Funding Proposal

Version 1.1

The Green Climate Fund (GCF) is seeking high-quality funding proposals.

Accredited entities are expected to develop their funding proposals, in close consultation with the relevant national designated authority, with due consideration of the GCF's Investment Framework and Results Management Framework. The funding proposals should demonstrate how the proposed projects or programmes will perform against the investment criteria and achieve part or all of the strategic impact results.

Project/Programme Title:	Climate-Resilient Water Sector in Grenada (G-CREWS)
Country/Region:	Grenada/Caribbean
Accredited Entity:	Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH
Date of Submission:	16 October 2017

GREEN CLIMATE FUND

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Note to accredited entities on the use of the funding proposal template

- Sections **A, B, D, E** and **H** of the funding proposal require detailed inputs from the accredited entity. For all other sections, including the Appraisal Summary in Section F, accredited entities have discretion in how they present the information. Accredited entities can either directly incorporate information into this proposal or provide summary information in the proposal with cross-reference to other project documents such as the project appraisal document.
- The total number of pages for the funding proposal (excluding annexes) is expected not to exceed 50.

Please submit the completed form to:
fundingproposal@gcfund.org

Please use the following name convention for the file name:
"[FP]-[Agency Short Name]-[Date]-[Serial Number]"

A.1. Brief Project/Programme Information			
A.1.1. Project/programme title		**Climate-Resilient Water Sector in Grenada (G-CREWS)**	
A.1.2. Project or programme		Project	
A.1.3. Country(ies)/region		**Grenada/Caribbean**	
A.1.4. National designated authority(ies)		**Department for Economic and Technical Cooperation (DETC) of the Ministry of Finance, Energy, Economic Development, Planning & Trade (MoFE)**	
A.1.5. Accredited entity		**Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH**	
A.1.5.a. Access modality		☐ Direct ☒ International	
A.1.6. Executing entities/beneficiary		Executing Entities (EE): • Ministry of Finance, Energy, Economic Development, Planning & Trade, Grenada (MoFE) • Grenada Development Bank (GDB) • Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH Beneficiaries: • National Water and Sewerage Authority (NAWASA) • The whole population of Grenada (approx. 106,000 people, of whom about 50 % are of female gender)	
A.1.7. Project size category (Total investment, million USD)		☐ Micro (≤10) ☐ Medium (50<x≤250)	☒ Small (10<x≤50) ☐ Large (>250)
A.1.8. Mitigation/adaptation focus		☐ Mitigation ☒ Adaptation ☐ Cross-cutting	
A.1.9. Date of submission		16 October 2017	
A.1.10. Project contact details	Contact person, position	Mr. Jochen Quinten	
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A.1.11. Results areas *(mark all that apply)*

Reduced emissions from:

- ☐ Energy access and power generation (E.g. on-grid, micro-grid or off-grid solar, wind, geothermal, etc.)
- ☐ Low emission transport (E.g. high-speed rail, rapid bus system, etc.)
- ☐ Buildings, cities and industries and appliances (E.g. new and retrofitted energy-efficient buildings, energy-efficient equipment for companies and supply chain management, etc.)
- ☐ Forestry and land use (E.g. forest conservation and management, agroforestry, agricultural irrigation, water treatment and management, etc.)

Increased resilience of:

- ☒ Most vulnerable people and communities (E.g. mitigation of operational risk associated with climate change — diversification of supply sources and supply chain management, relocation of manufacturing facilities and warehouses, etc.)
- ☒ Health and well-being, and food and water security (E.g. climate-resilient crops, efficient irrigation systems, etc.)
- ☒ Infrastructure and built environment (E.g. sea walls, resilient road networks, etc.)
- ☐ Ecosystem and ecosystem services (E.g. ecosystem conservation and management, ecotourism, etc.)

A.2. Project/Programme Executive Summary (max 300 words)

This project presents an opportunity to comprehensively mainstream and implement climate resilience throughout Grenada's entire national water sector. The project's holistic approach addresses two main climate risks and vulnerabilities of Grenada: freshwater availability and disaster preparedness. Other Caribbean communities share these vulnerabilities, rendering this project a model for regional application.

Climate change poses a severe threat to Grenada's water supply because the small island developing state (SIDS) relies on surface water sources and rainwater catchment. Water is a scarce resource in Grenada and climate change has already begun to aggravate the problem with an increasing average temperature and more erratic rainfall. More frequent heavy rainfall events make water supply outages more common due to high turbidity in the raw water supply. Saltwater intrusion in coastal groundwater aquifers due to sea level rise will further reduce the availability of freshwater in the future. The Vulnerability Assessment (VA) undertaken as part of the G-CREWS project preparation also indicates the water sector's high level of exposure, sensitivity and limited adaptive capacity to cope with climate change impacts (see Annex).

