or sectorial initiatives would be organised broadly around the SDGs in special purpose vehicles (SPVs) that use the global infrastructure.

6.3 The umbrella organisation

The umbrella organisation needs to be mutualistic in nature, whether in the form of an actual mutual or of a foundation chartered in Switzerland or another European jurisdiction. Given its pivotal role, the social mission needs to be at the core of this entity.

This umbrella organisation establishes the narrative for regional / sectorial funds, which in turn each demonstrate the convening power of all implementing entities on a given topic and in a given region.

Only under a powerful “banner” with sponsored funds generating high levels of capital will players cluster and eventually hold one another accountable. For this to work, however, the system design needs to ensure that success payments rely on every player doing its part and receiving its weighted share of pay-out based on individual or group contributions.

6.3.1 Sectorial market networks

Using the infrastructure outlined in Sections [4](#), [5](#), [6](#) and [7](#), it becomes possible to convene, coordinate and support multi-stakeholder networks that organise around one or more SDGs. These market networks are, in equal parts, a marketplace, a social network and a workflow management tool around a shared purpose, such as advancing solutions for SDG 6. Such market networks do not necessarily form discrete entities themselves, but take the form of distributed efforts operating on a shared, digital “backbone”. One or more members of a market network could emerge as the sponsors of a special purpose vehicle (SPV) that implements a suite of interventions to advance measurable outcomes towards achieving a specific SDG goal.

6.3.2 Sponsored funds

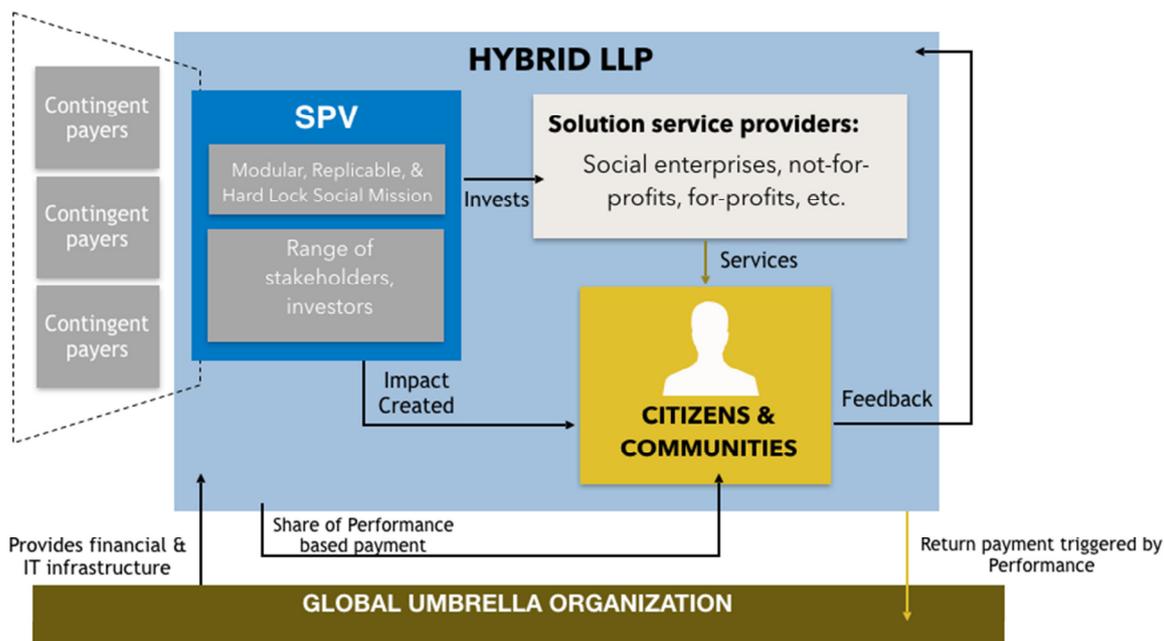
Figure 7 shows the broad mechanics of a sample-sponsored fund for the Senegal River Basin that could equally apply to another sector or geography. It illustrates how the fund would raise and deploy capital towards an outcome with success payments to be distributed at initially-agreed proportions among investors and other stakeholders.

The fund would carry out the social impact mission under the guidelines set by the umbrella organisation described above. The latter would support the fund with a set of technical processes to measure the value of contributions. It would also manage the commitments made to investors and other stakeholders. As previously noted, certain common traits such as the social mission are to be locked in. However, the details of each sponsored fund can be tailored to the needs of investors and the community being served.

If the scale justifies the expense of a public offering, some classes of the securities could be issued as such from the outset. This would tap into a huge market of investors interested in financial and social returns.

In other cases, the securities could initially be sold to investors in a private placement and, once the volume justifies the expense, the securities could then be traded publicly through an exchange-traded fund or other investment vehicle. However, further work needs to be done to create an investment vehicle that could be applied to a range of national investment markets.

Figure 7: Sample structure for a regional or sectorial sponsored fund



6.4 Governance

The market network is designed in such a manner that those individuals, enterprises, organisations, networks and funders who contribute value to a solution participate proportionally in the rewards, both reputational and financial.

The legal documents will hardwire the social mission in an unequivocal way so that it becomes possible to deliver different or indeed differing economic and financial returns to a range of funders and stakeholders whose shared goal is the achievement of SDG 6. The legal and governance structure proposed is inspired by innovative partnerships that already have achieved some success, such as GAVI, the Vaccine Alliance; the Global Alliance for Humanitarian Innovation (GAHI) and the Global Humanitarian Lab (GHL). These organisations exist to formalise and organise all of the entities in their field. They may serve as models to form a WASH equivalent.

The legal structure is held together by an interlocked ('nested') set of contracts that govern how (a) investors contribute to the special purpose vehicles, (b) how contributors to beneficial outcomes are rewarded, and (c) how contingent payments are released. While this may seem daunting, it is made possible by the use of **'smart contracts'**. These are contracts that self-execute, because the terms of the agreement between parties are directly written into lines of code. The code, and the agreements contained therein, are stored on a decentralised and distributed, digital ledger. How this actually works is expanded on in the next section.

7 SYSTEM DESIGN

We have been describing a complete framework to facilitate collaboration on WASH and other social outcomes at a scale that matters. We now turn to the question of how to operationalize such a framework. Or, in other words, to answer the question of how to stick it all together:

How to build a digital infrastructure that enables stakeholders to come and work together along the unified metrics, financial and legal mechanisms described and that is universally accessible, equitable, scalable, replicable, and cost-effective?

Recent advances in digital technologies make it possible to answer this question.

The digital infrastructure underpinning this market network must adhere to the **principles** articulated in [Section 3](#). It requires the following:

- A methodology to quantify externalities and to measure and value incremental contributions to desired outcomes, i.e. the Delta of Improvement
- Creation of the mechanism of blue equity, including interoperability with other funding and investment tools, so that existing financial and programme innovations in WASH may be better supported and leveraged
- Efficient implementation and coordination of a nested local-to-global metrics, legal, and governance structure
- A technology roadmap that enables connecting data through distributed ledgers to (a) track individual collaborative transactions, (b) ensure innovations by participants may be franchised or licensed by others, and (c) track and reward the contribution to outcomes from multiple stakeholders.

Box 2: Distributed ledger⁴⁸

A **distributed ledger** is a consensus of replicated, shared and synchronized digital data geographically spread across multiple sites, countries or institutions. There is no central administrator or data storage. The replication of data across the system is achieved by an algorithm. Blockchain is a prominent form of design for distributed ledgers. For example, Ethereum is a Swiss-based platform and operating system using blockchain. The underlying algorithms for encrypting and validating transactions on the blockchain are scale-constrained, which is why the project team is working with an alternative distributed ledger design based on ecological design principles. The latter is called [Holochain](#)

Note that most, if not all, components of this market network already have been developed. Also, efforts to integrate specific platforms, software and databases in support of the network are already underway, starting with the Artha Network and Sphaera. Therefore, many of the costs and risks

⁴⁸ Sources: Distributed Ledger Technology: beyond block chain (PDF) (Report). UK Government, Office for Science. January 2016; Brock, Arthur et al. December 2017. Holo Green Paper. 38 pp. Available at: <https://holo.host/greenpaper>.

associated with undertaking a massive engineering effort from the beginning are diminished. This enables the focus to be on building the “connective tissue” between existing platforms and products.

In the following sections, the design principles and functional requirements of a market network are defined in greater detail, before grounding it in the Senegal River Basin (SRB).

7.1 Design rationale

Our design is fundamentally modular in approach, using an open, distributed architecture (both technically and operationally). This allows adding, augmenting or removing functional components and contributing actors according to evolving requirements, as guided by feedback and metrics flowing throughout the system. This essential aspect of the market network architecture supports both healthy competition and systemic innovation among those who share the objective of impact through implementation.

Box 3: Design rationale⁴⁹

A design rationale [...] seeks to provide argumentation-based structure to the political, collaborative process of addressing complex problems. [...] A design rationale is the explicit listing of decisions made during a design process, and the reasons why those decisions were made. Its primary goal is to support designers by providing a means to record and communicate the argumentation and reasoning behind the design process. It normally includes the reasons behind a design decision, the justification for it, the other alternatives considered, the trade-offs evaluated and the argumentation that led to the decision.

The market network is purposefully designed to mitigate the failures of other market-based approaches to wicked problems, including nepotism, corruption, unearned privilege and vendor lock-in. Should a partner or process fail to deliver, or no longer be optimal or necessary as the situation evolves, it will be removed or replaced with another solution or partner that better serves the needs of the market as a whole.

Because it is modular, different financing tools can be implemented in line with the requirements of the market. The same applies to metrics as variable tools and techniques will be used to track and measure differing metrics, depending upon what is required or possible.

Distributed storage achieves other significant benefits. Not only does it minimise the costs, plus mitigate the risks associated with centralised data storage, it also achieves parity amongst data providers. This ensures that no matter their type, size or location, *all* market network participants, all the way to the centre (the citizen), are appropriately acknowledged and compensated for the value they bring to the market network. This data has high intrinsic value.⁵⁰ Over time, it will provide also commercial value as it increases in volume and thus will enable predictive analytics.

Treating all participants in the market network equitably is core to our design rationale. In the past decades, other economic sectors have become much more customer-centric. Today, market

⁴⁹ https://en.wikipedia.org/wiki/Design_rationale#.

⁵⁰ See article on value of data as leveraged by corporates: <https://www.fastcompany.com/40516659/can-big-tech-companies-find-a-way-to-reward-users-for-their-data>.

demand is driving not only the design of products, but also the way they are manufactured, packaged, shipped and received. However, efforts to do the same in the development sector have not yet yielded significant results. It can be argued that for the most part, it is not functioning as a market whose products and services are driven by the demands of those at the very end of the supply chain.

Thus, before changing the competitive dynamics between small organisations in a 'field' environment that is resource-constrained, we must first establish the processes through which we will understand **whose work is better received by the citizens being served.**

This means that we must pay due attention to the correlations and inter-dependencies between various types of interventions, which may, in equal or unequal parts, reinforce and/or undermine the work of others. The current system is characterized by bilateralism (i.e. an organisation responds to a public tender or request for proposals, gets selected, wins the financing and then implements).

A sophisticated governance framework comprising a wide range of special purpose vehicles will lead to a more ideal outcome in the form of nested smart contracts that sit on a distributed ledger, as outlined in Section 6.3.

Tracking all forms of contributions of capital and assessing them in aggregation can be systematised and thus become the key to valuing (and validating) contributions. An essential component is the engagement of '**contingent payers**' (i.e. organisations and individuals that make a promise to pay if specific outcomes are achieved). These provide the financial security to a consortium of partners who are dedicated to realising a collective goal in a setting that is accessible and transparent.

A basic blueprint for this has been mapped out with the founder team at [Holochain](#).⁵¹ To develop more detailed specifications, the business case, which could be the SRB, must be outlined (in a Phase 2 of this work).

7.2 Functional requirements

Many different technologies are driving the way other sectors are consolidated, redefined and reinvented. Some of these can be applied to the vision and concept of *Project 1800*:

Digital identity

To track value and compensate the various contributions to the market network, it is essential that individuals, organisations and assets be identified with a unique and long-lasting identity.

Distributed ledgering

Distributed ledgers constitute the key technological innovation. Currently, there is much buzz, misunderstanding and speculation on this topic. *Project 1800* will only use the following two elements of this technology:

1. The ability to execute closed transactions and to track (pay and motivate) stakeholders, just as a customer relation management (CRM) system does, such as inside a bank.

⁵¹ Holochain is an open source project to build a distributed generalised computing platform.

2. The application of an extended distributed ledger, which allows identifying and tracking granular value through a complex system, and rewarding it, also for cross-border contributions.

Open architecture

By building this framework in an open manner (not open source), the market network becomes configurable, transparently enabling other processes, entrepreneurial capability and financing tools to be integrated. This ensures that the system can be easily adapted and updated.

Customisation

Partners must be able to brand a configuration of tools, processes or competencies as their own. From a risk management perspective, this means being able to control one's own compliance and procurement as a function of one's own brand.

Data visualisation

Complex data sets cannot be parsed semantically, i.e., their meaning eludes the normal, natural language-based processing that our brains do. Participants must be able to consume relevant data from the market network in a way that best supports effective decision-making, meaning data needs to be visualized so that its meaning is accessible.

Analytics

As the volume and quality of data flowing through the market network increases, so too does its value. Being able to run robust analyses of this data is a critical first step to maximise its benefit to all participants.

Progressive enhancement

Starting with simple features first that can be accessed in low-bandwidth setting, and by developing in a 'mobile first' manner, the market network brings the ability to connect and generate feedback at a granular level and at extreme low cost, such that citizens and communities are prioritised as key participants.

Short Message Service (SMS) integration

Given the spread of mobile telecommunications in the global South, the architecture must support the sending and receiving of short messages as the baseline for market network interaction.

Reputation metrics

While not a functional requirement at launch, the market network can and should begin to recognise the value of the contributions made by participating entities. It should enhance their reputation in visible and beneficial ways to grow social capital.

Compliance

The framework must be constructed, managed and hosted in such a way that it complies fully with the various jurisdictions in which its participants will be active.

7.3 Methodology

Table 5 defines the methodology, including stages and primary activities, associated with implementing a market network in the SRB or elsewhere. This forms the basis for the planning and implementation in Phase II (see below).

