

# BLUE PEACE BULLETIN

VOL 17/MAY 2020

# FINANCIAL INNOVATION



*Strategic Foresight Group*





**The Global High Level Panel on Water and Peace called for financial innovation to mobilize resources for the water sector, particularly for water cooperation. In this volume we look at some new instruments of innovative finance which can help mobilize resources in the times of boom, as well as recession.**

## Introduction

On account of the suspension of the world economy caused by the Covid 19 pandemic in the first half of 2020, it is generally expected that recession will set in for at least two years. It will be difficult to mobilise additional resources with declining tax revenues, reduction in savings and drastic cuts in development cooperation budgets. As a result, Sustainable Development Goals (SDGs) will be underfunded. One of the most significant SDGs is the one related to water, since it is at the core of our economic and social life. If water does not receive funding due to the expected recession of the next 2-3 years, there will be multiple crises. It is necessary to craft innovative ways and means to develop new funding avenues for water. This issue of Blue Peace Bulletin provides many examples of innovative instruments to finance water.

The ecosystem of water infrastructure has many facets. It includes companies that provide public water supply (construction, distribution and delivery) through dedicated equipment and technologies. Users of water are found in WASH sectors, households, industry, agriculture, environmental activities and recreational activities. In order for water infrastructure projects to function effectively they need to overcome various primary, transactional and maintenance related costs. The traditional approach to finance water has been through taxes, transfers and tariffs. As this money is in short supply, it is necessary to develop an innovative approach in the search for finance.

The Water and Sanitation Program of the World Bank Group, has calculated that the world needs USD 114 billion (range of USD 74 billion to USD 166 billion) a year in order to fulfil SDG 6.1 and 6.2. This is broken down under annual costs of safe fecal waste management (USD 49 billion), safe water (USD 37.6 billion), basic sanitation (USD 19.5 billion) and hygiene (USD 2 billion) per

year. The geographic share of USD 114 billion per year is to be divided among Sub-Saharan Africa (approximately one third), Southern Asia, Eastern Asia, Latin America with Caribbean region and South-eastern Asia. In addition, funds are required for sectors using water resources. These include hydroelectricity, irrigation, industrial cooling, navigation, ecological tourism, among others. The investments in these sectors would amount to hundreds of billions of dollars. Most of these are long term investments.

In this paper, the following funds and instruments have been explained, dedicated to water and water infrastructure:

- Congo Basin Blue Fund
- Sovereign Wealth Funds
- Water Finance Facility
- Green Bonds for water
- Green Climate Fund
- Blockchain token economy.

The World Bank Group suggests that projects define water goals for increased mobilization of funding sources, improve governance and regulations to service blended finance, reduce project costs to maximize asset value and advance research and development to enhance the impact of climate finance for water.





## Congo Basin Blue Fund

The Blue Fund supports the financial viability and sustainability of Blue Peace. The Blue Peace process as explained by the Strategic Foresight Group, is a means to promote peace through trans-boundary water cooperation. The Blue Fund is designed to cover overhead costs in water based projects, inclusive of and limited to lakes, rivers and aquifers with an emphasis on regional ownership of projects. Accordingly, the Blue Fund, enabler of blue peace finance, serves as its backbone.

The Blue Fund is an innovation that maintains the principles of blended finance at its core. This means, it aims to use public and philanthropic capital or development finance to catalyse private investment or additional finance for the purpose of sustainable development in developing countries. The Blue Fund has the following characteristics –

- a) **Commercial sustainability:** It is structured to cover auxiliary costs of water infrastructure projects, such as, interest rates, prefiguration study, insurance and so on, while providing investors with an attractive financial return when compared to market rates.
- b) **Sustainable Development Goals:** It aims to solve local challenges within SDG 6 and SDG 16 and associated development challenges of the project over time .
- c) **Blended Finance:** Private sector money or commercial finance enters in the mix only due to the catalytic nature of the project that public money envisages to achieve. Hereby unlocking all sources of finance (development and commercial) to create real economic assets.

Here, a Blue Fund will be explored through the framework of a Joint Investment Plan. The advantage of a Joint Investment Plan approach for trans-boundary water cooperation and basin development is to practice active water cooperation through engagement of partner countries involved. The ability of each partner country to envisage active water cooperation either over a single sector or avail a multi-sectoral approach, will result in reduction of conflict and promotion of peace. In a Blue Fund, the technicalities of the investment plan or design of the finance vehicle demonstrate a financial rationale. At present, a first of its kind, implementation of a Blue Fund is being explored in Western Africa.



