The Lab

Driving Sustainable Investment

Climate Adaptation Notes

LAB INSTRUMENT ANALYSIS

September 2020

DESCRIPTION & GOAL —

Climate Adaptation Notes is an innovative funding structure for water and wastewater climate adaptation projects in Southern Africa. Climate Adaptation Notes is designed to catalyse and increase the flow of institutional capital and to lower financing costs for these climate adaptation projects.

SECTOR —

Climate Adaptation | Water | Sanitation | Wastewater

FINANCE TARGET —

Local debt capital markets | First loss capital from Development Finance Institutions | Commercial Banks | Institutional Investors | Life Companies

GEOGRAPHY —

For pilot phase: Botswana, Eswatini, Lesotho, Namibia, South Africa

In the future: Full SADC region and throughout Africa

The Lab identifies, develops, and launches sustainable finance instruments that can drive billions to a low-carbon economy. The 2020 Global Lab cycle targets four specific sectors across mitigation and adaptation: nature-based solutions; sustainable agriculture for smallholders in sub-Saharan Africa; sustainable energy access; and sustainable cities, as well as three regions: India, Brazil and Southern Africa.

AUTHORS AND ACKNOWLEDGEMENTS

The authors of this brief are Amanda Lonsdale and Morgan Richmond.

The authors would like to acknowledge the following professionals for their cooperation and valued contributions including the proponents Jonathan First (GFA Climate & Infrastructure) and Heather Jackson (Renewable by Nature); and the working group members: Anne Gruenewald (DWS), Martie Janse van Rensburg (Independent), Gill Raine (ASISA), Adre Smit (ASISA), Tumi Mathabatha (USAID), Akinwale Aboyade (USAID), Malango Mughogho (CRIDF), Dr. Peter Johnston (University of Cape Town), Bashi Gaetsaloe (Jupiter Consulting), Bertrand Reysset (AFD), Mariana Deheza (AFD), Heidi Sternberg (PIC). The authors would like to acknowledge the contribution of the experts: Angelique Kalam (Futuregrowth), Jason Lightfoot (Futuregrowth), Madeleine Ronquest (FirstRand), Tamlyn Fung (FirstRand), Johan Marnevick (Stanlib), Armine Schafer (Nedbank), Hendrik Ackermann (Nedbank), Isaac Ramputa (Riscura), Malcolm Fair (Riscura), Zoya Sisulu (Standard Bank), Jeremy Gorelick (Green Finance Institute), Mark van Wyk (Mergence), Jurgens van Zyl (INCA), Gert Van Der Linde (INCA), Steve Baillie (IFC), Alex McNamara (NBI), Adam Tunnicliffe (CFM).

The authors would also like to thank Ben Broche, Barbara Buchner, Elysha Davila, Valerio Micale, and Rob Kahn, and Júlio Lubianco for their continuous advice, support, comments, design, and internal review.

The Lab's 2019/2020 programs have been funded by the Australian, Dutch, German, and UK governments, as well as Bloomberg Philanthropies, GIZ, the International Fund for Agricultural Development (IFAD), the Rockefeller Foundation, and the Shakti Sustainable Energy Foundation. Climate Policy Initiative (CPI) serves as Secretariat and analytical provider.

SUMMARY

Southern Africa faces severe climate change-related water scarcity. This crisis is compounded by limited public funding for the repair, replacement, and development of infrastructure and other interventions to help solve or mitigate the situation. The COVID-19 pandemic has further increased pressure on public budgets, straining the situation at a time when water and sanitation are of utmost importance to support basic health outcomes and prevent viral spread. To date, private sector finance has not filled the funding gap due to both a perception of risk and inadequate financial structures. There is an opportunity for an innovative blended finance mechanism to tap into private capital — especially domestic institutional capital — where there is growing interest in impact investment, particularly targeting climate adaptation.

Climate Adaptation Notes is designed to catalyze and increase the flow of institutional capital and lower financing costs for climate adaptation projects by allocating technical and credit risk to the financial actors best equipped to manage the risk. The instrument combines the construction financing and refinancing phases of climate adaptation projects in water and wastewater infrastructure into a single bond instrument administered through a debt capital markets (DCM) platform. The platform is managed by an independent financial institution with the capacity to serve as trustee and manage the performance monitoring of project climate adaptation metrics.

Assessed against the Lab criteria, Climate Adaptation Notes is:

- Innovative: Climate Adaptation Notes is the first instrument to address water scarcity in Southern Africa by streamlining adaptation project financing into a single instrument through a partnership between commercial banks and institutional investors. The instrument proponents have identified a set of barriers associated with addressing climate-related water risks in Southern Africa and developed a financially and legally viable structure to overcome these obstacles for both projects and investors.
- Financially Sustainable: The savings to projects from the lower financing costs (interest rate) on Climate Adaptation Notes is such that it enables the DCM platform to charge a structuring and administrative fee while still offering significant savings to developers. As the instrument is replicated, it will also develop a large and diverse portfolio of projects in the water and wastewater sectors, solidifying its financial sustainability, while also reducing overall risk, reducing the need for concessional finance from DFIs, and increasing the share of private sector funding.
- Catalytic: A pilot at the scale envisioned would leverage approximately USD 100 million of private capital for water and wastewater sector projects in Southern Africa. If successful, the model would increase overall treatment capacity by 90 megaliters per day and could serve an additional 90,000 or more municipal residents. Climate Adaptation Notes has the potential to increase the pipeline of bankable projects due to the significant reduction in financing costs to developers including municipalities.
- Actionable: The instrument is backed by a strong partnership between GFA Climate and Infrastructure (with experience in pipeline development and evaluation) and Renewable by Nature (a specialistic impact investment manager). The structure has been legally vetted, and key institutional investors as well as other financiers and non-financial parties in the region have been engaged towards initial implementation.

The Lab secretariat recommends endorsement of Climate Adaptation Notes due to its performance against the Lab criteria, as well as its broader significance during the COVID pandemic, when water and sanitation access and resilient economic growth are paramount. The instrument is implementable and can generate economic, environmental, and social returns amidst the pandemic, making it a potential green recovery instrument in a region with a dire need for wider access to water and sanitation to manage viral spread. Following endorsement by the Lab, Climate Adaptation Notes will seek to finalize a project pipeline developed during the Lab analysis process and to engage commercial banks, institutional investors, and DFIs for a first round of implementation.

