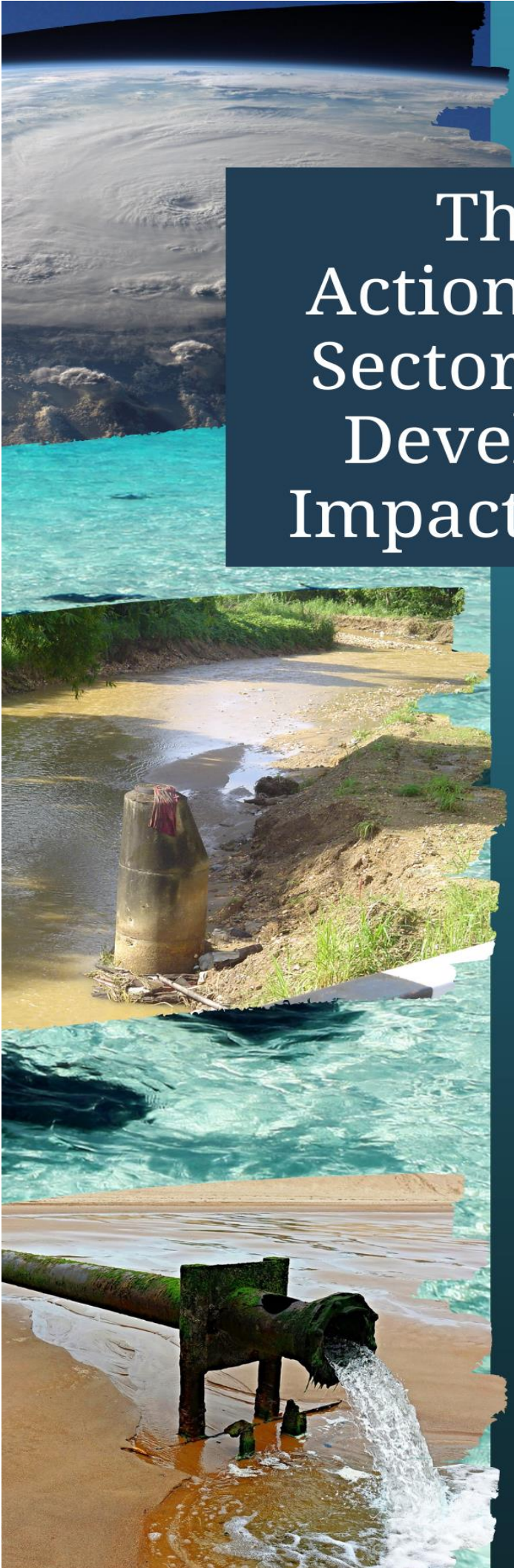

The Regional Strategic Action Plan for the Water Sector in the Caribbean to Develop Resilience to the Impacts of Climate Change

IMPLEMENTATION PLAN 2021

IDB Inter-American Development Bank

CARIBBEAN WATER AND WASTEWATER ASSOCIATION

THE CARIBBEAN WATER AND WASTEWATER ASSOCIATION

C/O WASA HEADQUARTERS, BLDG HO12
ST. JOSEPH, TRINIDAD AND TOBAGO

Regional Strategic Action Plan for the Water Sector in the Caribbean to Develop Resilience to the Impacts of Climate Change

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Second Implementation Plan Regional Level Responses IP-2021

August 2021

Final

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Glossary

ACP	Asia Caribbean Pacific
CARICOM	Caribbean Community
CARIFORUM	Caribbean Forum
CARPHA	Caribbean Public Health Agency
CAR/RCU	Caribbean Regional Coordination Unit
CAWASA	Caribbean Water and Sewerage Association Inc.
CBO	Community Based Organisation
CC & CV	Climate Change and Climate Variability
CDB	Caribbean Development Bank
CDEMA	Caribbean Disaster Emergency Management Agency
CEP	Caribbean Environment Programme
CIMH	Caribbean Institute for Meteorology and Hydrology
CLME+	Caribbean Large Marine Ecosystem
COTED	Council for Trade and Economic Development
CPD	Continuing Professional Development
CReW+	Caribbean Revolving Fund for Wastewater
CWWA	Caribbean Water and Wastewater Association
DRR	Disaster Risk Reduction
EIB	European Investment Bank
EU	European Union
GCF	Green Climate Fund
GEF	Global Environment Facility
GWP-C	Global Water Partners-Caribbean
HLF	High Level Forum of Ministers with Responsibility for Water
IBNET	International Benchmarking Network for Water and Sanitation Utilities
IDB	Inter-American Development Bank
INGO	International Non-Governmental Organisations
IWEco	Integrating Water, Land and Ecosystems Management in Caribbean Small Island Developing States
IWRM	Integrated Water Resources Management
MEA	Multi-lateral Environmental Agreement
MFI	Multi-lateral Financial Institution
NAMA	Nationally Appropriate Mitigation Actions
NAP	National Adaptation Plans
NRW	Non-Revenue Water
OOCUR	Organisation of Caribbean Utility Regulators
PAHO	Pan-American Health Organization
PPP	Public Private Partnership
RE	Renewable Energy
RCC	Regional Climate Centre
RSAP	Regional Strategic Action Plan for Water Governance
SDG	Sustainable Development Goals
SIDS	Small Island Developing States
SMART	Specific, Measurable, Achievable, Relevant, Time-bound
SOE	State Owned Enterprise
TBD	To Be Decided
UKAID	United Kingdom Agency for International Development

UNDP	United Nations Development Programme	USAID	United States Agency for International Development
UNEP	United Nations Environment Programme	WMO	World Meteorological Organisation
UNFCCC	United Nations Framework Convention on Climate Change		

Introduction

The Regional Strategic Action Plan for the Water Sector in the Caribbean (RSAP) was developed by Regional Stakeholders for the 8th World Water Forum, held in Brazil, 18 – 23 March 2018. A revised and updated document was presented to the 14th High Level Forum, held in Montego Bay Jamaica, 9 – 10 October, 2018. Recognising that the RSAP is a response to the myriad of common challenges facing the Caribbean Water Sector it proposed a framework of action, at the national and regional levels to respond to the challenges. At the heart of the document is the acknowledgement of commonalities and of differences in circumstances and challenges but that by working together Caribbean countries will be better able to respond.

At the 14th High Level Forum, the Ministers declared that:

- The CWWA and its partners should continue the development of an Implementation Plan for the RSAP, and that this decision does not bind any government to any financial or new policy obligations.
- They be kept informed about and engaged in the implementation of the RSAP.

Responding to the Ministers, the First Implementation Plan was developed setting out proposed regional level response building on known and proposed initiatives. The responses were based around the five pillars identified in the RSAP:

- Climate-resilient Water Governance,
- Climate-informed Decision Support,
- Climate-resilient Water Resources Management,
- Climate-resilient Water Service Provision, and
- Capacity building and sensitization for Climate-resilience.

In addition, the RSAP Implementation Plan recognises and incorporates the research and development needs of the water sector. An important component is that of Monitoring and Evaluation as part of Capacity Building. This acknowledges the role of regional institutions and in particular the CWWA in monitoring and reporting back to Ministers on the progress in respect of the development and implementation of the RSAP. The RSAP 1st Implementation Plan was presented to the 15th HLF held at Basseterre, Saint Kitts and Nevis, October 14-15, 2019. The meeting confirmed the Caribbean Water and Wastewater Association as lead entity for the HLF-Water and the willingness of CWWA to act as lead agency for the RSAP. Further, they declared their commitment to the First Implementation Plan – Regional Level Responses, to work with RSAP partners and agreement, at the national level, to execute the First Implementation Plan and support their respective Country's Action Plan. Furthermore, the HLF recognise the consensus of national and regional stakeholders (partners) that the CWWA would act as the lead agency to coordinate and monitor progress of the RSAP.

The 16th HLF, hosted virtually by Saint Lucia, October 27 – 28, 2020, reaffirmed the Basseterre Declaration and recommitted the region to the RSAP and the First Implementation Plan – Regional Level Responses. The Forum noted positive developments since the previous HLF such as:

- Positive measures and programmes to address the levels of Non-Revenue Water across Caribbean states are being implemented;
- Wastewater represents a valuable resource and encourages national actions for its productive utilisation;

- The need to redouble efforts to mainstream water conservation measures into national plans of action;
- Initiatives being taken under Component 4 Climate Resilient Water Services of the RSAP.

The 16th HLF took place during the COVID-19 pandemic and its impacts served to highlight the vulnerabilities and importance of the water sector in underpinning health, well-being and development. The ministers resolved that the lessons from the pandemic and its impacts must be mainstreamed and incorporated into disaster planning and preparedness to increase resilience in Caribbean states.

Since the inception of the RSAP First Implementation Plan – Regional Level Responses, the CWWA has embraced its role and responsibility in respect of monitoring the Implementation Plan. It has set up and convened the RSAP Implementation Monitoring Committee on which regional and interested agencies participate, see Annex 1 for its Terms of Reference. In his address to the 16th HLF, the CWWA Executive Director reported that many of the proposed actions had been put on hold because of the advent and impact of Covid-19 on the region. He noted that the region is learning to live with the effects, that utilities are adapting and transitions such as on-line meetings and webinars are being made. In spite of the challenges brought on by COVID-19, the work of the Implementation Monitoring Committee has continued. This update has been initiated by the Committee and its terms of reference developed jointly by its members.

The Second Implementation Plan – Regional Responses

The First Implementation Plan (IP-2019) contained a summary of the expected sector level impacts of climate change and climate variability, outlining the future environment and conditions within which the sector can expect to operate and provide services. In many cases these constitute additional stressors, having a multiplier effect that could otherwise circumscribe the ability of the water sector to achieve Sustainable Development Goal 6: Clean Water and Sanitation. It also sets out the Implementation Plan Actions to be undertaken that respond to the cross-cutting and/or common regional challenges, based on the information available at the time.

A key challenge in the execution of the First Implementation Plan is the issue of how realistic the compendium of regional initiatives listed in Table 3: Regional Level Actions is, and the need for an improved implementation and monitoring framework. Accordingly, the RSAP Implementation Committee with the assistance of the Inter-American Development Bank (IDB) has resolved that there should be prepared a Second RSAP Implementation Plan (IP-2021). The objective is that IP-2021 will guide activities in the water sector in the Caribbean according to the five pillars in the RSAP 2018 document – see Annex 2. Further, it is to provide a framework for monitoring the implementation of regional initiatives aimed at improving the water sector of the Caribbean in response to climate change.

The benefit of the RSAP Implementation Monitoring Committee (RSAP-IMC) and the role it is playing in coordinating regional actions has been demonstrated through the development of IP-2021. First of all, the terms of reference for the development of IP-2021 were jointly developed by the members of the Committee and hence reflect a consensus regarding what is required. As importantly, noting that there are other regional level actions being undertaken, the Committee has provided a platform to coordinate and streamline those regional level actions. So whilst, IP-2021 is being undertaken through the IDB and CWWA, there are three other consultancies which are gathering data; Preparation of a Water and Sanitation Sector Policy, Strategy and Operational Guidelines for the CDB (CDB); Development of a Regional Action Framework for Integrated Water

Resources Management (IWRM) for the CARICOM Region (UNEP), and; Survey of the Regional Wastewater Utilities (UN-Habitat). Through the intervention of the Implementation Monitoring Committee, the four initiatives are coordinating their data gathering efforts and supporting each other. Hence the IP-2021 will not only reflect the initiatives that are being implemented to strengthen water governance, responses to climate change and the improvement of water management in the Region, it will also be an outcome of the collaborative efforts to address the challenges.

Summary of Impacts on the Water Sector

Whilst a concern has been the impacts of climate change on the water sector, events since 2020 have demonstrated that climate change is not the only physical stressor that impacts the resilience of the sector. The emergence of the COVID-19 pandemic in early 2020 was something the sector was not prepared for in its disaster planning; though in fairness few sectors, if any, were. Some experts in the health sector have been warning of the threat of a global pandemic yet the extent to which COVID-19 has impacted the world has taken the global community by surprise. It is true to say that we are still living with the effects and all indications are that although there have been tremendous efforts to deal with the impacts, they will be with us for years to come and previously normal practices will have to change.

The impacts of COVID-19 on the water sector may be summarised as follows. Efforts to contain the spread of the virus have focused on minimising contact between people to try to break the cycle of transmission. This has led to lock-downs across the globe to restrict movement and has resulted in a significant decrease in journeys and transport of all kinds. It has led to the virtual collapse of the tourism industry and associated activities. At the same time, it has forced changes in working practices, such as working from home. However, there are many who by nature of their work cannot work from home and they are often in the lower income groups. COVID-19 has reinforced pre-existing disparities and socio-economic vulnerabilities. The changes in working practices, particularly in urban areas has resulted in a marked decrease in commercial activity and hence a drop in water consumption. Conversely, with families restricted to their homes, domestic water consumption has increased. Industry and manufacturing has been impact by lower demand for goods as well as restrictions on work forces and it too has seen a decline in water consumption.

Decreases in consumption, particularly from the non-residential sectors whose water consumption is charged at a higher tariff have led to a fall in revenue from these sectors. At the same time decreases in economic activity have meant that some have been challenged in being able to pay their water bills. Furthermore, changes in working practices such as the need for maintaining social distances, have increased operating costs. The slowdown in economic activity and the disruption of supply chains, has meant that obtaining parts and goods, such as chemicals has been a challenge and also increased purchase prices. Some of these impacts are of a medium term nature, as economies slowly recover. However, they have highlighted system vulnerabilities. How long these effects will last depends on the nature and pace of economic recovery. But there has been some evidence of a slowdown in investments and projects though governments are seeking to ramp up the implemented of capital projects as a means of providing economic stimulation to their economies.

More localised has been the impact of the eruption of the La Soufriere volcano in Saint Vincent. The ashfalls affected not just the island of Saint Vincent but adjacent Caribbean islands as well. The ashfalls and lahars impacted the water infrastructure in Saint Vincent interrupting water

supplies for protracted periods. It led to the relocation of persons including to shelters, which were not designed to accommodate the numbers of persons for the long periods of time – this placed a burden on sanitation facilities as well as water supplies. On the adjacent islands, whilst water infrastructure was not adversely affected, the clean-up needs increased the demand for water, often met from potable supplies. The Barbados Water Authority (BWA) for example asked consumers to be sparing with their water use and not to clean their vehicles. A potential benefit was the realisation that treated wastewater could be used for clean-up purposes.

By themselves these phenomena had and continue to have impacts on the water sector, infrastructure, consumption patterns, revenue generation and expenditure. Of increasing concern is the conjunctive effect of multiple hazards occurring in close proximity to each other and even some of the longer term, delayed effects. For example, within days of the volcanic eruption on Saint Vincent, the island was hit by a tropical wave which caused flooding and damage just as the damage from the eruption was being addressed.

The region is still in the early stages of digesting the lessons to be learnt from the combination of health pandemics, natural hazards and the impact of climate change. It can be anticipated that in future planning of programmes and projects more attention will have to be paid to the probability of and responses to conjunctive events.

Summary of Climate Change Impacts on the Water Sector

The effects of climate change and climate variability on the water sector can be broken down into the effects on water resources and on the provision of water services. Through on-going research into the potential consequences of continued greenhouse gas emissions on the global climate a more detailed appreciation of the effects on the regional climate continues to develop. Changes in rainfall patterns, intensities, increases in the number and frequency of continuous dry days, increases in day and night time temperatures, increases in continuously hot days, sea level rise and other parameters are now better understood, with a higher degree of probability, depending on climate scenario. However, according to the World Meteorological Organization (WMO) assessment the signs and impacts of global heating are speeding up climate changes. Given the vulnerable nature of the Caribbean Region this should add fresh urgency to efforts to include and operationalise climate resilience into the water sector. The following provides a very general overview of impacts, acknowledging that there are local factors that will modulate the effects of climate change and climate variability.

Water Resources Impacts

Water resources provide the supply of water to meet the consumptive needs of a country. At a basic level, climate change and climate variability will have impacts on water quantity and water quality. In general, there is expected to be a general drying trend and increased variability; less overall rainfall, increases in the number of consecutive dry days, increased prevalence of drought conditions and changes in rainfall intensity. Coupled with the expected increases in temperature these conditions will over time change the condition of watersheds and catchments. Changes in vegetation to cope with prevailing higher air and soil temperatures and lower soil moisture will have a direct impact reducing the amount of run-off and a deterioration of water quality through increased sediment loads and erosion.

Human activities in watersheds and catchments will also respond to the changed conditions through changes in agricultural practices and cultivation, increased water use, and increased use

of fertilisers and pesticides in an effort to maintain productivity. Such adaptive practices run the risk of accelerating the detrimental effects on watersheds through negative feedback loops.

Overall there will be less run-off to maintain surface water resources and greater variability in run-off with both lower and higher flows. Higher rates of run-off and instream flows will not only transfer greater volumes of water into the marine environment, but they will also carry higher sediment loads, including biochemical pollutants. Intense rainfalls and flash flooding often provide the trigger for mass movements such as landslides which damage infrastructure like pipelines and water installations and have reduced the storage capacity of dams and impoundments. Even under non-extreme conditions greater variability of soil temperature and moisture induces soil movement, stressing buried infrastructure and increasing bursts and leakages particularly among aging pipeline assets.