Table 5: Methodology to implement a market network

1. SETUP		
1A. Research	1B. Metrics	1C. Funding
Conduct desk and field research to identify problems, solutions, actors and context	Determine metrics requirements and methodologies Harmonise stakeholder expectations and establish baselines	Identify funding needs and funders aligned with philosophical and practical requirements From metrics, identify the possible contingent payers - government, philanthropic and corporate
1D. Governance		
<p>Define the appropriate legal and governance structures to address the project requirements Identify players to aggregate (partners, process and capital) From the perspective of <i>Project 1800</i>: infrastructure to facilitate aggregating processes and tools to assist in aggregation of capital</p> <ol style="list-style-type: none"> 1. By the holding structure - the umbrella entity 2. By the finance frame <ol style="list-style-type: none"> a. Tactical enabler b. Strategic outcome model 		
2. IMPLEMENTATION		
2A. Catalysing	2B. Commercialising and 2C. Implementing	
Design a challenge mechanism to solicit ideas for outcome based interventions And/or identify key players to act aggregators of stakeholders - map capability against value chain	TBD - The exact case needs to be agreed with SDC and other stakeholders - we have used SRB as an outline. In Phase 2, this can and should be focused by issue, geography or indeed business line.	
2D. Insuring / blended value models		
Consider risk mitigation tools to systematically reduce or price out risk so as to attract more capital		
3. REPLICATION		
3A. Convening	3B. Publishing	3C. Advocating
Use in-person, community sponsored convening to seed digital community	Publish both narrative content and formal reports to inspire and inform future applications of the market network	Develop solutions to predictable regulatory and legislative challenges

4. EDUCATION

Design and launch culturally appropriate outreach, education and engagement campaigns to align all citizens across all sectors participating in the market network.

7.4 Illustrative use case: Swiss Fresh Water / Access to Water Foundation

Swiss Fresh Water (SFW), the very first portfolio company of the SDC-financed Swiss Bluetec Bridge, has been operating successfully in the Sine Saloum Delta since 2012. Its business model today is as follows:

- SFW develops, manufactures and sells machines and support services through an online platform (including technical training).
- Access to Water Foundation (A2W) manages water supply and job creation projects (including training, etc.). For example, A2W manages the project with the OPEC Fund for International Development (OFID).

Since 2017, A2W manages the activities in Senegal through a local entity called SENOP. A2W, through SENOP, plans to install additional machines at a high rhythm over the coming years. However, the most significant constraint to scale of A2W is the capital costs (CAPEX) of the machine. The estimated ratio is 7 to 2.7 for variable daily costs. Thus, driving economies of scale would have a considerable impact on the business model of A2W and its overall social impact.

If it is possible to calculate the social impact (or total externalities) that A2W and its local partners are making today as well as to estimate the growth potential and the related social impact over a number of years, the case could then be made to contingent payers to cover the capital costs of A2W. Indeed, if the company has only to concern itself with variable costs (the latter would furthermore be declining as economies of scale are driven in), it would free up A2W for considerable growth much quicker and accelerate the move to higher cost-efficiency.

SFW is currently identifying simple indicators that it then wants to use to inform a market study in Senegal. This study would be realised with staff from its local operation SENOP and from A2W, the staff going from door-to-door around selected installed water kiosks to collect data. It is also negotiating with several potential investors, including Aqua for All (A4A) to help fund its growth. It plans to set up an African LLC for this purpose.

Instead, SFW could join *Project 1800* and use the tool and methods already developed by Integrity Action to collect near real-time data and community feedback needed to convince investors and contingent payers. This tool would price the social equity just like Reuters prices a stock, based on real-time information from the markets. Initially, a secondary market for financial actors would be created. Unlike today, where investors have to lock in their money for several years - which, incidentally, excludes a big proportion of potentially available capital - adding contingent payers (from across a wide spectrum of donors) to the equation reduces the investors' risk.

The LLC could be invested by SFW and other actors (e.g. A4A) who believe they could work together to reach the desired social outcome more quickly. Each of these actors would take a differing and different return. (For example, a foundation that in a classic model would have provided a grant would at best get its money back, at worst lose it; an impact fund could provide a

loan, a local community could provide in-kind contributions and receive a cut of future profits, the relevant ministry could help with political support, advice and get goodwill in return,...). If the outcome or results are achieved faster, the value of the social equity will increase.

Contingent payers could include agencies like SDC, OPEC Fund for International Development (OFID), Coca Cola, a tourism association or business, a philanthropist or the central government. If there are challenges or issues on the ground (e.g. an Ebola crisis), it would be expected that the value of the social equity would decrease or become volatile, exactly as happens in public financial markets. The financial engineering required to set this up is called securitisation.⁵²

Certain indisputable data and indicators are measured already today, such as the:

- number of machines installed and their daily production (in litres)
- production trends in water kiosks installed in small-, medium- and large-sized villages
- number of times a machine is down and the number of maintenance and/or repair interventions.

Other outcomes are more difficult to measure, but proxy markers could be used, such as the number of new TVs in villages or decrease of petty thefts in shops (as expression of an increase in the quality of life). Furthermore, the current 'looking glass' is water. Many other issues and actors could be added, notably schools, environment; women, children. This would increase the range of potentially-interested funders.

Finally, if new players use the technical and social innovations of SFW / A2W to replicate elsewhere, the distributed ledger technology used in *Project 1800* would be able to recognise the contribution of SFW, A2W and SENOP, track its use and pay out it in due course.

7.5 Risk assessment

An overview of the range and types of risk associated with *Project 1800* is presented below. Note that many operational risks will be mitigated once a more detailed scoping of the technology architecture has been done.

Generally speaking, the overall level of risk associated with the requested investment is manageable. On the one hand, the presented concept is quite new. On the other, many sub-components of the work, be it legal, metrics, finance or technology, already have been tested and are functioning. What is new is the context and 'packaging' in which they are brought together

Furthermore, using technology to rationalise business models has been done successfully in many sectors of the economy. Thanks to cloud, mobile and distributed ledger technology, those same methodologies can now be applied to development. In this sense, the model is an iteration rather than something totally new. Thus, proceeding step by step should support mitigation to a reasonable extent. An incremental approach across multiple fronts will ensure conservatism in cost and project management bandwidth.

We also recognise the **process risk** and the supporting infrastructure we will need to support *Project 1800*, in particular to reconcile the complexity of the investment with the legal and

⁵² For an explanation of this term, see <https://www.imf.org/external/pubs/ft/fandd/2008/09/pdf/basics.pdf>.

technology interface. We have spent therefore a considerable effort on aligning a two-tier legal team. In other words, we have a *pro bono* team of legal experts who can filter what comes from a global *pro bono* lawyer (i.e. experts will be talking to experts). At the metrics level, we have spoken to Stanford University about performing a role as overseers of the process we have designed with UNICEF, Integrity Action and The Social Progress Imperative. To measure the exact risk related to an outcome model for the SRB, the corresponding risk frame will be critical to measure the exact risk.

Risk may be assessed on several levels in this project. This includes high level concept risks as well as more standard risks associated with financing agents on the ground (i.e. the range of social for-profit and not-for-profit entities charged with execution and service to community). These are categorised below with each risk tagged as “Low”, “Moderate”, or “High”:

Demand risk [Moderate]: There is a risk that the collaborative spirit of *Project 1800* may not be well received by large peer constituents in the development finance arena. The opportunity to collaborate must be presented in a way so that other players are able to participate and co-lead in areas where they perceive and can justify their comparative and competitive advantage of ‘knowledge or expertise’, whether theoretical or practical. A key component of this risk lies in our understanding of the incentives and ‘rewards’ for success, as framed by other major foundations and institutions engaged in alleviating water and WASH-related challenges on the ground. This risk will need to be assessed over time as a function of the outreach, education / awareness and buy-in achieved while further developing this work.

Market risk [Low to moderate]: Although financial markets forecasts from experts currently seem to indicate that public company earnings and economic growth data do not portend crisis in the immediate future, it is possible that *Project 1800* and its funders may be adversely impacted by a downturn or future crisis in the financial markets. This risk may be limited by including a diverse range of peer funders in the foundation world. Fortunately, good portions of the development ecosystem in which *Project 1800* will operate are historically and generally uncorrelated to the performance of the financial markets in developed countries.

Operational risk [Low to high]: There are a number of operational topics and sub-topics associated with the core components of the *Project 1800* concept that must be enumerated below.

- **Metrics [High]:** Diversification of sources and methods by which metric feedback loops are aggregated and validated will be a key mitigation of risk, as this is certainly still an experimental area in the field of development, albeit supported by excellent technology solutions. Although using the Integrity Action method associated with Galtung’s group is a noteworthy aspect of our model today, other approaches including Acumen’s Lean Data approach or Ushahidi’s work using SMS servers to glean data from communities on the ground, particularly in highly resource-constrained or urgent humanitarian crisis contexts will be important to consider.
- **Financial [Low to moderate]:** There are two aspects of risk associated with this operational sub-topic, namely the difficulty of cross-jurisdiction ‘validity’ (in theory and in practice) of various financial instruments. This includes the ability of such structures to be communicated by their ‘sellers’ as real, practical connection to the capitalization of actual projects. Much of this can be mitigated by in-depth knowledge of underlying diligence and verification, and the ability to capture this in standardised processes and templates on an

information infrastructure. *Project 1800* believes that the level of overall financial risk to SDC can be managed and maintained at reasonable levels given the third-party funding and co-funding approaches being presently pursued in discussions with the Bill & Melinda Gates Foundation and others.

- **Technology risk [Low to moderate]:** There is some level of risk associated with distributed ledger applications insofar as their acceptance, adoption and regulatory treatment under differing national/regional contexts. The design and code that underpins the concept of *Project 1800* should be developed, compiled, distributed and documented to transfer to others if/when necessary, or if there is a radical regulatory change in that which constitutes 'security' or 'classification' for distributed ledger products. Essentially, however, *Project 1800* believes that the technology risk associated is moderate insofar as the focus rests on compiling and integrating existent databases and the use of standardised profiles for the range of users involved.
- **Legal risk [Moderate]:** While we have had a very well-reputed and highly experienced panel of legal experts opine on the legal vision of *Project 1800*, we do face a number of risks. There is relatively [Low] risk associated with using LLC, C-Corp with golden share, and/or other well-established not-for-profit structures that will serve as a vehicle for standardised exchange-traded fund products to be utilized in this context. Indeed, the lawyer that designed a key element of the legal frame has the former US philanthropic regulator (for ten years) as part of the *Project 1800* team. There is, however, a [Moderate] risk that US securities (or other jurisdiction) regulations may adversely impact this concept insofar as launching a pipeline of investible securities based on hard-to-assess "non-compliant" underlying enterprises to blue equity range of products is concerned. This is a nuance that will require further exploration in Phase 2. Taking a systematic approach to the diligence and transaction history (inclusive of all types and flavours of capital) will be a key mitigating measure, as will the tracking and compliance supported by Artha Networks Inc. through their legal partnerships.
- **Typical execution risk at the level of SRB / SDG 6 'portfolio' [Moderate]:** While it is clear that the vast majority of interventions supported / financed on the ground in the SRB region under the framework of SDG 6 will be implemented by those who understand the context of BoP execution and the nuances of resident business models, there is moderate risk around the testing, deployment and scaling of these interventions. This includes risks such as:
 - [Moderate] **Appropriate product and/or service models at the BoP:** mitigated by rigorous selection and diligence criteria
 - [Moderate] **Interventions/enterprises selected are unable to reach financial break-even:** mitigated by potential first stop loss or other blended financing structures, provided impact is both *high and measurable* and justifiable for some form of subsidy support for a *specific* period of time.
 - [Moderate] **Interventions/enterprises selected may default on loans:** mitigated by realistic (*vis-à-vis* cash projections) and intelligence re; development of debt structures, as well as backstop / credit guarantee approaches. Defaults of this nature tend to be relatively low if extended by a local financial institution that also offers business support/mentoring.

- [Low] **Development capital runs dry for the SRB** under this SDG: The intrinsically collaborative network approach proposed by *Project 1800* is its own structural mitigation of this risk.
- [Low] **Key person risk**: Mitigation includes support of underlying accelerators and ‘closer to the ground’ impact investors and donors who are able to incorporate sufficiently detailed documentation and reporting activities, such that such surprises become quite unlikely.
- [Low to moderate] **Challenge to see Swiss-born solutions and entrepreneurs able and willing to execute in certain emerging market contexts**: The proper documentation of business opportunities and solutions (via Sphaera), professional support for market development / entry and above all, provision of soft finance for testing and kick-offs, partnership and collaborative opportunities that actually encourage local third parties to execute and implement (rather than foreign elements) will support a range of channels for mitigation.
- [Moderate / hard to forecast] **Political risk**: Mitigation may include the ability to leverage Swiss diplomatic and political representation in a given state, as well as the reinforcement of sensitisation to the important of the SDG 6 banner.
- [Low to moderate] **Administrative risks and SDC positioning**: Mitigation includes due collective process and “checks and balances” on all elements required for the disbursement of finance, as well as period audits on both finances and impact, and proactive relationship management with all entrepreneurs and project leads on the ground.
- [Moderate] **Other risks** such as problems associated with personnel or implementation, including fraud and misallocation of resources may only be mitigated by proactive management and tracking, particularly at the critical nexus where an appraisal or assessment becomes digitised and tracked.

8 CONCLUSION AND NEXT STEPS

The challenge we have sought to address is the glaring mismatch between available financing for development and the rhetoric of the SDGs. The financing needs to reach targets 6.1 (water) and 6.2 (sanitation) alone are estimated at \$1.5+ trillion. Traditional financing mechanisms – aid and foundation funding – are not only insufficient; they are also flat or are declining in real terms. The political focus on immigration has reduced European and Swiss aid budgets. The cuts ordered by Trump in the USA are making things even worse.

Both are harbingers of the long term ‘twin pincers’ of demographics. The first pincer is the ageing populations in the so-called developed world, which result in huge health and pension liabilities that are mostly unfunded and which will put further pressure on aid budgets. The second pincer is the increase in youth populations in the so-called developing world. This is reflected already in increased radicalisation and political instability.

To add to this ‘perfect storm’ in the making, the global investment banking, securities and investment management firm Goldman Sachs recently noted that stock market valuations are at an all-time high since 1900. The “inevitable correction” is likely to reduce social spending from both foundations and governments, as has happened in the aftermath of past financial crises.⁵³

What we have outlined in this report takes as its guiding principle the challenge posed by former President Clinton: “The problems of the 20th century have for the most part been solved by someone somewhere. The challenge of the 21st century is in scaling them.”