TABLE OF CONTENTS

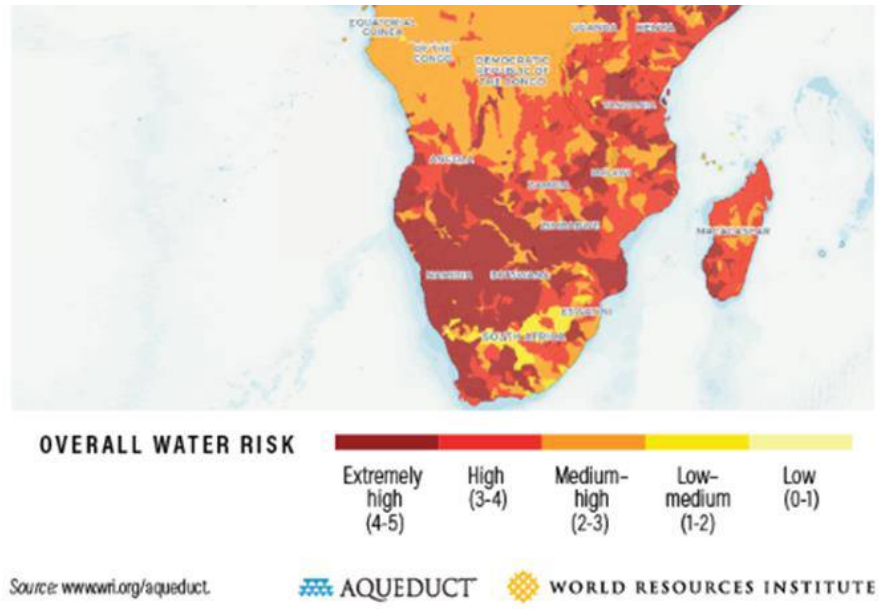
SUMMARY 3
CONTEXT 6
CONCEPT 6
1. Instrument Mechanics 6
1.1 Instrument Mechanics 6
1.2 Instrument Target Sectors 8
2. Innovation 9
2.1 Barriers Addressed 9
2.2 Innovation 9
2.3 Challenges to Instrument Success 10
MARKET TEST AND BEYOND 11
3. Implementation Pathway and Replication 11
4. Financial Impact and Sustainability 13
4.1 Quantitative Modeling 13
4.2 Private Finance Mobilization and Replication Potential 15
5. Environmental and Socio-economic Impact 15
5.1 Environmental Impact 15
5.2 Social and Economic impact 17
NEXT STEPS 17
REFERENCES 19
ANNEX 21
Annex 1. Project Adaptation Criteria 21
Annex 2. Taxonomy of Project Pipeline 22
Annex 3. Outcome Indicators by Sector and Activities 24

CONTEXT

Climate change is severely impacting Southern Africa's water and wastewater sectors. Upgraded water and wastewater infrastructure to address water security is critically needed, but there is a considerable funding gap to finance these projects.

Southern Africa is one of the globe's most water stressed regions. Approximately 39% of the regions' population does not have access to safe drinking water and 61% of the population does not have access to adequate sanitation facilities (SADC). Climate change is leading to more erratic rainfall and a resulting increase in the risk of droughts and floods. Figure 1 illustrates the critical level of water stress and drought risk facing the region as assessed by the World Resources Institute's Water Aqueduct tool.

Figure 1. Map of water stress and drought risk in Southern Africa, WRI



Significant investment in the water and wastewater sectors is critical to ensure the livability of the region for generations to come. However, there is a substantial funding gap due to limited availability of government funding and low private sector investment due to risk perceptions, challenges with project profitability, and the complexity of the due diligence process. The current funding gap has been exacerbated by increasing demands on public budgets given the COVID-19 crisis.

CONCEPT

1. INSTRUMENT MECHANICS

Climate Adaptation Notes is a structured funding mechanism aimed at increasing private, institutional investment in water and wastewater sector infrastructure projects. The instrument combines short-term project financing for construction from commercial banks with long-term asset-based infrastructure funding provided by institutional investors.

1.1 INSTRUMENT MECHANICS

Climate Adaptation Notes aims to increase the flow of commercial, institutional and DFI funding into water and wastewater sector adaptation projects in Southern Africa by combining construction financing and post-construction refinancing phases into a single instrument, reducing the time and cost involved in carrying out two financings. The instrument employs a type of asset-backed bond (the "notes") administered through a debt capital markets (DCM) platform. The platform is managed by a partnership between GFA

Climate and Infrastructure and Renewable by Nature with the capacity to serve as trustee and manage the screening and performance monitoring of project climate adaptation metrics.

The instrument leverages commercial banks' construction project expertise to mitigate technical risk, thereby broadening the appeal of such investments to long-term funders, who currently view the sector as too risky. This new approach enables climate adaptation projects to tap into the nearly USD 550 billion in capital in the domestic institutional savings pool in the Southern Africa region.

Climate Adaptation Notes works through a three-stage process, managed through the DCM Platform. The full transaction is represented in the instrument mechanics graph in Figure 2.

In Stage 1, the independent manager of the DCM Platform works predominantly with local commercial banks to identify and screen suitable projects. These projects may be developed by public or private developers, or through a public-private partnership where the underlying asset is backed by a stream of payments such as an off-take agreement. Criteria for selection include not only commercial viability, but also a set of adaptation criteria to ensure that projects reduce climate-related risk. These criteria include:

- A clear identification of risks, vulnerabilities, and impacts related to climate change,
- Clear articulation of the project's intent to address that context, and
- A demonstrable direct link between the financed activities and the climate-related risks addressed[1].