The Government of Grenada (GoG) has demonstrated strong leadership in preparing the way for a paradigm shift in the water sector through clearly formulated national climate policy priorities. National climate change documents and strategies rank the water sector as one of those most affected by climate change – this includes Grenada's Nationally Determined Contribution (NDC), the recently finalised National Adaptation Plan (NAP) and the currently updated National Climate Change Policy, 2017-2021. The National Growth and Poverty Reduction Strategy highlights the impacts of climate change, including on the water sector, for Grenada's economic development.

In order to avoid critical climate-induced water shortages in the future, this project supports Grenada's water sector in both reducing its water demand and improving water availability so that Grenada is able to ensure resilience to climate variability and expected future climate change until 2050. The main objective of the G-CREWS project is to increase systemic climate change resilience in Grenada's water sector. The entire population of Grenada will benefit from the project.

To achieve its objective, the project supports the water sector's comprehensive transformation on multiple levels, which represents a nationwide 'paradigm shift' for Grenada's overall resilience. This paradigm shift will include citizens and businesses as water users, the public sector as provider of potable water and infrastructure, and behavioural changes triggered through appropriate governance, regulation, economic incentives and raising awareness.

This translates into the following five components:

- Climate-Resilient Water Governance
- Climate-Resilient Water Users
- Climate-Resilient Water Supply System
- Additional Contributions of the Water Sector to Grenada's NDC (financed by BMUB, Germany)
- Regional learning and replication (financed by BMUB, Germany)

A.3. Project/Programme Milestone

Expected approval from accredited entity's Board (if applicable)	21 June 2017
Expected financial close (if applicable)	N/A
Estimated implementation start and end date	Start: 1 October 2018 End: 30 September 2024
Project/programme lifespan	6 years, 0 months

B.1. Description of Financial Elements of the Project/Programme

The GoG is seeking grant-funding to alleviate severe climate-induced risks related to drinking water availability for almost the entire population of Grenada, including particularly poor and vulnerable groups, and the two largest and highly vulnerable economic sectors: tourism and agriculture. The GCF grant is used to overcome the Government's recent constraints to source public funding or assume additional debt to invest in urgently needed adaptation measures for the water sector. The landfall of two hurricanes, Ivan in 2004 and Emily in 2005, came as catastrophic shocks to both the people and the economy of Grenada, with an estimated damage equivalent to 200 % of GDP. In addition, Grenada's tourism-based economy was heavily hit by a decrease in the number of visitors during the global financial crisis. These series of shocks led to the tri-island state's inability to service its debt in 2013, leading to a lengthy debt restructuring process assisted by the Extended Credit Facility Support Programme of the International Monetary Fund (IMF). According to the IMF, the Government was able to reduce debt from 114 % of GDP to 83.4 % in 2016. Despite Grenada's impressive achievements in fiscal consolidation, the IMF noted a number of outstanding challenges: public debt is still considerably high and Grenada remains vulnerable to shocks. Therefore, Grenada has to stay on the current fiscal path of fiscal prudence until various reforms yield expected results. This means Grenada must continue avoiding any burden on public debt. The GoG has formulated a clear commitment to continue reducing its debt to 60 % of GDP in the coming years.

The limited public financing available and the constraints regarding Grenada's ability to take on additional debt are hindering the country's implementation of long-term adaptation measures in its water sector. The Government of Grenada, with a current debt burden of around 900 million USD, seeks maximum concessionality from the GCF (100 % grant) to undertake the proposed adaptation investments.

The expected total costs of the G-CREWS project are EUR 42.057 million. This includes the GCF financing of EUR 35.290 million, Grenada's contributions of EUR 4.267 million, and the contribution of the Germany's Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) of EUR 2.500 million. This demonstrates the high level of Government ownership in this project especially considering the Government's public debt constraints (see C.1). Grenada's contribution of EUR 4.267 million consists of :

- In-kind contribution of the GoG amounting to EUR 3.338 million for e.g. staff costs, office space, the planned new Water Resources Management Unit, and the value of land acquisitions.
- In-kind contribution of NAWASA amounting to EUR 0.703 million for staff costs, office costs and smaller construction works, including the distribution pipelines on Carriacou island.
- In-kind contribution of GDB and other organisations amounting to EUR 0.226 million.