The Congo Basin Blue Fund, a collective of 11 beneficiary countries in the Congo Basin, was developed by The Brazzaville Foundation in cooperation with the Strategic Foresight Group to build and strengthen the regions' blue economy. The Congo Basin is the second largest tropical forest area in the world, source of medicine and materials, home to a vast expanse of plant, bird and animal biodiversity, houses a network of rivers and lakes with major waterways for trade. Currently, the region is challenged with unsustainable practices of income generation. The most pressing issue of this region is the reliance on deforestation for economic growth and desertification of lakes in the region. The Congo Basin Blue Fund, a special purpose vehicle, has been developed to shift the focus of income generation from unsustainable deforestation practices and ivory trade to development of a sustainable water-based blue economy. The following table presents an overview of how the Congo Basin Blue Fund is being developed to help shift the Basin from forest economy to a river economy.

The purpose of a Blue Fund is to 'enable' projects to attract actual capital cost. The original idea was for the financiers to provide the fund amount (Euro 100 million) as aid money to learn of best outcomes and results in the course of this funding. As of January, 2020, a pipeline of 215 projects was approved. Although instead of seeking Euro 100 million (USD 109 million), now, the Fund is proposed to be made of the entire capital cost of an estimated USD 7.5 billion. This is a complete change from the original idea of what the Blue Fund was meant to unlock in the first place. Only time will tell how much of USD 7.5 billion will actually be disbursed. While this Blue Fund is for the benefit of the region of Congo Basin, the model can be replicated anywhere so that various groups of countries benefit, provided there is political will.

The Fund benefits member states, making them aware of common climate change and environmental challenges before them. The Congo Basin Blue Fund hopes to create a regional blue economy in the Congo Basin with scope to further explore other areas of economic cooperation and

### Overview of Congo Basin Blue Fund

Area of focus	Details
Enabling Purpose	Shift towards a renewable water-based 'blue economy', resulting in sustainable sources of income generation and build regional peace
Countries involved	Angola, Burundi, Cameroon, Central African Republic, Democratic Republic of Congo, Equatorial Guinea, Gabon, Rwanda, United Republic of Tanzania and Zambia + Morocco
Blue economy projects	Improved river navigation, hydro-electricity projects, irrigation projects, promote sustainable fishing practice, water treatment and eco-tourism
Fund amount	Euros 100 million/annual renewal (allowing Euro 3 billion to unlock for project cost through multilateral credit)
Use of Fund amount	Cover interest rate subsidies (IRS) on loans for projects, payment of Insurance Premia (IP), cover cost of technical assistance or charges (TA), direct grants (DG), payment of Project Implementation Units (PIUs)
Financers	Green Climate Fund, Global Environment Fund, African Development Bank

Source: <https://brazzavillefoundation.org/images/nos-actions/congo-basin-blue-fund.pdf>



help to maintain political peace in the region. It maintains a multi-sectoral approach to trans-boundary water cooperation. Each Blue Fund could be designed as per its locale and future requirements. The fundamentals, however, remain unchanged – focus on commercial sustainability, SDGs and partnerships, while it promotes Blue Peace, pushes for ESG (Environmental, Social, Governance) principles and creates positive externalities.

The task of raising capital cost of USD 7.5 billion is exceedingly ambitious considering that the world is expected to go through recession in the second half of 2020, all of 2021 and perhaps part of 2022. The shrinking of global economy will reduce funds available for development infrastructure. It will be therefore more prudent for the Congo Basin Blue Fund to revert to its original plan of raising USD 100 million per annum in aid money for enabling costs and use it to raise and service capital cost of USD 2-3 billion. Such a pragmatic approach may yield results even in difficult times.

## Sovereign Wealth Fund for Water Infrastructure

Water infrastructure projects by nature are longer term projects that contribute to economic development and are most needed in developing economies. While such projects can be found at the local, national and international level their financing can be met through international investments. In the interest of low risk appetite across long term funds, a Sovereign Investment Vehicle for water infrastructure finance is a promising goal. There are various structures of such a Vehicle, bearing there is no urgent need for liquidity.

A Sovereign Wealth Fund (SWF) is an independent government run investment of a single country formed by its surplus reserves, usually due to over-performance of a single domestic industry, with the objective to invest across a portfolio of industries, within its own economy or around the world. These funds can have a variety of assets under management (AUM) in the form of shares, bonds, property or other strategic classes. The objective behind a SWF to finance a foreign water infrastructure project, besides investment return, is for diversification towards a renewable resource, protect domestic economy from over-emphasis on one non-renewable resource, increase savings for future generations or possibly even exercise political ambition through its Fund. Ticket size is also favourable factor.