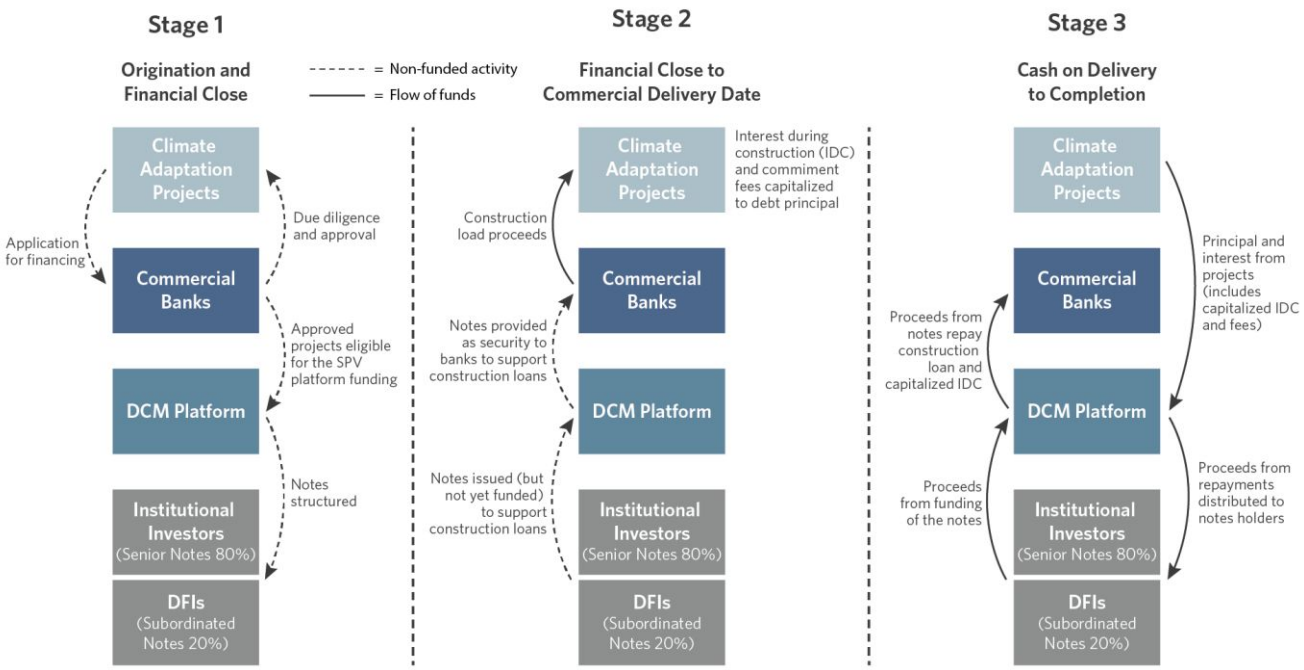
Once selected, the platform manager markets these projects to pre-identified long-term commercial investors (such as pension funds and life insurance companies) and DFIs, then structures a notes offering. No funding takes place at this point – instead the notes represent a commitment to the commercial bank to refinance the construction loans after the project's commercial operation date (COD). In exchange for this commitment, the long-term investors receive a fee, which is capitalized and repaid by the project developer via the DCM Platform after commercial operation. The platform manager also receives a fee for structuring the notes and supporting project preparation and evaluation.

In Stage 2, commercial banks will provide short-term construction loans to the pre-approved projects and assume project risk. The commitment of the notes allows the banks to provide more competitive loan pricing, as they have a commitment of exit and refinancing and are therefore not subject to the high cost of committed long term funding borne by commercial banks under Basel III (BIS, 2015). Interest during construction is capitalized into the debt principal.

In Stage 3, after the projects reach commercial operation, the notes are funded. Their proceeds are used to repay the short-term loans and refinance the projects. The long-term investors assume the credit risk, and the projects benefit from the more favorable terms of the notes compared to traditional construction financing. A first loss tranche from DFIs will protect investor returns in the event of default of underlying projects. The project developers repay the new loans and the capitalized commitment fee through the DCM Platform. The DCM then distributes the loan repayments to the notes holders.

[1] A detailed climate adaptation project criteria framework is included in Annex 1.

Figure 2. Climate Adaptation Notes instrument mechanics



Climate Adaptation Notes is targeting investment from the debt capital markets in Southern Africa, including asset managers with pension fund and insurance capital under their management. To help attract this investment, Climate Adaptation Notes plans to offer a first-loss tranche funded by DFIs.

1.2 INSTRUMENT TARGET SECTORS

Proceeds from the notes will fund water, wastewater, and sanitation sector projects that reduce the severity of water shortages by improving residential and commercial infrastructure, strengthening resilience to climate risks, and enhancing water efficiency and quality. These projects cover a wide potential range of activities within these sectors. Table 1. Taxonomy of project sectors and activities targeted illustrates the key sectors and activities the instrument aims to finance provided the adaptation criteria are met. Annex 2 includes a full taxonomy with additional details on the sub-activities targeted.

Table 1. Taxonomy of project sectors and activities targeted

Category	Sector	Activities	Sub-Activities
Water and wastewater management	Water supply and treatment	Sustainable water collection	Expansion of reservoirs; Reinforcement of river basins; Boreholes and tubewells; Household water safe storage; Rainwater harvesting from roofs; Stormwater retention
		Water treatment	Water reuse; Water reclamation; Household water treatment; Low carbon desalination
		Water supply	Construction and/or upgrade of water distribution networks; Leakage management; Increased use of water efficient fixtures and appliances

	Wastewater collection and treatment	Wastewater collection networks	Construction and/or upgrade of sewer systems; Raw water supply
		Wastewater treatment facilities	Reuse of sludge; Brine discharge; Construction and/or upgrade of wastewater treatment plants; Renewable energy solutions for water treatment
		Sanitation	Anaerobic digestion of sewage sludge with low carbon footprint (e.g. energy generation); Composting of bio-waste;
Agriculture	Irrigation	Water harvesting and irrigation	Increasing water availability and efficiency of use; Smart agriculture technologies; Rainwater collection from ground surface reservoirs; Rainwater harvesting from roofs
Infrastructure, energy and other built environment	Power generation	Hydropower	Building resilience into infrastructure such as protection systems for dams; Construction of new hydropower infrastructure; Pumped storage construction and maintenance
Disaster risk management	Early warning and management systems	Early warning and response systems	Early warning / emergency response systems for water and wastewater infrastructure; Construction or improvement of drainage systems; Enhanced catchment basins

2. INNOVATION

Climate Adaptation Notes is the first instrument to address water scarcity in Southern Africa by streamlining adaptation project financing into a single instrument through a partnership between commercial banks and institutional investors.

2.1 BARRIERS ADDRESSED

The instrument is structured to unlock the liquidity of the local debt capital markets for climate adaptation projects

To-date, institutional investors have largely avoided financing water and wastewater projects in the region due to cost recovery challenges and the complexity of the technical due diligence. Climate Adaptation Notes is designed to catalyze and increase the flow of institutional capital and lower financing costs for climate adaptation projects through allocation of technical and credit risk to the actors best equipped to manage the risk. Institutional investors can more directly access climate adaptation projects by leveraging the due diligence expertise of the commercial banks. Commercial banks are able to tap into the long-term financing and liquidity of the local debt capital markets.

2.2 INNOVATION

Combining construction and refinancing phases into a single instrument mitigates uncertainties and reduces financing **costs for projects, thereby improving the projects'** likelihood of success and profitability

Climate Adaptation Notes is the first instrument to address water scarcity in Southern Africa by streamlining adaptation project financing into a single instrument through a partnership between commercial banks and institutional investors. Engagements with commercial

banks, institutional investors, and industry experts indicate that the phased structuring approach applied by Climate Adaptation Notes is unique in the climate finance space. Combining financing phases and leveraging the pricing and tenors of institutional investors can improve individual project returns by 3-5% on average, see Section 4.1. The pilot issuance of USD 125 million would preserve over USD 10 million in project value on a net present value basis. For projects that are not highly profitable in a business as usual case, these improvements can make the difference in projects being able to obtain financing.