The total of Grenada's contributions for the project is authorized in writing by the GoG (see supporting document 03).

The BMUB contributes EUR 2.500 million for regional learning and scaling-up activities, as well as activities to increase water and energy efficiency in the water sector, building on its existing commitment to the island over the past four years through the project "Integrated Climate Change Adaptation Strategies" (ICCAS).

Furthermore, the project is expected to leverage EUR 2.89 million in private sector contributions, mainly within the Challenge Fund for Climate-Resilient Commercial Water Users. However, the private sector funding is not included in tables in B.1. and B.2., since it will not be considered as co-financing.

On behalf of the GoG, GIZ seeks EUR 35.290 million in grant funding from the GCF, since the country urgently needs to adapt to the negative impacts of climate change that particularly affect Grenada's water availability, putting additional stress on a highly vulnerable and indebted Caribbean small island developing state.

Component	Funding Source	Activities	Amount	Currency	Amount	Local currency
Component 1 **Climate-Resilient Water Governance**	**GCF**	Activity 1.1: Establishment and Empowerment of WRMU	1.200	million euro (€)	3.578	million XCD
		Activity 1.2: Mainstreaming of Climate Resilience Water-Related Sectors	0.445	million euro (€)	1.327	million XCD
		Activity 1.3: Climate-Responsive Water Tariff	0.618	million euro (€)	1.843	million XCD
		Total Component 1 GCF	**2.263**	**million euro (€)**	**6.748**	**million XCD**
	Country	Activity 1.1: Establishment and Empowerment of WRMU	0.224	million euro (€)	0.668	million XCD
		Activity 1.2: Mainstreaming of Climate Resilience Water-Related Sectors	0.076	million euro (€)	0.227	million XCD
		Activity 1.3: Climate-Responsive Water Tariff	0.097	million euro (€)	0.289	million XCD
		Total Component 1 GoG	**0.397**	**million euro (€)**	**1.184**	**million XCD**
	Total Component 1		**2.660**	**million euro (€)**	**7.932**	**million XCD**
Component 2 **Climate-Resilient Water Users**	**GCF**	Activity 2.1: Challenge Fund for Climate-Resilient Commercial Water Users	3.427	million euro (€)	10.219	million XCD
		Activity 2.2: Awareness, Education and Outreach	1.722	million euro (€)	5.135	million XCD
		Total Component 2 GCF	**5.149**	**million euro (€)**	**15.354**	**million XCD**
	Country	Activity 2.1: Challenge Fund for Climate-Resilient Commercial Water Users	0.516	million euro (€)	1.539	million XCD
		Activity 2.2: Awareness, Education and Outreach	0.184	million euro (€)	0.549	million XCD
		Total Component 2 GoG	**0.700**	**million euro (€)**	**2.088**	**million XCD**
	Total Component 2		**5.849**	**million euro (€)**	**17442**	**million XCD**
Component 3 **Climate-Resilient Water Supply Systems**	**GCF**	Activity 3.1: Climate-Resilience of NAWASA's Supply Systems	21.962	million euro (€)	65.462	million XCD
		Activity 3.2: Disaster-Resilience in Medical Centres	0.527	million euro (€)	1.631	million XCD
		Activity 3.3: Disaster-Resilience in NAWASA's Systems	1.566	million euro (€)	4.637	million XCD

		Total Component 3 GCF	**24.055**	**million euro (€)**	**71.729**	**million XCD**
	Country	Activity 3.1: Climate-Resilience of NAWASA's Supply Systems	2.756	million euro (€)	8.218	million XCD
		Activity 3.2: Disaster-Resilience in Medical Centres	0.068	million euro (€)	0.203	million XCD
		Activity 3.3: Disaster-Resilience in NAWASA's Systems	0.346	million euro (€)	1.032	million XCD
		Total Component 3 GoG	**3.170**	**million euro (€)**	**9.453**	**million XCD**
	Total Component 3		**27.225**	**million euro (€)**	**81.182**	**million XCD**
Component 4 **Additional Contribution of the Water Sector to Grenada's NDC**	**BMUB**	Activity 4.1: Water and Energy Efficiency	1.700	million euro (€)	5.069	million XCD
		Total Component 4 BMUB	**1.700**	**million euro (€)**	**5.069**	**million XCD**
	Total Component 4		**1.700**	**million euro (€)**	**5.069**	**million XCD**
Component 5 **Regional Learning and Replication**	**BMUB**	Activity 5.1: Lessons Learned and replication in the Caribbean	0.800	million euro (€)	2.386	million XCD
		Total Component 5 BMUB	**0.800**	**million euro (€)**	**2.386**	**million XCD**
	Total Component 5		**0.800**	**million euro (€)**	**2.386**	**million XCD**
Total Financing GCF Components 1-5			**31.467**	**million euro (€)**	**93.831**	**million XCD**
Project Management Costs			**2.143**	**million euro (€)**	**6.390**	**million XCD**
Taxes, legal capacity, customs, etc.			**0.970**	**million euro (€)**	**2.892**	**million XCD**
Contingencies			**0.710**	**million euro (€)**	**2.117**	**million XCD**
Total Project Financing GCF			**35.290**	**million euro (€)**	**105.230**	**Million XCD**
Total Project Financing GoG			**4.267**	**million euro (€)**	**12.724**	**Million XCD**
Total Project Financing BMUB			**2.500**	**million euro (€)**	**7.455**	**Million XCD**
Total Project Financing			**42.057**	**million euro (€)**	**125.409**	**Million XCD**