As of 29 April 2020, Sovereign Wealth Fund Institute explained that the cumulated asset value of the world's top 91 active and large SWFs stood at USD 8.1 trillion. Within this, infrastructure projects have managed to become a favourite due to its inflation adjusted steady income streams. As SWFs reflect available government surplus, it is not possible to find detailed data. In 2018, global SWF AUM was a total of USD 7.45 trillion dollars. SWFs,



globally, invest 90% of their funds in domestic local projects due to fewer long term financing options. Infrastructure investments were targeted by 64% of SWFs in 2018 with a heavy focus on direct investments (92% of SWFs) and greenfield projects (no prior infrastructure work and possibly unused land). SWFs also invest in green assets. From 2015-2018 size of green investments by SWF rose to USD 11 billion and specifically to the extent of USD 2.2 billion in green infrastructure funds. Infrastructure AUM rose by 16.5% CAGR between 2010 and 2016. By 2017, emerging markets represented 30% of total SWF for infrastructure projects.

The International Working Group of Sovereign Wealth Funds (IWG) helps SWFs around the world to cooperate and better understand nuances. In SWF infrastructure investment, the 'route to market' refers to the different ways to invest in infrastructure projects. These include –

- a) Equity vs debt investment – Equity is higher risk and higher return than debt
- b) Listed vs Unlisted investment – Listed are easy to find and invest whereas unlisted are found in the private market, making it difficult to access
- c) Direct options for investment vs traditional delegated investment – There are three direct options: solo (asset owner acquires stake in an asset without other partners), partnerships (asset owner forms a partnership with one or more asset owner) and co-investing (asset owner invests in a fund run by an asset owner).

As of March 2016, aggregate SWF AUM totalled USD 6.51 trillion. On average, 62% of SWFs dedicated their proceedings to infrastructure projects worldwide and within this 61% of SWFs invest in water infrastructure, versus, 95%, 86%, 64% to energy, transport and utilities infrastructure respectively. Infrastructure, alongside real estate, commodities, hedge funds and private equity are known as alternative investments.

The evidence of growth in SWFs dedicated to infrastructure and moreover the scope for increase in water infrastructure projects makes SWFs a promising tool to attract funding for water and SDGs. More measurable the SDG, the easier it becomes for SWF to incorporate them in their investment processes. A SWF specifically for development is known as sovereign development fund (SDF). A SDF promotes overall economic development. SWFs are good for SDGs as they have linkages to developing countries, are pathways to enormous pools of capital, have patient and long term capital and can influence governments and regulators.

Currently SWFs with an emphasis on water are not only small in ticket size but also few details are available. Initiatives of Ithmar Capital aim to have a pan-Africa impact, while ADIA has focused specifically on one UK water utility based company. In the case of Australia and Ireland, both have focused on improvement of

Sovereign Wealth Funds with a Focus on Water Infrastructure

Name of Sovereign Wealth Fund	Water infrastructure related details
Morocco - Ithmar Capital formed Green Growth Infrastructure Facility for Africa (GGIF) with World Bank in 2016	<ul style="list-style-type: none"> <li>- Private equity fund</li> <li>- Will raise USD 1 to 2 billion</li> <li>- Low carbon water projects</li> <li>- Green assets exposure (2015-17) = 500 million</li> </ul>
UAE - Abu Dhabi Investment Authority (ADIA) was established in 1976	<ul style="list-style-type: none"> <li>- Increased their funding in U.K's Anglian Water</li> <li>- Invested in water industrial projects</li> <li>- Green assets exposure (2015-17) = &lt;1000 million</li> </ul>
Australia – Future Fund	<ul style="list-style-type: none"> <li>- Total value = USD 162.6 billion (7.5% to infrastructure) in June, 2019</li> <li>- 3-4% of above 7.5% to water infrastructure</li> <li>- Growing interest in unlisted infrastructure</li> </ul>
Ireland Strategic Investment Fund	<ul style="list-style-type: none"> <li>- Investment of Euro 450 million in Irish Water (2016), a national service water utility company</li> </ul>

Source: <https://www.ifswf.org/our-members>





domestic water projects. These water infrastructure supported SWFs in the Global North appear to have matured. The state of water infrastructure supported by SWF in the Eastern part of the world is at a nascent stage.

The National Investment and Infrastructure Fund (NIIF), India, set up in 2015, has been formed to advance greenfield, brownfield and stalled infrastructure projects in India within areas of water, transportation and energy. In 2017, it received USD 1 billion funding from ADIA. In 2015, China discussed a green finance system to tackle pollutants in drinking water supplies and has committed investments in water treatment technologies. Another under explored SWF is the Kazakhstan SamrukKazyna with plans to develop water in the areas of water supply and sanitation, water recycling and irrigation. There are many other water infrastructure projects backed by SWFs, in Italy, Senegal, Malaysia, Saudi Arabia among others.