The Lab Secretariat has assessed several financial instruments with similar climate adaptation project aims, as well as an instrument that employs a similar collapsed financing phases approach. Table 2. Comparable instruments to Climate Adaptation Notes summarizes these instruments and outlines how they are differentiated from Climate Adaptation Notes.

Table 2. Comparable instruments to Climate Adaptation Notes

Similar Instruments	Description	Differentiation
Water Financing Facility	Mobilizes domestic investment into climate compatible water sector projects through the local bond market	Does not combine financing phases to combine commercial bank and institutional investor finance
DBSA Climate Finance Facility	Credit Enhancement based debt facility to support private sector projects that mitigate or adapt to climate change in the Rand Common Monetary Area	Does not access the DCM or note security structure in the same way
Climate Investor One	Financing facility for early-stage development, construction financing, and refinancing to fast-track renewable energy projects in developing countries	Similar sequential implementation during construction but different structuring and sectors

2.3 CHALLENGES TO INSTRUMENT SUCCESS

There are three core challenges to be mitigated to ensure instrument success, summarized in Table 3 below.

Table 3. Challenges and management strategies for Climate Adaptation Notes

Potential Challenge	Management Strategy
Project pipeline risk: lack of investment worthy-projects, licensing barriers, and lengthy project development cycle could reduce pool of financeable projects	The project will leverage commercial bank due diligence expertise to assess project risk and notes will be issued only to projects that pass bank screening. A first loss tranche from DFIs will further protect investor returns in the event of default of underlying projects. Proponents have had discussions with commercial banks who have indicated that they have significant eligible pipeline and the platform will work actively to help banks with outreach on origination to develop a robust pipeline. Improved financing from the unique Climate Adaptation Notes will reduce the overall debt burden on qualifying projects, improving their returns and bankability.

Instrument structure: the dual phase structure and note commitment pre-funding are new and require socialization and vetting	The proponents have had extensive discussions with asset managers, legal counsel, DFIs, banks, pensions funds, and others to introduce the instrument concept and address any issues up front. A favorable legal opinion on the viability of the structure has been obtained.
Monitoring and measurement: climate criteria can add a burden for lenders	The DCM Platform will develop simple, yet robust, criteria for screening projects for climate adaptation relevance, and will manage the process of monitoring and measurement throughout the lifecycle of the instrument.
Increased demand for capital: COVID may increase demand for capital and limit public budgets	Climate adaptation notes aims to efficiently harness available capital by improving due diligence practices and matching the financing capacity of commercial banks and institutional investors. The instrument also is relevant in a "green recovery" given both the climate adaptation benefits of projects financed and the sanitation and health focus of those projects.

MARKET TEST AND BEYOND

3. IMPLEMENTATION PATHWAY AND REPLICATION

The instrument aims to raise USD 125 million in a pilot issuance, backed by a project pipeline of diverse water and wastewater projects originating from national and sub-national governments and private developers based in countries in the Southern African Customs Union.

The target markets for Climate Adaptation Notes are divided into three categories: pilot countries in the Southern African Customs Union, countries in the remainder of the Southern African Development Community (SADC), and then countries in the broader sub-Saharan Africa region. To lower currency risk concerns, the initial implementation focus is on the five countries in the Southern African Customs Union where countries are either Rand-based or have currency closely tied to the Rand (Botswana). Figure 3 maps the proposed phases of implementation.

Figure 3. Map of Climate Adaptation Notes implementation

Phase 1: Pilot countries.

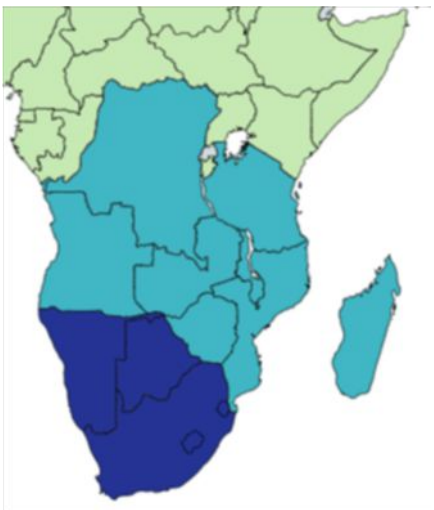
Immediately implementable countries in the Southern African Customs Union: Botswana, Eswatini, Lesotho, Namibia, South Africa.

Phase 2: Secondary countries.

Implementation in the remainder of SADC.

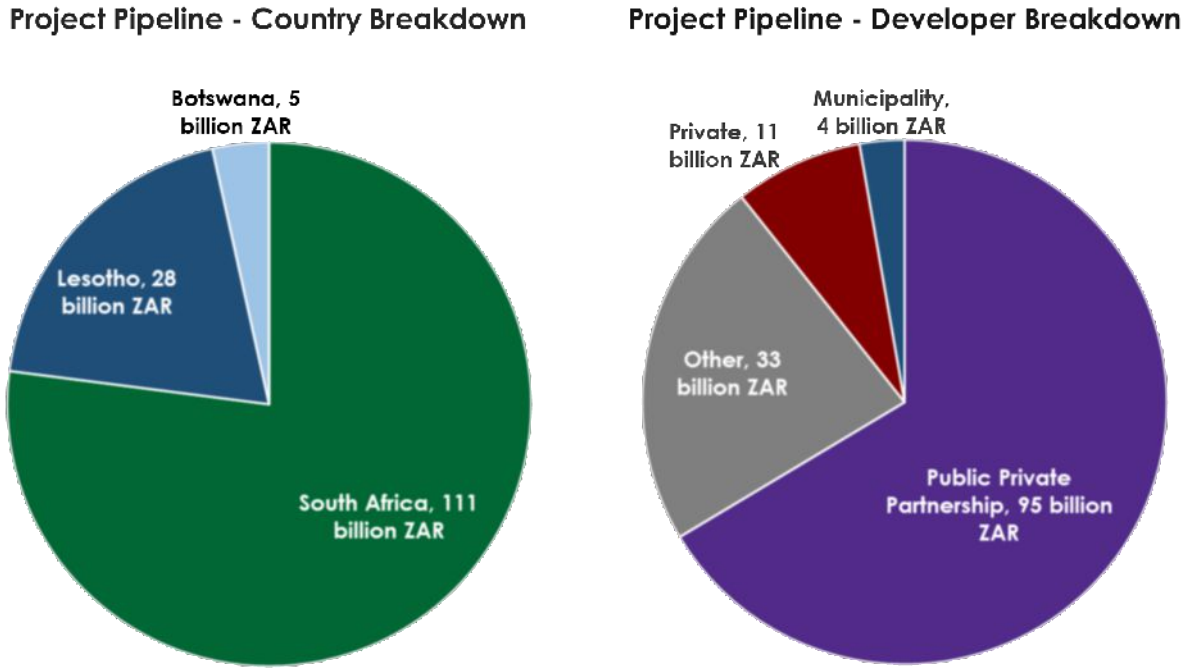
Phase 3: Tertiary countries.