B.2. Project Financing Information

	Financial Instrument	Amount	Currency	Tenor	Pricing
(a) Total project financing (a) = (b) + (c)		42.057	million euro (€)		
(b) GCF financing to recipient	(i) Senior loans (ii) Subordinated loans (iii) Equity (iv) Guarantees (v) Reimbursable grants * (vi) Grants *	.... 35.290	million euro (€) Options Options Options Options	( ) years ( ) years	( ) % ( ) % ( ) % IRR
	Please provide economic and financial justification in section F.1 for the concessionality that GCF is expected to provide, particularly in the case of grants. Please specify difference in tenor and price between GCF financing and that of accredited entities. Please note that the level of concessionality should correspond to the level of the project/programme's expected performance against the investment criteria indicated in section E.				
	Total requested (i+ii+iii+iv+v+vi)	35.290	million euro (€)		

(c) Co-financing to recipient	Financial Instrument	Amount	Currency	Name of Institution	Tenor	Pricing	Seniority
	Grant	2.500	million euro (€)	BMUB	( ) years	( ) % ( ) %	Options Options
	In-kind/cash	4.267	million euro (€)	GoG, NAWASA, GDB	( ) years	( ) % IRR	Options Options
	Please provide a confirmation letter or a letter of commitment in Section I issued by the co-financing institution.						

B.3. Financial Markets Overview (if applicable)

Not applicable.

C.1. Strategic Context

Grenada, located between Saint Vincent and the Grenadines to the north and Trinidad and Tobago to the south, is a small island developing state consisting of three islands: Grenada, Carriacou and Petite Martinique. The island of Grenada is the largest of the three at 34 kilometres (21 miles) long and 18 kilometres (12 miles) wide. The total land area of the three islands is 345 square kilometres (133 square miles).[1] In 2017, the World Bank gave the country's population as 107,317, of which approx. 46.41% were women and girls.[2] The vast majority of the population lives on the biggest island, Grenada, with about 5,000 people on Carriacou (around 51 % of whom are men and boys) and 500 people on Petite Martinique.[3] According to the Human Development Index (HDI) of 2016, Grenada's HDI value is 0.754.[4, 5] This score ranks Grenada 79th out of 188 countries and territories and thus places it in the high human development category.

Grenada's Economy

Grenada has a small, open economy that is highly vulnerable not only to adverse international economic developments and shocks but also to natural hazards such as hurricanes. This is reflected in pronounced fluctuations in annual real gross domestic product (GDP) growth.[6] Due to hurricanes and spill-over effects of the recent financial crisis, Grenada built up a public deficit of 114 % of GDP, which the Government was able to reduce to 83.4 % in 2016.[7]

Tourism contributes significantly to overall GDP, employment creation and foreign exchange earnings. In 2014, tourism contributed about EUR 50 million to the country's economy.[8] In 2016, approximately 9 % of the workforce was employed directly in the tourism sector.

The agriculture sector has played a major role as a macroeconomic shock absorber during the adjustment period. Between 2009 and 2011, its growth rate was approximately 10 % per year. Agricultural production accounted for roughly 5 % of GDP in 2014. Continued strong performance in 2015, with approximately 45 % growth, was followed by a decline of 18 % during the first three quarters of 2016 – mainly due to sharply reduced rainfall during the first quarter. Agriculture employs approximately 13 % of Grenada's workforce and also provides subsistence support to a much larger number of small-scale farmers.