By integrating innovations in technology, metrics, finance and the law as well as technology platforms developed in the last ten years in an open framework, we seek to make a better and more cost-effective use of social sector organisations and hybrids as well as impact investment to deliver social entrepreneurial innovation at a scale that matters.

Furthermore, we are placing the community and social stakeholders at the centre of the model, not least to include the most vulnerable members of society. This captures not only the economic value of social entrepreneurial innovation, but also monetises that value. Thus, equity is understood in both senses, financial and social.

The focus on payment outcomes driven by community valuation gives a three-way lock for auditing social impact. It reduces corruption as extended ledgering will make processes more transparent. So do payments and monetisation focused on and validated by communities and contingent payers, since both have a vested interest in tangible transparent processes that deliver true and auditable social outcomes.

The foundations for this collaborative framework are the same as those that have revolutionised other fragmented sectors of the economy over the past decades, from banking to taxis to housing. Recent innovations such as blockchain, cloud and mobile now make these foundations applicable to the development sector. When married to a metrics model (“dollar or franc for delta”) that

⁵³ <https://www.bloomberg.com/news/articles/2017-11-29/goldman-warns-highest-valuations-since-1900-mean-pain-is-coming>.

provides a competitive and comparative uniform social cost of capital, it can then be shaped into an equity that will trade as a function of the social outcome.

The standardisation and scale made possible creates a win-win scenario in which both for-profit (corporates and finance institutions) and not-for-profit (governments, philanthropists, NGOs) can bring their respective skills to bear in collaborative scale to address the challenges posed by the SDGs.

When valuable knowledge becomes accessible to many and product innovations that work for people are made visible, the tide raises all boats. Individual interventions are measured against the baseline and competencies are assessed objectively by those who have to live with the solutions deployed.

SDC deploys between CHF 500-600 million per year in bilateral official development assistance to Africa. If just one tenth of this budget had been deployed via a market network in 2016, and assuming a conservative 1:1 match of private funding, this could have doubled the amount available for interventions (to approx. CHF 104 million). This is not counting the benefits of deploying via hybrid vehicles (incorporating the community as both stakeholder *and* shareholder) to help manage execution risk, nor the returns flowing back across the range of potential LLC structures whose activities might also support developing high value intellectual property and smart cross-sector use of soft capital. Imagine the *catalytic impact* that existing funding from SDC could have on a vibrant ecosystem of philanthropists, family offices, high net worth individuals, social venture funds and, indeed, development finance institutions!

The first conclusion to date is that the legal, financial, technical and sector experts consulted during this scoping process find the proposed framework and architecture to be feasible, provided that SDC and/or other interested parties in the global development community show leadership and support this process. In essence, this is a change management issue.

The second conclusion is that there are still a number of unresolved issues, which would need to be addressed in a next phase. They include:

- refining the methods for estimating the 'Delta' in country-specific contexts;
- ground-truthing the process for identifying interventions that truly address BoP needs as opposed to those that can be achieved quickly; and the scaling of the community feedback mechanism;
- integrating the legal framework with the distributed ledger technology to allow it to become highly transparent, scalable and cost-effective;
- defining the exact nature and form of the umbrella organisation, which will emerge out of the first set of use cases and
- translating this material into even plainer language for multiple audiences.

The question to SDC now is:

What is the role that SDC would wish to take and the scope it would want to cover going forward in the Senegalese River Basin or elsewhere? There are a number of ways of looking at this: by participants, by issue (e.g. education), by the whole water basin, by a regional subsection or by business lines. Note that the latter would have the advantage of creating a clearer dialogue with commercial players.

Next steps:

Once this final draft report has been delivered to SDC, the core team of *Project 1800* is planning a detailed debrief on the process and findings so far on 5 April 2018.

We will then start to brief, in a coordinated way, aligned funders and partners on the conceptual advances related to the legal and financial aspects of an SDG 6 market network made during our work under this mandate.

In particular, the Sustainable Sanitation program of the GIZ is interested in convening a workshop on innovative mechanisms for scaling and financing solutions in June.

We will also work on a number of targeted communication pieces for both practitioners and general audiences, and seek to place them in pertinent media and conversations.

Finally, we will continue our work towards a first prototype of a SDG 6 market network, currently under construction at <http://sanitation.sphaera.world>, aiming for a public launch by July of this year.

II. PROJECT PLAN

1 Introduction

This section articulates a pathway for developing an SDG 6 market network in the Senegal River Basin (SRB). We describe this in terms of the necessary steps for implementation, which the consortium of authors and contributors to this report is committed to pursuing with SDC, if that is of interest, as well as with other development, corporate and philanthropic partners.

An immediate next step the consortium will take is to share and socialise the conceptual advances we have made over the course of this scoping process with the home institutions of individual contributors, notably UNICEF, as well as with the funders and partners of previous work that was leveraged in this scoping process, notably the Bill and Melinda Gates Foundation.

At the same time, we will use also the insights from this scoping process to inform on-going conversations with aligned donors, corporations, civil society organisations, and intergovernmental organisations, including DFAT, DGIS, GIZ, USAID, Ambev, Coca-Cola, Nike, UBS, IFRC, IUCN, GHIL, GWP, SuSanA and the Toilet Board Coalition.

Before we outline the project plan, it is useful to make a distinction between **the capital we seek to mobilise** (further described in [Section 2](#) below), and **the funding required to create the prototype** of the financial and IT infrastructure we have described in this report.

It is a highly catalytic use of the limited annual funds of, say, the WSH program of the Bill and Melinda Gates Foundation or SDC's Global Program Water, to underwrite the necessary R&D and prototyping of this infrastructure. When implemented in a use case such as the SRB, it creates the financial products and legal and governance pathways to attract and deploy the trillions of private capital looking for investment opportunities. Another potential funder of the prototype is an organisation, such as Aqua 4 All, that is actively working on a financing mechanism for WASH solutions and needs as an example of the infrastructure described herein.

We outline a budget estimate to create a global SDG 6 market network in [Section 4](#). It is informed by the SRB use case.

2 Sources of capital

There is a lot of capital from private and public sources that is potentially available for deployment through blue equity. The premise of our work is that we can tap the largest pool of it by creating outcome-based securities that attract private investments from the corporate and financial sectors.

2.1 Government

Total expenditures of the Bretton Woods institutions to address core global development issues hover currently around US\$150bn per annum. However, as a function of the success of the post-world order in achieving greater longevity (thanks to better healthcare and longer life spans), Western Governments now have substantive unfunded liabilities between now and 2050. In the U.S., the best positioned of any G20 country, these are estimated at US\$3 to US\$9 trillion, with health liabilities potentially ten times these figures. This is a global phenomenon. It is also a

question that has been posed by academics since the late eighties and, given its slow-burning long-term impacts, effectively ignored by policy makers.⁵⁴

In Japan, South Korea, Italy, Germany and eventually China (because of the one-child policy), the ratio of the population over 64 to the one 15-64 will grow from 10-30 retired to every 100 working to 60-70 retired for every 100 in work, all for the most part unfunded.. Over the last two years in Europe with the migration crisis, OECD rules have allowed the cannibalisation of aid budgets. The same has happened in the U.S., where the Trump Administration has raised this to be crystallised in hearts and minds. The bottom line is that Government as the primary systems player will remain a key stakeholder but cannot provide the scale of capital we need. Even the traditional social impact bond faces long-term problems.

2.2 Philanthropy

Globally, foundations control around US\$1 trillion in assets but less than 3% of their core assets are aligned with social purpose. Of the 5% they give away in the US to maintain their tax status, only approximately 5-10% is applied to international causes. A credible case can be made that after frictional costs, corruption and the system inefficiencies that the amount of capital actually reaching the front line is no more than that earned by the bankers, who make 1-2% on the management of the core funds of foundations.

The strategic opportunity, therefore, is to align the core funds of foundations (i.e. mission-related investment – MRI – of US\$1 trillion) and to increase programme-related investments (PRI). PRI are investments foundations that are allowed to make investments from grants in some jurisdictions, including in the U.S., where this has been enshrined in law since 1969. Currently, MRI and PRI amount to at less than 5% of the possible allocations that could be made.

The related impact investing market has grown to US\$75 billion globally, and is estimated to be growing at 16% annually. Much of it is closely aligned, or potentially aligned, with the SDGs.

2.3 Corporate & financial sectors

There is an estimated US\$218 trillion of private capital available in global financial markets, making it by far the largest pool of capital to tap for creating market demand out of social need. Private corporations and financial service businesses, especially in the insurance industry, are also potential contingent payers. For example, beverage and consumer goods companies that need water to produce their products have a vested interested in clean water as well as in healthy employees in the places they operate.

⁵⁴ For example, the Maastricht Treaty in Europe ignores unfunded pension liabilities and, it could be argued, makes optimistic assumptions regarding productivity growth.

3 Building the market network

The following sequence of activities lays out how we would design, fund, launch and manage an SDG 6 market network in the Senegal River Basin, as outlined in [Section 7](#) of the report.

3.1 Planning & scoping

The immediate next phase of *Project 1800* is an approximately six-months R&D and extended scoping phase. During this phase, we would undertake the following 4 major activities:

3.1.1 Formalise the consortium

Building on the outreach to aligned parties immediately following the publication of this report, and on the pre-existing relationships between the existing and contributing partners, we will formalise the roles and responsibilities of participating parties. In this phase, we will also choose the use-case that will inform the initial implementation of the SDG market network, and this will in no small part be driven by the interests of funders underwriting this phase. To the extent that SDC is moving into this next phase, its interests in a place like the SRB would drive the use-case and thus the composition of the Consortium.

3.1.2 Refine the metrics framework

The metrics framework described in [Section 4](#) of the report works conceptually. We have identified some research and development work that is needed to estimate the costs, benefits and impacts required for the financial transactions contemplated for the blue equity.

Externalities at the country and / or river basin scale will have to be analysed. While the methodology for this exists, it has not yet been applied to WASH in Africa. This work also needs to be informed by the use case chosen.

Refining the metrics framework also entails ethnographic and local discovery work in the geographies of the use case to make sure we understand the communities' needs and interests as well as the modalities for implementing the feedback mechanism. This element will require in-country field work. It will rely on established anthropological and rapid assessment methods for understanding local political, familial and economic relationships and contexts.

3.1.3 Scale the feedback mechanism

One of the most important areas of methodological refinement is the question of how to scale the community feedback mechanism. As noted previously, we are deliberately departing from the standard M&E practices in the development arena because they are not scalable. In the community feedback mechanism pioneered by Integrity Action, we have the kernel of a method that provides the real-time feedback from communities necessary for an outcome-based approach such as the one we are proposing. During this planning & scoping phase, we will investigate how to scale this approach to the tens of thousands of communities ultimately required. We have begun investigating methods using simple, voice-based surveys and a feedback mechanism administered by cell phone.

There are related questions of education, communication and engagement with and between citizens, communities as well as sectorial participants in the market network. Specifically, the need to develop culturally-appropriate messaging that can be delivered, at cost-effective scale, to remote and marginalised communities. We believe that technology is an essential ingredient in this process, given the vast cost of implementing on-the-ground programs driven by human facilitators. In short, the cost-efficiencies of robust content-delivery hardware come in at less than 10% of the cost of salaried workers over a similar period of time.

Additionally, in communities that do not have a reliable power and telecommunications infrastructure, there is a need for a centralised source of information and applications, plus an easy way to aggregate data from field reports. By using context-appropriate hardware solutions, we can begin to address the digital divide that today limits the possibilities for true citizen-centric solutions.

3.1.4 Integrate the legal structure with the distributed ledger

Implementing SDG market networks relies, at scale, on replacing expensive, tailored legal agreements to organise multi-party collaborations / investment structures with smart contracts that are stored on a distributed ledger. While we established that this is feasible conceptually, the actual integration and translation of the legal innovations and structures proposed here with a distributed ledger, such as Holochain, remains an item for exploration and refinement.

A central activity during this phase will be a multi-day design workshop involving the legal experts and the team from Holochain. In essence, the legal and governance structures described in [Sections 5](#) and [6](#) define a list of requirements that need to inform the engineering of algorithms to track the contractual commitments, the contributions by individuals and organisations to outcomes, and the feedback loop that triggers contingent payments.

3.2 Set up the use case

The use-case will be chosen in the first stage (3.1) of the next phase. Assuming that SDC would wish to pursue with the Senegal River Basin, we would first need to understand what is already working in the SRB and what still needs to be done. The Swiss Embassy in Dakar could possibly introduce a qualified Swiss WASH expert based there to *Project 1800* to support this step.

Then, we build the structure to support the scaling of the appropriate solutions to the identified challenges. This includes:

3.2.1 Carry out regional research

- Researching and prioritising the interventions required in the SRB
- Cataloguing the various actors across all sectors and functions
- Cataloguing WASH solutions already being implemented
- Reviewing WASH solutions that have been proven elsewhere

3.2.2 Establish baseline & measure outcomes

- Predictive modelling of the total externalities: anticipate which interventions will resolve challenges
- Tracking and articulation of sources of successful (solution) inputs and interventions, with attribution for eventual purposes of remuneration

- All measurements tied to key performance indicators (KPIs)
- Benchmark creation so as to set minimum performance expectations and thresholds around specific interventions (and the nature of their financing)
- Examples:
 - Measuring at the school level (using the methodologies of Integrity Action and Social Progress Index at the community level to track total externalities and outcomes)
 - Measuring outcomes, for example reverse migration back to the villages where interventions take place
 - Measuring community acceptance of the intervention: For example seeing demand for water kiosks going up, and kiosks being used by community leaders.

There are significant unknowns in this rubric, including:

- Investor quality (for metrics): assessment of rigour in structuring, oversight and post-investment management of interventions undertaken by investors is an important part of ensuring objective data and metrics (alongside the subjective feedback loops) are credible.
- Acceptance of interventions by community/population

3.2.3 Secure funding

To ensure a vibrant and robust market network that is focused on a set of niche interventions within a specific sector, it will be necessary to landscape and analyse where relevant investors and donors are concerned. This ecosystem will be naturally segmented along the traditional fault lines of 'early stage', small ticket funders as well as grantee to later stage, seeking funding, with diverse funding models.