Future implementation in Sub-Saharan Africa.



The instrument's pilot implementation aim is to raise USD 125 million to fund climate adaptation projects in Phase 1 countries. To succeed in pilot implementation and develop the instrument structure, the proponents will require start-up capital. These funds will support the technical set up of the instrument, and establish the investment mandate, impact criteria, and reporting requirements. This funding will also go toward establishing the DCM Platform, and pay fees to legal counsel, underwriters, and other 3rd party service providers to implement the pilot issuance. The proponents intend to seek grant funding to support these efforts. Once this funding is secured, the platform manager will be able to actively engage the other key stakeholders beyond its market testing activities to-date including in efforts to further develop and finalize project pipeline. Figure 4 outlines the project pipeline to-date by country and developer type[2].

Figure 4. Project pipeline by country and developer type



A diverse set of stakeholders will be involved in the implementation of Climate Adaptation Notes, as indicated in Table 4.

Table 4. Key Climate Adaptation Notes stakeholders

Stakeholder category	Activity to-date
Project developers are the source of the climate adaptation projects. Developers may be public, private, or joint (PPP) entities. They are responsible for developing the projects, complying with climate adaptation criteria, and repaying all debt and fees.	Pipeline of nearly 100 public and private sector projects identified to-date. Proponents have engaged with government offices and associations representing project developers.
Commercial banks are the lead entity for origination (sourcing) of projects, they carry out financial and technical due diligence, and provide the initial screen for project eligibility under climate adaptation criteria. These banks provide the construction financing for projects.	Conversation with FirstRand, NedBank, RMB, and Standard Bank to assess overall structure, pricing, pipeline, and appetite for product

[2] Project developers categorized as "Other" include water and sanitation governance bodies, water utilities, and water user associations.

Long-term investors provide the funding for the refinancing of the climate adaptation projects once they have successfully reached commercial operations and met any remaining loan conditions. These investors commit to this funding at the close of finance on the construction loans, enabling commercial banks to charge lower interest rates than under a business as usual scenario.	Conversation with ASISA (professional association), Riscura, PIC, Sanlam, Stanlib, Futuregrowth etc. to vet the overall structure, pricing, and appetite for product
Development finance institutions (DFIs) provide the funding for a "first loss" subordinate debt tranche to protect the returns of the long-term investors. DFIs will also provide guidance on the climate adaptation screening and monitoring criteria.	Conversations with AFD, DBSA, IFC, and KfW around instrument mechanics, appetite for first loss tranche, potential climate metrics
DCM Platform Manager will be an independent, accredited financial institution, and will be responsible for origination and screening (in cooperation with commercial banks), notes structuring and sale, monitoring and measurement of performance against climate adaptation criteria, and the processing and distribution of loan payments from projects to notes holders (DFIs and long-term investors).	Identification and set up of an independent impact investment manager to create and manage the platform
3rd party service providers include legal counsel, underwriters, and auditors.	Engagement of counsel (Webber Wentzel) to provide legal opinion on instrument structure
Donors will be needed to provide startup capital and fund the initial setup and structuring costs for the DCM Platform	The proponents are actively engaging with donors

Alongside stakeholder engagement, the instrument's focus on project pipeline to benefit the green recovery through climate resilience, health, and sanitation outcomes will buoy the fundraising potential of the instrument.

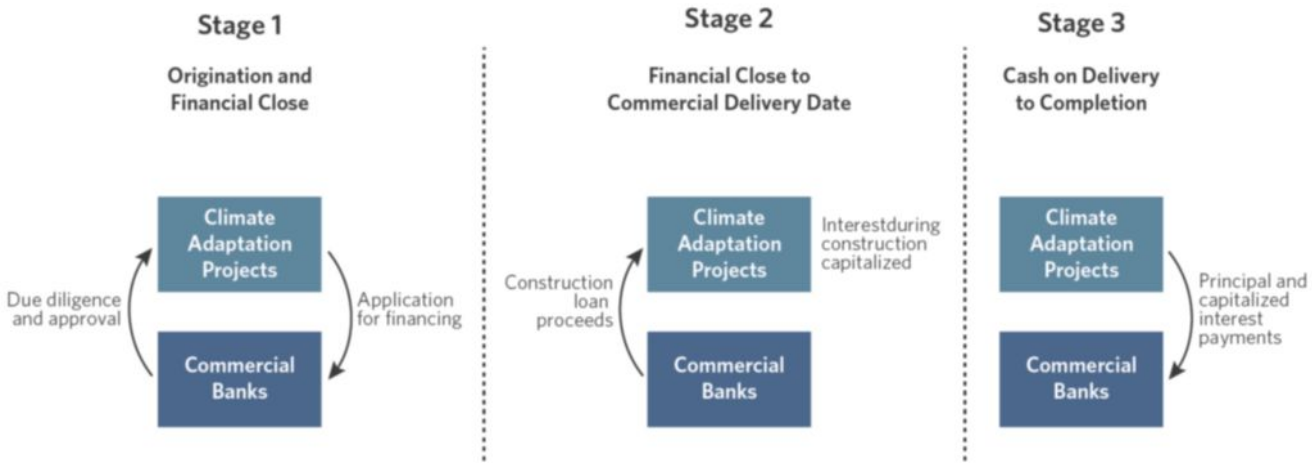
4. FINANCIAL IMPACT AND SUSTAINABILITY

4.1 QUANTITATIVE MODELING

The Lab Secretariat developed a financial model comparing the economics of a sample ZAR 550 million (USD 30 million) wastewater treatment project between a "business as usual (BAU)" construction loan and a project financed through the Climate Adaptation Notes mechanism.

The BAU scenario assumes commercial bank financing at a 70:30 debt-to-equity ratio at an interest rate of JIBAR + 4%. The project has a construction period of 2 years, during which interest is capitalized into the debt principal. Repayments on a 12-year tenor loan begin once the project reaches commercial operation and is generating revenue. The instrument mechanics of the business as usual standard financing are illustrated in Figure 5.