There are two important considerations for the water sector while harnessing SWFs in the future. First, the water sector should provide proposals for innovative greenfield projects which can attract real investment and have an impact on the ground. It is easier for the SWFs to invest in the financial economy through capital markets, rather the real economy through greenfield projects. Therefore innovation in conceiving new greenfield projects is essential. Secondly, even in a recessionary period, SWFs have considerable resources to invest. It is for the water sector to present attractive projects.

## Water Financing Facility

It is well known that infrastructure projects are long term projects. The time provided for a project to payback its interest on a bank loan is usually not sufficient. Adding to this, the interest rates are expensive and make it difficult for infrastructure projects to generate returns. As water companies compete for the same and limited source of funding, it could possibly prevent projects from taking off and thus prove unsustainable for long term finance needs. When it comes to water infrastructure projects, fortunately, there is a cooperation based domestic finance solution that can be replicated at a local level, benefiting developing countries.

The Water Finance Facility (WFF) platform encourages the local currency bond market (LCBM). In doing so the platform connects domestic emerging market institutional lenders (private investment or commercial finance) of local currency bonds in the capital market with those who have demand for finance, such as WASH infrastructure project owners in order to fulfill country based SDG 6 priorities. A WFF enables investors and water companies to accomplish their goals by reducing financial risk and burden, avoid traditional practice of bank loan and in the long run attract international investment for the water sector.

The Secretariat of WFF is based in The Netherlands with Cardano Development and The Global Innovation Lab for Climate Finance as partners. The Government of Netherlands has provided EUR 10 million to the initiative. This grant makes WFF or at national level, a National Water Finance Facility (NWFF) project one that will enjoy benefits of blended finance. At NWFF level, the platform provides financial development support, covers operational start-up expense and mobilizes local pooled bond transaction. A WFF identifies and pools water projects of water companies that are in need of finance that benefit the public. WFF will calculate the total sum of finance required across these projects. On a parallel track, it will create a single bond in the capital market that will finance the sum



total of projects in the pool. In doing so, it will increase share of commercial lenders such as insurance companies or pension funds, possibly establish a reserve fund, de-risk by designing provision of a grant amount and most importantly, will make sure that its role as an intermediary creates security between investors and borrowers, while reducing the finance gap.

In theory, pooling of investment grade resilient water bonds, either publicly listed or private placement, has several benefits. The risk of investors reduces as they deal with the water financing facility as an entity and not with individual companies. Specifically, this model reduces transaction costs, enables larger capital market financing through more investors and has properties that will credit enhance the pooled bond. On the other hand, success of this model relies on two fronts: the domestic financial sector must have the potential to raise additional funds from within the country if and when necessary and domestic investors should have experience with issuing bonds. The domestic WASH sector should have clear and defined investment needs for water and sanitation and a history of successful repayment of loans.

The first NWFF is the Kenya Pooled Water Fund (approx. KES 3.5 Billion or USD 33 million for six water services providers). The WFF aims to function for a period of ten years. Within this time period it aims to provide WASH sector benefits to 20 million beneficiaries in 6-8 countries across Africa, Asia and Latin America while raising Euro 1 billion in water bonds along the way. If loans to water companies prove to remain less expensive with a longer payback period, then this will reduce risk and further the acceptance of blended finance across capital market structures.



### Green Bonds for Water

A sizeable range of environmental projects have been on the rise in the last decade. The finance for such projects has largely taken shape in the form of green bonds. While the global universe of bonds is USD 100 trillion, the green bond, a financially viable sub-set, has been maturing in bond size and diversity of issuers over the years. The climate bond market has green, social and sustainability bonds among others. Within them green bonds have outperformed.

Green bonds, simply, are fixed income securities issued by public and private sector that finance or re-finance projects with environmental benefits such as water. An overview of annual issuance of green bonds shows that dollar amount dedicated to water bonds has been increasing although percentage share as compared to other sectors has been in decline.

## Green bonds Universe and Focus on Water

	2019	2018	2017
Climate aligned bond market (outstanding, since 2005)	No data	\$1450 billion	\$895 billion
Labelled green bond (outstanding)	No data	\$389 billion	\$221 billion
Labelled green bond <b>issuance</b>	\$257.7 billion	\$167.6 billion	\$ 162.1 billion
Bonds dedicated to water (outstanding)	No data	\$100.5 billion	\$32 billion
Labelled green bond; water (outstanding)	No data	\$17 billion	\$13.2 billion
<b>Labelled green bond; water issuance</b>	\$23.2 billion (9% of 257.7)	\$20.1 billion (12% of 167.6)	\$19.45 billion (12% of 162.1)
Hydro energy projects (outstanding)	No data	\$54 billion (20%) of \$271 billion	\$47 billion (27%) of \$173.4 billion