This needs to be distinguished from larger ticket investors, whose positioning is more likely to make them a contingent (our "outcome") payer in our model. Namely corporates that see an economic opportunity or the ability to address a cost which constrains or threatens their business; a government, who sees an economic, social or political issue to be resolved, or a philanthropist, who could align funds, e.g. through a donor advisor fund to save taxes, and then take a contingent liability based on tangible social outcomes. These contingent returns could be disbursed in tranches, thus allowing incentives to be dynamic.

It is already common practice for equity investors who invest into smaller social enterprises to disburse cash in a series of tranches against operational milestones. One could say that this is a simple approach that 'rewards' (just the management team, of course) based on outcomes (performance). This is not far from the concept we propose. The reward can take the form of simply triggering a subsequent tranche of money. Or it can translate as far as the valuation exercise of shareholders. The equity model also allows a more sophisticated way of managing the diverse incentives and financial requirements of different stakeholders.

This type of activity is typically deal-specific. However, this may be captured and shared along a chain or network of concerned parties towards understanding (a) the true cost of broader outcomes and (b) what constitutes a reasonable expectation for X or Y level of investment and risk. Performance on an absolute basis (i.e. digging three bore-wells in a span of X months for Y cost) is fine. However, few benchmarks exist that serve as a point of reference on relative performance for field level interventions, particularly when financed by a wide and diverse range of

fundors. When private capital is deployed bilaterally, most investment managers do not have the bandwidth to ascertain the 'true cost' or price of a particular intervention.

The emergence of a price discovery mechanism on the back of a blue equity structure is almost an incidental by-product. Participants in current structures are typically incentivized to blur or obscure their true operating costs. The outcome or reward for behaving in concert and with urgency and transparency thus not only benefits from the feedback loop from 'citizens' on the ground, it also yields previously hidden information on how much input was required to generate output and therefore, proven outcome.

Only thus can we begin to operate in a world where minimum expected baselines for performance are set, where those who work fastest and most efficiently may be rewarded by 'sale' of an outcome to the highest contingent paying bidder. In sum, we must:

- Identify and landscape sources of funding:
 - start-up funding (to create entities and technology; contract official development assistance, special purpose vehicles and Holochain providers)
 - contingent payers (payers who make a promise to pay if result or outcome is achieved), including:
 - communities
 - governments
 - corporates (who have a vested interest in, for example, healthier populations)
- Secure start-up funding
- On-board contingent payers

Likely, 'priming the pump' and working with grant-making philanthropists with reasonable risk appetites will constitute a first phase of this work. From within and across a number of impact finance organisations and networks, careful assessment and relationship management must be undertaken to engage with investors capable of seeing their role as 'ecosystem funder'.

The final structure will be defined together with the legal team. However, as a general rule of thumb, the larger the scale of capital raised, the more we can apply risk management tools and sophistication. The larger scale and replication implicit in this proposal provides the opportunity to apply wider and more sophisticated financial tools to social issues.

3.2.4 Define governance

According to [Section 6](#) of the report

3.3 Implementation

This phase requires identifying and assembling already implicated and ready actors and innovations as well as engaging with and on-boarding key relationships. Thus, it can be ensured that collaborative interventions are tested, and if proven effective, scaled.

This includes:

3.3.1 Catalysing ideas

- Design a challenge mechanism to solicit ideas for outcome-based interventions

Challenge mechanisms are useful to elicit early stage investment proposals from a wide ecosystem, particularly when it is nascent. They also provide the benefit of making a particular 'campaign' within a given issue more visible. Numerous formats exist, but it is worth noting that a challenge can provide its 'finalists' or 'winners' the opportunity not only to receive a grant or 'prize', but also the chance to benefit from longer-term technical and capacity assistance programming as well as direct mentoring. This, in turn, may be followed by a variety of blended financing opportunities. For example, in the case of the Artha Venture Challenge deployed in India for the last four years, up to 24 months of technical assistance is followed by a commitment to match additional funding from other investors, be it debt, grant, or peer equity. This venture challenge model has been adapted from the UK-based Big Venture Challenge operated by UnLtd. in various forms since 2002.

- Organise inputs around KPIs to track for contingent payments

3.3.2 Implementing and commercialising

To commercialise individual and collaborative interventions, e.g. Swiss Fresh Water and Access to Water, the question to be asked is how must technology, financial, and business support be organised to enable scaling? When considering this, it is important to note that BoP markets do not buy or invest in promises. This is proven by the relatively low market take-up of water kiosks compared to the high -up of mobile phones. The value and service delivery of the latter is both tangible and immediate. We are dealing with the world's most quality-focused, discerning consumers.

Examples of key actors that can play a collaborative role in scaling interventions:

- Access to Fresh Water/ Access to Water Foundation
- cewas - ecosystem builder, incubator
- Other regionally impact-focused incubators and accelerators
- Water.org and Aqua for All
- Bill and Melinda Gates Foundation

Note: payments to any entity providing inputs will be linked to key performance indicators (KPI).

3.3.3 Insurance

Insurance markets also can play a role in reducing risk and leveraging the core capital market offering of blue equity and its social impact by:

1. Micro-insurance to de-risk the engagement of a community in a WASH solution = an insurance payment scheme against a leasing arrangement;
2. Using insurance structures to de-risk a tranche of investment to change the credit risk profile of part or all of an investment. This can be from taking the volatility out of an

- investment to foreign exchange (forex) and interest rate risk, to create more effective blended value models;
3. Changing the risk and credit profile of local currency investments, allowing local capital markets (pension funds) to invest in their own sustainable infrastructure;
 4. Using insurance investment frameworks as “wrappers” to create tax efficient frames for Investment in WASH products.

3.4 Replication

The third stage of deployment consists of getting all the checks, balances and influencing factors in place to foster the on-going success of interventions whose outputs and outcomes have been best received and absorbed by intended target client / citizen communities. Crucially, this stage will also set them up to be replicated at a similar (or larger) scale, targeting another region, issue, or both.

3.4.1 Convening

We envisage a technology platform capable of holding user profile, deal, solution and basic activity information as points of reference, coupled with in-person convening to foster collaboration and sharing.

The team has a nearly 10-year track record of convening in-person / offline sessions within the social investment community on a monthly basis, focusing on various geographies and sectors.

3.4.2 Publishing

In addition to the convening activity mentioned above, storytelling and publishing data analytics and market intelligence are vital to invite new emergent businesses into the network (‘the eBay effect’).

The purpose of this is to inspire not only those who may wish to develop a greenfield idea, but also those whose existing enterprise solutions and pilot tests in other geographies (near or far) may be applicable and transposable to the SRB context. A case in point is the work of a major impact innovation network like Ashoka. Its approach is shifting slowly from individual ‘hero-preneurs’ to more collective, campaigned and strategic action where a number of individuals working on e.g. menstrual hygiene programmes are supported to access proven market solutions on a franchise basis.

3.4.3 Advocating

Advocacy is another vital component of this work to identify and push for regulatory and legislative changes to advance more collaborative and orchestrated approaches to large and complex societal problems.

For example, any corporate procurement activities or corporate social responsibility (CSR) programming touching on a particular sector are characterized by standards and protocols / processes. This may or may not be mirrored by minimum standards or information provision requirements set at the regulatory level that help all incorporated entities with, e.g. a national chamber of commerce, to be easily located, identifiable and verifiable. These types of inputs representing public administration and process are an integral part of the implementation plan.

3.5 Educating

Education runs throughout the entire process of building a market network. It begins with a preliminary set of tailored outreach initiatives to adapt to the local language(s) and jargon as well as to integrate main players. It also includes proactive engagement with local and municipal governments regarding potential benefits and outcomes, clear value addition vis-à-vis investors and contingent payers, who may or may not be already visible and active in the region, and peer-to-peer (P2P) education within and amongst community leaders.

At its most basic level, this is an obvious bridge-building and crossover point through which to engage with SDG 4, as it is not unusual for many awareness programs to be looking at using eager young children in school settings as the primary channel through which to reach community elders.

4 Project partners

We have identified a number of potential project partners, whom we profile here in the interest of exposition. It should be noted, however, that with the exception of the four Project Partners listed immediately below, representing the authors of this report, the entities mentioned in the Project Plan are *not* confirmed partnerships, and are included for the purpose of demonstrating the breadth of aligned individuals, organisations and networks that we are already working with in the implementation of separate but aligned projects in WASH.

Artha Networks Inc., a program associated with Rianta Capital Zurich, is designed to pursue the goals of realising sustainable development in India and beyond. The word 'artha' is a Sanskrit term that refers to 'purpose', 'prosperity' and the 'pursuit of wealth'. Rianta Capital Zurich is Artha's main investor and de facto 'parent'. It is a Zurich-based separate entity and is comprised of a team with a focus on appraising direct private equity investment opportunities for their clients. The clients of Rianta Capital are a range of offshore entities from which the Singh family may benefit; the head of the family is Tom Singh, who is founder of a well-known UK retail business called New Look.

The objective of the Artha program and related investment activities is to apply the rigor of commercial thinking to the challenges of development throughout India, particularly in the context of marginalized rural communities and villages. Artha strives to support those who are validating the market niche for providing important goods and services to the 'base of the pyramid', with an emphasis on those who work the land and who are producers.

Sphaera is a social benefit technology company and advisory firm created to address the question of how we can accelerate the pace of social change in the face of climate change and other urgent challenges of the 21st century. Centrally concerned with the creation of infrastructure that advances solutions from idea stage to implementation at scale, Sphaera collaborates with a number of aligned technology companies, including Artha Networks, icoloi, and Induct to build a modular, open, global architecture for facilitating the flow of innovations and capital along the social value chain. Particularly pertinent to this project, Artha started as a proprietary deal sourcing and diligence platform for impact investments in social enterprises in India and parts of Asia, and has since been white-labelled for use by the Inter-American Development Bank, and we are now working on a solution sourcing and investing platform for a network of European foundations.

Induct is currently developing an innovation ecosystem for the government of Norway, with a view of sourcing those across networks larger than the Induct platform.

Strategos is a boutique consulting practice founded in 1997 and based in Lausanne, Switzerland. Its mission is to help its clients identify and work on fundamental business, strategy and/or organisational questions with the aim to build enabling and sustainable solutions. Through eleven partners, it provides a range of services such as strategy consulting, complex project management, organisational development, participatory leadership & dialogue and coaching. Among its clients are public services of the Swiss Confederation, various cantonal and city administrations, corporations such as Conforama or Migros, local, national and international foundations and associations (cinfo, YWCA, UICC) as well as SMEs and start-ups or the Lausanne and Geneva teaching hospitals (CHUV and HUG) and Universities (UNIL, UNIGE, EPFL).

Total Impact Advisers is part of Total Impact Capital. It specialises in identifying sourcing and developing private investment opportunities that are socially and financially attractive. We see global problems as win-win global opportunities for the social sector and the private sector with the need to apply “market-based solutions for philanthropy” - a now much used term that we actually coined in a joint report in 2005 with UBS. In essence, we seek to create market demand for social need. Looking at models beyond the classic VC-PE models with a focus on outcome models, we seek to design innovative, sustainable financial solutions and strategies for governments, corporates and non-profits to support their missions. This has included the conceptualisation of the Social Impact Bond, one of the first blended value models, the DB / Ashoka / IAPB Eye Fund as well as working with former regulators to change (and pass into law) the legal frameworks to stimulate social impact investment. Our clients are major foundations, UN organisations, social entrepreneurs and corporates.

Thomas W. Brunner is a partner in LeapFrog Investments, a leading manager of impact investment funds supporting innovative providers of financial services and health care to low income people in Asia and Africa. From LeapFrog's launch in 2009 through 2016, he served as its general counsel. Previously, Tom was a Partner at the Washington, DC law firm of Wiley Rein where he founded and chaired the firm's insurance practice. He was the co-chair of the Washington Lawyers' Committee for Civil Rights and Urban Affairs, served for many years on its Board and received its Wiley Branton Award for Civil Rights Litigation. He coordinates impact investment projects for International Senior Lawyers Project.

Global Geneva is a print and online publication stressing quality journalism and exploring critically themes represented by the international Geneva or Switzerland hub. These range from humanitarian response, conservation and disaster prevention to human rights, world trade and conflict mediation. Almost all are linked in one way or another to the 17 Sustainable Development Goals (SDGs) of the UN promoted by the [Global Compact Network](#).

Holochain is a global team of meta-currency and crypto-currency designers that have been working on the leading edge of digital currencies for over twenty years. Co-founded by Art Brock and Eric Harris-Braun—global thought leaders in meta-currency design—the Holochain team are developing distributed ledgering technologies that support truly representative governance, equitable wealth distribution, and accessibility of information, especially for those most frequently overlooked by the design of 21st century technologies.

Guy Hutton is a development economist, currently serving as a Senior Advisor for WASH at UNICEF, based in New York. He has provided vision to the WASH sector since his publications in the early 2000s on the costs and benefits of water and sanitation interventions, gaining consensus on the methodologies for evaluating WASH interventions across major agencies such as the World Bank, WHO and UNICEF. He has previously held positions at the University of London, the University of Basel and the World Bank. He has lead country implementation projects, international research studies and global advocacy initiatives in the fields of water supply and sanitation, health, air pollution and climate change. He currently provides leadership for several global initiatives in the water and sanitation sector, including WASH costing and economics, the WHO/UNICEF Joint Monitoring Programme, WASH public financing for children (PF4C), the WASH bottleneck analysis tool, and WASH in the workplace. He is the author of 40 peer-reviewed journal articles, and over 100 published reports, manuals, guidelines, book chapters, and donor policy papers in the field of international development; and contributing author to flagship reports such as the World Health Report, Human Development Report, Intergovernmental Panel on Climate Change (IPCC), Commission on Sustainable Development, Disease Control Priorities Project, and the “Copenhagen Consensus” on human development priorities.

Integrity Action enables citizens to improve the delivery of essential services, infrastructure projects and humanitarian aid in some of the world’s most challenging environments. This is achieved through the promotion of integrity. Rather than top-down finger pointing, the bottom-up promotion of integrity creates an environment where corruption and mismanagement are simply not tolerated. Integrity Action addresses this challenge with its own unique mix of knowledge, tools and approaches. It helps everyday citizens to monitor projects and services in their own community; it provides tech tools to help them post their findings openly and in real time; and it enables these citizen monitors to work with those responsible and constructively solve the problems they find. Integrity Action’s work has resulted in a range of outcomes, from essential repairs to schools and water infrastructure, to improved construction of roads and health facilities, to faster and more equitable earthquake relief. To date the organisation has worked with just under ten thousand of community monitors across more than a dozen countries in Africa, Asia and the Middle East who between them have monitored over US\$1 billion worth of projects and services – including in the WASH sector.