Figure 5. Standard project finance instrument mechanics



Under the Climate Adaptation Notes structure, the debt-to-equity ratio, construction period, and loan tenor remain the same. Because of the commitment from long-term investors to fund the refinancing after commercial operation, commercial banks are able to offer lower interest rates, currently modeled at JIBAR + 1.5%. The long-term investors receive a commitment fee of 1.5%, which is capitalized into the debt principal. The interest rate charged for the refinancing is CPI + 3%. Under this pricing, which is based on the historic spreads between JIBAR and CPI, the sample projects modeled achieve on average a 3-5% improvement on their return to the project developer. This improvement is critical to infrastructure projects, which typically have modest return expectations (e.g.,11-12%). CAN funding can be the "make or break" element that gets critical climate adaptation infrastructure built. Table 5 below indicates the project returns for both the BAU project financing and Climate Adaptation Notes financing approaches.

Table 5. Financial modeling illustrative project returns

Illustrative Project Returns			
Indicator	Standard project financing (BAU)	Climate Adaptation Notes financing	Difference
IRR	10.0%	13.1%	3.1%
$NPV_{10\ (USD)}$	(0)	2,200,000	2,200,000

After completing the project modeling comparison, the Lab Secretariat modeled the Climate Adaptation Notes facility itself by combining approximately 5 sample projects into a ZAR 2.25 billion (USD ~125 million) facility. As indicated in the instrument diagram, the facility will have a senior tranche comprised of long-term investors that takes on 80% of the facility, and a subordinate "first loss" tranche funded by DFIs funding the remaining 20%. Structuring and administrative fees for the Platform are included in the model, and note repayments are sized to achieve the target CPI + 3% return for the note holders (currently 7.5%), with a 25bps premium to the subordinated tranche.

The chart below shows the investment terms and expected returns to both tranches. With the incorporation of the commitment fee, the instrument is able to exceed the interest rate targets of 7.5% and 7.75% respectively.

Table 6. Financial modeling illustrative notes returns

Illustrative Notes Returns		
	Senior Tranche	Subordinated Tranche
Investment amount (USD)	100 million	25 million
Coupon	7.5% (CPI + 3)	7.75% (CPI + 3.25)
Commitment fee	1.5%	1.5%
Net return	7.6%	7.8%

4.2 PRIVATE FINANCE MOBILIZATION AND REPLICATION POTENTIAL

After the Phase 1 pilot, the Climate Adaptation Notes model aims to scale the size of future note offerings, expanding across Southern Africa. The Secretariat identified a current potential pipeline in the target region of ZAR 140 billion (USD ~7.8 billion), equivalent to 70x the target size of the pilot issuance. The projects identified are primarily in South Africa. Anecdotal evidence indicates significant additional pipeline in other countries, as well as from private sector sources. With the increased pressure on local and national government budgets related to the COVID-19 pandemic, the need for private sector financing for climate resilient infrastructure is expected to increase significantly and a relatively small portion of DFI financing is needed to unlock this private sector financing.

Successful implementation of the Climate Adaptation Notes model would have a significant demonstration effect, and give project developers, commercial banks, and the public sector increased incentives to develop qualifying climate adaptation projects. While water and sanitation in Southern Africa is the focus of this instrument, this structure has global applications for project finance outside of the region and the sector and could catalyze significant investment in sustainable infrastructure in other emerging economies with developed capital markets.

5. ENVIRONMENTAL AND SOCIO-ECONOMIC IMPACT

Proceeds from Climate Adaptation Notes will fund projects that reduce the severity of water shortages by improving infrastructure, strengthen water and wastewater infrastructure against extreme weather events, and enhance efficiency to expand sustainable water supply per capita.

5.1 ENVIRONMENTAL IMPACT

During the planning, implementation, and operation of the financed projects, there are two ways adaptation will be incorporated into the process. The first, through project criteria, is intended to assess whether a project qualifies as climate adaptation for Climate Adaptation Notes. This assessment will be conducted by the independent financial institution managing the DCM with insight from the commercial banks and DFIs and is described in additional detail in Annex 1.

The second element of the climate adaptation approach is a set of project metrics intended to assess how a project is delivering on climate adaptation outcomes undertaken at financing. These metrics will differ based on the sub-sector of projects financed. The assessment will likely be done by a combination of the platform manager and DFIs. A

project must have measurable adaptation-related outcomes to be selected for Climate Adaptation Notes financing, and impact metrics serve to fully account for flows of adaptation finance where outcomes of the investment can be variable.

Table 6 includes illustrative examples of the types of climate adaptation indicators that projects in the Climate Adaptation Notes pipeline could develop, while Annex 3 provides a more complete taxonomy of proposed indicators. These metrics measure both the resilience of the project itself vis-a-vis climate adaptation, as well as the resilience it fosters through its development.

Table 7. Climate Adaptation Notes-funded project outcome indicators

Sector	Activities	Outcome Indicators: Resilience *of* the Project	Outcome Indicators: Resilience *through* the Project
Water supply and treatment	Water treatment	• Reduction in number of days facility is out of service due to flooding or extreme weather • Achieving no or limited reduction in the quality of water treated during drought or storm occurrence • Proportion of asset that is waterproofed and located outside of current and projected flood plains • Reduced repair costs after extreme storm events	• Expected additional safely managed drinking water in cubic meters • Decrease in frequency of days or weeks of water use restrictions • Reduced number of infectious disease patients during outbreaks following flooding
Wastewater collection and treatment	Wastewater collection networks	• Reduction in number of days system is out of service due to flooding or extreme weather • Achieving no or limited reduction in the quality of water supplied during drought or storm occurrence • Proportion of asset that is waterproofed and located outside of current and projected flood plains • Reduced repair costs after extreme storm events	• Reduced number of properties affected by sewer flooding • Reduced quantity of contaminated flow into drainage • Improvement in the quality of water in surrounding water bodies
Agricultural irrigation	Water harvesting and irrigation	• Expected additional agricultural area under productive and sustainable agriculture in acres • Percent of cropping area with irrigation	• Number of additional landowners with access to resilience solutions for agricultural use • Increase in households with climate-resilience food supply.
Disaster risk management	Drainage systems	• Reduction in number of days drainage system/basin is non-functional service due to flooding or extreme weather • Proportion of asset that is waterproofed	• Reduced damage costs of systems or region protected by drainage systems / catchment basin • Decrease in households flooded or adversely affected by extreme storm

5.2 SOCIAL AND ECONOMIC IMPACT

A USD 125 million implementation targeting water and wastewater treatment projects would increase water and wastewater treatment capacity by approximately 90 megaliters per day, reaching an additional 90,000 or more municipal residents. The initial implementation could also yield additional resilience outcomes including a decline in the frequency of days or weeks with water use restrictions, a decline in households flooded during extreme storm events, and an increase in the number of households with climate-resilient food supply.