Sources: [https://www.climatebonds.net/files/reports/2019\\_annual\\_highlights-final.pdf](https://www.climatebonds.net/files/reports/2019_annual_highlights-final.pdf),  
[https://www.climatebonds.net/files/reports/cbi\\_gbm\\_final\\_032019\\_web.pdf](https://www.climatebonds.net/files/reports/cbi_gbm_final_032019_web.pdf),  
[https://www.climatebonds.net/files/reports/cbi-sotm\\_2017-bondsclimatechange.pdf](https://www.climatebonds.net/files/reports/cbi-sotm_2017-bondsclimatechange.pdf)

The table shows that the annual issuance of labelled green bonds as a segment has been growing. In 2017, total green bonds issued was USD 162.1 billion and in 2019 total green bonds issued was USD 257.7 billion. Due to unavailability of data, share of labelled green bonds issued for water represented above are approximate calculations of USD 19.45 billion (2017) and USD 20.1 billion (2018) respectively.

Above data was gathered from online publications of the Climate Bond Initiative (CBI). They include water and water infrastructure assets and projects eligible to issue green bonds if they deliver on GHG mitigation, promote climate change adaptation and facilitate increased climate resilience criteria. CBI recognises that adaptation and resilience water infrastructure projects will hold high value owing to city lifestyle and rise in sea level around the world. Green bonds for water is a resource that has not been harnessed to its real potential. There is tremendous scope to develop this further.



## Green Climate Fund

The Green Climate Fund (GCF) was set up in 2010 by the United Nations Framework Convention on Climate Change (UNFCCC) with the purpose to raise and direct finance towards projects that will have positive climate outcomes in developing countries. It is the world's largest fund dedicated to climate action. GCF made its first investment in 2015 and invests in adaptation (50% desired commitment), mitigation and cross-cutting requirements of developing countries. GCF takes a wholesome approach inclusive of ESG parameters, beyond climate action and enables direct communication between fund provider (industrialized country) and recipient (developing country) through the structure of the GCF Board.

The Fund directs its finance to eight adaptation and mitigation based themes. 'Health, food and water security' theme includes water, though water projects can be found across other themes as well. GCF defines water largely as water security. In total, from 2015 to 15 March 2020, GCF has approved 129 projects to be implemented across 108 developing countries through a pipeline of USD 5.6 billion GCF funding with access to additional USD 14.4 billion, taking total value of approved projects to USD 20 billion.

From the table below, water based projects were calculated by studying each and every project of the GCF. Out of USD 5.6 billion, it was calculated that GCF funding supported water and water infrastructure projects totaling USD 1.5 billion (USD1505 million) across 49 countries covering 19 facets of water in 45 projects, such as, water supply, hydro infrastructure, flood control, drinking water, among others. An additional USD 3.2 billion was raised through co-financing in the form of either loans, grants, In-kind or other.

Thus, roughly 27% of GCF funding goes to water projects. With just one project funded by private sector, it is safe to conclude that there is a greater role for private sector in GCF water projects, especially for big ticket opportunities. In Feb 2019, GCF established a global partnership of climate change and water experts. It recognises funding for water as a high priority that has implications on food and health security. Accordingly, GCF has created systems such as Funded Activity Agreement, Accredited Entities, direct access modality, Readiness Program, Project Preparation Facilities, and National Designated Authorities. Such a support system for water will only attract and increase the size of the water pie in the funding mix.

### Green Climate Fund projects – Focus on Water

Overview parameters	Green Climate Fund	Water based projects
Total projects and nature of projects	129; adaptation, mitigation, cross-cutting	45; adaptation, cross-cutting
Total countries	108	49
Total funding (USD):	5.6 billion + 14.4 billion	1.5 billion + 3.2 billion
- Private sector	2.2 billion (27 projects)	60 m (1 project)
- Public sector	3.4 billion (102 projects)	1445 m (44 projects)
- Financial instruments	Grants (48%), Loans (38%), Equity (9%), Results-based payment (4%), Guarantees (1%)	GCF Financing = 1327.3 million grants, 117.7 million loans, 60 million equity  Co-financing = loan, grant, In-kind, other

Source: <https://www.greenclimate.fund/#>

## Tokenization for Water

Up until now the solutions explored have included a mix of financial instruments. In recent times, blockchain technology (BT) has caught the interest of industry, financial institutions, academia and even governments in applications for daily work. There already are examples of how BT has entered the water infrastructure space. This section explains: a) blockchain infrastructure and b) the relevance of blockchain tokenization when it comes to finance for water infrastructure.