William C. (Bill) Kelly is Founder, former President and now Strategic Advisor to Stewards of Affordable Housing for the Future, an organisation committed to dignity, innovation and excellence in affordable housing. Previously he was a partner in the global law firm of Latham & Watkins. He is also a Director of Ashoka, the Low Income Investment Fund, the International Senior Lawyers Project, and the Governance Institute. Mr Kelly was a law clerk for U. S. Supreme Court Justice Lewis F. Powell, Jr.

Cantwell F. Muckenfuss III is a retired partner in the D.C. office of Gibson Dunn focusing on regulation and public policy related to financial institutions. Previously, Mr Muckenfuss was Senior Deputy Comptroller of the Currency for Policy and Counsel to the Chairman of the Federal Deposit Insurance Corporation. Mr Muckenfuss is a founder and Chairman of the Board of City First Bank of D.C., a community development bank in Washington, and Chairman of City First Enterprises, Inc., the non-profit parent of City First Bank. He is an Operating Partner of Vista Capital Advisors, a member of the Board of Ethos Lending LLC and the advisory boards of several financial technology start-ups. He is a Clinical Visiting Lecturer in Law at Yale Law School.

Marc Owens is a partner in the Washington, DC, office of the law firm, Loeb & Loeb, LLP, where he specializes in federal tax issues relating to tax-exempt organisations, including charities and issue advocacy groups. Prior to joining Loeb & Loeb, he spent 15 years in private practice and 25 years with the US Internal Revenue Service, including serving as Director of the Exempt Organizations Division from 1990 until 2000. As Director of the Exempt Organizations Division, he was responsible for the design and implementation of federal tax rulings and enforcement programs for charities and other tax-exempt organisations. He is a member of the District of Columbia and Florida Bars and he is a member of the Board of Directors of the Pemsel Case Foundation, a Canadian foundation focusing on the development of the law of charity. He is also co-chair of the Subcommittee on Audits and Appeals of the Exempt Organizations Committee of the American Bar Association Tax Section. Chambers USA ranked him as a “Top Lawyer” in 2009-2012; he is also named to “Best Lawyers of America” for non-profit /charities law and tax law for 2008-2018. Thomson Reuters identified him as a “Washington, DC Super Lawyer” in 2012-2017; and The Legal 500 US named him as a “Leading Lawyer” in non-profit and tax-exempt organisations.

Social Progress Imperative consists of partner organisations in business, government and civil society that use the Social Progress Index to improve human wellbeing. Born out of the World Economic Forum, it creates a framework for social development in the same way GNP measures economic development. The Social Progress Imperative, through regional partnerships, promotes the formation of local networks which apply the Social Progress Index within countries or regions to guide social investments. Local networks operate at a national scale or focus on specific areas within a country. This provides a unique opportunity for social innovators to lead social progress in communities they know best.

UNICEF has country offices working on WASH in almost all sub-Saharan countries, and depending on the context and demand from government, it deploys a mixture of programming approaches to achieve its aim of bringing affordable, quality WASH services to poor people, in particular children and women. Through bilateral funding (DFID, DGIS, SIDA) UNICEF is implementing WASH projects targeting the poor across West Africa. These projects include WASH monitoring, sustainability, financing and knowledge management as major areas of focus. In addition, UNICEF is the co-lead or the lead development partner in many countries, and is a relied on partner to the governments for its convening power and its know-how.

5 Timeline and budget

5.1 Timeline

We believe that a fully functional SDG 6 market network could be in operation in the SRB or another geographic or sectorial use case within 24 months.

[Appendix L](#) summarises an indicative work plan to that end, covering a 6-month prototyping phase, during which some essential methodological issues need to be resolved and baseline data collected.

The output of that phase would be (i) a formalised funder consortium co-creating the financial and IT infrastructure of the market network, (ii) a baseline of estimates for a range of WASH indicators that are actionable in terms of investment transactions, (iii) legally compliant prototypes of both a

financial vehicle and the distributed IT infrastructure for aggregating solutions, measuring impact and feedback, and organising multiple stakeholders, and (iv) a demonstration of how the market network is beginning to mobilise these stakeholders and their capital.

Over the subsequent 18 months, we will then iterate on the critical requirements for the legal, financial and technological mechanisms to support the market network, both in analogue and digital forms.

5.2 Budget

While creating an SDG 6 market network is a complex task, the necessary legal, technical and administrative work is well understood. It can be scoped with some degree of accuracy.

To build the overall market network infrastructure will require approximately US\$ 10 million over 24 months, not including the capital raised into the special purpose vehicle(s) for specific use cases like the SRB. Table 6 presents a summary budget.

Table 6: Summary budget

Tasks	Monthly rate	FTE	SDG 6 market network (24 months)	SDC (6 months)	Notes
Project management	\$10,000	1	\$240,000	\$30,000	a
Stakeholder management	\$15,000	1	\$360,000	\$90,000	b
Product management	\$10,000	1	\$240,000	\$10,000	c
Technology management	\$10,000	1	\$240,000	\$10,000	d
Engineering	\$10,000	4	\$960,000	\$40,000	e
UX Design	\$7,000	1	\$168,000	\$7,000	f
Financial engineering	\$15,000	1	\$360,000	\$90,000	g
Distributed ledger design	\$10,000	4	\$960,000	\$10,000	h
Strategy	\$15,000	2	\$720,000	\$30,000	i
Legal	\$20,000	4	\$1,920,000	\$0	j
Metrics	\$4,000	1	\$96,000	\$76,500	k
Benefits (33% on salaries)	\$41,580		\$2,067,120	\$0	l
<i>Consultants</i>					
metrics in 3 countries			\$157,500	-	
service fees for IA & SPI to scale their methodologies				\$60,000	m
<i>Travel</i>	\$5,000		\$120,000	\$10,000	n
<i>Conferences & meetings</i>			\$100,000	\$75,000	o

Direct total	\$172,580		\$8,708,620	\$538,500	
Admin o/h (15%)	\$25,887		\$1,306,293	\$80,775	p
Grand total	\$198,467		\$10,014,913	\$619,275	

This budget assumes the following:

- a. The project manager is shared 50:50 with an aligned SDG 6 use case such as the Bill and Melinda Gates Foundation.
- b. There is a full-time stakeholder manager and coordinator for the SDC use case, including curating potential investors into the eventual special purpose vehicle.
- c. One month of a product manager to integrate what is built for SDC with the adjacent use case(s)
- d. One month of a technology lead / CTO to ensure the same
- e. One month of engineering talent to build a prototype
- f. One month of user experience (UX) design
- g. Full-time support for financial strategy, product design and engineering
- h. Honoraria for distributed ledger experts to attend workshops
- i. One month each of Artha and Sphaera team on systems design
- j. Legal work continued to be pro bono in this phase
- k. Field and analytical work for deriving baseline estimates in one country
- l. Rates are inclusive of taxes & benefits
- m. Honoraria to Integrity Action, SPI and others for mindshare on refining metrics
- n. Core team travel to workshops and for outreach activities
- o. Three in-person meetings of the consortium, incl. travel and lodging for 10, at 25K per meeting
- p. Standard 15% rate for overheard and administration

III. APPENDICES

A. Abbreviations & acronyms

API	Application programming interface
A2W	Access to Water Foundation
BoP	Base of the pyramid
DAF	Donor advised fund
ETF	Exchange-traded fund
FMCG	Fast-moving consumer goods
GAHI	Global Alliance for Humanitarian Innovation
GAVI	Global Alliance for Vaccines and Immunisations
GWP	Global Water Partnership
HNWI	High net worth individual
IRR	Internal rate of return
LLC	Limited liability company
LLP	Limited liability partnership
MHM	Menstrual hygiene management
MRI	Mission-related investment
OMVS	<i>Organisation pour la Mise en Valeur du fleuve Sénégal</i> / Senegal River Basin Development Authority
PE	Private equity
R&D	Research and development
SDC	Swiss Agency for Development and Cooperation
SDE	<i>Sénégalaise des Eaux</i>
SDG	Sustainable Development Goal
SIB	Social Impact Bond
SPI	Social Progress Index
SRB	Senegal River Basin
UNICEF	United Nations Children's Fund
UX	User experience
VC	Venture capital
WHO	World Health Organisation
WSP	World Bank Water and Sanitation Program
WSSCC	Water Supply and Sanitation Collaborative Council

B Glossary

Term	Definition
Terms related to the final product	
Open architecture framework	A type of system architecture that is designed to make adding, upgrading and swapping components easy
Systems architecture	
Market network	As with below (SDG 6 market network), but for any subject.
Multi-sided market network	The generic description of what we are building: multi-sided because it enables transactions and interactions between more than two sides of a market (innovators, investors, implementers, donors, technical experts, citizens, etc.)
SDG 6 market network	A global ecosystem that <ol style="list-style-type: none"> 1) facilitates the transactions of WASH solutions 2) binds together the global community of WASH practitioners, experts and investors and 3) serves as a workflow engine that facilitates collaboration, innovation, measurement, aggregation and financing of solutions.
Terms related to the co-creation process	
Ecosystem	The interaction of stakeholders in a (bounded) economic or social system
Platform	A platform is a combination of a community of users, interacting with each other on some technology layer, and the data these interactions generate. The challenge is that even a static communications website is a “platform”, and the term is also widely used to mean voice or policy position.
Resilient	A system, organisation or person that is robust despite facing abnormal conditions and that is capable of rapid recovery
Systems approach	An approach that recognises that to solve e.g. a social problem requires multiple stakeholders
Use case	A specific example that informs the development of the global infrastructure by offering up ‘on the ground’ experience, challenges and general data
Technology related terms	
Agile	The values and principles of software development, under which requirements and solutions evolve through the collaborative effort of cross functional teams Read more
Application user interface (API)	The means by which separate databases communicate
Blockchain	An open, distributed ledger that allows transactions, data and more to travel between individuals without the use of a centralized authority Read more
Bi-directional APIs	Application Programming Interface (API) that allows integration between 2 or

	<p>more platforms. Bi-directional APIs allow data to flow in all directions; creating and updating in any system that has been integrated</p> <p>Read more</p>
Customisation	The ability of organisations to apply solutions made by other organisations to its own market or clients, mixing and matching to fit the context
Data classification	The process of organising data into categories that can then be easily shared across platforms. For example, identifying what are individual, organisational and network data so that it shows up the same way on each platform
Data standardisation/ normalisation	The process of creating standard terms that can then be understood no matter the context. For example; standardising the definition of the word 'poverty'
Distributed ledgers	A consensus of replicated, shared, and synchronized digital data; geographically spread across multiple sites, countries or institutions. There is no central administrator or centralized data storage.
Holochain	<p>A next-generation meta-currency that allows many-to-many transactions and sharing; nested smart contracts and other improvements on blockchain, while also needing less energy for computing</p> <p>Read more</p>
Personalisation	<p>The ability to present one's integrated solutions (see customisation) through one's own brand or compliance lens</p> <p>Combining personalisation and customisation means that one can co-create solutions and avoid reinventing the wheel, while still retaining control over one's brand, compliance and positioning.</p>
Smart contract	Self-executing contract with the terms of the agreement between buyer and seller being directly written into lines of code. The code and the agreements within exist across a distributed ledger.
Finance related terms	
Asset class	<p>A group of securities that exhibits similar characteristics and that behaves similarly in the marketplace. Often, the same laws and regulations apply to the group.</p> <p>Examples: equities (or stocks), fixed income (or bonds), cash equivalents (or money market instruments), real estate, commodities</p>
Blue equity	Blue equity is the proposal to create a tradable equity that reflects the performance of a social outcome. As a standard equity, it would be fungible and tradable, and be equal to (<i>pari passu</i>) any other equity.
Convertible	Traditionally, a debt security that would convert into equity at a specified price and time
Exchange-traded fund (ETF)	<p>A fund with a range of investable companies / participants, where the fund reflects the performance of those constituent parts. The fund trades on a normal exchange.</p> <p>Currently, ETFs are one of the fastest growing investment products providing asset diversification around unique asset classes.</p>
Externality	In economics, an externality is the cost or benefit that affects a party who did not choose to incur that cost or benefit.
Financial product	An instrument that is connected with the way in which money is saved, invested, managed or used. It is issued by a bank, financial institution, stock

	broker, insurance provider, credit card agency or government-sponsored entity. Examples: bank account, credit card, insurance, equity, bond, exchange-traded fund
Investment class	Same as asset class
Liquid yield option notes (LYONS)	A form of convertible that trades both as bonds but also the performance of an underlying equity
Outcomes-based financing	Financing mechanisms that see end-funding triggered when the systemic outcomes are met, e.g. how many children die in a region. A process that usually means that diverse stakeholders work together. As opposed to an Output mechanism that looks at funding a bilateral intervention and then measuring that, e.g. build a hospital and then measure the impact
Principal	<ol style="list-style-type: none"> 1. A sum of money or capital which can earn interest 2. The owner of a firm or other asset(s) who assigns the management of the firm or asset(s) to an agent (who acts on behalf of the principal)
Private equity (PE)	Private equity is a non-publicly traded source of capital from investors who seek to invest or acquire equity ownership in a company. A private equity investment will generally be made by a private equity firm, a venture capital firm or an angel investor. Each of these categories of investors has its own set of goals, preferences and investment strategies. However, all provide working capital to a target company to nurture expansion, new-product development or restructuring of the company's operations, management or ownership
Private placement	A private placement is a funding round of securities that are sold to a small number of chosen investors and not through a public offering in the stock market.
Programme related investment (PRI)	Passed in 1969 by the U.S. Congress, PRI are investments made by a foundation in a for profit security with a social purpose. Such investments count towards the 5% the foundation has to allocate to retain its tax benefits of being a foundation There are a number of constraints, including that the investment has to provide below market returns at the outset. The PRI rules were revised in the USA from 2012 to 2016. They now reflect the changes that would enable blue equity. In other jurisdictions, a similar process can be achieved by contract law.
Quasi-equity	A synthetic security created by financial engineering. It creates an equity-like structure around a defined issue, e.g. WASH.
Royalty	A payment to an author or composer for each copy of a work sold or to an inventor for each item sold under a patent
Security (fr.: valeur, titre; dt: Wertpapier)	An instrument of investment that takes the form of a document (such as a stock certificate or bond) that provides evidence of its ownership
Tax wrapper	A way to structure an asset class so that is saving taxes ('tax efficiency') Examples: pension fund, foundation
Venture capital (VC)	A type of private equity, a form of financing that is provided by firms or funds to small, early-stage, emerging firms that are expected to have a high growth potential.