Similarly, changes in rainfall-runoff patterns will impact groundwater recharge; decreases in rainfall means lower recharge while higher rates of run-off will exceed the infiltration capacity of soils and aquifers also resulting in lower recharge rates. Changes in land and agricultural practices that result in loss of vegetative cover adversely affect recharge as water is not being retained and made available for recharge. Furthermore, increased use of biochemical pollutants increases the risk of contamination of aquifers. Groundwater flows also have a role in maintaining surface water flows. Decreases in recharge to coastal aquifers increases the risk of saline intrusion and if abstraction rates are not adjusted accordingly, they run the risk of having to be abandoned as a freshwater resource due to the increase in salinity levels.

Drought conditions exacerbate the negative impacts described above; salinization of aquifers, reduction in the dilution of pollutants, reduction in streamflows and aquifer recharge, and accelerated degradation of watersheds. The expected increase in the recurrence of drought conditions will pose severe challenges for maintaining a basic level of supply and increase costs through the need for remediative actions such as tinkering and desalination. An emerging concern is that of water security, particularly in times of emergencies, as limited water supply from a diminished or compromised resource could have adverse socio-economic and public order consequences. Table 1 summarises the impacts of climate change and variability on water resources and provides an indication of common responses that have been proposed to adapt to or mitigate the impacts on the supply side.

Table 1: Impacts of Climate Change on Water Resources

Driver	State	Impact	Response
Intense rainfall	Higher run-off Landslides Flooding Debris flows	Increased pollutant loads Loss of supply Loss of storage capacity Damage to water infrastructure Impact on marine environment Loss of power supplies Socio-economic stresses	Increase systems resilience and redundancy.
Decreased rainfall and increased variability	Decrease streamflows Variable surface water flows Decreased aquifer recharge	Decrease in available water and loss of supply Loss of arable land	Improve watershed management Increase water capture and storage Diversify water resources Introduce payment for environmental services schemes Develop water sharing protocols

Higher temperatures	Increased evaporation and evapotranspiration Deterioration of watershed conditions Soil movement	Reduction in water quantity Increased pollutant loads Increased in bursts and leakages Environmental health impacts	Improve watershed management
Drought conditions	Salinization of coastal aquifers Reduced stream flows Reduced aquifer recharge and yields Deterioration of watershed conditions	Decrease in available water Saline intrusion Increased levels of pollution Water rationing Socio-economic stresses Loss of agricultural productivity and vegetation cover	Reduce demand and consumption Improve water use efficiency Wastewater reuse Desalination

Whilst there have been developments in the general understanding of the impact of climate change a continuing challenge remains, that of being able to translate the impacts from the general to the particular. This requires the collection of appropriate, good quality data, the ability to use the data in models, and the translation of model outputs into formats to inform policy decisions. This reinforces the need to invest in data gathering and data sharing, and to develop capacity on a systematic basis.

Water Services Impacts

The provision of water services; i.e. water supply, wastewater collection, treatment and disposal, are dependent on the availability of water resources. Water services encompasses the physical infrastructure required to convey water to points of consumption and from there to collection and disposal. It also entails institutional and economic aspects that condition the way in which the services are provided.

Intense rainfall events including those associated with tropical storms can give rise to flash floods and debris flows. The rainfall can result in slope instabilities resulting in mass movements and landslides. Landslides affect water distribution systems, pump stations and reservoir impoundments whilst flooding and debris flows have damaged water and wastewater infrastructure.

Decreases in water availability resulting from reductions in water resources is felt through a need to find additional sources of supply and to provide additional storage capacity to bridge periods of low supply. Decreases in volumes can have water quality impacts. Firstly, through an increase in pollution concentrations and secondly intermittent supplies mobilise sediments in the pipelines. On the one hand this leads to increased water treatment costs and on the other results in poor water quality being supplied, and an increase in complaints. The link between increases in temperature and other weather-related factors and water consumption has so far not been shown to be strong with respect to domestic demand; however, for other sectors such as agriculture the need to offset higher rates of evapotranspiration is well established. Climate change and climate variability is expected to result not only in high water demands but also in increased competition for the available water resources. In the absence of robust water sharing protocols, levels of constrained demand, social inequality and economic impacts will increase – particularly acute during times of drought. Decreases in water availability may have some limited beneficial effects in that it would encourage a greater emphasis on water use efficiency; achieving the same level of service and satisfaction but with a reduced volume of water.

Seasonal and intermittent changes in soil temperature and moisture lead to differential soil movement which affects buried assets such as pipelines. In the cases where these assets are

'old' and depending on factors such as the pipe material and age, an increase in differential movement will stress the pipelines and result in an increase in bursts and leaks. Newer, more flexible materials with fewer joints perform better under these conditions but many water distribution systems are characterised by an aging infrastructure. Increased temperatures would have a negative effect on impoundments through increased rates of evaporation and could reduce 'headroom' – the difference between water available and water required to meet demand.

With respect to the impact of climate change on sanitation and wastewater there may be some beneficial aspects with respect to wastewater treatment. Increased temperatures are likely to have a positive impact on microbial activity, increasing the effectiveness of treatment. However, since the Caribbean has a low coverage of centralised wastewater treatment works any potential benefit will be limited in scope. Wastewater treatment works are usually located downstream from where wastewater is generated and often in lower lying coastal areas. These are particularly vulnerable to flooding and debris flows associated with intense rainfall events.

Overall, the consideration of the potential impacts of climate change and variability on water services needs to be an integral part of water master planning and asset management. Whilst there are impacts on the water services physical infrastructure, they also have institutional and financial implications; challenges to managerial capabilities, financial impacts and regulatory implications. On top of mostly poorly maintained and aged infrastructure resulting in low continuity of service, climate related impacts have already exposed vulnerabilities in water systems and resulted in increased capital and operational costs, particularly during fast and slow onset events. Failure to increase the resilience of the water sector infrastructure, physical and non-physical, will result in an escalation of costs and a deterioration of levels of service to be provided, compromise a country's ability to provide for the social welfare of its citizens, and impede development. The impacts are summarised in Table 2.

Table 2: Impact of Climate Change on Water Services

Driver	State	Impact	Response
Intense rainfall	Landslides Flooding Debris flows	Damage to intake structures, pump stations, pipelines, reservoirs, water treatment works, and wastewater treatment works	Adopt climate resilient design codes Increase inter-connectivity of water systems
Decreased and more variable water availability	Decrease streamflows Variable surface water flows Decreased aquifer recharge	Insufficient storage, poorer water quality and increased treatment costs, increased complaints. Increased competition for water.	Diversify water sources. Pipeline replacement programme Increase water use efficiency Reduce leaks and bursts (NRW)
Higher temperatures	Soil movement Increased evaporation from impoundments	Reduction in water quantity and increased pollutant loads Increased in bursts and leakages Increases in water demand Wastewater treatment improvement	Increase water quality monitoring Update design standards
Drought conditions	Reduced water availability Poorer water quality	Restricted and constrained supply - rationing. Decrease in productivity Increase in social and economic stresses	Reduce consumption through rationing and cut-offs Introduce water efficient incentive mechanisms Increase storage Introduce conjunctive use schemes

A survey of water utilities and responsible ministries[1] identified damage to infrastructure, saline intrusion, drought and extreme flooding as the primary threats to the water sector from climate change. It is interesting that the impacts on utilities primary productive input – water resources, were not mentioned. Only salinization of coastal aquifers is related to water resources. The top priority actions identified by the survey included: redesign and protection of critical water infrastructure, improved water management, and improved water storage[2].

Indirectly related to climate change are financial considerations. Water utilities are already financially challenged in being able to raise loans for infrastructure improvements. Their restricted ability to generate sufficient revenue to service loans makes them dependent on central government for raining capital funding. This is at a time where governments are heavily in debt and seeking to restrict borrowings. Water utilities find that it is difficult to distinguish between investment needs resulting from the impact of climate change from those associated with developmental needs, in part because they do not have the information to be able to do so. Without sufficient motivation, bodies such as the Green Climate Fund appear hesitant to advance grants. The co-occurrence of climate, natural and health related disaster is likely to put an increased strain on the ability of utilities to finance their operations and invest in measures to mitigate the effects of these category of disasters. More emphasis on developing business cases and financial analysis is going to be needed in the future.

National Actions

Since 2018 a number of Caribbean countries have been developing their Nationally Appropriate Mitigation Actions (NAMA) under the UNFCCC[2], and cross sectoral actions to reduce emissions. A few countries have been preparing their National Adaptation Plans (NAP) which aim to reduce vulnerability to the impacts of climate change and to integrate climate change adaptation into policies, programmes and activities. These include Grenada, Saint Lucia – which has also produced Sector NAPs including the water sector, and Saint Vincent and the Grenadines. Other countries in the Caribbean have received support for developing countries but these have not translated into approved documents[3]. An example of how NAPs can be used to guide interventions in the water sector can be seen from Saint Lucia and its "Sectoral Adaptation Strategy and Action Plan for the Water Sector"[4]. There have also been successful applications to the Green Climate Fund (GCF) with respect to the funding of water sector projects; the Water Sector Resilience Nexus for Sustainability in Barbados (WSRN-S), the Grenada Climate-Resilient Water Sector (G-CREWS), and Resilience to hurricanes in the building sector in Antigua and Barbuda which has some water sector related features such as drainage and rainwater harvesting. In addition to these, there are only 5 other applications to the GCF which are either in the project preparation or Concept Note stage of development. All of the GCF related projects have been developed through intermediaries such as the Climate Change Centre, the CDB or GIZ. Only the Antigua and Barbuda project was developed by the country itself. Clearly, there are challenges in developing proposals, as has been alluded to above. In March 2021, the GCF ran a 5-day informational event for the Caribbean to elaborate on strengthening country

[1] HR Wallingford (2018). Planning for the integration of Climate Resilience in the Water Sector in the Caribbean. CBD.
[2] United Nations Framework Convention on Climate Change
[3] National Adaptation Plans 2020: Progress in the formulation and implementation of NAPS. United Nations Climate Change Secretariat, Bonn.
[4] https://climatechange.govt.lc/climate-change-programme/

ownership of programming in the region, targeting areas of high mitigation potential and adaptation needs, catalysing private sector finance at scale, improving access to GCF resources and streamlining operational and institutional priorities. Furthermore, both the CDB and the IDB are seeking to develop their strategies and interventions to support the Caribbean water sector. This updating will also serve to inform their strategies. Other details are covered in Table 3.

Core Problems to be Addressed

Water sector governance is essentially about who gets water, when and how. It is about the determination of the equity and efficiency in water resources and water services allocation and distribution, balancing the competing uses of water by different stakeholders. Water governance encompasses the formulation of policies, supportive legislation and regulation, institutional arrangements concerning roles and responsibilities, and the instruments available to ensure the desired outcomes. The elements of water governance comprise:

- Institutional frameworks – defines roles and responsibilities,
- Enabling environment – encompasses the setting of policies and enacting legislation,
- Management instruments – covers the allocation, assessments and economic levers.

The water sector is embedded in the wider social, political and economic environment, affected and affecting outside of the sector. Given the complexity and multi-faceted nature of water it is no surprise that the water sector struggles to its aspirational goal of underpinning meaningful and dignified human development. Often, failure to achieve this is in large part due to a failure of governance. Governance operates at many levels; at the regional level shaping the relationship between individual countries and between countries and regional coordinating mechanisms (CARICOM), at the national level between the actors that constitute the water sector, and at the organizational level. Many of the core problems are of a cross-cutting nature.

A report by KM Advisors[5], commissioned by the IDB, assess the performance of the water and sanitation sector in the Caribbean. It covers the impact of COVID-19 on the water sector and the resilience of water utilities to natural disasters. The Paper complements and reinforces an earlier studies[6] commissioned by the IDB and CDB into the performance of water utilities. The papers taken together with other reports and discussions in webinars that have taken place during 2020 and 2021 with stakeholders have highlighted a number of **core problems** within utilities. These core problems are common across utilities and form a cross-cutting subset of challenges within the ambit of the RSAP. As such they would be amenable to a coordinated regional approach. The core problems identified are discussed below and their relationship to the RSAP is shown in Figure 1 below.

[5] Caribbean Water Study (RG-T3467) (2021). KM Advisors

[6] Cole Engineering Group (2015). Assessment and Analysis of the Water Sector in the Caribbean. Caribbean Development Bank.

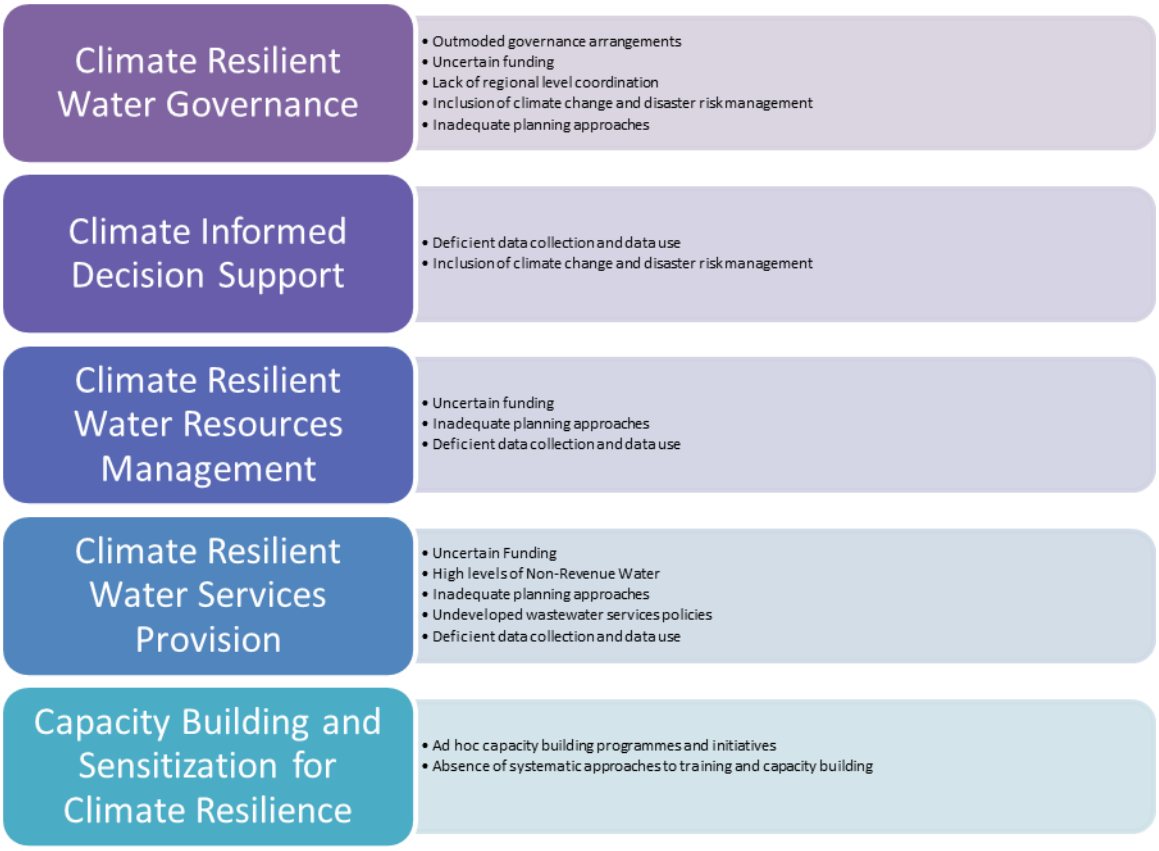


Figure 1: Relationship of Core Problems to the Pillars of the RSAP

Non-Revenue Water

Levels of Non-Revenue Water (NRW) are, with the exceptions of Belize, Grenada and Curaçao, above 30% of the water produced and many utilities have NRW levels in excess of 40% and even extending to as much as 70% in some cases. Losses of this level, real and apparent, put a strain on water resources, incur additional and unnecessary costs, give rise to complaints about poor service provision. Perversely, they can encourage the development of additional expensive resources rather than invest in reducing losses. NRW also represents lost revenue which could otherwise have contributed to the financial stability of utilities. In a water constrained environment, addressing non-revenue water often offers better cost-effective investment than other augmentation options, and reductions in water losses will postpone major capital investments. High levels of NRW are seen as symptomatic of poor financial planning, resource allocations, and weak management drivers; ultimately these are a product of poor governance.

Water utilities are often ill-equipped and under-resourced to institute measures to address and reduce the level of losses. Some utilities have sought to address NRW through in-house interventions, Belize Water Services for example, others have sought to contract it out, as in the case of The Bahamas, whilst Jamaica has gone for a hybrid approach being a blend of developing in-house capacity married with a performance based contract. Increasingly, water utilities have recognised that they have to address NRW, particularly taking into account climate change and variability. Recent work by the IDB and Jamaica's National Water Commission (NWC) demonstrated that investment in NRW Loss Reduction programmes can have internal rates of

return of 30% or higher making these very cost effective investments. However, it can take several years for the benefits to be realised.

Recognising that there is experience in the region in NRW Loss Reduction, a series of well attended webinars was organised and presented in 2020. A particular feature of the webinar series was the active role played by utilities in looking at their own situations and using the webinar tools to understand their NRW situation and the financial feasibility of Loss Reduction programmes. This serves as an examples of regional capacity building and information sharing. Such actions may result in the development of well-motivated interventions which could be financed.