In brief, each side of a single block in BT is made of digital entries of encrypted data (distributed ledger technology) collected from around the world, during a transaction. Tokenization is the representation of a real asset in digital format recoded on a BT platform in the course of a transaction in the form of tokens. After a block collects assigned data, it leaves one side open to be attached to another block, thus a chain. Blockchain data is decentralized across individual computers and generally made publicly available.

Blockchains store lots of data in an automated manner, continuously formed and altered by consensus algorithms. The above mentioned individual computers serve as 'nodes' of data input and output which provide the decentralized feature of a blockchain through a peer-to-peer network. In other words, all interconnected nodes (individual computers), created by peers are directly connected to the network which instantaneously distributes and shares publicly available data (transactions) as and when performed, hereby eliminating the need of a middleman. With time, BT has grown to perform complex tasks. A blockchain system is characterized as being a decentralized system, transparent and immutable or unable to tamper with data once published to the chain. In effect, it tackles misinformation.

The very nature of BT is disruptive and this is where it has implications in the field of finance. The fundamental function of blockchain is to enable secure transactions. The technology has evolved to smart contracts (rules of a transaction managed by blockchain), cryptocurrency and Initial Coin Offerings (digital coins), blockchain token and Security Token Offerings (a unit of value issued by a private entity) among other developments. When a transaction needs to take place on a blockchain network, the peer-to-peer functionality ensures transferability of ownership between owner of asset (coin, token, documents etc) and the future owner of the asset (investor) in complete anonymity. Not only does this improve trust between parties to increase investment amounts, but also explores a wider list of real assets that can be transacted.







## Blockchain for Sustainable Development Goals (SDGs)

The SDGs highlight where each country stands on various development sector parameters and the challenges that it must overcome in order to achieve a high score on each SDG target. To this effect, blockchain can help SDGs in many ways: keep economies free off carbon intense products by recording footprint of these products on a ledger platform, connect BT to Internet of Things (IoT) and collect data on water, widen impact investments through tokenization, use smart contracts to automate green bond markets and other financial instruments mentioned in this paper, such that they may scale in a shorter period of time, among other applications.

The Task Force on Digital Financing of the Sustainable Development Goals has recorded case studies of how blockchain has already made positive interventions in SDG 7 (sell back excess solar power in cities), SDG 11 (track land investments in Ghana and Honduras) and SDG 13. Green Assets Wallet (SDG 13) under the Stockholm Green Digital Finance initiative helps green bonds reach a wider audience in emerging markets by validating commitments (pre and post project level) and uploading data on green investments through BT (cost effective and immutable). It allows issuers of green bonds to cut costs, enable impact reporting and on a parallel track enable investors to make sound long term investment decisions.

SDGs and blockchain application has also been found through UNDP in areas of financial inclusion in Tajikistan, provision of solar energy infrastructure in Moldova and reforestation through cryptocurrency rewards in Lebanon. Also, in 2017, the Climate Chain Coalition was established to advance distributed ledger technology for climate action through climate finance.



## Tokenization and Water Infrastructure

The global market size of digital financing technologies inclusive of blockchain stood at USD 127 billion in 2018 and is set to cross USD 300 billion by 2022. This is a positive development for the spread and reach of BT. For blockchain tokenization of water infrastructure, it means, improvements in auditing, ownership, accounting, cost cutting, trading, explaining rules, eliminating intermediaries and reducing information discrepancies.

In traditional finance, securitization allows retail investors to invest in illiquid assets bundled into a security, which would not have been accessible to the individual otherwise. Likewise, by assigning a unit of economic value to a real asset or financial instruments in the form of a digital token, blockchain technology 'tokenizes assets' or converts the rights from a real asset into a digital token. These asset-backed tokens are managed on a blockchain network. Being secure on a blockchain network, according to Finoa Banking, the tokenization market is set to touch USD 24 trillion by 2027. Its relevance to water infrastructure projects include:

- After the cost of a water infrastructure project is calculated, the owner/s of the project can tokenize a part of the project in order to raise capital from retail investors. Such fractional ownership or divisibility enables crowdfunding. It increases liquidity for both, the asset owner and investor, at a lower transaction cost while securing owner/s of the water infrastructure project from steep liquidity premiums.
- It enables small-scale water infrastructure projects an investment scale that will suit developing country requirements. By combining blockchain with IoT, costs can be reduced to significant levels.

WaterChain, Watercoin, Clean Water Coin and Earth Token are tokens with an offline impact. Its

participants, from around the world, have a stake in the success of the project being supported. WaterChain, US based, aims to fund water treatment facilities (the asset) around the world through crypto investors. Blockchain will issue WaterChain tokens and store hyperlocal water data on water contaminants that can be used for better asset management. Through smart contract, investors may decide which projects they wish to fund and receive dividend. Smart contracts will also, automatically, credit profit earned. WaterChain will invest the money in profitable infrastructure and technologies. With time, WaterChain asset base should grow.