Other terms	
C-Corp	A standard corporate framework in the U.S.

C List of tables, figures and boxes

Table 1: Sustainable Development Goal Nr 6 - key targets and indicators.....	10
Table 2: Work streams and their participants.....	19
Table 3: Building blocks of social equity.....	29
Table 4: Different types and roles of stakeholders.....	32
Table 5: Methodology to implement a market network.....	40
Table 6: Summary budget.....	62
Figure 1: Achieving the SDGs requires old and new sources of financing.....	13
Figure 2: Every day, 1800 children die from diseases caused by poor WASH.....	14
Figure 3: Map of the Senegal River Basin.....	15
Figure 4: Ten design principles inform the work of Project 1800.....	17
Figure 5: A citizen-centric model for creating an SDG 6 market network.....	18
Figure 6: Data-driven design of interventions and tracking of outcomes.....	25
Figure 7: Sample structure for a regional or sectorial sponsored fund.....	35
Box 1: Design thinking.....	20
Box 2: Distributed ledger.....	36
Box 3: Design rationale.....	37

D. The Senegal River Basin⁵⁵

5.3 Environment

The basin has three distinct parts:

- the upper, mountainous basin
- the valley and
- the delta, a source of biological diversity and wetlands.

Most of the SRB has a sub-Saharan desert climate, which has been aggravated by more or less long periods of drought during the 1970s. Seasonal temperatures vary extensively.

5.4 Politics

Eyeballing the maps of administrative units,⁵⁶⁵⁷⁵⁸⁵⁹ the following estimate emerges of jurisdictions in the SRB. To simplify, we have assumed that departments = prefectures and communes = sub-prefectures.⁶⁰

	Regions	Departments	Communes	Rural Districts
Senegal	Saint-Louis	Dagana	5	5
		Podor	12	10
		Saint-Louis	2	3
	Matam	Kanel	6	5
		Matam	4	6
		Ranéroou Ferlo	1	3
	Louga?	Kébémér	1	17
		Linguère	3	16
		Louga	1	13

⁵⁵ Sources: <http://blogs.worldbank.org/nasililiza/setting-example-cooperative-management-transboundary-water-resources-west-africa>; http://www.unesco.org/new/fileadmin/MULTIMEDIA/HQ/SC/pdf/wwap_Senegal%20river%20Basin_case%20studies1_EN.pdf; <http://portail-omvs.org/en/presentation/objectives/objectives> (retrieved 13.02.18); <http://ase.tufts.edu/water/pdf/WaterConflict/OusmaneDione.pdf>.

⁵⁶ https://en.wikipedia.org/wiki/Departments_of_Senegal.

⁵⁷ https://en.wikipedia.org/wiki/Departments_of_Mauritania.

⁵⁸ https://en.wikipedia.org/wiki/Guinea#Government_and_politics.

⁵⁹ <https://en.wikipedia.org/wiki/Mali#Geography>.

⁶⁰ ? Indicate administrative units that may or may not be in the watershed, or unknown numbers.

Mauritania	Assaba	Aftout	?	?
		Bouneid	?	?
		Guerou	1	?
		Kankossa	?	?
		Kiffa	1	?
	Brakna	Boghe	1	?
		Bababe	?	?
		M'Bagne	?	?
		Aleg?	1	?
		Magta-Lahjar	?	?
	Gorgol	Kaedi	?	?
		M'Bout	?	?
		Maghama	?	?
		Monguel	?	?
	Guidimaka	Ould Yenge	?	?
		Sélibaby	?	?
	Hodh El Gharbi	Kobenni	?	?
		Tintane	?	?
		Ayoun el Atrous	?	?
		Tamchekket	?	?
	Trarza ⁶¹	Keur Massene	?	?
		Rosso	?	?

⁶¹ There are 3 more departments in the region that were judged, by visual inspection, to lie outside the SRB

		R'Kiz	?	?
Mali	Kayes	Kayes	28	?
		Bafoulabé	13	?
		Kéniéba	12	?
		Kita	33	?
		Diéma	15	?
		Nioro	16	?
	Yélimané	12	?	
	Koulikoro	7	106	?
Guinea	Labé	5 prefectures	53 subpref's	?
	Kankan	5 prefectures	57 subpref's	?
Total	13	56	384	78+

5.5 WASH landscape

Swiss NGOs	Local NGOs	Private Actors	Org's at SRB Level	World Bank Programs @RB level	International (outside SRB)	International WASH w/SRB interest
Terre Des Hommes	ENDA-EAU (Senegal)	SDE (Senegalaise des Eaux)	OMVS	PGIRE II	Gates	SWA - all countries
HEKS/EPER			African Network of Basin Organizations	CIWA (not yet there??)	WSH team	CLTS - all countries
Action de Careme			SITWA	MWRD (ongoing?)	GWP	WaterAID
GWP's Country Water Partnership in Senegal (accredited in 2017)			Project RIOB		IWP (India Water Partnership?)	UNICEF
MSF Suisse					Toilet board Coalition	
Verein Hand für Afrika					International Water Association	
World Vision Schweiz					IUCN	
Handicap International Suisse					International Water Governance	

Foundation funding does not seem to have focused on WASH from 2010 to 2015 according to SDG PP (although their results are very high level and mostly focused on U.S. foundations) <http://sdgfunders.org/sdgs/country/senegal/dataset/historical/>.

The range of players, though not fully captured in the above table, does signal the potential of a blue equity structure to be applied in the context, as the SRB ecosystem is rich with programmatic activity. There are many international organisations whose footprints and relationships may help to leverage philanthropy, venture philanthropy and impact investment.

5.6 Unedited notes

Mauritania

“The local administration is adopted from French local administration framework with a Ministry of Internal Control governing the local bodies. The original administration was held by governors of each district, but after the municipal elections in 1994, the powers have been decentralized from the district bodies.^[11] Mauritania has been divided into 13 *wilayas* (regions), including the Nouakchott Capital District. The smallest administrative division in the country is the commune and the country has 216 of them. A group of communes form a *moughataa* (department) and the group of moughataa form a district. There are total of 53 moughataa for the 13 districts in the country. The executive power of the district is vested on a district chief, while it is on hakem for moughataa.^[12] Out of the 216 communes, 53 classified as urban and rest 163 are rural. The communes are responsible for overseeing and coordinating development activities and are financed by the state. The local governments have their own legal jurisdiction, financial autonomy, an annual budget, staff, and an office.”⁶²

Who is on the ground?

Senegal

- L'ETAT définit la politique globale du secteur.
- La SONES (Société Nationale des Eaux du Sénégal) est chargée de la gestion du patrimoine, la maîtrise d'ouvrage des travaux de renouvellement et d'extension de l'infrastructure, le contrôle de la qualité de l'exploitation.
- La SDE (Sénégalaise des Eaux), société privée, est chargée de l'exploitation [de l'eau en milieu urbain]. Elle a pris service le 23 avril 1996. Elle est lié à l'Etat du Sénégal par un contrat d'affermage⁶³ et avec la SONES par un contrat de performances.
- L'ONAS (Office National de l'Assainissement) est chargé de l'exploitation de l'assainissement.⁶⁴

The *PLAN SENEGAL EMERGENT - Plan d'Actions Prioritaires 2014-2018* describes the strategic and sectoral priorities as well as action lines of the Senegalese government during the period 2014-2018.

⁶² https://en.wikipedia.org/wiki/Assaba_Region

⁶³ <http://ppp.worldbank.org/public-private-partnership/agreements/leases-and-affermage-contracts>

⁶⁴ <http://www.sde.sn/Pages/Partie-Institutionnelle.aspx>

https://www.sec.gouv.sn/IMG/pdf/PAP_2014-2018_du_PSE_version_definitive_commentaires_et_ANNEXES.pdf

Two tables in the document might be of interest to the Metrics team:

1. Evaluation grid to determine priorities for action (“en fonction de leur apport probable, essentiellement sur la croissance économique et le développement humain durable”) (p. 2)

No	Libellé	Poids
1	Accélération de la croissance économique ou la productivité	20
2	Amélioration de l'environnement des affaires	7
3	Amélioration la gestion des finances publiques	5
4	Création d'emplois	8
5	Réduction des inégalités	10
6	Impact sur le développement local	12
7	Amélioration des conditions de vie des populations	30
8	Bonne gouvernance sectorielle	8
	Total	100

2. Criteria of choice for public private partnerships (p. 5)

Critères de pondération des PPP	Poids
C1: Qualité LA (1-LA=1 si LA est de rang 1; 0-si non)	40
C2: Génération directe de revenus (1-Oui; 0- si Non)	10
C3: Impact population (1-Oui; 0- si Non)	15
C4: Impact sur l'emploi (1-Oui; 0-si Non)	7
C5: Qualité service public (1-Oui; 0-si Non)	7
C6: Impact sur l'environnement (1-Oui; 0-si Non)	7
C7: Initiative présidentielle ou primatorale (1-Oui; 0-sinon)	15
Total	100

Water and sanitation are mentioned as follows:

(P. 7) Les principaux projets et programmes inscrits dans le gap de financement du volet public d'un montant de 2 361 milliards de FCFA montrent la prépondérance des six (6) secteurs suivants :

- ...
- l'eau potable et de l'assainissement pour 251,6 milliards de FCFA, soit 10,7% ; avec le PEPAM pour la résorption de son gap de financement ainsi que l'assainissement rural et des villes ; [5th position, after education and training, before health]
- ...

À ces six (6) premiers secteurs, suivent dans l'ordre cinq (5) secteurs tout aussi importants mais dont les gaps de financement sont inférieurs à 100 milliards de FCFA:

- ...
- les risques et catastrophes pour 40 milliards de FCFA, avec le projet de gestion des eaux pluviales et le projet de résilience climatiques et gestion des risques et catastrophes ;
- ...

Le volet PPP du PAP, d'un montant de 1587 milliards de FCFA concerne les secteurs suivants :

- ...
- l'eau potable et l'assainissement : 40 milliards de FCFA avec la réalisation d'une usine de dessalement de l'eau de mer ;
- ...

The government has 3 strategic axes:

1. Transformation structurelle de l'économie et croissance, frs CFA bn 6,439,266 (66,5%)
2. Capital humain, Protection sociale et Développement durable, frs CFA bn 2,520,487 (26,0%)
3. Gouvernance, Institutions, Paix et sécurité, frs CFA bn 725,972 (7,5%)

WASH is considered part of *axe 2 capital humain, la protection sociale et le développement durable* (p. 9)

E. Design principles

Citizen-centred

Citizen-centred design means designing for the needs of the individual participants and recognizing their sovereignty and agency. By placing the human individual at the centre of the design experience, we ensure the design of a system that transcends organisational and political boundaries.

Equitable

All participation in the framework must be appropriately recognised, attributed, and valued, with participation in the governance of the framework *in situ* commensurate with one's level of experience, investment, and/or risk.

Agile

We are not going to get this perfectly right before we begin. Being agile means focusing on the development of minimum viable agreements and a minimum viable product, and iterating forward on the basis of user feedback.

Distributed

The centralisation of data is one of the primary causes of dysfunction within this market. We favour a decentralised approach to both data sharing and platform interactions utilising distributed ledger technologies to validate value creation.

Persistent

Network participants should be able to interact with the network regardless of physical or digital location, technology, bandwidth or other factors unique to their context. Further, they should be able to interact meaningfully with the entire system from any of the platforms involved.

Modular

By developing a framework comprised of multiple disparate entities, the components must be designed to work together, or alone, with equal effectiveness. This also minimises risk by permitting modules to be swapped out as required.

Scalable

Most 'development' technology platforms are designed for use in high-bandwidth, high-computing power environments, with reliable network and power access. This excludes many citizens from actively participating in, and benefiting from, the framework. For the framework to be scalable it has to work in low bandwidth settings, and allow for asynchronous operation.

Interoperable

The platform, and its data, must be interoperable with all other adjacent and overlapping platforms and databases. This requires data protocols and standards, including universal taxonomies, as well as the design of application programming interfaces (API) as a functional requirement.

Measurable

The system must be designed in such a way that data flows are quantifiable, supporting better sense-making, value-recognition and capital flow.

Investable

Monetary value must be able to be assigned to the value created within the framework. This is the only way in which the necessary level of financial capital can be brought to bear on wicked problems.⁶⁵

⁶⁵ We expand on this model in considerable detail in Burgess et al. 2018. Op. cit.