Inadequate Planning

Few countries have a water sector master plan which guides their medium to long term goals, programmes and projects; there are no formal drivers which require them to be produced or if they do to update them on a periodic basis. Too often utilities are prompted to respond to politically pushed programme interventions that seek to respond to an immediate appeal but at the expense of having to reallocate funding and resources away from planned interventions. Under such circumstances it becomes increasingly difficult to build a sustainable investment plan when the emphasis is on responding to short-term needs and problem solving. There is thus a focus on delivering capital works projects that are not based on proper cost/benefit analyses and an appreciation of wider needs. This bias towards a project-based approach is compounded by an absence in the organisational arrangement of utilities of a planning function and dedicated department[7]. The absence of planning and economic appraisal capabilities means that utilities are often not able to develop compelling and motivated business cases for proposing and prioritising planned interventions[89]. The tendency towards short-termism runs counter to the fact that water utilities are dependent on assets which are long-lived and expected to function over extended periods of time; there are operational pipelines which are 150 years old. Failure to take a long view runs the risk of utilities becoming 'locked in' with infrastructure assets and operational procedures that do not meet the needs of the country or impose an unnecessary economic burden. Programmes, projects and designs should take into account future conditions under which they will be called on to operate: meeting future growth, water demands and quality requirements; the impact of climate change and variability and; providing robust and resilient infrastructure to withstand extreme events and conjunctive disasters. In the absence of a medium to long-term planning ethos that is embedded within national development plans and sectoral policies there will be sub-optimal investments.

Planning also has to respond to and be driven by national and sectoral policies as well as the expectations and directives of ministers. It thus entails a delicate balancing act. Indeed, planning is the bridge between politics, policymakers/shareholders and utility managers. Without planning that responds to policy directives, it will not be possible to identify the extent to which policy objectives that incorporate social, developmental, economic and environmental goals can be achieved and the resources required for their achievement. This is a necessary condition for the

[7] Martin, N and Sohail, M. (2005). Can regional cooperation deliver private investments for the water and sanitation sector in the Caribbean. Social and Economic Studies 54(4) 42-69.
[8] Andrés, L., Guasch, J. and Azumenti, J. (2011). Governance of State-Owned Enterprises Revisited: The case of Water and Electricity in Latin America and the Caribbean. World Bank Policy Working Paper 5747.
[9] Scobie, M. (2016). Policy coherence in climate governance in Caribbean Small Island Developing States. Environmental Science and Policy. 58. 16-28.

productive interplay between the political and the technocratic spheres, distinguishing between the possible and the aspirational.

Periodic reviews of water master plans and related supporting plans (e.g. drought management plans) are required to ensure their currency. A benefit of institutionalising planning is that it will serve to highlight data, information and analytical deficiencies. This is a first and necessary step towards mobilising efforts to improve the collection and analysis of data and to support evidence-based decision-making.

Few countries have well-developed water utility regulatory arrangements. Independent regulation if properly structured, can provide a more certain operating environment. At the same time though, good regulation should encourage better business planning, the motivation of investments and improved operational efficiency. The problem is that under current arrangements, there are few credible and effective sanction mechanisms available to regulators to enforce compliance; there is no point in seeking to impose fines on a water utility that makes a loss and cannot pay. The present lack of institutionalised planning and preparedness for independent regulation implies that utilities may not be fully supporting national development needs.

Planning by its nature is reliant on and makes use of the best available data to inform decision-making; whether the decision-making concerns daily production or long-term capital investment decisions. The generation of data and information, the quality and completeness of data, and the choice of what data to gather are important determinants of the quality of planning and decision-making. There are opportunities for water utilities and water resource managers to improve significantly the base information through the adoption and introduction of SMART water information systems. That said, before the advances that have been made can be utilised the basic infrastructure and processes have to be in place. This also implies changes in corporate culture and the assignment of the resources needed to make proper use of the advances. It is an aspect which requires more thought and consideration and support.

Uncertain Funding

It is a common complaint among water utilities that they are not properly financed, that tariffs are low and do not cover their costs and that they do not have the funds necessary to improve the services they provide. It is clear from the information contained in the Caribbean Water Study Report that many water utilities are financially challenged but also that they do not have the data needed to properly understand their financial position. Furthermore, many of them have only a basic idea as to their future funding requirements – in part due to factors discussed in the previous section. Whilst utilities may be able to cover their operation and maintenance costs from funds raised from tariffs, there is a reliance on forms of government support (e.g. transfers and guarantees) to enable the financing of investment programmes and capital works. In some cases, governments are seeking to reduce their financial support to State Owned Enterprises (SOEs) e.g. Barbados and Jamaica and generally government support can be fickle for a variety of reasons, particularly when there are many calls on a government to provide support across different sectors and sections of the population. Minimisation of direct financial support and encouraging self-financing of operations and services and better financial management is not in itself problematic. But there are two sides to this, governments have to empower utilities to be able to be self-reliant. This means making hard decisions around the principle of cost recovery through tariffs, greater managerial autonomy, and transparency.

There is clearly a problem for utilities to understand what their future financing needs are to support national development and the extent to which internally generated funds contribute towards that. The gap between funds that can be generated internally, and the estimated, long term investment requirements represents the funding requirements that would need to be met from other sources. The ability to raise such funds is in part dependent on the level of risk investment associated with utility, a reflection of its ability to service any debt and by extension its financial competency and standing. Alternatively, funds would have to come via central government, with all the caveats that would apply to that. The Caribbean Water Study does not paint an encouraging picture of the ability of the majority of Caribbean utilities to attract loans. Uncertainty over where and to what extent funding can be obtained constrains the ability of utilities to provide the level of service, now and in the future, that society expects of them.

Other associated issues that have been highlighted are:

- Challenges in developing credible funding proposals with sound business cases for investment. There have been concerns expressed that organisations experiencing a range of difficulties in developing project proposals ranging from a lack of capacity and expertise particularly with respect to the financial and economic analyses, reluctance in proposing alternative technologies or approaches in part due to a lack of information through to a lack of credible data on which to motivate proposals;
- The Green Climate Funds is not the financial saviour it was thought to be. Applications are being constrained by the ability to develop climate rationales and difficulties in demonstrating how interventions meet financial and economic expectations. In addition, it can take at least three years from the time of commencing the process of application to the approval of funding and a further several years before completion of implementation. Whilst the GCF has indicated a willingness to support SIDS, the process of accessing funding is protracted and uncertain;
- The general conditions of low growth and high government debt are inhibiting economic recovery and development. Several governments have signalled that they are reluctant to take on further debt and are looking to the utilities in particular to fund developments from revenues raised or by way of other means. A development that is gaining in application is the installation of renewable energy (RE) schemes by water utilities with the proceeds from the sale of energy and/or savings in energy costs being re-invested. However, these moves face challenges. On the one hand enabling utilities to self-finance developments is hampered by existing policies and governance arrangements and on the other, installation of RE schemes can be hampered by existing regulations;
- Chinese interest in the Caribbean in the form of trade, credits and investments has increased significantly since the 1990's with the Belt and Roads initiative being the latest global manifestation of China's increasing role in development. Several capital-works or infrastructural projects across the Caribbean region have also been financed by the Chinese government; the Chinese government for example has indicated its willingness to finance Barbados' South Coast Sewage upgrade at concessionary interest rates.;
- There is interest in potential alternative niche funding vehicles such as Green and Catastrophe Bonds and their applicability to the water sector is starting to be contemplated remains to be explored. The GCF and other International Financing Institutions (IFIs) are beginning to support the issuing of Green Bonds. The Jamaican Government recently launched a Green Bond Project, intended to raise funds on the domestic and regional debt capital markets to finance the implementation of climate-related or environmentally

sustainable activities locally. These include engagements targeting energy efficiency; clean transportation; pollution prevention; sustainable agriculture, fisheries and forestry; protection of aquatic and terrestrial ecosystems; clean water; and sustainable water management;

- The Global Environmental Facility (GEF) has and continues to support regional projects which have a combination of regional and national components. The level of financial support can range from the hundreds of thousands of US$ to tens of millions of dollars in direct funding, plus counterpart funding. The projects supported are usually targeted and have to align with the GEF strategic goals and strategy. Projects include multiple countries so that funds when distributed are seldom substantive at the country level and the type of interventions circumscribed, mostly focused on soft interventions. Furthermore, the time taken to develop and have approved GEF funded projects can take several years, with the danger that circumstances may well have changed since the initial formulation. Because of the nature of how GEF projects operate, considerable project management expertise is required;
- The presence and support of other IFI's for the water sector are significantly influenced by either their own policies and goals or those of the government(s) that support them. For example, support through USAID and UKAID is very much a function of their respective government's politics and strategic goals. Thus potential beneficiary countries are 'support aid takers' with limited influence over the targeting of funds and with questions over continuity of support, e.g. AUSAID exited support for the Caribbean as a result of changing priorities of the Australian Government. In some cases, development aid is directed through regional IFIs such as CDB (as is the case with some UKAID support). Thus it might be said that support from Development Agencies tends to be of a more ephemeral nature and that development of projects and partnerships are or a more opportunistic nature requiring careful engagement;
- Whilst some IFI's have exited the Region, there are others which, again as a result of their own agendas, are interested in developing support programmes, the European Investment Bank (EIB) and the Latin American Development Bank (CAF) are examples. The support is primarily aimed at providing loans for infrastructure projects – which given the reluctance of governments to take on further debt might face some challenges;
- Other IFIs such as the Adaptation Fund and the Climate Investment Funds, are funded through portfolios of donors (governments, international development banks, private sector etc.) and often work with and through other development agencies and so are very much at arm's length, which complicates the process of developing funded projects, noting that only a limited number of projects have been supported by them;
- A possible option that has been explored at the government level has been debt restructuring, essentially easing the burden of debt repayment conditions enabling governments to take on further debt. Examples of this include the governments of Barbados and Jamaica; their water sectors benefit indirectly as a result of such arrangements;
- There are some international Non-Governmental Organisations (INGO) which have the ability to raise finance and support projects and programmes. Such interventions can be in conjunction with IFIs but would tend to provide direct support to national NGOs and Community Based Organisations (CBO) rather than engaging with governments, and hence are not a major or secure source of financing;

- In some quarters there is growing interest in Public Private Partnerships (PPP) e.g. Jamaica but the track record in the Caribbean has been chequered. The ability of government to finance their portion of risks in PPP is a constraint to be overcome;
- An oft cited difficulty is the time taken by countries to draw down on funds that have been approved and provided. Factors which influence this include delays in putting in place the project management and coordination arrangements, lack of qualified persons and cumbersome administrative procedures, all of which contribute to delays in implementation and draw down.

Taken overall there is financing available for the water sector but accessing it comes with a number of caveats. First of all, what might be termed the transaction costs associated with accessing funding are high. Secondly, there is the real potential for a mismatch between what IFIs are prepared to finance and what countries would like to see financed and supported for reasons suggested above. One of the ways which could be considered to address some of the problems would be to have a much stronger and coordinated regional approach to interacting with potential funding bodies and IFIs. It would require having an entity which could speak authoritatively on behalf of the Caribbean water sector, having a firm understanding of the needs of the region and to be seen as being impartial.

Governance Issues

Through several regional projects there are efforts being made to introduce Integrated Water Resources Management (IWRM) into water sector working practices. Efforts are being made to support the development of water sector policies, objectives and priorities to guide water resources managers, utilities, and associated entities. The development of national policies would inform water utilities' planning and decision-making, which in turn should inform investment and capital works programmes along with planning and operational objectives. However, it is also widely accepted that the legislative frameworks within which many water utilities operate are outmoded and inadequate to sustain efficient water utilities. Most of the utilities are government-owned, established by acts of parliament which do not clearly provide for accountability, transparency and managerial autonomy to deliver water services under sound business principles. There are some exceptions where policies do exist such as in the case of Jamaica. Here, the country's Water Sector Policy dictates that, water being an economic resource, and that water service provision is costly, services in the water sector must be delivered efficiently and should be self- financing. However, translating this policy position into financing actions is at an incipient stage. In this respect there is still much to be done to address the inadequacies of the existing governance frameworks. Examples of lack of policy that illustrate key problems include:

Enabling Environment

I. In all of the English-speaking Caribbean wastewater coverage in terms of improved collection treatment and disposal is at or below 30% of the population. However, except for a few countries, there are no policy pronouncements as to what level of coverage respective governments wish to see achieved and no dialogue informing the formulation of a policy. This complicates reporting on progress towards achieving Sustainable Development Goal 6.2: the achievement of access to adequate and equitable sanitation and hygiene for all – something that UN Habitat is seeking to address through its engagement in the Region.

II. In many countries the extent to which water utilities are to be expected to cover their operations, maintenance, investment and other costs by way of tariffs and other charges is seldom set out. The result is an inability for proper planning to fund the services and that governments are left, to a greater or lesser extent, being responsible for the shortfall between revenues collected and the cost of service provision. The net result is the water utilities are under-funded and often in weak financial position, which inhibits their ability to improve services, and fund replacement, upgrading and expansion of service provision to meet developmental needs.

Institutional Framework

I. One of the principles of integrated water resources management is that there should be a separation between the provision of services and the allocation and management of water resources. Whilst there has been progress towards separating these functions, there are still examples of where the service providers are also responsible for water resources management. Quite apart from the management of water resources being a much lower priority than the provision of water services, it constitutes a conflict of interest. This hampers the collection of data on water resources, one effect of which can be seen in the difficulties in developing a climate rationale for applications to the GCF. Furthermore, there can be a lack of coordination as to how water resources are allocated and harnessed by different actors e.g. for irrigation.

II. Best practice suggests that there should be independent oversight of the determination of tariffs in order to protect the interests of consumers as well as of the utility, and at arm's length from the executive. The absence of independent adjudication of tariff setting means on the one hand that there is little objective scrutiny of the proposal and on the other, knowing that ministers and cabinet are tariff-raising averse, there is a reluctance to apply necessary increases.

Similar arguments can be made with respect to the use of management instruments such as requirement for formal planning, asset management and investment plans.

Many of these governance problems are common across the Caribbean and there is a continuum of practices, for example with respect to economic regulation and the management of water resources. Hence, a regional approach to the evaluation of experiences, lessons learnt, benefits and costs would be advantageous.

Utility Turnaround Issues

It is clear from the Caribbean Water Study as well as other initiatives by the CDB and IDB that many water utilities are in a poor financial position, and more worryingly, many do not know how they are performing. One initiative by the IDB is to encourage utilities to adopt the AquaRating methodology and to use the World Bank's Water Utility Turnaround Framework document in order to better understand their situation. A fundamental issue is the ability to collect and access the data required to carry out the evaluations. In addition to this, there is a perceived need to support utilities in understanding their financial performance and developing water sector plans. This aspect of understanding is becoming even more important as government's struggle to cope with the impact of COVID-19 and plan their economic recovery. Understanding how the potential reduction of central government support and the shifts in consumption patterns will impact

financial performance is seen as key to being able to maintain levels of service. It also becomes a key part of the engagement between water utilities and their governments.

There is a strong recommendation that a regional approach should be developed to assist utilities in the application of turnaround metrics, benchmarking performance and with business case planning. Coupled with this was an identified need for there to be a monitoring and reporting mechanisms[10].

Capacity Building and Knowledge Management

The approach to training, capacity building and knowledge management across the water sector is fragmented beyond the tertiary level. Continuing Professional Development, which professions such as medicine considered critical, is seldom considered, and this is not unique to professional development but to skills development in general. There are many different initiatives, often attached to particular projects or programmes, which when they are completed leave no institutional memory or succession plan. This can lead to the duplication of effort, inefficient use of resources, and restricted access to materials developed. Very often there are insufficient funds allocated to be able to offer the level of training that goes beyond the 'one-off' intervention.

An approach to address this issue would be to develop a regionally based mechanism that would allow the collation and curation of information regarding training, capacity building, and knowledge management. This would provide a better understanding of what is available and match this against the sector's needs and requirements. It would then be possible to assist projects and programmes that incorporate training and develop more coherent and targeted training opportunities while at the same time improving the ability of the region to provide for its own capacity building and knowledge management needs.

Implementation Plan: Regional Level Responses

Comparison with IP-2019

An examination of the First Implementation Plan (IP-2019) indicates that many of the activities reported on have been mainstreamed and are also contained in IP-2021. The IP-2019 put forward a number of suggested activities which have not gained traction. The more impactful of these are set out below in Table 3 and reflect some of the areas highlighted above where fewer resources would appear to have been allocated.

[10] An example of a monitoring, reporting and rating system is AquaRating, a rating system for water and sanitation utilities developed by the IDB and the International Water Association, see http://aquarating.org/en/ . It can be used to identify utility strengths and inform specific actions.