Water infrastructure is a green investment project. The perception is that green projects are more expensive and have higher upfront costs. Asset tokenization (of the physical infrastructure or water itself) aims to reduce risk premium priced by investors so that revenue streams cover project costs. Several components of asset tokenization are yet to be understood. These include, true value of asset, cybersecurity, compliance with regulations, smart contract validation and others. Until then, education, knowledge of water infrastructure trends and the need to solve local water requirements will vouch for continued role of asset tokenization.





## Conclusion

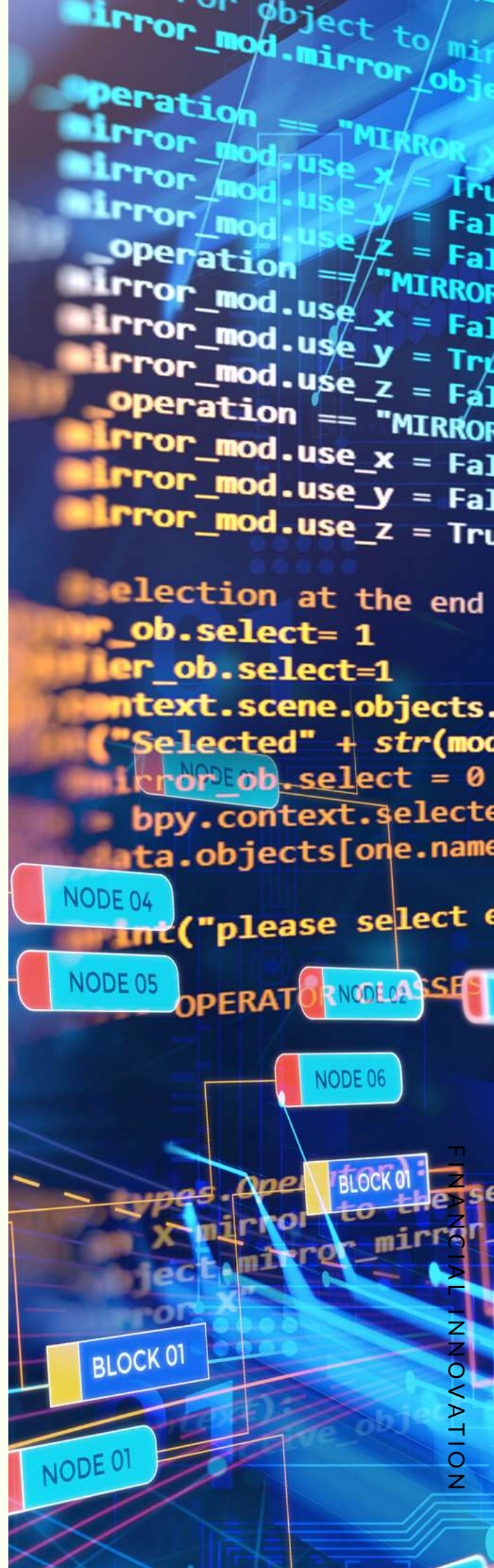
This paper gives some examples of how financial innovation can generate resources for water infrastructure, even in difficult times. This is not a full and comprehensive list of such innovations. There is scope to further research the size, role and impact of initiatives that will further water and water infrastructure. These include, Water ETFs (this asset class is largely equity dominated), World Bank Group's Water Global Practice, 2030 Water Resources Group, Climate Investment Funds, International Platform on Sustainable Finance (established in October 2019), Sustainable Banking Network (established in 2012), developments in the water technology space, expanse of blockchain in centralized finance institutions and the ever growing influence of ESG parameters on water and associated sectors. It is necessary to undertake further exploration to identify more avenues of innovative financial resources.

Most of the examples discussed in this paper are relatively new. It will take a few years to assess their viability and impact. It is also possible that some new instruments will be introduced in the future.

Some of the instruments are likely to be able to resist the recession that the world is due to experience from July 2020 for one or two years. Only time will tell if they are indeed able to withstand declining flows in the world economy in the next two years. If we take a long term perspective, financial innovation for water is absolutely essential since there is no alternative to water.