F. Activities carried out under this phase

Item	Activities
A. Project management	<ul style="list-style-type: none"> • Strategos negotiated the service contracts with partners (Arthur Wood, Sphaera and Artha Networks Inc.) and executed down payments. • The core team started with a face-to-face kick-off meeting, where it got introduced to each other and developed ground rules for the work at hand. Later on, it met once to twice per week; depending on needs—to discuss strategy, stakeholders and execution (running notes of these meetings are available upon request). • Project management tools and terms of references for the work streams were drafted (available upon request). • Strategos prepared an interim statement and will prepare a final financial report.
B. Immersion workshop	See description in Section 3
C. Financial tool design	<p>The finance work stream, composed of Jacqueline Barendse (WASTE), Sjeff Ernes (Aqua for All), Audrey Selian (Artha Networks Inc./Rianta Capital Zurich) and Arthur Wood (Total Impact Advisors), met two times to prepare itself for the immersion workshop. First in person (15 November 2017 at the Geneva Impact Hub - meeting graciously hosted by Rianta Capital Zurich) and then via videoconferencing. After some further email exchanges, the group produced an interim report that was distributed to the other workshop participants. After the workshop, further online meetings and exchanges per email took place, the results of which were integrated into this report.</p>
D. Metrics framework design	<p>The process in the metrics work stream, composed of Fredrik Galtung (Integrity Action), Michael Green (Social Progress Imperative), Guy Hutton (UNICEF), Astrid Scholz (Sphaera) and Arthur Wood (Total Impact Advisors) was similar. A first face-to-face meeting took place on 10 November 2017, graciously hosted by UNICEF Geneva. Another online meeting and an email exchange followed, resulting in an interim report for the immersion workshop participants. Again, following the immersion, several other online meetings and email exchanges took place afterwards. The results have been integrated into this report.</p>
E. Legal scoping	<p>The kick-off meeting of the legal work stream took place on 20 November 2017 in Washington D.C. Work stream members were Bill Kelly (retired partner, Latham & Watkins), Chuck Muckenfuss (retired partner, Gibson Dunn), Marc Owens (Loeb & Loeb - former US philanthropic regulator), Astrid Scholz (Sphaera) and Arthur Wood (Total Impact Advisors). Again, the team produced an interim report for the immersion. Subsequently, extensive further discussions have been held on the complex issues of the governance frame of both blue (social) equity and the umbrella holding entity. Further legal expertise has been engaged through the</p>

	International Senior Lawyers Group, including Tom Brunner, the General Counsel of Leapfrog, with an eye to engaging a major global legal firm for a possible Phase 2 of the Project.
F. Systems architecture	The systems architecture builds on previous work done by Sphaera with other actors in the WASH space, notably the Bill and Melinda Gates Foundation, the World Intellectual Property Organisation (WIPO), and private corporations. Using the design principles, discovery process and immersion workshop detailed here, we refined the systems architecture to incorporate the insights yielded from the metrics, finance, and legal works teams supported by Project 1800.
G. Engagement of stakeholders	<p>Meetings and conversations with SDC:</p> <ul style="list-style-type: none"> • Mid-term briefing meeting with SDC-GPW (Johan Gély, Eileen Hofstetter, Pierre Kistler, Roman Ambühl) and SDC-e+i (Peter Beez) on 8 December 2018 in Bern, including Arthur Wood, Audrey Selian and Violette Ruppanner • Participation in Global Programme annual presentation on 17 January 2018 in Bern, followed by networking conversations with Tatiana von Steiger, Deputy Global Programmes, and other participants • Meeting with SDC-e+i (Peter Beez) (Arthur Wood and Violette Ruppanner) on 26 January 2018 in Bern) • Regular informal meetings and phone conversations with Pierre Kistler • Sometimes weekly, sometimes over longer periods email reports disseminated to core stakeholders in SDC <p>Other stakeholder meetings, conversations (incl. by phone) and email exchanges:</p> <ol style="list-style-type: none"> 1. Marion Weichelt Krupski, Ambassador, Swiss Embassy, Dakar, on 22 November 2017 2. Lamine Ndiaye, Director of Environment and Sustainable Development, Organisation pour la mise en valeur du fleuve Sénégal on 31 November 2017 3. Renaud de Watteville, Swiss Fresh Water (several occasions) 4. Dinner with extended stakeholder group on 14 December 2018 at Château de Bossey (for a full list of participants, see Appendix G) 5. Mark Smith, Director Global Water Programme, IUCN, on 18 December 2017 6. Francois Brikke & Frederik Pischke, Global Water Partnership (GWP), November - December 2017 7. François Münger, Geneva Water Hub on 8 January 2018 in Lausanne 8. Tina Beattie, Global Humanitarian Lab (GHL), on 28 January and 8 February 2018 9. Stéphanie Kioutsoukis, Fresh Strategy, consultant to SDC on engagement of private sector on 6 February 2018 (referral from Tatiana von Steiger) 10. Simon Stiles, Chief investment officer HNWI at UBS on 7 February 2018 in Zurich 11. Ben Lambert, Canadian Government Pension Fund (CCIBP), on 8 February 2018

	<ol style="list-style-type: none"> 12. Shaun Hazeldine, Head of Strategy, International Federation of Red Cross and Red Crescent Societies (IFRC) on 9 February 2018 13. Agnès Montangero & Soraya Kohler, Swiss Water Partnership (SWP) and Franck Barroso, Waterpreneurs, on 15 February 2018 14. Arne Pansenar, Director for Sustainable Sanitation, GIZ, several occasions 15. Arno Rosemarin, Stockholm Environmental Institute / Sustainable Sanitation Alliance (SuSanA), several occasions 16. Jan Willem Rosenboom, WSH program of the Bill and Melinda Gates Foundation, numerous occasions 17. Diane Kellogg, Senior Adviser to SuSanA, numerous occasions 18. John Tidmarsh, Chief Investment Officer, R20 Regions of Climate Action 19. Tal Ronen, YK Centre (California / Israel) 20. John Simon, Total Impact Capital (former head of OPIC, former American Ambassador to the African Union) 21. Michael Webber, Former UK Charity Commissioner 22. Aida Karazhanova, UNESCAP 23. Anatole Krattinger, formerly WIPO 24. Jon Lane, former Executive Director of World Water Supply and Sanitation Collaborative Council (WSSCC, numerous calls in January and February 2018)⁶⁶ 25. Cheryl Hicks, CEO, Toilet Board Coalition, on 5 March 2018 26. Nicholas Lorne, CEO Waterpreneurs, on 5 March 2018 27. Stanford Water Financing Workshop, Washington DC, on 7 March 2018 (participation funded by Stanford)
H. Communications	<ul style="list-style-type: none"> • Briefing meeting Arthur Wood , Ed Girardet (October) • Kick-off communication group (Ed Girardet, Violette Ruppanner) on 29 November 2017 • Preparatory meeting with SECO (WEIF) and active participation of Arthur Wood and Violette Ruppanner (reception only due to illness) in UBS Optimus Foundation-SECO-SDC Social Impact Bond Conference on 18 January 2018 in Zurich • 2nd meeting of communication team (Violette Ruppanner and Ed Girardet) on 23 January 2018 • Contribution to Waterpreneurs white paper <i>Innovative Finance for scaling-up WASH Market Based Solutions</i> (to be published on 22 March 2018) • Participation in information event on SWP financing facility on 2 March 2018 (Arthur Wood, Violette Ruppanner) • Participation in the Stanford Water Financing Workshop - Washington DC - 7 March 2018 (participation funded by Stanford) event on WASH and system financing in Washington DC

⁶⁶ Jon Lane produced the report [Increasing Financial Flows for Urban Sanitation](#), published by the World Water Council in March 2018.

	<p>on 7 March 2018 (Arthur Wood)</p> <ul style="list-style-type: none"> ● Planned participation in 8th World Water Forum 18-22 March 2018 (Violette Ruppner)
<p>I. Scope & budget for Phase 2</p>	<p>Leveraging the previous roadmap for an SDG 6 market network developed by Sphaera for the Bill and Melinda Gates Foundation, we refined the estimates to reflect the insights about necessary methods development, legal costs and financial product development gathered in <i>Project 1800</i>. We also updated the estimates for engineering as well as for the “soft” costs of project management, stakeholder engagement, coordination and travel to reflect the complexity and specificity of the SRB as a potential first use case for an SDG 6 Market Network.</p>
<p>J. Summary report</p>	<p>The summary report was authored by the core team members and staff of participating organisations, with contributions from the work stream members (especially Bill Kelly from the legal work stream and Guy Hutton on the metrics work stream). It was edited by Ed Girardet.</p>

G. Participants at the extended stakeholder dinner

First name	Last name	Organisation	Title
Jacqueline	Barendse	WASTE	Managing Director
Franck	Barroso	Waterpreneurs	Managing Partner
Cameron	Burgess	Sphaera	Systems design
Renaud	de Watteville	Swiss Fresh Water	CEO
Badara	Diom	SENOP	CEO, Mayor of Djirnda rural community
Sjef	Ernes	Aqua for All	CEO
Alessandro	Fedele	IFRC	Unit Manager, Private Sector
Linzi	Fidelin	Sphaera	Project manager
Frederik	Galtung	Integrity Action	CEO
Edward (Ed)	Girardet	Geneva Global	Editor in Chief
Michael	Green	Social Progress Imperative	CEO
Johannes	Heeb	seecon / cewas	Co-founder, Chair executive board
Guy	Hutton	UNICEF	Senior Advisor
Jenny	Karlsen	WSSCC	Partnerships
Bill	Kelly	Latham & Watkins	Senior Advisor
Cynthia	Kelly	Atomic Heritage Foundation	Founder and President
Anatole	Krattiger	WIPO	Director, Global Challenges Division
Clémence	Langone	Access to Water Foundation	Project manager
Olivier	Magnin	-	Water Engineer
Rui	Melo	IMC Technologies	CTO
Nicholas	Niggli	Republic & State of Geneva	Director General
Violette	Ruppanner	Strategos	Partner
Astrid	Scholz	Sphaera	CEO
Audrey	Selian	Artha / Rianta	Director
John	Tidmarsh	Regions of Climate Action	Chief Investment Officer
David	Trouba	WSSCC	Senior Comm. & Outreach Officer
Anja	Von Der Ropp	WIPO	Legal Officer, Global Challenges Div.
Sandra	Wirth	Strategos	Partner
Arthur	Wood	Total Impact Capital	Co-Founder, Lead Project "1800"

H. Immersion workshop participants

Name & organisation	Current position & professional experience
Jacqueline Barendse WASTE www.waste.nl	<ul style="list-style-type: none"> • <i>Managing Director & Senior Business Adviser and Coordinator of the Solid Waste Group</i> • Broad range of financing and project expertise (access to finance, microfinance, SME development, infrastructural projects, corporate financing, guarantee and investment funding, development finance, private sector development programmes, public private partnerships) • Finance and business development for micro- to large enterprises in different sectors (industry, ICT, financial sector, infrastructure). • Product and business development manager for Philips Electronics • Investment manager, ING Bank
Cameron Burgess Sphaera Solutions Uncompromise	Experienced impact entrepreneur and commercialisation strategist, with more than 20 years of experience at the intersection of social technology and social change. Cameron has worked globally across more than 30 market segments from social enterprise, civil society, green goods, fintech, cleantec and renewable energy.
Renaud de Watteville Swiss Fresh Water Access to Water Foundation	<ul style="list-style-type: none"> • <i>CEO & Founder SFW</i> • <i>Founder, Access To Water Foundation</i> • Co-Founder, Dream Boxes and Founder, Swiss Mate (event organiser, incl. Freestyle.ch) • Delegate for sports, Expo.02 • Professional pilot
Badara Diom Djirnda rural community SENOP Access to Water Foundation	<ul style="list-style-type: none"> • <i>Mayor of the Djirnda rural community (youngest mayor ever elected in Senegal), General Manager, SENOP Ltd & Senegal Representative, Access to Water Foundation</i> • President of the regional association of rural community presidents of Senegal from 2009- 2014 • President of the Djirnda rural community from 2002-14
Sjef Ernes Aqua for All	<ul style="list-style-type: none"> • <i>Managing Director and CEO</i> • Former Managing Director, Municipal Water Company, Eindhoven • Business Development Manager and CEO for a private company in the industrial water sector • Lived for five years in rural areas of Mozambique working for the Ministry of Agriculture and contributing to the development of irrigation systems and infrastructure for access to drinking water • Consultant for UNEP and the Water Education Institute
Linzi Fidelin Sphaera Solutions	<ul style="list-style-type: none"> • <i>Key Accounts and Training Lead</i> • <i>Facilitator</i> • Global development veteran • 10 years working in 18+ countries • Consultant for Care, WFP, BASF etc. • Specialised in organisational learning, collaborative technologies, Communities of Practice, research, narrative & storytelling, information management, workshop facilitation

<p>Fredrik Galtung <u>Integrity Action</u></p>	<ul style="list-style-type: none"> • <i>President and co-founder</i> • World-renowned expert in measurements and metrics pertaining to corruption, fraud and organisational integrity • Founding staff member and Head of Research of Transparency International (TI) • Products: Development Check (https://developmentcheck.org/), Bribe Payers Index (BPI), Global Corruption Barometer (with Gallup International) • Founder of Integrity Education Network • Lecturer • Ashoka Fellow
<p>Edward (Ed) Girardet <u>Global Geneva magazine</u></p>	<ul style="list-style-type: none"> • <i>Editor, Global Geneva magazine</i> • Editor, Le News • Reporter for The Christian Science Monitor, US News and World Report and the PBS MacNeil-Lehrer NewsHour • Regarded as one of the most informed international journalists on Afghanistan and humanitarian media issues. • Author of several books, including Killing the Cranes
<p>Michael Green <u>Social Progress Imperative</u></p>	<ul style="list-style-type: none"> • <i>CEO</i> • <i>Economist</i> • Co-author of Philanthrocapitalism: How Giving Can Save the World and The Road from Ruin: A New Capitalism for a Big Society: • Senior official in the U.K. Government's Department for International Development, Economics lecturer at Warsaw University in Poland • Named one of "The 100 Most Connected Men in Britain" by GQ Magazine and one of the NonProfit Times's "Power & Influence Top 50" in 2016 • https://www.ted.com/talks/michael_green_what_the_social_progress_index_can_reveal_about_your_country
<p>Johannes Heeb <u>seecon</u> <u>cewas</u></p>	<ul style="list-style-type: none"> • <i>Co-founder & Chairman of the executive board</i> • <i>Managing Director, cewas– International Centre for Water Management Services</i> • Expert in regional development, sustainable resource management and ecological engineering • Board member, Tropenhaus Wolhusen and Tropenhaus Frutigen • Assistant director, regiosuisse • Co-founder Centre for Applied Ecology, International Ecological Engineering Society (IEES), Centre for Ecological Engineering Tartu (CEET) • Lecturer at the University of Basel and the Lucerne University of Applied Sciences and Arts • Member of the cantonal parliament of Canton Lucerne (1987-1995)
<p>Guy Hutton <u>UNICEF</u></p>	<ul style="list-style-type: none"> • <i>Senior Advisor</i> • <i>Development Economist</i> • University of London, University of Basel, World Bank • Leader of country implementation projects, international research studies and global advocacy initiatives in the fields of water, sanitation, health, air pollution and climate change • Played a leading role in the global "economics of sanitation initiative" and global results monitoring for the World Bank; the process to select global water, sanitation and hygiene (WASH) targets and indicators after 2015 for the Joint Monitoring Program (World Health Organisation and UNICEF); the review of indicators to monitor affordability of WASH services globally (UN Office of the High Commissioner for Human Rights), global and country economic briefings for the 'high-level meetings' (Sanitation and Water for All partnership), the World Bank's global SDG WASH costing study, WASH chapter of 3rd edition of Disease Control Priorities and many