Table 3: Proposed Future Activities for Consideration

Component	Activities	Comment
Sub-component 1.1: Improve national and regional institutional and legislative frameworks	Establish water resources agencies in each Member State	Carry out a review of water resource management agency arrangements across the Caribbean including; institutional arrangements, regulatory scope and remits, staffing, legal status, powers, and financing arrangements. Evaluate the relative effectiveness of the regional arrangements, report on best practice, and set out proposal and a roadmap for implementation.
	Establish independent national water utility regulation	Carry out a review of the status of national frameworks for the regulation of the water sector including water utilities, benchmarking against international best practice and evaluate the scope for change.
	Develop mechanisms to engage the private sector.	Review best practice and develop guidance for engaging with the private sector in water service provision and financing.
Sub-component 1.2: Mainstream climate change policies in the water sector	Establish mechanism for national coherence of water sector plans with development and investment programmes	Accelerate development of bankable projects and applications to Adaptation and Green Climate Fund
	Establish mechanism for national coherence of water sector plans with development and investment programmes	Accelerate development of bankable projects and applications to Adaptation and Green Climate Fund
Sub-component 2.1: Quantify water resources, water budgets and supply-demand balances	Undertake a programme of surface and groundwater modelling to estimate water resources, and the capacity to meet future demands	Development of a Concept Note and supporting studies to assess the potential use and deployment of new technologies to assess surface and groundwater resources including water quality, in three pilot study countries.
Sub-component 2.2: Develop and adopt IWRM Plans	Develop watershed/catchment management plans - some work in progress	Some work on this has commenced under IWEco
	Develop water sharing protocols	The GWP launched in 2019 a Water Sharing initiative looking at the robustness of water sharing arrangements in the context of valuing water.
Sub-component 3.1: Develop National Water Decision Support System (WDSS) for climate-informed decision-making	Analyse and interpret data with the WDSS to assess social, economic and environmental impacts on water resources	
	Training and capacity building for personnel in data entry, analysis and dissemination	The CWWA and CAWASA through their joint capacity building and training sessions can undertake regional training for business analytics in the sector utilising tools such as AquaRating.
	Develop national level requirement for water resources management planning taking in future development scenarios.	No proposed regional level action
Sub-component 4.2: Optimise efficient use	Green Climate Fund Related Activities	The development and acceptance of Concept Notes and Full Proposals continues to be a slow and protracted process.

of water resources to adapt to climate related water scarcity (Climate-proof water resources and services)		
Subcomponent 4.4: Improve the performance of the water and sanitation sector	Assess adequacy of Human Resources Management.	CAWASA through the Caribbean Water Operators Partnership (CariWOP) provides access to training and capacity building for utility water operators. Assess the status of current offerings, identify needs and gaps, and develop revised programme of capacity development and certification.
	Evaluate the state of Financial Management: reliable budgeting and planning cycle in place.	Finance and financing are critical to the sound operation of utilities, this entails having an understanding of what is needed to develop a comprehensive utility master management plan aligned to the World Bank's Water Utility Turnaround Framework, assess the cost of services, understand cost recovery, and undertake economic analyses including cost-benefit analyses. In order to assist utilities in better understanding a Hands-on training and capacity building programme can be developed with the financial assistance of Development partners.
Sub-component 5a.1: A mechanism to coordinate research and identify research needs	Develop proposals for appropriate funding mechanisms to support research	Few water utilities actively engage in and support research related to their operational challenges. At the same time regionally based researchers have limited access to research funds, and often these are part of research grants to organisations and universities not based in the region. In other parts of the world funds have been set up to support and encourage research. The first step will be to review funding initiatives from other regions and to consider the practicality of setting up a regional research fund, an appropriate fund raising vehicle and an estimation of the funds that could be raised.
	Develop proposals for the establishment of a Caribbean Water Research Council (CWRC)	To follow from 5a.1.1

Project and programme status IP-2021

Table 4 below sets out the regional actions and initiatives that are being undertaken across the Caribbean. The information has been compiled from feedback provided by national and regional entities on work that they have or are undertaking. The information presented is an update of the first Implementation Plan and, as was indicated the Implementation Plan, is a living document to be updated and revised in line with developments and on-going needs assessment. The information presented will be used by the Implementation Monitoring Committee, which provides a platform not just for monitoring but also for coordination and collaboration between parties. It also provides the basis for reporting back to Ministers with Responsibility for Water on progress being made. It is the intention that this will form the basis of deeper engagement by CWWA, through the Ministers, with CARICOM COTED in order to raise the profile and underline the importance of the water sector to the development of the Region.

Subsequent to the drawing up of the First Implementation Plan (IP-2019) and the initiation by CWWA of following up on the proposed activities was the feedback that some bodies were not aware of the RSAP and the Implementation Plan. In a minority of cases there was some pushback with the perception that they were being dictated to, even though the activities contained in IP-2019 were suggested for consideration. Subsequent to this, the CWWA as made concerted efforts to engage with a wide range of bodies and to be inclusive of their views. This can be seen in the increasing participation of a range of bodies included in the Implementation Monitoring Committee and its work. Furthermore, in this iteration of the Implementation Plan, only activities that have been or are ongoing are included, whilst a separate table of activities not taken up or for which there has been marginal support has been prepared for further consideration and with no attribution. The RSAP-IMP Committee would be advised to give consideration as to how to disseminate and use the content of this document, how to invite constructive feedback and to incorporate the feedback.

The table has been compiled from responses to a data gathering instrument developed in conjunction with the Implementation Monitoring Committee, see Annex 3. Requests for information were sent out to 20 regional or international bodies active in supporting water and climate initiatives in the Caribbean. Information was requested on initiatives that had been or are being supported and that may have been initiated in the last three years. Of the 20 bodies the request was sent to a total of five did not respond or provide information. However, those organisation which did respond represent the more active and prominent bodies supporting the water sector, several of which are represented on the Committee.

During the data collection exercise, through the Implementation Monitoring Committee, effort was put into ensuring that the exercised it was streamlined to avoid duplication of effort and to avoid the same bodies being approached by multiple organisations requesting similar information. Similar information on national level interventions is in the process of being collected by another party. The intention would be, when it becomes available, to incorporate that into Table 3. The ultimate goal would be to develop a platform through which the information contained in Table 3 would be collected, updated and made available. The Latin America Water Observatory (OLAS), if extended to the Caribbean, offers a potential pathway to achieving this goal.

From the responses, shown in Table 3, it can be seen that some of the sub-components are better supported than others. Among the well supported sub-components are the following:

Component 1: Climate Resilient Water Governance

Sub-component 1.1: Improve national and regional institutional and legislative frameworks

Sub-component 1.2: Mainstream climate change policies in the water sector

Component 2: Climate-resilient Water Resources Management

Sub-component 2.2: Develop and adopt IWRM Plans

Component 3: Climate-informed Decision Support

Sub-component 3.1: Develop National Water Decision Support System (WDSS) for climate-informed decision-making

Component 4: Climate-resilient Water Services

Sub-component 4.2: Optimise efficient use of water resources to adapt to climate related water scarcity (Climate-proof water resources and services)

Subcomponent 4.4: Improve the performance of the water and sanitation sector

Component 5: Capacity Building and Public Education for Climate-resilience

Sub-component 5.1: Promote and encourage regional learning and replication

Sub-component 5.2: Support training and capacity building

Less well supported are the following:

Component 2: Climate-resilient Water Resources Management

Sub-component 2.1: Quantify water resources, water budgets and supply-demand balances

Component 3: Climate-informed Decision Support

Sub-component 3.2: Establish water resources management planning cycle for improving responsiveness to climate impacts

Component 4: Climate-resilient Water Services

Sub-component 4.1: Reduce water demand to acceptable levels to adapt to climate related water scarcity

Component 5: Capacity Building and Public Education for Climate-resilience

Sub-component 5.3: Engage in a comprehensive public awareness campaign

Component 5a: Research and Development

Sub-component 5a.1: A mechanism to coordinate research and identify research needs

Almost all of the initiatives support several sub-components. One of the aspects that the responses do not distinguish between and would be quite difficult to do so at this level, is to identify individual amounts that could be ascribed to a sub-component within a particular project. However, it is evident that a significant proportion of the available funding has gone to infrastructure related initiatives (sub-component 4.2) and also to initiatives related to Governance (Component 1). The apparent lack of support for Research and Development – sub-component 5a.1 is interesting.

Furthermore, in terms of support for individual countries, Belize, Guyana, Suriname, and Trinidad and Tobago appear to be attracting less attention than other Caribbean states. In saying this it

should be noted that the responses were from regional bodies and thus do not reflect individual country investments.

Collaborations

An examination of the information consolidated in Table 3 indicates a number of areas of opportunity where collaboration between projects and initiatives could fruitfully be pursued.

It is noted that under Sub-component 1.1: Improve national and regional institutional and legislative frameworks and Sub-component 1.2: Mainstream climate change policies in the water sector there are initiatives with very similar outputs. The initiatives include the EU/CARIFORUM Strengthening Climate Resilient Health Systems in the Caribbean, Grenada Climate Resilient Water Sector G-CREWS, CReW+ An Integrated Approach to Water and Wastewater Management, ILM Integrated Landscape Approaches and Investments in Sustainable Land Management, IWEco Integrating Water, Land and Ecosystems Management in Caribbean SIDS, and Capacity Building to Support Multi-Lateral Environmental Agreements. All have activities that address to a greater or lesser extent water policies, legislation and regulations, and mainstreaming climate change.

Similarly, there are several projects which have activities that are aligned with Sub-component 2.2: Develop and adopt IWRM Plans; these include CReW+, IWEco, EU/CARIFORUM and ILM, whether these are explicitly IWRM plans, Watershed Management Plans, Water and Sanitation Safety Plans – all contribute to IWRM. The implementation or upgrading of wastewater treatment facilities features in a number of initiatives including SMART Hospitals, CReW+, IWEco, and BioSPACE. However, there appears to be less attention within these projects paid to the reuse of treated wastewater and issues such as financial viability and acceptability.

Whilst it is not that evident that under component 3: Climate-informed Decision Support that there are overlaps, it should be the case that there are opportunities for the sharing and dissemination of outputs and outcomes from the activities falling under it. This though lies beyond the individual projects and initiatives and would require some form of coordination, similar to that which is touched on under component 5.

Activities and initiatives falling under Component 4: Climate-resilient Water Services whilst they may share similarities, due to their nature have less potential to overlap and conflict with each other. There could be learning and sharing opportunities but these could well be operationalised under Component 5.

The other major area where there are potential synergies is under Component 5: Capacity Building and Public Education for Climate-resilience. Almost all of the initiatives have to a greater or lesser extent some activities that would fall under this component. A strong case can be made for a more coordinated and comprehensive approach to be made to activities under this component. This is particularly relevant given that such activities will only occur whilst there is project funding. The sustainability of work under this component requires careful consideration.

As indicated above, the missed opportunity evident from the information provided is that related to research and development. It is the one conspicuous area where very little appears to be happening or initiated.

Table 4: Regional Level Actions

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
Component 1: Climate Resilient Water Governance					
Sub-component 1.1: Improve national and regional institutional and legislative frameworks	**EU/CARIFORUM Strengthening Climate Resilient Health Systems in the Caribbean:** Using the One Health Approach; 1) Piloting of tools to measure the health co-benefits of climate mitigation 2) Development of Health National Adaptation Plans, *3) Climate and Health early warning systems and risk management for water, sanitation and food safety,* 4) Climate and Health Leadership. *Climate resilient Water and Sanitation Safety Plan Training, Pilot Climate Resilient Water and Sanitation Safety Plans in 2 Countries*	PAHO	European Union €6.850 million	2020 - 2025	No details given
	Grenada Climate Resilient Water Sector (G-CREWS): Increase the systemic resilience to climate change in the Grenadian water sector	NAWASA/GIZ	GCF, German Federal Ministry of Environment-International Climate Initiative US$48 million + counterpart GoG US$5 million	2019-2025	Establishment of national water policy, revised and updated Water Act, RWH regulation, revision of water tariffs

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	CReW+ An Integrated Approach to Water and Wastewater Management using Innovative Solutions and Promoting Financing Mechanisms in the Wider Caribbean Region: Identify and support sustainable and tailored financing options for urban, peri-urban and rural Integrated Water and Wastewater Management (IWWM). Regional platform for IWWM development. Capacity building workshops to drive national and regional institutional policy legislative and regulatory reforms for IWWM and, for reporting on relevant SDGs. Integrated guidelines and implementation plan consistent with IWRM with a focus on water source protection and use efficiency, land use protection and food, energy and ecosystems nexus trade-offs. Training on innovative low-cost integrated water and wastewater management such as though webinars, MOOCs, training programmes with the participation of civil society. Implement innovative decentralized, rural community based interventions for wastewater management in at least 4 Contracting Parties working with Civil Society/NGOs and in partnerships with larger GEF Funded Projects on Wastewater. Participating countries: Barbados, Belize, Colombia, Costa Rica, Cuba, Dominican Republic, Grenada, Guatemala, Guyana, Honduras, Jamaica, Mexico, Panama, St Kitts & Nevis, St Lucia, St Vincent and the Grenadines, Suriname, and Trinidad and Tobago.	GWP/UNEP-CEP	GEF - IDB US$14.944 million	2021-2023	Diagnostic analysis of existing policy frameworks, legislation, guidelines and standards in support of IWWM; recommendations for reforms and development of national IWWM plans, in at least 9 countries. Recommendations of amendments to the LBS Protocol to facilitate increased reuse of domestic wastewater, including the adoption of new criteria or standards for domestic wastewater reuse. Review, analysis and report for developing a new strategy or Protocol on the management of freshwater resources within the Cartagena Convention framework. Country specific Cabinet/Parliamentary submissions prepared for formal ratification of the LBS Protocol. Regional Platform for Integrated Water and Wastewater Management (IWWM).
	Review and update of National Water Sector Policy and Implementation Plan for Jamaica: Review existing water policy, update Jamaica's implementation plan, review and update the monitoring and evaluation framework.	Ministry of Economic Growth and Job Creation - Jamaica	IDB	2020-2021	Updated Implementation Plan and Monitoring and Evaluation Framework
	Development of a Model Hydro-Meteorological Services Bill and a Draft Meteorology Policy to Guide the Operations of National Meteorological and Hydrological Services In OECS Member States. The preparation of a Model Hydro-Meteorological Services Bill and an accompanying Meteorology Policy, through a consultative process involving national stakeholders. Countries included: Antigua & Barbuda, Barbados, Belize, Cayman Islands, Dominica, Grenada, Jamaica, St Kitts and Nevis, St Lucia, and St Vincent and the Grenadines.	CIMH/OECS	CMO/WMO	2020-2021	Model Hydro-Meteorological Services Bill and an accompanying Meteorology Policy

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	Integrated Landscape Approaches and Investments in Sustainable Land Management (ILM): Enhance natural ecosystem management, climate change mitigation/adaptation, and achieve food security and sustainable agriculture; enhance capacities to improve land-use management, reverse land degradation and forests/ecosystems loss; enhance quality of life for multi-stakeholder interest groups such as local farmers, and communities in selected watersheds and other geographic locations of Member States. Specific Objective is to strengthen the economic, social, and environmental resilience of OECS Member States to the impacts of climate change and other hazards through the implementation of Integrated Landscape Management (ILM), Sustainable Land Management (SLM), Integrated Watershed Management (IWM), and other relevant approaches. The Expected Project Outputs are: ● Scalable physical adaptation initiatives that help conciliate different land uses, foster innovation and lessons learning are field tested and deliver multiple agricultural, climate and biodiversity-related benefits. ● Improved land governance and management systems are promoted, notably through better cross-sectoral coordination, enhanced participation of land users and local stakeholders, including local communities, women, and the private sector, in land-related decisions, and other appropriate land governance measures; and ● The capacities of actors and institutions for sustainable landscape management are enhanced.	OECS	GEF US$1.778 million + counterpart US$3.460 million	2018-2023	Review and strengthening of national and regional-level policy, legislation, plans and strategies for improved water, land and ecosystems management.

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	Integrating Water, Land and Ecosystems Management in Caribbean Small Island Developing States (IWEco): Strengthening of the Policy, Legislative and Institutional Reforms and Capacity Building for Sustainable Land Management, Integrated Water Resources Management and Ecosystems Services Management. Countries include: Antigua and Barbuda, Barbados, Grenada, Jamaica, St Kitts & Nevis, St Lucia, St Vincent and the Grenadines and Trinidad and Tobago. 1. Recommendations and Terms of Reference for priority interventions that would facilitate development and/or implementation of new or strengthening of existing policies, legislative instruments, frameworks, action plans and strategies at the national and regional level. 2. Implementation of priority national and regional activities in support of the new and or upgraded/strengthened policies, legislative instruments, frameworks, action plans and strategies for participating states based on recommendations. 3. A Regional Action Framework for Integrated Water Resources Management (IWRM) for the CARICOM Region. 4. Implementation of priority regional and national activities under the Regional Action Framework for IWRM for the CARICOM Region.	OECS/CARPHA	GEF US$1.778 million + counterpart US$3.460 million	2018-2023	Review and strengthening of national and regional-level policy, legislation, plans and strategies for improved water, land and ecosystems management (implementation of specific areas of strengthening undergoing selection and approval process).
	Capacity Building to Support Multilateral Environmental Agreements: Support to fulfil MEA obligations related to biodiversity, chemicals and waste including hazardous pesticides.	UNEP-CEP	EU US$31.240 million	2019-2024	Develop/Update national legislation and/or regulations on wastewater effluent discharges in at least 6 Contracting Parties on the LBS Protocol - Cartagena Convention Annex III
Sub-component 1.2: Mainstream climate change policies in the water sector	**Strengthening Recovery and Resilience in the Caribbean:** Improved planning, decision making and action for gender responsive and inclusive climate resilience in key livelihood sectors. Gender-responsive and inclusive NAP and NAMA priority interventions implemented in target sectors in collaboration with state and non-state sectoral actors.	UNDP	UKAID with Govt. of Canada US$10,000	2019-2023	Development and implementation of gender-responsive and inclusive NAPs and NAMAs in 4 countries (Belize, St Lucia, St Vincent and the Grenadines & Suriname.