Climate Adaptation Notes will fund projects that improve the resilience of communities to climate-related health risks by increasing the number of households connected to water and sewage networks and improve the reticulation services where water access has deteriorated. COVID-19 has shifted the focus to infrastructure to support "community well-being", which is indicative of the need for a systematic approach to supporting a green recovery. Climate Adaptation Notes financed projects will address of number of the key issues related to improving community well-being, which are clearly expressed through the Sustainable Development Goals (SDGs). Table below shows those SDGs where Climate Adaptation Notes has a direct impact.

Table 8. Climate Adaptation Notes' impact by Sustainable Development Goal (SDG)

SDG	CAN Impact	SDG	CAN Impact
	Access to clean water is critical in promoting good health outcomes, and is instrumental in stopping the spread of COVID-19		Increasing access to clean water and sanitation will reduce the inequalities in health and well-being
	Projects financed through CAN will provide clean water for residential and commercial use for thousands of people		By improving existing or installing new, climate adaptive infrastructure, CAN funding will improve the sustainability of cities and communities
	CAN funding will be used build new, climate adaptive infrastructure, and make existing infrastructure more resilient		CAN is specifically designed to fund those projects that address climate adaptation needs in Southern Africa and globally

NEXT STEPS

If endorsed by the Lab, Climate Adaptation Notes will seek technical assistance grants to fund the operations of the DCM Platform manager, structure the instrument, and begin marketing to commercial banks, institutional investors, and DFIs. In addition to seeking grant funding, the proponents will prepare a detailed budget and implementation plan for structuring the notes and managing the platform and begin engaging with commercial banks and long-term investors. Following structuring, the project pipeline will be finalized, and the instrument will be marketed to institutional investors. Commercial banks will then finance project construction, notes will be sold to institutional investors for re-financing, and the DCM Platform manager and DFIs will evaluate project outcomes.

After the Phase 1 pilot, the Climate Adaptation Notes model will be scaled across Southern Africa, mobilizing private capital to increase water security for millions in the region. In an environment where local and national government budgets are increasingly stressed by the

COVID-19 pandemic, this instrument can play a critical role in increasing private sector financing for climate resilient infrastructure and fostering a green recovery.

REFERENCES

Bank for International Settlements (BIS). (2015). "Regulatory Consistency Assessment Programme (RCAP). Assessment of Basel III risk-based capital regulations – South Africa." https://www.bis.org/bcbs/publ/d322.pdf

CDP. (2018). "CDP South Africa Water 2018." https://www.nbi.org.za/wp-content/uploads/2019/06/NBI_CDP-South-Africa_Water-Report_2018.pdf

Climate Bonds Initiative. (2019). "Climate Resilience Principles." https://www.climatebonds.net/files/files/climate-resilience-principles-climate-bonds-initiative-20190917.pdf

CostWater. (2020). "Running COSTs of wastewater treatment plants." http://costwater.com/runningcostwastewater.htm

Global Commission on Adaptation. (2019). "Adapt Now: A Global Call for Leadership on Climate Resilience. Global Commission on Adaptation."https://cdn.gca.org/assets/

GreenCape. (2020). "Water - 2020 Market Intelligence Report." https://www.greencape.co.za/assets/Uploads/WATER_MARKET_INTELLIGENCE_REPORT_19_3_20_WEB.pdf

HLEG. (2018). "Informal Supplementary Document on Sustainable Taxonomy." https://ec.europa.eu/info/sites/info/files/180131-sustainable-finance-final-report-annex-3_en.pdf

International Development Finance Club. (2018). "Lessons Learned – From three years of implementing the MDB-IDFC Common Principles for Climate Change Adaptation Finance Tracking." https://www.idfc.org/wp-content/uploads/2018/12/mdb_idfc_lessonslearned-full-report.pdf

National Business Initiative. (2019a). "An Introduction to PPPs in South Africa." https://www.nbi.org.za/wp-content/uploads/2019/05/NBI_KYM-Report-3_Introduction-to-PPPs.pdf

National Business Initiative. (2019b). "Barriers and Solutions to Implementing Municipal Water PPPs." https://www.nbi.org.za/wp-content/uploads/2019/05/NBI_KYM-Report-6_PPP-Barriers-Solutions.pdf

National Business Initiative. (2019c). "Solving for Municipal Wastewater Treatment." https://www.nbi.org.za/wp-content/uploads/2019/06/NBI_KYM-Report-7_Solving-Wastewater-Treatment.pdf

National Business Initiative. (2019d). "Unlocking Water Investment in South Africa." https://www.nbi.org.za/wp-content/uploads/2019/05/NBI_KYM-Report-1_Unlocking-Water-Investment.pdf

Southern African Development Community. "Water & Sanitation." https://www.sadc.int/themes/infrastructure/water-sanitation/

UNDP. (2006). "Human Development Report 2006. Beyond scarcity: Power, poverty and the global water crisis." http://hdr.undp.org/en/content/human-development-report-2006

UNEP. (2018). "The Adaptation Gap Report 2018." https://www.unenvironment.org/resources/adaptation-gap-report

UN Water. (2020). "Water, Sanitation and Hygiene." https://www.unwater.org/water-facts/water-sanitation-and-hygiene/

World Bank. (2016). "The Costs of Meeting the 2030 Sustainable Development Goal Targets on Drinking Water, Sanitation, and Hygiene." https://www.worldbank.org/en/topic/water/publication/the-costs-of-meeting-the-2030-sustainable-development-goal-targets-on-drinking-water-sanitation-and-hygiene

World Resources Institute. (2018). "3 Things Cities Can Learn from Cape Town's Impending "Day Zero" Water Shut-Off." https://www.wri.org/blog/2018/02/3-things-cities-can-learn-cape-towns-impending-day-zero-water-shut

World Resources Institute. (2019a). "Climate Change Is Hurting Africa's Water Sector, but Investing in Water Can Pay Off." https://www.wri.org/blog/2019/10/climate-change-hurting-africa-s-water-sector-investing-water-can-pay

World Resources Institute. (2019b). "Unaffordable and Undrinkable: Rethinking Urban Water Access in the Global South." https://www.wri.org/wri-citiesforall/publication/unaffordable-and-undrinkable-rethinking-urban-water-access-global-south

World Resources Institute. (2020). "Aqueduct Water Risk Atlas." https://www.wri.org/resources/maps/aqueduct-water-risk-atlas

ANNEX

ANNEX 1. PROJECT ADAPTATION CRITERIA

Criteria 1. Understanding material physical climate risks	Criteria 2. Supporting systems adaptation	Criteria 3. Monitoring adaptation results
• Project has conducted a climate risk assessment which considers both current weather variability and future climate change, including uncertainty. • The project climate risk assessment is based on robust analysis of available climate data and projections across a range of future scenarios. • The project climate risk assessment is consistent with the expected lifetime of the activity.	• The project is adressing the climate risks identified (resilience of the project and/or through the project) • The project and its adaptation measures do not increase the risks of an adverse climate impact on other people, nature and assets, or hamper adaptation elsewhere. • The project and its adaptation measures are consistent with sectoral, regional, and/or national adaptation efforts.	• The reduction of physical climate risks associated with the project implementation can be measured. • Implementers have developed 1-3 metrics for adaptation results to be monitored and measured against defined indicators.