	more
William (Bill) Kelly Retired partner, <u>Latham & Watkins</u>	<ul style="list-style-type: none"> • <i>Retired Partner</i> • <i>Board Member, Ashoka</i> • Former President, Stewards for Affordable Housing • Member of the Bar of the District of Columbia • Director, Ashoka Innovators for the Public, the Governance Institute and the Washington Legal Clinic for the Homeless • Member of the Elderly Housing Coalition and the D.C. Bar's Community Economic Development Pro Bono Project • Executive Assistant to the Secretary of the United States Department of Housing and Urban Development
Pierre Kistler <u>Swiss Agency for Development and Cooperation (SDC)</u>	<ul style="list-style-type: none"> • <i>Programme Manager, Global Programme Water</i> • <i>Geographer & ethnologist</i> • Programme manager, Institutional partnerships, SDC • Programme manager, West Africa, SWISSAID • Project director, Otto Frei AG • Project Director, Centre for Development and Environment (CDE), University of Bern (Madagascar)
Clémence Langone <u>Access to Water Foundation</u>	<ul style="list-style-type: none"> • <i>Project manager</i> • Traineeships: • Bureau cantonal d'aide au retour - Service de la population (Vaud) • EarthCheck, Relationship Management and Consulting (Australia) • Youth Welfare & Social Affairs, Ville de Pully • Volunteer experience: Barefoot College, Enrich & Solar Programmes (Rajasthan, India) Jumeirah Group / Jumeirah Hotels & Resorts, Guest Relations Trainee (Dubai)
Olivier Magnin	<ul style="list-style-type: none"> • Former programme manager SDC (2008 - 2017) • Hydrogeologist engineer and WASH specialist • Experience in project and programme design and management in development and cooperation • Experience and knowledge in water governance and in integrated water resources management (IWRM) as well as in disaster risk reduction and climate change • Worked with the International Committee of the Red Cross (ICRC), various NGOs, with the Swiss government and as freelance consultant in Africa in humanitarian and development programmes
Violette Ruppner <u>Strategos</u> <u>Swiss Bluetec Bridge</u>	<ul style="list-style-type: none"> • <i>Partner, Strategos</i> • <i>Manager, Swiss Bluetec Bridge</i> • <i>Co-Lead Project 1800</i> • Strategy development & change facilitation • Experience and knowhow in project design & management, strategy development & execution, business planning & development as well as change facilitation & organisational governance • Worked in government, IGO, NGO and the private sector on topics such as international trade, trade diplomacy, economic development cooperation, trade and development, human rights and trade
Astrid Scholz <u>Sphaera Solutions</u>	<ul style="list-style-type: none"> • <i>CEO</i> • <i>Co-Lead Project 1800</i> • immediate past President of Ecotrust (where Sphaera was incubated in partnership with the Rockefeller Foundation, Mercy Corps, Oxfam, the Island Institute and other like-minded organisations) • Advisor for public-private partnerships for conservation and social outcomes (for example the State of California's Marine Life Protection Act Initiative) • Founding board member of XXcelerate Fund, a revolving loan fund created for and by women entrepreneurs piloting in Oregon, US • Board member of several conservation and economic development related civil society organisations.

	<ul style="list-style-type: none">• Speaker on social innovation, the business of philanthropy and the role of technology for change
Arthur Wood Total Impact Advisors	<ul style="list-style-type: none">• <i>Founding partner</i>• <i>Lead Project "1800"</i>• Convenor, World Sanitation Financing Facility• Senior Vice President and Global Head of Social Financial Services, Ashoka• Director - Head of Product Development and E Commerce - Kleinwort Benson• Institutional specialist in US Aerospace Defense / Geopolitics Co-creator of L3C legal structure in the US and the SELLP legal structure in the UK as well as social impact bonds and social equity; the first blended value model (Eye Fund)• Advisor to OECD on G8 Impact Investing Report and served for 3 years on the WEF Social Investment / Philanthropy Council• Regular speaker at leading global academic institutions as well as industry forums on social finance

I. WASH indicators

The most important feedback loop is derived from the direct inputs of citizens in their communities, with the segmentation of their subjective assessment of benefit falling under three main categories (defined below) for valuation purposes. Many outcomes/impacts can fall under more than one category.

- A financial benefit has a direct, measurable impact on household finances
- An economic benefit is longer-term impact that is likely to impact household finances (such as a child death), or is a resource (such as time) that can be valued in monetary terms
- A social benefit is related to non-financial non-market impacts, such as dignity, social status, comfort, quality of life, etc. Note, however, that some of these benefits can be given monetary value through willingness to pay surveys.

The calculation methodology (algorithm), data sources and causal pathways of impact need to be determined for each of these benefits, drawing on past studies that have done the same. The potential financing sources and willingness to pay for each of these benefits also require assessment. For real-time monitoring following project implementation, it is often necessary to identify which variables can be captured, by whom and with what validity.

Benefit type	Financial	Economic	Social
Health benefits (positive externality)			
· Value to individuals and households	Yes	Yes	Yes
· Value to businesses and employers	Yes		
· Value to educational attainment		Yes	Yes
Time benefits (private benefit)			
· Value to individuals and households	Yes	Yes	
· Value to businesses and employers	Yes		
· Value to educational attainment		Yes	
Environmental benefits (positive externality)			
· Value of cleaner environment to households and community		Yes	
· Value of cleaner water to households	Yes	Yes	
· Value to producers (water quality)	Yes		
· Value to businesses and employers (due to improved aesthetics)	Yes		

Productive value of excreta/sludge (private benefit)			
· Value to households	(Yes)	Yes	
· Value to producers (fertiliser, soil conditioner, wastewater reuse, energy)	Yes		
Additional benefits of institutional WASH			
· Value to would-be employers able to work (women)	Yes		Yes
· Value to existing workforce	Yes		Yes
· Value to children able to attend school		Yes	Yes
· Health benefits – averted death	(Yes)	Yes	Yes
· Health benefits – averted disease cases	Yes	Yes	Yes
· Time savings for productive /leisure uses	Yes	Yes	
· Reduced infections from WASH in health care facilities	Yes	Yes	
Social benefits (convenience, dignity)			
· Value to women, mothers and girls			Yes
· Value to elderly, impaired			Yes
· Value to households (guests)			Yes

I. WASH status indicators

Household coverage and practices	Institutions and public spaces (schools, health facilities, markets)
Basic water (community source)	Basic water
Household water treatment	Basic sanitation
Piped water supply	Basic hygiene
Basic sanitation	Menstrual hygiene management (MHM)
Hand washing	Other hygiene, such as food
Safely managed water (SDG target 6.1.1)	

Safely managed sanitation (SDG target 6.2.1)	
Other hygiene (food, MHM, floor)	

- II. Benefits, costs and total externalities of WASH
- III. Changes in WASH status

J. Sample product: An exchange-traded fund (ETF)

One of the standard primary instruments at our disposal to realise a broader blue equity structure is the 'exchange-traded fund' or ETF.

An ETF, or exchange-traded fund, is a marketable security and special purposes vehicle that tracks an index, a commodity, bonds, or a basket of assets. Unlike mutual funds, ETFs trade like a common stock on a stock exchange. They can experience frequent price changes as they are bought and sold and typically have higher liquidity and lower fees than mutual fund shares, making them an attractive alternative for individual investors. Because they trade like a stock, ETFs do not have their net asset value (NAV) calculated once at the end of every day like mutual funds.⁶⁷

Further, an ETF is a type of fund that owns its own underlying assets (shares of stock, bonds, oil futures, gold bars, foreign currency, etc.) and divides ownership of those assets into shares. The actual investment vehicle structure (such as a corporation or investment trust) will vary by country, and within one country there can be multiple structures that co-exist. Shareholders do not directly own or have any direct claim to the underlying investments in the fund; rather they indirectly own these assets. They are entitled to a proportion of the profits, such as earned interest or dividends paid, and they may get a residual value in case the fund is liquidated. The ownership of the fund can thus easily be bought, sold or transferred in much the same way as shares of stock, since ETF shares are traded on public stock exchanges.

Our thesis that tradable financial mechanisms are useful to our objective is based on the idea that the umbrella organisation will provide digital infrastructure and support any number of dynamic, mission-locked ETFs / SPVs. Each ETF may on average manage up to USD US\$20-30m; with individual structured products, one could probably raise in the range of US\$5m. This is further elaborated upon in [Section 6](#), where we explore a potential governance framework.

The legal counsel consulted for *Project 1800* are those whose careers have been entrenched in the work of the SEC, and other major social impact / entrepreneur support organisations in the USA. Ample evidence has been provided from the case of pro bono legal service to an ETF issuer called Impact Shares (<http://www.impactshares.org/>), who in November 2017 set up three funds (one for women's empowerment, one for minority empowerment and one for various causes), all of which have been slated to launch in Q1 2018.

The essence of their design, which is replicable for ours, is in the formation of a series of socially responsible investment solutions that enable not-for-profits and for-profits to together invest in low cost equity solutions designed to enable such collaboration. This precedent is a critical one for *Project 1800*, insofar as costs are controlled in a context in which corporate responsibility, deep social sector expertise, and the value of public brands are all optimally leveraged and aligned for collective benefit. Our iteration is to take that model and add in a contingent payment solution, where economic value is managed inside the traditional ETF structure, but social value is calculated and activated as a driver of return. If we move to Phase 2 of operationalising this plan,

⁶⁷ <https://www.investopedia.com/terms/e/etf.asp#ixzz56vm2W6o7>

the appropriate legal team has already been identified, and initial conversations with a leading ETF lawyer already completed.

Such products are intended to build “the” new channel for retail and small to mid-sized institutional investors to use their capital to engage with social causes while earning an equity market return. They are also flexible enough to integrate the smaller, more agile (but not necessarily less deep-pocketed) private wealth funds whose increasing awareness of their role as catalyst is only becoming more obvious with time.

The true versatility of the ETF as a liquid, tradable investment instrument is perhaps best captured by the range of risks that are listed in the standard registration statements stipulated by the SEC. Indeed, most ETFs are investment companies. Therefore, the Funds’ purchases of ETF shares generally are subject to the limitations on, and the risks of, the Funds’ investments in other investment companies. This range is indicative of the vast possibilities in the context of using ETFs for social purpose,⁶⁸ including the ability of deriving daily investment results that correspond to the inverse (or a multiple of the inverse) of the daily performance of some or another index.

In terms of who can partake in an ETF, any range of players may join in the equity structure of this vehicle, whose mission may be ‘locked’ through the issue of a ‘golden share’. How one may be rewarded for taking risk in financing an intervention that will have a target outcome may be determined on the back of the algorithms of the underlying information infrastructure or integrated platform that profiles and tracks all relevant activity.

Practical elements related to costs for specific time periods and target percentage returns for each year must be articulated, and investors in ETFs may pay brokerage commissions on their purchases and sales of fund shares. The turnover of a portfolio is a function of the commissions it pays when it buys and sells securities within its portfolio. A higher portfolio turnover rate may indicate higher transaction costs and may result in higher taxes when fund shares are held in a taxable account. These are the costs that affect annual fund operating expenses and thus, performance.

For *Project 1800*, we are considering using an ETF as a management frame of the Investment opportunities and the members of the LP in say the SRB. This would give a standard fund management frame for the Investments. Attached also would be the contingent payments reflecting the payments from the contingent payers triggered by the achievement of a delta of improvement of a social issue. Logically the ETF security would trade as a function of the combined economic and the market perception of the likely achievement of the social outcomes. As an ETF it has the benefit of providing a tradable frame with standard exchange mechanisms. As an ETF it could be placed in most standard portfolios and have access to a wide range of tax wrappers in which it could be placed - hence securing both compliant and efficient tax distribution in a range of jurisdictions. This will be subject to legal review in Phase 2 and will also be dependent on the size of the assets raised to address the issue. Dependent on the practicalities it therefore may be a private placement but with an eye to blending into an ETF structure going forward. The ultimate vision is a range of securities trading as a function of the achievement of social outcomes.

⁶⁸ The [Statement of Additional Information](#) provides relevant information on investment restrictions, management of the trust, and description of the Fund’s shares.

Project 1800

A report for the Swiss Agency for Development and Cooperation

K. Sample product: Aqua for All

Aqua for All (A4A) intends to apply the insights gained from *Project 1800* as well as the proposed structures to several of its public-private-partnership (PPP) projects currently being developed:

The sanitation social impact bond INDIA (where the contingent payment will come from the Clean India subsidy from the national Modi Government).

1. The rainwater-harvesting aquifer recharge approach as inevitable intervention for water source related parties (potential contingent payers could be corporates, breweries, bottlers, utilities, agriculture and industry)
2. The Finish mondial concept (contingent payer not identified yet)
3. Carbon credit related interventions (with carbon credits as contingent outcome payer), for example biogas programmes, charcoal substitution, re-use of compost to avoid artificial fertiliser production

The goal is to test the concepts in practice, to provide insights for the architecture and to demonstrate the benefits to all players within a single proposition. It rests on the assumption that there is no global solution for this global problem, but that the latter needs to be addressed through many local approaches and solutions (for example within a river basin, public territory, area of mandate or market segment).

For each of the projects mentioned, A4A will price either the negative or the positive externalities and contract a contingent payer as (ultimate) beneficiary. It will aggregate the players that can perform the wanted social impact as well as the process and the capital streams. The projects will be structured in a way that provides for a positive financial return. For this, it will need guidance in metrics for outcome monitoring, as different social value will ask for different parameters (that align with literature and practical abilities).

In parallel, A4A will start providing support to Swiss Fresh Water (previously supported by cewas and the Swiss Bluetec Bridge) to help it realise its ambition to scale up its business in the Senegal River basin.

The person responsible for *Project 1800* is Sjef Ernes CEO of Aqua 4 All working with Jacqueline Barendse, CEO of WASTE and Founding Manager of @scale ltd, a joint venture between A4A and Waste. The plan is to provide the Dutch Directorate-General for International Cooperation (DGIS) with a 'bidbook' of programmes that A4A wishes to support from 2019 onwards. In this 'bidbook', priority will be given to @scale-programs with DGIS funding to leverage DRFC and technical assistance (TA) support, unlocking private sector capital for scaling WASH interventions. Within that proposal, A4A will urge DGIS to participate in the further roll out of *Project 1800* as co-funder, provided that the Bill and Melinda Gates Foundation (BMGF), SDC and WIPO continue their support.