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	EU/CARIFORUM Strengthening Climate Resilient Health Systems in the Caribbean: Using the One Health Approach; 1) Piloting of tools to measure the health co-benefits of climate mitigation 2) Development of Health National Adaptation Plans, *3) Climate and Health early warning systems and risk management for water, sanitation and food safety,* 4) Climate and Health Leadership. *Climate resilient Water and Sanitation Safety Plan Training, Pilot Climate Resilient Water and Sanitation Safety Plans in 2 Countries*	PAHO	European Union US$8.05 million	2020 - 2025	No details given
	EU GCCA+ Enhanced Caribbean Climate Resilient Water Infrastructure: Develop Rapid Vulnerability assessments of water utility assets to climate hazards 2. Develop/strengthen adaptation plans 3. Develop Standard Operating Procedures (SOPs) and guidance documents, and protocols on the planning of new water infrastructure. 4. Develop and implement investment projects (5 million Euros) 5. Improve knowledge sharing on climate vulnerability management between utilities 6. Enhance operational climate vulnerability management	CCCCC	European Union US$7.10 million	2019-2023	Adaptation Plans for Belize, Guyana, St Kitts and Nevis, Trinidad and Tobago, and Antigua and Barbuda
	Flood risk assessment and landslide threat assessment - Dominican Republic: Develop a technical analysis to address additional climate risks that were not included in the first NDC submitted by the Dominican Republic to inform the second NDC submission in 2020. Generate climate projections for localized increased, intense rainfall. Produce estimates of increased risk of flooding in major riverine valleys and large human settlements. Assess threats of landslides on steep slopes and establish projections of affected households and loss of livelihoods.	GWP	World Resources Institute Technical Assistance Fund, on behalf of Nationally Determined Contribution Partnership Climate Action Package. US$58 million	2020-2021	Rainfall Projections 2030's, 2050's, 2070's ; Flood and Landslide Risk Assessments in the Dominican Republic informed by Rainfall Projections 2030's, 2050's, 2070's
	Development of Bankable Investment Portfolio for financing climate change projects in the Dominican Republic, to support the second submission of Nationally Determined Contributions (NDCs): Development an investment-ready portfolio of technically sound and economically viable climate change projects at basin-level in the Dominican Republic. Portfolio is developed with a basin-scale approach and includes water resources, livelihoods diversification, and resilient agriculture, processing schemes, supply chains and food security, integrating transboundary cooperation when appropriate.	GWP	World Resources Institute Technical Assistance Fund, on behalf of Nationally Determined Contribution Partnership Climate Action Package. US$58 million	2020-2021	Investment-ready portfolio of technically sound and economically viable climate change projects at basin-level in the Dominican Republic.

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	Develop a Regional Action Framework for IWRM for the CARICOM Region (IWEco): Strengthen policy, legislative and institutional frameworks, support institutional reforms and capacity building for Sustainable Land Management (SLM), Integrating Water Resources Management (IWRM)/Water Use Efficiency (WUE)/ watershed management and ecosystem services management utilising a watershed management and planning approach and taking into consideration climate change resilience building. Develop an Integrated Water Resources Management regional framework for the CARICOM region, develop/revise/strengthen associated regional-level IWRM strategies and action plans, and evelop/revised/strengthen national IWRM related road maps and action plans for IWEco participating countries (Antigua and Barbuda, Barbados, Cuba, Dominican Republic, Grenada, Jamaica, Saint Lucia, Saint Christopher and Nevis, Saint Vincent and the Grenadines and Trinidad and Tobago).	GWP/OECS/CARPHA	GEF - IDB US$90 million	2021-22	A comprehensive review of water resource issues in 10 CARICOM+ countries, inclusive of the socioeconomic aspects of water resource management and the impact of water use and wastewater management on terrestrial and aquatic ecosystems. A review and assessment of existing policies, legislation and institutional arrangements in support of IWRM at the CARICOM level as well as at the national level within IWEco participating member states. A map of all the relevant stakeholders having roles and responsibility in water resource development and management, including areas of conflict or influence and their capacity building requirements.
Component 2: Climate-resilient Water Resources Management					
Sub-component 2.1: Quantify water resources, water budgets and supply-demand balances	**UK Caribbean Infrastructure Fund (UKCIF)**: Build high quality economic infrastructure – roads, ports, water and sanitation systems and other public assets – which will provide a boost to economic growth, help reduce poverty and increase inclusion and benefits for marginalised or disadvantaged groups, including women, youth and persons with disabilities. In addition, UKCIF will help set regional benchmarks for developing climate and disaster-resilient infrastructure.	CDB	UKAID US$458 million	2016 - 2024	Financing DOWASCO to make informed decisions on infrastructure redevelopment, water resources management.

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
Sub-component 2.2: Develop and adopt IWRM Plans	**Strengthening health facilities in the Caribbean (SMART hospitals-phase 2)**: Scale up innovative pilot activities that strengthens health facilities in the region by combining disaster safety and environmental (e.g. energy and water) improvements that address weaknesses, boost future climate resilience, and generate operational savings.	PAHO	UKAID US$64 million	2015-2022	Comprehensive assessments of disaster safety and environmental management at 415 health facilities across Belize, Dominica, Grenada, Guyana, Jamaica, St Lucia and St Vincent and the Grenadines
	CReW+ An Integrated Approach to Water and Wastewater Management using Innovative Solutions and Promoting Financing Mechanisms in the Wider Caribbean Region: Identify and support sustainable and tailored financing options for urban, peri-urban and rural Integrated Water and Wastewater Management (IWWM). Regional platform for IWWM development. Capacity building workshops to drive national and regional institutional policy legislative and regulatory reforms for IWWM and, for reporting on relevant SDGs. Integrated guidelines and implementation plan consistent with IWRM with a focus on water source protection and use efficiency, land use protection and food, energy and ecosystems nexus trade-offs. Training on innovative low-cost integrated water and wastewater management such as though webinars, MOOCs, training programmes with the participation of civil society. Implement innovative decentralized, rural community based interventions for wastewater management in at least 4 Contracting Parties working with Civil Society/NGOs and in partnerships with larger GEF Funded Projects on Wastewater. Participating countries: Barbados, Belize, Colombia, Costa Rica, Cuba, Dominican Republic, Grenada, Guatemala, Guyana, Honduras, Jamaica, Mexico, Panama, St Kitts & Nevis, St Lucia, St Vincent and the Grenadines, Suriname, and Trinidad and Tobago.	GIZ/UNEP-CEP	GEF - IDB US$14.944 million	2021-2023	Integrated guidelines and implementation plan consistent with IWRM with a focus on water source protection and use efficiency, land use protection and food, energy and ecosystems nexus trade-offs
	EU/CARIFORUM Strengthening Climate Resilient Health Systems in the Caribbean: Using the One Health Approach; 1) Piloting of tools to measure the health co-benefits of climate mitigation 2) Development of Health National Adaptation Plans, *3) Climate and Health early warning systems and risk management for water, sanitation and food safety,* 4) Climate and Health Leadership. *Climate resilient Water and Sanitation Safety Plan Training, Pilot Climate Resilient Water and Sanitation Safety Plans in 2 Countries*	PAHO	European Union US$8.05 million	2020 - 2025	No details given

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	Develop a Regional Action Framework for IWRM for the CARICOM Region (IWEco): Strengthen policy, legislative and institutional frameworks, support institutional reforms and capacity building for Sustainable Land Management (SLM), Integrating Water Resources Management (IWRM)/Water Use Efficiency (WUE)/ watershed management and ecosystem services management utilising a watershed management and planning approach and taking into consideration climate change resilience building. Develop an Integrated Water Resources Management regional framework for the CARICOM region, develop/revise/strengthen associated regional-level IWRM strategies and action plans, and develop/revised/strengthen national IWRM related road maps and action plans for IWEco participating countries (Antigua and Barbuda, Barbados, Cuba, Dominican Republic, Grenada, Jamaica, Saint Lucia, Saint Christopher and Nevis, Saint Vincent and the Grenadines and Trinidad and Tobago).	GWP/OECS/CARPHA	GEF - IDB US$90 million	2021-22	A CARICOM Integrated Water Resources Management (IWRM) Framework. Specific actions and interventions for advancing IWRM at the CARICOM level as well as at the National level within the 10 (ten) IWEco participating member states

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	Integrated Landscape Approaches and Investments in Sustainable Land Management (ILM): Enhance natural ecosystem management, climate change mitigation/adaptation, and achieve food security and sustainable agriculture; enhance capacities to improve land-use management, reverse land degradation and forests/ecosystems loss; enhance quality of life for multi-stakeholder interest groups such as local farmers, and communities in selected watersheds and other geographic locations of Member States. Specific Objective is to strengthen the economic, social, and environmental resilience of OECS Member States to the impacts of climate change and other hazards through the implementation of Integrated Landscape Management (ILM), Sustainable Land Management (SLM), Integrated Watershed Management (IWM), and other relevant approaches. The Expected Project Outputs are: ● Scalable physical adaptation initiatives that help conciliate different land uses, foster innovation and lessons learning are field tested and deliver multiple agricultural, climate and biodiversity-related benefits. ● Improved land governance and management systems are promoted, notably through better cross-sectoral coordination, enhanced participation of land users and local stakeholders, including local communities, women, and the private sector, in land-related decisions, and other appropriate land governance measures; and ● The capacities of actors and institutions for sustainable landscape management are enhanced.	OECS	GEF US$1.778 million + counterpart US$3.460 million	2018-2023	Physical Development Plan review, Development/Revision of Watershed Management Plans in specific Participating States (activities undergoing approval process)

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	Integrating Water, Land and Ecosystems Management in Caribbean Small Island Developing States (IWEco): Strengthening of the Policy, Legislative and Institutional Reforms and Capacity Building for Sustainable Land Management, Integrated Water Resources Management and Ecosystems Services Management. Countries include: Antigua and Barbuda, Barbados, Grenada, Jamaica, St Kitts & Nevis, St Lucia, St Vincent and the Grenadines and trinidad and Tobago. 1. Recommendations and Terms of Reference for priority interventions that would facilitate development and/or implementation of new or strengthening of existing policies, legislative instruments, frameworks, action plans and strategies at the national and regional level. 2. Implementation of priority national and regional activities in support of the new and or upgraded/strengthened policies, legislative instruments, frameworks, action plans and strategies for participating states based on recommendations. 3. A Regional Action Framework for Integrated Water Resources Management (IWRM) for the CARICOM Region. 4. Implementation of priority regional and national activities under the Regional Action Framework for IWRM for the CARICOM Region.	OECS/CARPHA	GEF US$1.778 million + counterpart US$3.460 million	2018-2023	Development of a Regional Action Framework for IWRM for the CARICOM Region
	Capacity Building to Support Multilateral Environmental Agreements: Support to fulfil MEA obligations related to biodiversity, chemicals and waste including hazardous pesticides.	UNEP-CEP	EU US$31.240 million	2019-2024	Develop national pollution reduction action plans for at least 5 Contracting Party countries to the LBS Protocol focusing on domestic wastewater and nutrient reduction strategies and action plans. I
Component 3: Climate-informed Decision Support					
Sub-component 3.1: Develop National Water Decision Support System (WDSS) for climate-informed decision-making	**Strengthening health facilities in the Caribbean (SMART hospitals-phase 2):** Scale up innovative pilot activities that strengthens health facilities in the region by combining disaster safety and environmental (e.g. energy and water) improvements that address weaknesses, boost future climate resilience, and generate operational savings.	PAHO	UKAID US$64 million	2015-2022	Develop support tool, training and new software for the assessment and upgrades for decarbonising and reducing hazard vulnerability at 55 health facilities

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	EU/CARIFORUM Strengthening Climate Resilient Health Systems in the Caribbean: Using the One Health Approach; 1) Piloting of tools to measure the health co-benefits of climate mitigation 2) Development of Health National Adaptation Plans, *3) Climate and Health early warning systems and risk management for water, sanitation and food safety,* 4) Climate and Health Leadership. *Climate resilient Water and Sanitation Safety Plan Training, Pilot Climate Resilient Water and Sanitation Safety Plans in 2 Countries*	PAHO	European Union €6.850 million	2020 - 2025	No details given
	EU GCCA+ Enhanced Caribbean Climate Resilient Water Infrastructure: Develop Rapid Vulnerability assessments of water utility assets to climate hazards 2. Develop/strengthen adaptation plans 3. Develop Standard Operating Procedures (SOPs) and guidance documents, and protocols on the planning of new water infrastructure. 4. Develop and implement investment projects (5 million Euros) 5. Improve knowledge sharing on climate vulnerability management between utilities 6. Enhance operational climate vulnerability management	CCCCC	European Union €6.045 million	2019-2023	Rapid Vulnerability Assessment completed for 16 CARIFORUM countries
	Grenada Climate Resilient Water Sector (G-CREWS): Increase the systemic resilience to climate change in the Grenadian water sector	NAWASA/GIZ	GCF, German Federal Ministry of Environment-International Climate Initiative US$48 million + counterpart GoG US$5 million	2019-2025	Introduction of SCADA system

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	CReW+ An Integrated Approach to Water and Wastewater Management using Innovative Solutions and Promoting Financing Mechanisms in the Wider Caribbean Region: Identify and support sustainable and tailored financing options for urban, peri-urban and rural Integrated Water and Wastewater Management (IWWM). Regional platform for IWWM development. Capacity building workshops to drive national and regional institutional policy legislative and regulatory reforms for IWWM and, for reporting on relevant SDGs. Integrated guidelines and implementation plan consistent with IWRM with a focus on water source protection and use efficiency, land use protection and food, energy and ecosystems nexus trade-offs. Training on innovative low-cost integrated water and wastewater management such as though webinars, MOOCs, training programmes with the participation of civil society. Implement innovative decentralized, rural community based interventions for wastewater management in at least 4 Contracting Parties working with Civil Society/NGOs and in partnerships with larger GEF Funded Projects on Wastewater. Participating countries: Barbados, Belize, Colombia, Costa Rica, Cuba, Dominican Republic, Grenada, Guatemala, Guyana, Honduras, Jamaica, Mexico, Panama, St Kitts & Nevis, St Lucia, St Vincent and the Grenadines, Suriname, and Trinidad and Tobago.	GIZ/UNEP-CEP	GEF - IDB US$14.944 million	2021-2023	New or updated national platform/databases, in at least 6 countries, supported by a regional platform for IWWM.
	Latin America Water Observatory (OLAS): Strengthen the water and sanitation data and information management capabilities in Caribbean countries, identify best sources of information to incorporate into the OLAS platform to support decision-making by relevant stakeholders	CWWA	IDB	TBD	Data repository for the collection, storage and sharing of water data and information
	Pilot Project for Climate Resilience Caribbean Track: Expansion of regional climate monitoring networks - weather data and climate products; and improved availability of downscaled and expanded climate projection models - computing facilities for UWI Mona and framework linking regional climate models to sector models.	PPCR	IDB/CIF	No details provided	No details provided

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	Integrating Water, Land and Ecosystems Management in Caribbean Small Island Developing States (IWEco): Strengthening of the Policy, Legislative and Institutional Reforms and Capacity Building for Sustainable Land Management, Integrated Water Resources Management and Ecosystems Services Management. Countries include: Antigua and Barbuda, Barbados, Grenada, Jamaica, St Kitts & Nevis, St Lucia, St Vincent and the Grenadines and Trinidad and Tobago. 1. Recommendations and Terms of Reference for priority interventions that would facilitate development and/or implementation of new or strengthening of existing policies, legislative instruments, frameworks, action plans and strategies at the national and regional level. 2. Implementation of priority national and regional activities in support of the new and or upgraded/strengthened policies, legislative instruments, frameworks, action plans and strategies for participating states based on recommendations. 3. A Regional Action Framework for Integrated Water Resources Management (IWRM) for the CARICOM Region. 4. Implementation of priority regional and national activities under the Regional Action Framework for IWRM for the CARICOM Region.	OECS/CARPHA	GEF US$1.778 million + counterpart US$3.460 million	2018-2023	Development of a National Water Information System for Barbados and St Kitts & Nevis
Sub-component 3.2: Establish water resources management planning cycle for improving responsiveness to climate impacts	**Grenada Climate Resilient Water Sector (G-CREWS):** Increase the systemic resilience to climate change in the Grenadian water sector	NAWASA/GIZ	GCF, German Federal Ministry of Environment-International Climate Initiative US$48 million + counterpart GoG US$5 million	2019-2025	Hydrological monitoring equipment procured - Seven(7) sets, one per beneficiary
	European Union/CARIFORUM (EU/CARIFORUM) Project - Strengthening Climate Resilient Health Systems in the Caribbean: Implementation of the project will support the development of the Caribbean Cooperation in Health Phase IV (CCH IV) and the Regional Health Framework for 2016-2025 which includes actions towards health and climate change. CARIFORUM countries would implement food, water and/or sanitation safety plans to address the effects of climate change on the determinants of health and develop sub-regional manuals/guidance documents.	CARPHA/PAHO	EU US$8.24 million	2020-2025	Water and sanitation safety plans. Sub-regional manuals and guidance documents