ANNEX 2. TAXONOMY OF PROJECT PIPELINE

Category	Sector	Activities	Sub-Activities
Water and wastewater management	Water supply and treatment	Water collection	Expansion of reservoirs
			Reinforcement of river basins
			Boreholes and tubewells
			Household water safe storage
			Well flood resilience
			Rainwater collection from ground surfaces-small reservoirs and microcatchments
			Rainwater harvesting from roofs
			Stormwater retention and detention systems
			Stormwater drainage
			Pump stations
			Dam construction
		Water treatment	Water reuse
			Water reclamation
			Construction and/or upgrade of water treatment plant
			Renewable energy solutions for water treatment
			Household water treatment
			Desalination
		Water supply	Construction and/or upgrade of water distribution networks
			Leakage management, detection, and repair in piped systems
			Increased use of water efficient fixtures and appliances
	Wastewater collection and treatment	Wastewater collection networks	Construction and/or upgrade of sewer systems
			Raw water supply
		Wastewater treatment facilities	Reuse of sludge
			Brine discharge
			Construction and/or upgrade of wastewater treatment plants
			Renewable energy solutions for water treatment
			Pumped marine outfalls
		Sanitation	Anaerobic digestion of sewage sludge with low carbon impact
			Anaerobic digestion of bio-waste with low carbon impact
			Composting of bio-waste

Agriculture	Irrigation	Water harvesting and irrigation	Increasing water availability and efficiency of use through harvesting and irrigation technologies
			Smart agriculture technologies
			Rainwater collection from ground surfaces-small reservoirs and microcatchments
			Rainwater harvesting from roofs
Infrastructure, energy and other built environment	Power generation	Hydropower	Building resilience into infrastructure such as protection systems for dams
			Construction of new hydropower infrastructure
			Pumped storage construction and maintenance
Disaster risk management	Early warning systems	Early warning and emergency response systems	Early warning / emergency response systems applied to water and wastewater
	Management systems	Drainage systems	Construction or improvement of drainage systems
			Enhanced catchment basins

ANNEX 3. OUTCOME INDICATORS BY SECTOR AND ACTIVITIES

Category	Sector	Activities	Outcome Indicators: Resilience *of* the Project	Outcome Indicators: Resilience *through* the Project
Water and wastewater management	Water supply and treatment	Water collection	• Reduction in number of days facility is out of service due to flooding or extreme weather • Achieving no or limited reduction in the quality of water collected during drought or storm occurrence • Proportion of asset that is waterproofed and located outside of current and projected flood plains • Reduced repair costs after extreme storm events	• Expected additional safely managed drinking water in cubic meters • Decrease in frequency of days or weeks of water use restrictions
		Water treatment	• Reduction in number of days facility is out of service due to flooding or extreme weather • Achieving no or limited reduction in the quality of water treated during drought or storm occurrence • Proportion of asset that is waterproofed and located outside of current and projected flood plains • Reduced repair costs after extreme storm events	• Expected additional safely managed drinking water in cubic meters • Decrease in frequency of days or weeks of water use restrictions • Reduced number of infectious disease patients during outbreaks following flooding
		Water supply	• Reduction in length or proportion of distribution networks at risk from flooding or extreme storms. • Reduction in number of days networks are out of service due to flooding or extreme weather. • Reduced repaid costs after extreme storm events	• Expected additional safely managed drinking water in cubic meters • Decrease in frequency of days or weeks of water use restrictions • Additional households with access to safely managed drinking water • Reduction in inefficient or leaked water in piped systems in cubic meters
	Wastewater collection and treatment	Wastewater collection networks	• Reduction in number of days system is out of service due to flooding or extreme weather • Achieving no or limited reduction in the quality of water supplied during drought or storm occurrence • Proportion of asset that is waterproofed and located outside of current and projected flood plains • Reduced repair costs after extreme storm events	• Reduction in number of properties affected by sewer flooding • Reduction in quantity of contaminated flow into drainage • Increase in quality of water in surrounding water bodies

		Wastewater treatment facilities	• Reduction in number of days wastewater treatment is out of service due to flooding or extreme weather • Achieving no or limited reduction in the quantity of wastewater treated during drought occurrence • Proportion of asset waterproofed and located outside of current and projected flood plains	• Number of additional people with access to wastewater services • Number of additional people with access to improved sanitation services • Decrease in frequency of days or weeks of water use restrictions
		Sanitation	• Reduction in number of days system is out of service due to flooding or extreme weather • Proportion of asset that is waterproofed and located outside of current and projected flood plains • Reduced repair costs after extreme storm events	• Reduction in number or length of sewerage and drainage networks at risk from flooding • Reduced investment in repair of sewer networks damaged by precipitations, rainstorms and/or flooding
Agriculture	Irrigation	Water harvesting and irrigation	• Expected additional agricultural area under productive and sustainable agriculture in acres • Percent of cropping area with sustainable irrigation • Percent of cropping area with enhanced soil water retention	• Number of additional landowners with access to resilience solutions for agricultural use. • Increase in households with climate-resilience food supply.
Infrastructure, energy and other built environment	Power generation	Hydropower	• Reduction in number of days facility is out of service due to flooding or extreme weather • Proportion of asset that is waterproofed and located outside of current and projected flood plains • Reduced repair costs after extreme storm events	• Achieving no or limited reduction in the generation of power during drought, heatwaves or storm occurrence
Disaster risk management	Early warning systems	Early warning and emergency response systems	N/A	• Reduced repaid costs to infrastructure protected after extreme storms. Decrease in number of days facilities are out of service.
	Management systems	Drainage systems	• Reduction in number of days drainage system/basin is non-functional service due to flooding or extreme weather • Proportion of asset that is waterproofed	• Reduced damage costs of systems or region protected by drainage systems / catchment basin • Decrease in households flooded or adversely affected by extreme storm