**Special thanks to Saahil Waslekar for his contribution to this Bulletin.**



## REFERENCES

- Hutton, G., & Varughese, M. (2016). The Costs of Meeting the 2030 Sustainable Development Goal Targets on Drinking Water, Sanitation, and Hygiene. Retrieved May 10, 2020, from <http://documents.worldbank.org/curated/en/415441467988938343/pdf/103171-PUB-Box394556B-PUBLIC-EPI-K8543-ADD-SERIES.pdf>
- Terms of Reference (ToR) Prefiguration study of the Congo Basin Blue Fund. (2018). Retrieved May 10, 2020, from [http://www.cbcc-bbcc.org/wp-content/uploads/2018/10/TDRs-Etude-pr%C3%A9figuration-Fonds-Bleu-Bassin-du-congo\\_-version-anglaise.pdf](http://www.cbcc-bbcc.org/wp-content/uploads/2018/10/TDRs-Etude-pr%C3%A9figuration-Fonds-Bleu-Bassin-du-congo_-version-anglaise.pdf)
- Proposal by the Republic of the Congo in collaboration with the Brazzaville Foundation for Peace and Conservation. (Last modified 2020). Retrieved May 10, 2020, from <https://brazzavillefoundation.org/images/nos-actions/congo-basin-blue-fund.pdf>
- What is a Sovereign Wealth Fund? - SWFI. (2020). Retrieved May 10, 2020, from <https://www.swfinstitute.org/research/sovereign-wealth-fund>
- PREQIN SPECIAL REPORT: SOVEREIGN WEALTH FUNDS. (2018). Retrieved May 10, 2020, from <https://docs.preqin.com/reports/Preqin-Special-Report-Sovereign-Wealth-Funds-August-2018.pdf>
- Sovereign Investors 2020 A growing force. (2019). Retrieved May 10, 2020, from <https://www.pwc.com/gx/en/sovereign-wealth-investment-funds/publications/assets/sovereign-investors-2020.pdf>
- International Forum of Sovereign Wealth Funds. (2020). Retrieved May 10, 2020, from <https://www.ifswf.org/>
- Financing the SDGs: the Role of Sovereign Wealth Funds for Green Investment. (2018). Retrieved May 10, 2020, from <http://www.greenfiscalpolicy.org/wp-content/uploads/2018/01/Policy-brief-SWF-2018-1.pdf>
- The Water Finance Facility (WFF) Tapping local capital markets. (2018). Retrieved May 10, 2020, from <https://www.oecd.org/water/OECD-GIZ-Conference-Background-Document-Water-Finance-Facility.pdf>
- Fonseca, C. (2015, June 21). Financing universal access: the role of Water Financing Facilities. Retrieved May 10, 2020, from <https://www.ircwash.org/blog/financing-universal-access-role-water-financing-facilities>
- Water Finance Facility. (2020). Retrieved from <https://waterfinancefacility.com/>
- Bonds and Climate Change The state of the Market 2017. (2017). Retrieved May 10, 2020, from [https://www.climatebonds.net/files/reports/cbi-sotm\\_2017-bondsclimatechange.pdf](https://www.climatebonds.net/files/reports/cbi-sotm_2017-bondsclimatechange.pdf)
- 2019 Green Bond Market Summary. (2020). Retrieved May 10, 2020, from [https://www.climatebonds.net/files/reports/2019\\_annual\\_highlights-final.pdf](https://www.climatebonds.net/files/reports/2019_annual_highlights-final.pdf)
- Green Bonds the State of the Market 2018. (Last modified 2019). Retrieved May 10, 2020, from [https://www.climatebonds.net/files/reports/cbi\\_gbm\\_final\\_032019\\_web.pdf](https://www.climatebonds.net/files/reports/cbi_gbm_final_032019_web.pdf)
- Finding Digital Answers to Global Sustainability Threats. (2020, April 7). Retrieved May 10, 2020, from <https://cointelegraph.com/news/finding-digital-answers-to-global-sustainability-threats>
- The Era of Tokenization – market outlook on a \$24trn opportunity. (2018). Retrieved May 10, 2020, from <https://hackernoon.com/market-outlook-on-tokenized-assets-a-usd24trn-opportunity-9bac0c4dfefb>
- Uzsoki, D. (2019). Tokenization of Infrastructure A blockchain-based solution to financing sustainable infrastructure. Retrieved May 10, 2020, from <https://www.iisd.org/sites/default/files/publications/tokenization-infrastructure-blockchain-solution.pdf>
- Cameron-Huff, A. (2017, March 28). Op Ed: How Tokenization Is Putting Real-World Assets on Blockchains. Retrieved May 10, 2020, from <https://bitcoinmagazine.com/articles/op-ed-how-tokenization-putting-real-world-assets-blockchains>



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***Blue Peace Bulletins are produced by Strategic Foresight Group as a part of a programme co-financed by the Swiss Agency for Development and Cooperation (SDC). They do not in any manner represent the official position of the SDC or any other branch of the Government of Switzerland.***