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
Component 4: Climate-resilient Water Services					
Sub-component 4.1: Reduce water demand to acceptable levels to adapt to climate related water scarcity	**Strengthening health facilities in the Caribbean (SMART hospitals-phase 2):** Scale up innovative pilot activities that strengthens health facilities in the region by combining disaster safety and environmental (e.g. energy and water) improvements that address weaknesses, boost future climate resilience, and generate operational savings.	PAHO	UKAID US$64 million	2015-2022	Introduction of RWH, storage tanks, installation of water savings devices at health facilities - number to be confirmed.
Sub-component 4.2: Optimise efficient use of water resources to adapt to climate related water scarcity (Climate-proof water resources and services)	**Strengthening health facilities in the Caribbean (SMART hospitals-phase 2):** Scale up innovative pilot activities that strengthens health facilities in the region by combining disaster safety and environmental (e.g. energy and water) improvements that address weaknesses, boost future climate resilience, and generate operational savings.	PAHO	UKAID US$64 million	2015-2022	Upgrade wastewater treatment at health facilities - number to be confirmed.
	Barbados Water Sector Resilience Nexus for Sustainability (WSRN-S): Implementing renewable energy solutions, increasing water capacity through rainwater harvesting and water storage, supporting adaptation funding, and raising awareness about climate change and the water cycle. An adaptation fund, set up with operational cost savings from implementing the renewable energy activities, provides credit lines to implement water conservation actions, building public awareness to achieve more sustainable water usage.	CCCCC/BWA	GCF US$27.6 million + co-financing US$17.6 million	2018-2024	Installation of 4.5MW Photovoltaic RE systems. Revolving Adaptation fund. Climate Change Adaptation Master Plan. Replacement of 16km of water mains. Installation of community RWH systems. Improved groundwater management. Staff training and public awareness campaigns.
	Pilot Project for Climate Resilience Caribbean Track: Rainwater Harvesting	PPCR/OECS	IDB/CIF	2018-2019	No details provided
	Barbados Potable Water Infrastructure Rehabilitation Project: Improve the quality, reliability and efficiency of Barbados' potable water and wastewater system.	BWA	EIB & CAF US$25 million, counterpart funding GoB US$3 million	2020 - 2024	Upgrading of 6 reservoirs and 4 pump stations, replacement of 16 km pipeline. Potable Water and Sewerage Master Plan
	EU GCCA+ Enhanced Caribbean Climate Resilient Water Infrastructure: Develop Rapid Vulnerability assessments of water utility assets to climate hazards 2. Develop/strengthen adaptation plans 3. Develop Standard Operating Procedures (SOPs) and guidance documents, and protocols on the planning of new water infrastructure. 4. Develop and implement investment projects (5 million Euros) 5. Improve knowledge sharing on climate vulnerability management between utilities 6. Enhance operational climate vulnerability management	CCCCC	European Union €6.045 million	2019-2023	Development of Standard Operating Procedures for the Water Sector

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	Feasibility Study to Upgrade Water Supply Facilities - Suriname: Technical assistance project to assist in developing technically viable, socially inclusive and climate resilient infrastructure in the districts of Nickerie, Paramaribo, Wanica and Para.	CDB/SVM	EIB Grant Facility for Climate Action US$748,550 + counterpart US$85,000 from SVM	2016-2022	Feasibility Study, Final Designs and Bid Documents for selected districts
	Water Supply Expansion and Sewerage Improvement Project - Grenada: Feasibility Study, Final Design and Bid documents for the augmentation of water supply in southern Grenada and Improvement of sewerage infrastructure in St Georges.	CDB/NAWASA	UKCIF ~US$525,000 + counterpart US$95,000 from NAWASA	2017-2022	Feasibility Study, Final Designs and Bid Documents for augmentation of water supply in southern Grenada and sewerage infrastructure improvements in St Georges
	Water Supply Network Upgrade Project - Barbados: Capital project aimed at enhanced safety and operational efficiency of the potable water supply system in Barbados; and enhanced water sector planning capacity in the areas of gender inclusion, climate change adaptation planning, and business planning. Cost of services study and Gender impact study. Replacement of 28 km of pipeline and 20 reservoirs, setting up of 33 District Metering Areas	CDB/BWA	EIB Climate Action Line of Credit US$35.883 million + counterpart US$16.859 million BWA	2016-2021	Upgrades to water production facilities, new and refurbished reservoirs, leakage detection equipment, establish 33 District Metering Areas, replacement of 28 km of mains, Costs of service study, training of BWA staff
	Rural Water Supply Programme - Jamaica: Capital programme comprising: a network infrastructure upgrade and ancillary works in respect of seven water supply systems in targeted rural communities; the integration of renewable energy and energy efficiency solutions; consultancy services for the supervision and certification of the infrastructure works; the completion of a feasibility study, final designs and bid document for community catchment and wayside tanks and rainwater harvesting systems in schools and institutions in the Programme Communities; the implementation of a social and gender-responsive communications plan; and institutional strengthening of the Rural Water Supply Limited (RWSL).	CDB/RWSL	CDB US$30 million	2021-2024	Network infrastructure upgrade and ancillary works in respect of seven water supply systems in targeted rural communities; the integration of renewable energy and energy efficiency solutions; consultancy services for the supervision and certification of the infrastructure works; the completion of a feasibility study, final designs and bid document for community catchment and wayside tanks and rainwater harvesting systems in schools and institutions in the Programme Communities; the implementation of a social and gender-responsive communications plan; and institutional strengthening of the Rural Water Supply Limited (RWSL). GIS & MIS software and decision support

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	Capacity Building to Support Multilateral Environmental Agreements: Support to fulfil MEA obligations related to biodiversity, chemicals and waste including hazardous pesticides.	UNEP-CEP	EU US$31.240 million	2019-2024	Implement innovative, decentralised, rural community-based interventions for wastewater management in at least 4 Contracting Party countries.
	CReW+ An Integrated Approach to Water and Wastewater Management using Innovative Solutions and Promoting Financing Mechanisms in the Wider Caribbean Region: Identify and support sustainable and tailored financing options for urban, peri-urban and rural Integrated Water and Wastewater Management (IWWM). Regional platform for IWWM development. Capacity building workshops to drive national and regional institutional policy legislative and regulatory reforms for IWWM and, for reporting on relevant SDGs. Integrated guidelines and implementation plan consistent with IWRM with a focus on water source protection and use efficiency, land use protection and food, energy and ecosystems nexus trade-offs. Training on innovative low-cost integrated water and wastewater management such as though webinars, MOOCs, training programmes with the participation of civil society. Implement innovative decentralized, rural community based interventions for wastewater management in at least 4 Contracting Parties working with Civil Society/NGOs and in partnerships with larger GEF Funded Projects on Wastewater. Participating countries: Barbados, Belize, Colombia, Costa Rica, Cuba, Dominican Republic, Grenada, Guatemala, Guyana, Honduras, Jamaica, Mexico, Panama, St Kitts & Nevis, St Lucia, St Vincent and the Grenadines, Suriname, and Trinidad and Tobago.	GIZ/UNEP-CEP	GEF - IDB US$14.944 million	2021-2022	Rural and community level Integrated and Innovative Water and Wastewater low tech solutions implemented, at least 12 pilot interventions; Minimum of 5,000,000 cubic meters per year of wastewater treated. Three demonstration projects implemented focusing on: (1) Prevention, Reduction and Control of point and non-point sources of pollution source through best land management practices and (2) Development and Implementation of water source protection, water use efficiency and reuse strategies and action plans.
	Grenada Climate Resilient Water Sector (G-CREWS): Increase the systemic resilience to climate change in the Grenadian water sector	NAWASA/GIZ	GCF, German Federal Ministry of Environment-International Climate Initiative US$48 million + counterpart GoG US$5 million	2019-2025	Installation of 35 km of new pipelines, replacement of 10 km of pipelines, construction of 16 reservoirs, retrofitting of 16 intakes. Support Rainwater Harvesting - not details given.

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
Sub-component 4.3: Improve energy efficiency in water use	**Strengthening health facilities in the Caribbean (SMART hospitals-phase 2):** Scale up innovative pilot activities that strengthens health facilities in the region by combining disaster safety and environmental (e.g. energy and water) improvements that address weaknesses, boost future climate resilience, and generate operational savings.	PAHO	UKAID US$64 million	2015-2022	Installation of solar PV, water heaters and wind turbines at health facilities, number to be confirmed.
	Water Supply Network Upgrade Project - Barbados: Capital project aimed at enhanced safety and operational efficiency of the potable water supply system in Barbados; and enhanced water sector planning capacity in the areas of gender inclusion, climate change adaptation planning, and business planning. Cost of services study and Gender impact study. Replacement of 28 km of pipeline and 20 reservoirs, setting up of 33 District Metering Areas	CDB/BWA	EIB Climate Action Line of Credit US$35.883 million + counterpart US$16.859 million BWA	2016-2021	Supply of solar PV plants
	Grenada Climate Resilient Water Sector (G-CREWS): Increase the systemic resilience to climate change in the Grenadian water sector	NAWASA/GIZ	GCF, German Federal Ministry of Environment-International Climate Initiative US$48 million + counterpart GoG US$5 million	2019-2025	Introduction of PV systems and micro generators in pipes. Increase energy efficiency by 5%
Subcomponent 4.4: Improve the performance of the water and sanitation sector	**UK Caribbean Infrastructure Fund (UKCIF)**: Build high quality economic infrastructure – roads, ports, water and sanitation systems and other public assets – which will provide a boost to economic growth, help reduce poverty and increase inclusion and benefits for marginalised or disadvantaged groups, including women, youth and persons with disabilities. In addition, UKCIF will help set regional benchmarks for developing climate and disaster-resilient infrastructure.	CDB	UKAID US$458 million	2016 - 2024	Grenada - Water supply and Expansion and Sewerage Improvement Project and Concord Water Supply System. Dominica - Financing DOWASCO to undertake institutional strengthening that would result in climate resilient water supply and wastewater infrastructure.

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	EU/CARIFORUM Strengthening Climate Resilient Health Systems in the Caribbean: Using the One Health Approach; 1) Piloting of tools to measure the health co-benefits of climate mitigation 2) Development of Health National Adaptation Plans, *3) Climate and Health early warning systems and risk management for water, sanitation and food safety,* 4) Climate and Health Leadership. *Climate resilient Water and Sanitation Safety Plan Training, Pilot Climate Resilient Water and Sanitation Safety Plans in 2 Countries*	PAHO	European Union €6.850 million	2020 - 2025	No details given
	Grenada Climate Resilient Water Sector (G-CREWS): Increase the systemic resilience to climate change in the Grenadian water sector	NAWASA/GIZ	GCF, German Federal Ministry of Environment-International Climate Initiative US$48 million + counterpart GoG US$5 million	2019-2025	Installation of leakage detection software, GIS and MIS tools. Reduce leakage from 29% to 19%
	Regional Strategic Action Plan for the Water Sector in the Caribbean to develop resilience to the impacts of climate change: Publication of the RSAP document and Implementation Plan, provision of Non-Revenue Water Reduction Training, evaluation of the financial impact of COVID-19 on water utilities and conceptualisation of an Insurance Mutual platform for the Caribbean water sector.	CWWA	IDB US$350,000 + counterpart funding from partners US$350,000	2019 & 2021	Conceptualisation of Insurance Mutual
	Caribbean Water Utility Insurance Company (CWUIC): Proposals for the establishment of an Insurance Mutual company to assist water utilities recover from the impact of natural disasters, support cooperation among utilities, and the financing of resilience measures.	IDB	IDB	2019-2021	Proposals for the establishment of CWUIC

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	The Biodiversity Support Programme for ACP Coastal Environments (BioSPACE): BioSPACE contributes to the sustainable development of Small Island Developing States and coastal countries within the African Caribbean and Pacific Group of States (ACP). The project also provides support to the Biodiversity and Ecosystems Management Framework, and contributes to the OECS Green-Blue Economy Strategy and Action Plan. It also supports the SAMOA Pathway through improving the management and sustainable use of coastal and marine resources. Build capacity of participating Member States through the provision of training, equipment and supplies, participation in regional and international dialogues (activities undergoing approval process). Revision/ Amendment of legislation in select PS to support fisheries development (activities undergoing approval process). Countries involved: Anguilla, Antigua & Barbuda, British Virgin Islands, Dominica, Grenada, Montserrat, St Kitts & Nevis, St Lucia and St Vincent and the Grenadines.	OECS	EU US$12.54 million	2020-2025	Sewage treatment and biodigester in select Participating States as a pilot project (activities undergoing approval process)

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	CReW+ An Integrated Approach to Water and Wastewater Management using Innovative Solutions and Promoting Financing Mechanisms in the Wider Caribbean Region: Identify and support sustainable and tailored financing options for urban, peri-urban and rural Integrated Water and Wastewater Management (IWWM). Regional platform for IWWM development. Capacity building workshops to drive national and regional institutional policy legislative and regulatory reforms for IWWM and, for reporting on relevant SDGs. Integrated guidelines and implementation plan consistent with IWRM with a focus on water source protection and use efficiency, land use protection and food, energy and ecosystems nexus trade-offs. Training on innovative low-cost integrated water and wastewater management such as though webinars, MOOCs, training programmes with the participation of civil society. Implement innovative decentralized, rural community based interventions for wastewater management in at least 4 Contracting Parties working with Civil Society/NGOs and in partnerships with larger GEF Funded Projects on Wastewater. Participating countries: Barbados, Belize, Colombia, Costa Rica, Cuba, Dominican Republic, Grenada, Guatemala, Guyana, Honduras, Jamaica, Mexico, Panama, St Kitts & Nevis, St Lucia, St Vincent and the Grenadines, Suriname, and Trinidad and Tobago.	GWP/GIZ/UNEP-CEP	GEF - IDB US$14.944 million	2021-2023	Implement innovative decentralized, rural community based interventions for wastewater management in at least 4 Contracting Parties working with Civil Society/NGOs and in partnerships with larger GEF Funded Projects on Wastewater. A series of community/rural specific financing action plans and business models to address IWWM including reuse (Minimum 8). Public–private mechanisms, payment options and recommendations on approaches to implement payment for ecosystem services developed (in at least 3 critical watersheds/hotspots)
Component 5: Capacity Building and Public Education for Climate-resilience					
Sub-component 5.1: Promote and encourage regional learning and replication	**Strengthening health facilities in the Caribbean (SMART hospitals-phase 2):** Scale up innovative pilot activities that strengthens health facilities in the region by combining disaster safety and environmental (e.g. energy and water) improvements that address weaknesses, boost future climate resilience, and generate operational savings.	PAHO	UKAID US$64 million	2015-2022	Build national capacity for further replication of "SMART" standards within public buildings and construction sectors
	GWP-C Water Academy for Youth: Programme for young leaders and professionals with an interest in water-related issues to gain a deeper understanding of them with a view to formulating sustainable and innovative solutions and developing practical transferable skills	GWP-C	GWP-C	Biennial	Cohort of 35 youth professionals trained each year. Internships for 2 selected persons each year. Strengthening of GWP-C youth involvement
	GWP-C Science Symposium: Providing a forum for sharing and disseminating Caribbean water sector scientific research and for bridging the science-policy divide.	GWP-C	GWP-C	Biennial	Development of Special Issues publication, Policy Perspective Paper presented at the HLF.

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	GWP-C Young Caribbean Water Entrepreneurs Shark Tank Competition: A unique opportunity for young Caribbean entrepreneurs to pitch their innovative water issue solutions and compete for seed funding to develop their product.	GWP-C	GWP-C	Biennial	Annual selection and financial support (€4,000) to the Shark Tank winner
	CReW+ An Integrated Approach to Water and Wastewater Management using Innovative Solutions and Promoting Financing Mechanisms in the Wider Caribbean Region: Identify and support sustainable and tailored financing options for urban, peri-urban and rural Integrated Water and Wastewater Management (IWWM). Regional platform for IWWM development. Capacity building workshops to drive national and regional institutional policy legislative and regulatory reforms for IWWM and, for reporting on relevant SDGs. Integrated guidelines and implementation plan consistent with IWRM with a focus on water source protection and use efficiency, land use protection and food, energy and ecosystems nexus trade-offs. Training on innovative low-cost integrated water and wastewater management such as though webinars, MOOCs, training programmes with the participation of civil society. Implement innovative decentralized, rural community based interventions for wastewater management in at least 4 Contracting Parties working with Civil Society/NGOs and in partnerships with larger GEF Funded Projects on Wastewater. Participating countries: Barbados, Belize, Colombia, Costa Rica, Cuba, Dominican Republic, Grenada, Guatemala, Guyana, Honduras, Jamaica, Mexico, Panama, St Kitts & Nevis, St Lucia, St Vincent and the Grenadines, Suriname, and Trinidad and Tobago.	GIZ/UNEP-CEP	GEF - IDB US$14.944 million	2021-2023	A communications strategy developed and implemented, including information and dissemination of products related to IWWM and watershed management. Updated CReW clearinghouse mechanism on financial options, small- and large-scale wastewater treatment technologies, and wastewater and water management policies and practices developed. Documented best practices, lessons and experiences from all Components (Minimum 20 reports/best practices and lessons learned broadly decimated in English and Spanish, 5 scientific publications and 5 short-films, animations and interviews). Operational information exchange mechanism for GEF and non-GEF projects established
	UK Caribbean Infrastructure Fund (UKCIF): Build high quality economic infrastructure – roads, ports, water and sanitation systems and other public assets – which will provide a boost to economic growth, help reduce poverty and increase inclusion and benefits for marginalised or disadvantaged groups, including women, youth and persons with disabilities. In addition, UKCIF will help set regional benchmarks for developing climate and disaster-resilient infrastructure.	CDB	UKAID US$458 million	2016 - 2024	No details provided
Sub-component 5.2: Support training and capacity building	**Strengthening Recovery and Resilience in the Caribbean:** Improved planning, decision making and action for gender responsive and inclusive climate resilience in key livelihood sectors. Gender-responsive and inclusive NAP and NAMA priority interventions implemented in target sectors in collaboration with state and non-state sectoral actors.	UNDP	UKAID with Govt. of Canada US$10,000	2019-2023	No details provided

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	Strengthening health facilities in the Caribbean (SMART hospitals-phase 2): Scale up innovative pilot activities that strengthens health facilities in the region by combining disaster safety and environmental (e.g. energy and water) improvements that address weaknesses, boost future climate resilience, and generate operational savings.	PAHO	UKAID US$64 million	2015-2022	Training of 1,131 persons
	UK Caribbean Infrastructure Fund (UKCIF): Build high quality economic infrastructure – roads, ports, water and sanitation systems and other public assets – which will provide a boost to economic growth, help reduce poverty and increase inclusion and benefits for marginalised or disadvantaged groups, including women, youth and persons with disabilities. In addition, UKCIF will help set regional benchmarks for developing climate and disaster-resilient infrastructure.	CDB	UKAID US$458 million	2016 - 2024	Training component - no details provided
	EU/CARIFORUM Strengthening Climate Resilient Health Systems in the Caribbean: Using the One Health Approach; 1) Piloting of tools to measure the health co-benefits of climate mitigation 2) Development of Health National Adaptation Plans, *3) Climate and Health early warning systems and risk management for water, sanitation and food safety,* 4) Climate and Health Leadership. *Climate resilient Water and Sanitation Safety Plan Training, Pilot Climate Resilient Water and Sanitation Safety Plans in 2 Countries*	PAHO	European Union €6.850 million	2020 - 2025	No details given
	EU GCCA+ Enhanced Caribben Climate Resilient Water Infrastructure: Develop Rapid Vulnerability assessments of water utility assets to climate hazards 2. Develop/strengthen adaptation plans 3. Develop Standard Operating Procedures (SOPs) and guidance documents, and protocols on the planning of new water infrastructure. 4. Develop and implement investment projects (5 million Euros) 5. Improve knowledge sharing on climate vulnerability management between utilities 6. Enhance operational climate vulnerability management	CCCCC	European Union €6.045 million	2019-2023	110 participants trained - no specific country numbers given

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	CReW+ An Integrated Approach to Water and Wastewater Management using Innovative Solutions and Promoting Financing Mechanisms in the Wider Caribbean Region: Identify and support sustainable and tailored financing options for urban, peri-urban and rural Integrated Water and Wastewater Management (IWWM). Regional platform for IWWM development. Capacity building workshops to drive national and regional institutional policy legislative and regulatory reforms for IWWM and, for reporting on relevant SDGs. Integrated guidelines and implementation plan consistent with IWRM with a focus on water source protection and use efficiency, land use protection and food, energy and ecosystems nexus trade-offs. Training on innovative low-cost integrated water and wastewater management such as though webinars, MOOCs, training programmes with the participation of civil society. Implement innovative decentralized, rural community based interventions for wastewater management in at least 4 Contracting Parties working with Civil Society/NGOs and in partnerships with larger GEF Funded Projects on Wastewater. Participating countries: Barbados, Belize, Colombia, Costa Rica, Cuba, Dominican Republic, Grenada, Guatemala, Guyana, Honduras, Jamaica, Mexico, Panama, St Kitts & Nevis, St Lucia, St Vincent and the Grenadines, Suriname, and Trinidad and Tobago.	GWP/GIZ/UNEP-CEP	GEF - IDB US$14.944 million	2021-2023	Capacity building workshops to drive national and regional reforms for IWWM and, for reporting on relevant SDGs (Min. 20 instructions; 100 participants and all participating countries). Training on innovative low-cost integrated water and wastewater management such as though webinars, MOOCs, training programmes with the participation of civil society. Training modules for selected persons and agencies in the design, strategic planning, establishment and management of the financial mechanisms (at least 100 participants).
	Regional Strategic Action Plan for the Water Sector in the Caribbean to develop resilience to the impacts of climate change: Publication of the RSAP document and Implementation Plan, provision of Non-Revenue Water Reduction Training, evaluation of the financial impact of COVID-19 on water utilities and conceptualisation of an Insurance Mutual platform for the Caribbean water sector.	CWWA	IDB US$350,000 + counterpart funding from partners US$350,000	2019 & 2021	Trained 40 water sector professions in Non-Revenue Water Reduction

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	Integrated Landscape Approaches and Investments in Sustainable Land Management (ILM): Enhance natural ecosystem management, climate change mitigation/adaptation, and achieve food security and sustainable agriculture; enhance capacities to improve land-use management, reverse land degradation and forests/ecosystems loss; enhance quality of life for multi-stakeholder interest groups such as local farmers, and communities in selected watersheds and other geographic locations of Member States. Specific Objective is to strengthen the economic, social, and environmental resilience of OECS Member States to the impacts of climate change and other hazards through the implementation of Integrated Landscape Management (ILM), Sustainable Land Management (SLM), Integrated Watershed Management (IWM), and other relevant approaches. The Expected Project Outputs are: ● Scalable physical adaptation initiatives that help conciliate different land uses, foster innovation and lessons learning are field tested and deliver multiple agricultural, climate and biodiversity-related benefits. ● Improved land governance and management systems are promoted, notably through better cross-sectoral coordination, enhanced participation of land users and local stakeholders, including local communities, women, and the private sector, in land-related decisions, and other appropriate land governance measures; and ● The capacities of actors and institutions for sustainable landscape management are enhanced.	OECS	GEF US$1.778 million + counterpart US$3.460 million	2018-2023	Capacity building in participating Member States through provision of training, equipment and supplies (activities undergoing approval process)

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	Integrating Water, Land and Ecosystems Management in Caribbean Small Island Developing States (IWEco): Strengthening of the Policy, Legislative and Institutional Reforms and Capacity Building for Sustainable Land Management, Integrated Water Resources Management and Ecosystems Services Management. Countries include: Antigua and Barbuda, Barbados, Grenada, Jamaica, St Kitts & Nevis, St Lucia, St Vincent and the Grenadines and Trinidad and Tobago. 1. Recommendations and Terms of Reference for priority interventions that would facilitate development and/or implementation of new or strengthening of existing policies, legislative instruments, frameworks, action plans and strategies at the national and regional level. 2. Implementation of priority national and regional activities in support of the new and or upgraded/strengthened policies, legislative instruments, frameworks, action plans and strategies for participating states based on recommendations. 3. A Regional Action Framework for Integrated Water Resources Management (IWRM) for the CARICOM Region. 4. Implementation of priority regional and national activities under the Regional Action Framework for IWRM for the CARICOM Region.	OECS/CARPHA	GEF US$1.778 million + counterpart US$3.460 million	2018-2023	Capacity building in areas which support improved water, land and ecosystems management undergoing selection and approval process.
	Grenada Climate Resilient Water Sector (G-CREWS): Increase the systemic resilience to climate change in the Grenadian water sector	NAWASA/GIZ	GCF, German Federal Ministry of Environment-International Climate Initiative US$48 million + counterpart GoG US$5 million	2019-2025	Training of 30 persons in leakage detection, 30 NAWASA personnel in various topics and 15 in Sales

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	Strengthening Disaster and Climate Resilience in the Eastern and Southern Caribbean: Goals (i) Improve systems to support efficient disaster recovery and response to natural disasters, and (ii) Strengthen early warning systems to enable improved response to hydro-meteorological and hydrological systems. The objectives are to (i) strengthen hydro-meteorological observation platforms; (ii) strengthen the human capacity and institutional resilience of National Meteorological and Hydrological Services (NMHSs) in the Caribbean to enable them to maintain some level of functionality under the most arduous conditions; (iii) strengthen multi-hazard early warning systems in the Caribbean by enhancing the timely collection and integration of pre- and post-impact data into regional multihazard impact-forecasting and decision-support platforms that improve risk forecasting, management and reduction and (iv) further strengthen and expand the development and delivery of climate services in the Caribbean. Countries covered: Antigua & Barbuda, Barbados, Dominica, Grenada, St Lucia, St Kitts & Nevis, St Vincent and the Grenadines.	CIMH	USAID US$1.8 million	2019-2021	Two 2-day virtual workshops 6 participants, for each of 2 countries to be scheduled. Capability developed in national and regional forecasters in the use of the tools and products of satellite meteorology. Training in the use of WRF/WRF-hydro delivered to NMHSs, CIMH, UWI staff built. The project will convene a virtually regional workshop with participants from the seven beneficiary countries, UWI and CIMH. Capacity for on-line course development and delivery built and on-line/blended course in use and application of NWP developed. Capacity built in the science sub-seasonal predictability and predictions. A virtually convened regional training workshop for participants drawn from the seven (7) beneficiary countries and CIMH on the science of sub-seasonal predictability and prediction. Capacity built in use of drought forecast for decision-making in the agriculture sector in 3 countries through the development of full annexes. Community hazard mapping developed and impact reports compiled for 2 pilot countries (Saint Lucia and Grenada)

Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	Strengthening Human Resilience in Northern Clarendon and Est Kingston - Jamaica (UNHSTF): The programme will: 1. Strengthen local and community governance bodies with youth participation to design and oversee interventions; 2. Enhance economic, food and nutritional security by creating a climate-resilient agriculture sector and diversified local economy; 3. Improve environmental, health and water security to safeguard communities against preventable illnesses such waterborne and sanitation-related diseases and ensure efficient and sustainable use of natural resources 4. Strengthen the institutional capacities of the Government and community stakeholders to mainstream the human security approach in Jamaica's development strategies.	UNDP/FAO/PAHO/UNEP-CEP	UN Trust Fund for Human Security - UNDP US$2.0 million + Pooled Funding US$4.450 million	2017-2021	Community and household capacities to access and manage safe water enhanced: Establish and /or strengthen community resource management committee; Develop effective models for participatory management and operation of community based water systems; Train community members on integrated water resources management; Train beneficiaries, with a focus on women, youth and persons with disabilities, and other institutional stakeholders in the design, construction, use and maintenance of water harvesting systems. Policy and regulatory framework for water resources management strengthened: Provide support for the formulation and implementation of a monitoring framework to support the National Water Sector Policy (NWSP); Provide support to the revision of the Draft Industry Specific legislation for the Water Sector Policy. Develop ffective models for participatory management and operation of community based water systems.
	Capacity Building to Support Multilateral Environmental Agreements: Support to fulfil MEA obligations related to biodiversity, chemicals and waste including hazardous pesticides.	UNEP-CEP	EU US$31.240 million	2019-2024	No details given
Sub-component 5.3: Engage in a comprehensive public awareness campaign	**Grenada Climate Resilient Water Sector (G-CREWS):** Increase the systemic resilience to climate change in the Grenadian water sector	NAWASA/GIZ	GCF, German Federal Ministry of Environment-International Climate Initiative US$48 million + counterpart GoG US$5 million	2019-2025	Establish and /or strengthen community resource management committee

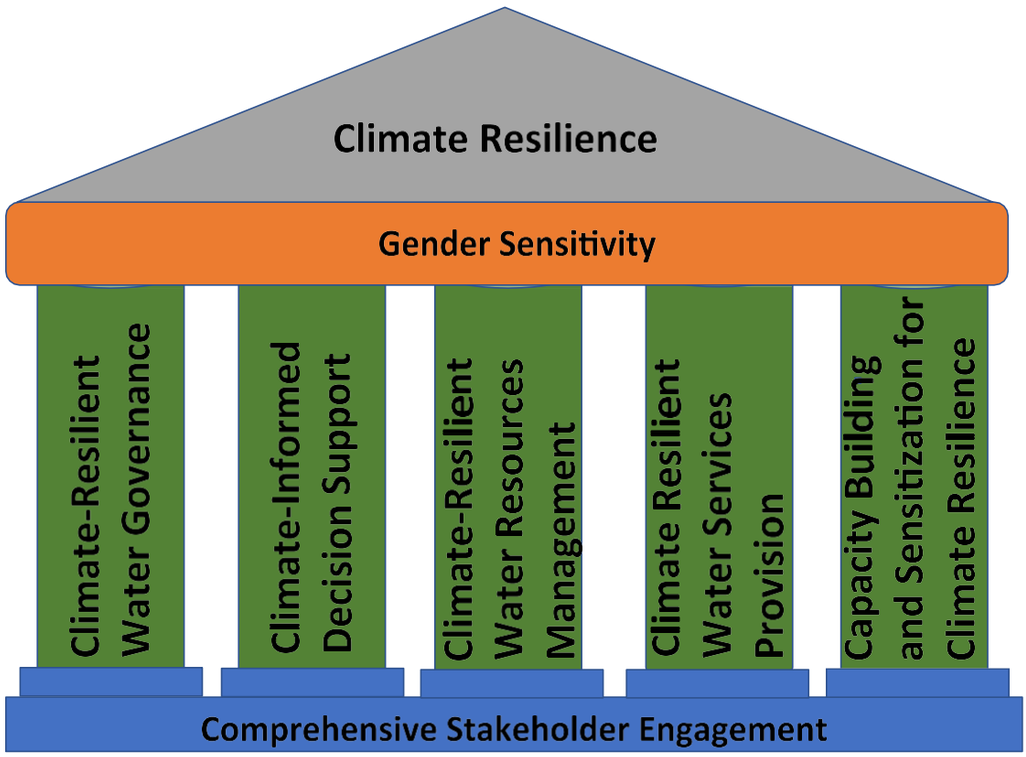
Component	Description of Actions	Lead Agency	Funding	Timescale	Outputs
	Regional Strategic Action Plan for the Water Sector in the Caribbean to develop resilience to the impacts of climate change: Publication of the RSAP document and Implementation Plan, provision of Non-Revenue Water Reduction Training, evaluation of the financial impact of COVID-19 on water utilities and conceptualisation of an Insurance Mutual platform for the Caribbean water sector.	CWWA	IDB US$350,000 + counterpart funding from partners US$350,000	2019 & 2021	Increased awareness among decision-makers
Sub-component 5.4: Monitoring and Evaluation of RSAP Implementation	**Regional Strategic Action Plan for the Water Sector in the Caribbean** to develop resilience to the impacts of climate change: Publication of the RSAP document and Implementation Plan, provision of Non-Revenue Water Reduction Training, evaluation of the financial impact of COVID-19 on water utilities and conceptualisation of an Insurance Mutual platform for the Caribbean water sector.	CWWA	IDB US$350,000 + counterpart funding from partners US$350,000	2019 & 2021	Develop effective models for participatory management and operation of community based water systems
Component 5a: Research and Development					
Sub-component 5a.1: A mechanism to coordinate research and identify research needs	**GWP-C Science Symposium:** Providing a forum for sharing and disseminating Caribbean water sector scientific research and for bridging the science-policy divide.	GWP-C	GWP-C	Biennial	Platform for collaboration and information exchange.

Annex 1: Terms of Reference of the RSAP Implementation Monitoring Committee

Annex 2: Five Pillars of the Regional Strategic Action Plan

Pillars of Plan

The Regional Strategic Action Plan for climate resilience in the water sector in the Caribbean is built along five main pillars, namely (i) water sector governance, (ii) decision support, (iii) water resources management, (iv) provision of water services, and (v) capacity building and public sensitization. Given the disproportionate impacts of water scarcity and extreme weather events on women in the Caribbean, it is very important that all interventions in the water sector recognize and cater to the need for gender sensitivity in planning, implementation, monitoring and evaluation. This is particularly the case with respect to intervention that are designed at increasing resilience to the impacts of climate change or reducing exposure to natural disasters.



Stakeholder Engagement

An important first step in the implementation of the plan should be the comprehensive identification and categorization of the myriad stakeholders who must be engaged. It is vitally important that stakeholder input and support is obtained at all levels. This is particularly the case at the community level, which is often the neglected component in national policy formulation and decision-making. There must be broad-based and committed stakeholder buy-in and engagement throughout and every effort must be made to solicit the perspectives of the myriad stakeholders. While this is at the core of pillar five, which speaks to public sensitization, it must also be a recurring theme in the implementation of the plan.

Another important stakeholder group that must be engaged and from which buy-in is essential is the political directorate. High-level political support is critical to the success of this action plan. The minister with responsibility for water must champion this action plan. However, support will also be required from the Minister for Finance and the Minister for Planning, given the important role of resource mobilization and resource allocation in this process. The support of the Office of the Prime Minister must also be enlisted because of the need to have water sector planning and a sensitivity to water management issues at the core of all decision making at the highest policy levels. Ministers with responsibility for sectors that depend on a reliable supply of water for their smooth functioning, such as the ministers of tourism, agriculture, industry, health and education, must also be engaged very early on in the development and execution of the plan.

Evidence Based Action

A robust, comprehensive and accurate evidence base must underpin the policy making process in the water sector. Resources are limited at all levels (natural, human, technical and financial) and Caribbean countries do not have the luxury of time in addressing the critical needs of the water sector. Therefore, interventions must be targeted, effective, efficient and coordinated. The

only way this can be assured is through a strong evidence base that will allow for accurate identification of the problem, and effective design and implementation of the intervention.

Another critical component of the Water Action Plan must be its reliance on continuous monitoring and evaluation. Naturally, this is predicated on the existence of sound and current databases. Because the water sector impacts so many economic, social and environmental processes and also because both resources and time are constrained, the authorities executing the plan must build in a planning, monitoring and evaluation architecture into the management of the plan. In other words, management of the Water Action Plan must always be results-based, with continuous monitoring to determine the efficacy of the programme and the flexibility to make any necessary adjustments to ensure the optimal effectiveness of the respective interventions.

As in the case of stakeholder engagement, this imperative is fundamental to one of the pillars of the plan – climate-informed decision support, but it is also a requirement for every one of the elements of the action plan.

Communication and Education

An important pre-requisite for the success of the Action Plan is a well-thought-out communications strategy and plan. To succeed, the Action Plan will require stakeholders at all levels to deviate from business as usual. It will be necessary to do different things from what they have been doing, and to do many of the things they have been doing differently. This change in culture, attitudes and practice will not happen overnight. It will require constant public education, encouragement and reinforcement. The sellers of the Plan must be credible and relatable and must, whenever possible, be prepared to lead by example.

Most Critical Component

Finally, perhaps the most critical ingredient for the successful implementation of the Water Action Plan will be inter-agency and inter-sector coordination and collaboration, which speaks directly to the issue of governance. As previously explained, the effective management of our water resources requires many agencies at the public sector and the private sector, and at the national and the community levels, to share information and to work together, with a common purpose. It might be useful to adopt an approach that was used successfully in the battle against HIV-AIDS known as the Three Ones Approach. That scenario called for One agreed action framework that formed the basis for coordinating the work of all development partners; One national AIDS coordinating authority, with a broad-based multi-sector mandate; and one agreed country-level monitoring and evaluation system (World Health Organization, 2004).

In the case of the water sector, it is proposed that there be ONE nationally and regionally agreed action plan for addressing the challenges in the water sector, for which this Action Plan can lay the foundation. There would then need to be agreement on the establishment of ONE national water action coordinating committee, which would bring together all the water stakeholders, across the various sectors, to agree on the steps that must be taken collectively and individually, but always in synergy, to address the myriad challenges causing water insecurity in the country. At the regional level, the High-Level Forum of the Caribbean Water and Wastewater Association should serve as the regional coordinating authority, with the blessing and endorsement of the Heads of Government of the Caribbean Community. This will also require an enhancement of the technical capacity and the resources that are available to support the Caribbean Water and Wastewater Association in the execution of this official mandate. Finally, there should be ONE monitoring and evaluation system, at the country level, that would allow for the continuous monitoring and evaluation, with adjustments and refinement where necessary, to ensure that Action Plan, with its various activities and interventions, is having the desired impact. At the regional level, the Caribbean Water and Wastewater Association should be charged with the responsibility for establishing the common platform for monitoring and evaluation of those activities of the programme that have a regional focus. This approach would lend itself to a minimization of duplication of effort, it would create the synergies and the critical mass that are necessary for transformational change in the water sector, and it would give development partners a clear platform for technical and financial support as well as a transparent mechanism for evaluating the efficacy of their interventions.

Water Sector Action Plan Coordination

Methodology

The approach taken with the articulation of the action plan is to coalesce the activities under the five broad pillars. That way, there will be synergy of action and commonality of purpose, which are prerequisites for success. While it may not always be possible for resources to be mobilized to address all the imperatives under a programme area, it is hoped that even when individual projects are pursued, they will align with the activities identified under the programme and consequently, will contribute to the achievement of the overall programme outcome.

Addressing the growing water insecurity of the Caribbean is one of the biggest developmental challenges confronting the citizens of the region. This Action Plan seeks to present a practicable road map for dealing with this challenge.

Component 1: Climate-Resilient Water Governance

The overall objective of the interventions in this component is to develop the enabling environment for the sustainable management of water resources at national and regional levels, through a participatory process involving stakeholders in the public and private sectors, with the aim of increasing resilience to the impacts of climate change.

- Sub-component 1.1: Improve national and regional institutional and legislative frameworks.
  - Activity 1.1.1: Develop national water policies in Member States where they do not exist and review all water policies against international best practice. Set targets to ensure that the objectives of the national water policy are met and the targets of Goal 6, Clean Water and Sanitation, of the 2030 Development Agenda are achieved.
  - Activity 1.1.2: Establish a water resources agency in each Member State, with a mandate to protect and enhance the water environment and facilitate Integrated Water Resources Management (IWRM).
  - Activity 1.1.3: Develop a mechanism for effective coordination among water management agencies, agencies responsible for policy formulation and programme implementation in climate change and disaster risk reduction, and the sectors that have a nexus with the water sector (such as energy, agriculture, and tourism).
  - Activity 1.1.4: Develop review and modernise legislation to facilitate the requisite institutional architecture and the pursuit of policies and programmes that will ensure sustainable management of water resources and pollution control.
  - Activity 1.1.5: Establish an independent national water utility regulator in each Member State, with a mandate to establish and monitor standards and benchmarks, protect consumer interests and set tariffs based on good economic practice and reflective of social and environmental sustainability considerations.
  - Activity 1.1.6: Develop a mechanism to engage with private sector stakeholders to ensure their commitment to the actions necessary for the effective management of water and wastewater.
  - Activity 1.1.7: Establish a sustainable regional coordinating mechanism for the water sector.

- Sub-component 1.2: Mainstream climate change policies in the water sector
  - Activity 1.2.1: Incorporate climate resilience and disaster risk reduction policies and plans into sector and national development plans by implementing the priority action areas and principles of the Sendai Framework for Disaster Risk Reduction, the 2030 Development Agenda and the Paris Agreement.
  - Activity 1.2.2 Establish a mechanism at the national level to ensure coherence and synergies between national water sector plans and all other sector or national development plans or public sector investment programmes.

Component 2: Climate-Resilient Water Resources Management

The objective of this component is to ensure the sustainable and efficient management of the water resources, from ridge to reef, through the adoption of IWRM principles. IWRM is an adaptation response to a reduction in water resource and requires the incorporation of indigenous and local knowledge on water use and management with scientific knowledge to ensure the cultural appropriateness of the approaches being proposed and greater potential for successful implementation.

- Sub-component 2.1: Comprehensively quantify water resources, including basin water budgets and supply-demand balances. These assessments should consider current (baseline) and future conditions, factoring in both climate change and different socio-economic development scenarios.
  - Activity 2.1.1: Undertake a programme of surface and groundwater modeling to estimate water resources from different sources and the capacity of these resources to meet projected future demands.
- Sub-component 2.2: Develop and adopt an IWRM plan, which incorporates social and gender equity, economic efficiency and ecological sustainability.
  - Activity 2.2.1: Develop a watershed management programme that includes restoration of forest cover, establishment of new forest cover where needed to help improve the integrity of watersheds and assist with slope stabilization, and establishment of buffer protection areas.
  - Activity 2.2.2: Reduce the sources of pollution of water sources, through enactment, where necessary, and enforcement of legislation and rigorous public education.
  - Activity 2.2.3: Involve communities as active players in watershed protection, given the key role that local communities and small farmers play in the management of watershed ecosystems.
  - Activity 2.2.4: Explore the feasibility of using Payment for Environmental Services schemes.
  - Activity 2.2.5: Develop robust water sharing protocols that are applicable across all sectors

Component 3: Climate-Informed Decision Support

The overall objective of this component is to facilitate the development of the robust evidence base that will be used to underpin all policy formulation and decision-making in the water sector at the domestic and regional levels. The intention here is to make the decision support mechanism open to all stakeholders, at different levels of input and access.

- Sub-component 3.1: Develop a National Water Decision Support System (DSS) for climate informed decision making that integrates environmental, social and economic data.
  - Activity 3.1.1: Develop data and information management protocols for the National DSS to set out the processes and procedures for data collection, storage, analysis and dissemination, archive and disposal within the DSS.
  - Activity 3.1.2: Establish a data centre to host the DSS and provide the computing capacity for big data analytics within the DSS. Develop the DSS architecture for storage, access and analysis of disaggregated data for all relevant stakeholders.
  - Activity 3.1.3: Develop monitoring system for data collection and integrate this within the DSS. Deploy instrumentation and equipment for data collection on sea level rise, the status of aquifers, stream flow, flood mapping and wastewater. Include collection of satellite data and LiDAR. This will provide an evidence base to determine the existing and potential future impacts of climate change on the water sector.
  - Activity 3.1.4: Develop accurate models to predict the impacts of extreme weather events and slow onset events including sea level rise on the water sector.
  - Activity 3.1.5: Map water supply system assets, undertake hydraulic modeling of the supply network and modeling of water resources and use GIS to develop, manage and analyze the requisite datasets.
  - Activity 3.1.5: Analysis and interpretation of water data within the DSS to assess social, economic and environmental impacts on water resources, including impacts from climate, land use, demographics and economic development.
  - Activity 3.1.6: Develop national early warning systems (e.g. drought and flood forecasting)

that will facilitate forecasting of pending water-related crises
    - Activity 3.1.7: Training and capacity building for all relevant personnel in data entry, analysis and dissemination.
- Sub-component 3.2: Establish a water resources management planning cycle for improving responsiveness to climate impacts
    - Activity 3.2.1: Establish a periodic national water census to quantify and value water resources as part of the work programme of the national statistics department.
    - Activity 3.2.2: Set standards and benchmarks to allow for accurate measurement of progress in relation to climate impacted variables (supply demand deficit, deployable output) and comparison with international best practice. Set standards for reduction in demand.
    - Activity 3.2.3: Institutionalise the production of an annual, national State of the Water Sector Report as a joint undertaking by the government, the regulator and the water utility company. To inform policy makers, water users and the water utility about where investments need to be made to manage climate related risks
    - Activity 3.2.4: Develop a national level requirement for water resource management planning, which takes possible future development scenarios into account.
    - Activity 3.2.5: Establish and monitor operational resilience metrics (such as duration of service interruption, time to repair) as a first step toward agreement on Levels of Service. This will be important in estimating the ability of the water system to cope with climate variability and planning climate change adaptation options.

Component 4: Climate-Resilient Water Services

This series of interventions is focused on developing resilience to the impacts of climate change and extreme weather events in the delivery of water services.

- Sub-component 4.1: Reduce water demand to acceptable levels to adapt to climate related water scarcity
    - Activity 4.1.1: Reduce levels of non-revenue water (NRW), through a programme to repair and replace damaged or aging infrastructure, metering of water supplies and measures to reduce theft of water.
    - Activity 4.1.2: Establish appropriate incentives that encourage water use efficiency or sanctions that penalize inefficient or unhelpful behaviour.
- Sub-component 4.2: Optimise efficient use of water resources to adapt to climate related water scarcity
    - Activity 4.2.1: Improve water storage infrastructure, both for untreated and treated water at the national level, municipal level and encouraging investments in increased water storage at the domestic and commercial levels.
    - Activity 4.2.2: Effectively manage recycled wastewater and water from other sources such as rainwater and untreated surface water, including its use as a resource in sectors such as tourism (landscape irrigation) and agriculture (irrigation and fertilizer).
    - Activity 4.2.3: Climate-proof water storage, treatment and distribution infrastructure to better withstand the impacts of climate change and extreme weather events.
    - Activity 4.2.4: Develop and implement contingency plans, including but not limited to desalination facilities that can be deployed in situations of acute water scarcity.
- Sub-component 4.3: Improve energy efficiency in water use
    - Activity 4.3.1: Reduce energy costs of the water utility by employing energy efficiency measures and by making use of cheaper renewable energy sources where possible.
    - Activity 4.3.2: Explore the feasibility of installing back-up energy sources for water utility companies to act as a contingency for when electricity supply is interrupted after an extreme weather event.

Component 5: Capacity Building and Public Education for Climate Resilience

This component aims to increase learning and develop capacity within utility companies and stakeholders in Member States to be able to develop climate-resilient water sector strategies across the Caribbean and address the myriad impacts of climate change.

- Sub-component 5.1: Promote and encourage regional learning and replication
    - Activity 5.1.1: Develop a regional community of practice that will allow for sharing of experiences and information and replication of best practice and strategies that have proven useful or successful in other jurisdictions.
    - Activity 5.1.2: Develop and maintain a database of water professionals in the Caribbean who may be called upon to assist at the national or regional level when a problem arises or capacity needs to be augmented.
- Sub-component 5.2: Support training and capacity building
    - Activity 5.2.1: Develop and execute a training programme, informed by a comprehensive capacity needs assessment, at the national and regional levels, to improve technical capacity in the government, the water utility and the private sector to understand and

manage climate impacts on the water sector.

- Sub-component 5.3: Engage in a comprehensive public awareness campaign
- Activity 5.3.1: Raising public awareness to promote and encourage action to adapt water use and wastewater management behaviour to climate variability and change.

Annex 3: Data Collection Instrument

Asset Investment Projects and Programmes: Data Collection

Basic Information	
Name of Organisation	OECS
Country	Saint Lucia
Website	https://www.oecs.org/en/
Contact person	Farzana Yusuf-Leon
Email	farzana.yusufleon@oecs.int; staff.bemp@oecs.int
Contact number	(758) 455-6331 / (758) 722-8135

The purpose of this data collection exercise is to gather information on the investments that are being made or are planned to be made in Water Sector assets over the next 5 years. The information will be used to update the Regional Strategic Action Plan for Water Inventory. The Inventory will inform Water Sector partners as to what activities are taking place, where there are potential synergies and where further investments could be targetted.

Project or Programme specific information

		#1	#2
Title/Name of the Project/Programme	Please give the offical title of the intervention		
General location	Is this part of a regional initiative, is it countrywide or is it location specific. If location specific indicate the name of the place or location.		
Project/programme description:	Give brief details of the Goals and Objectives that the intervention is supposed to achieve		
Project Outputs and Outcomes	Please list the breakdown of expected outputs and outcomes for each intervention. This information should be taken from project documents and would include, but not limited to examples like:		
	· Length of pipelines new (metres)		
	· Length of pipelines replaced (metres)		
	· Reservoirs (number and capacity)		
	· Intakes (number and capacity)		
	· Pumping installations (number and capacity)		
	· Treatment works (capacity)		
	· Machinery & Equipment (brief details)		
	· Meters installed (production/bulkwater/district/consumer)		
	· Wastewater treatment works (primary/secondary/tertiary & capacity)		
	· Training and capacity building (numbers of persons)		
	· Legislative review and change (brief details)		
	· Organisational change (brief details)		

	· Plans, Studies and Feasibility Studies (brief details)		
	· Systems and software, decision support systems (type)		
	· Monitoring networks established or upgraded (number of instruments and types)		
	· Community outreach and engagement (number of meetings and materials)		
	· Reduction in Non-Revenue Water (target % improvement)		
	· Energy use efficiency (target % improvement)		
	· Renewable energy (type and installed capacity)		
	· Water reuse (volume)		
	· Stormwater management (number of structures)		
	· Other		
Funding agency	The name of the funding agency and if this is part of a specific funding initiative, please include that information		
Value of funding	Please provide the value of the funding, in US$ if possible.		
Counterpart funding	Is there any counterpart funding that is additional to that provided by the Funding agency?		
Value of funding	Please provide the value of the funding, in US$ if possible.		
Implementing agency	Please give the name of the Agency implementing the initiative		
Start date	Month if possible and year		
End date	Month if possible and year		
Website	Please include the project/programme website if there is one.		
The Regional Strategic Action Plan identifies different categories of intervention. These are listed below. Please indicate which of these the initiative most closely corresponds to. You can choose more than one of the components.			
Component 1: Climate Resilient Water Governance			
1.1: Improve national and regional institutional and legislative frameworks (Enabling environment including policies, legislation & regulations; strengthen institutional frameworks, national and regional coordination systems)			
1.2: Mainstream climate change policies in the water sector (climate resilience & disaster management plans)			
Component 2: Climate-resilient Water Resources Management			
2.1: Quantify water resources, water budgets and supply-demand balances (water resources assessments, water demand assessments)			
2.2: Develop and adopt IWRM Plans (catchment management, public engagement, community involvement, PES, water allocations)			
Component 3: Climate-informed Decision Support			

3.1: Develop National Water Decision Support System (WDSS) for climate-informed decision-making (Data management and support systems, monitoring networks, decision support systems, impact assessments, socio-economic impact assessments, early warning systems)		
3.2: Establish water resources management planning cycle for improving responsiveness to climate impacts (water assessments and reporting mechanisms)		
Component 4: Climate-resilient Water Services		
4.1: Reduce water demand to acceptable levels to adapt to climate related water scarcity (NRW, water use efficiency)		
4.2: Optimise efficient use of water resources to adapt to climate related water scarcity (Climate-proof water resources and services, water storage, wastewater reuse, stormwater management, irrigation, managed aquifer recharge, climate robust infrastructure)		
4.3: Improve energy efficiency in water use (energy audits, energy efficiency, renewable energy systems)		
4.4: Improve the performance of the water and sanitation sector (organisational strengthening, capacity building, organisational efficiency, financial management, benchmarking)		
Component 5: Capacity Building and Public Education for Climate-resilience		
5.1: Promote and encourage regional learning and replication (Communities of practice, information sharing, data base of professional resources)		
5.2: Support training and capacity building (capacity assessments, training and capacity building)		
5.3: Engage in a comprehensive public awareness campaign		
5.4: Monitoring and Evaluation of RSAP Implementation		
Component 5a: Research and Development		
5a.1: A mechanism to coordinate research and identify research needs (funding to support research).		