Grenada's rate of unemployment has varied only slightly in the last few years (by less than 5 %). In 2013, unemployment was 32.5 %, dropping to 28.9 % in 2014 before rising slightly to 30.4 % in 2015.[9] In 2015, the highest unemployment rate was among people between the ages of 15 to 24.[10] The Government of Grenada's 2016 Labour Force survey found that unemployment is 31.2 % for women and 25.6 % for men.

National Debt

The landfall of hurricanes Ivan (2004) and Emily (2005) were economic catastrophes. Damage costs of more than 200 % of GDP had tremendous effects on Grenada's debts. In addition, the economic and financial crisis hit the country hard just as it began to rebound from the hurricanes. As a result, the GoG announced in March 2013 that it would undertake a comprehensive restructuring of the public debt. In 2014, the IMF approved an extended credit facility for Grenada of USD 21.7 million over a three-year period.[11] Nonetheless, Grenada remains one of the most heavily indebted small-island

[1] Government of Grenada 2011.
[2] World Bank data, https://data.worldbank.org/indicator/SP.POP.TOTL?locations=GD, accessed 14 November 2017.
[3] CARILED 2015.
[4] The Human Development Index (HDI) is a summary measure of average achievement in key dimensions of human development, including living a long and healthy life, being knowledgeable and having a decent standard of living (UNDP, Human Development Index).
[5] UNDP, Table 1: 'Human Development Index and its Components', accessed 9 June 2017.
[6] GDP growth averaged negative 1.3 % over the period 2008-2012, then rebounded strongly over the next four years to 2.4 % in 2013, 7.3 % in 2014, 6.2 % in 2015 and 3.4 % in 2016. Projections for 2017 and 2018 are 2.1 % and 3.2 %, respectively.
[7] IMF Country Report No.17131 05/2017.
[8] World Travel and Tourism Council 2015.
[9] Government of Grenada 2015a; Government of Grenada 2015c.
[10] Government of Grenada 2015c.
[11] Government of Grenada (2015f). Prospectus for Government Securities for the Period February 2015-November 2015. St. George's: Ministry of Finance, Government of Grenada.

developing states in the world. Grenada's public debt to GDP ratio was expected to fall from 109.1 % in 2014 to 103.6 % in 2015.[12] The Government of Grenada intends to reduce its debt to 60 % of GDP by 2020.

Poverty

In spite of development progress, poverty is still very present across Grenada. The most recent Country Poverty Assessment, conducted for Grenada over the 2007-2008 period, revealed a poverty rate of 37.7 % and an indigence (extreme poverty) rate of 2.4 %.[13] When combined with the percentage of people considered vulnerable (living above the poverty line but vulnerable to becoming poor), just over half of the population was classified as either poor or vulnerable. Of poor people, 65 % were employed at the time of the assessment, and 31.5 % of employed people were living below the poverty line, as was half of the unemployed portion of the labour force.[14] The 2008 poverty rate increased by 5.6 % in comparison with the poverty rate reported in the 1998 assessment. This increase can be explained by the successive natural and economic challenges, including severe storms, droughts, and economic crises.

Grenada's Climate

Grenada has a humid tropical climate, with an average annual temperature of 26°C. The country has two distinct seasons: a dry season (January to May) and a rainy season (June to December). On average, Grenada receives around 1,150 mm of rain per year. Though there is a slight decrease in rainfall in September preceding the peak in November, the main rainy season delivers approximately 75 % of total annual rainfall.[15] However, there is a considerable variation between the northern and southern parts of Grenada – the latter being both the country's driest and most populous region. Carriacou and Petite Martinique are significantly drier than the main island due to their small size and relatively low elevations. During the dry season, all three islands can experience severe drought conditions.[16] For details on climate variability and change, please see the attached Vulnerability Assessment.

Grenada's Water Sector

Grenada is divided into 71 watersheds, which are well defined due to the steep, hilly topography. The 29 water supply facilities operated by NAWASA provide piped water to approximately 43,000 customer connections, covering 98 % of the islands' population. There are two sewage collection disposal systems.[17] Water for irrigation is not supplied by NAWASA, and the abstraction of irrigation water from rivers does not diminish NAWASA's raw water supply, as abstraction takes place either downstream of NAWASA's dams and intake structures or in other watersheds. The responsibility for the supply of agricultural water rests primarily with the Irrigation Management Unit of the Ministry of Agriculture, Land, Forestry, Fisheries and Environment (MALFFE). NAWASA exploits 23 surface and six groundwater supply sources on mainland Grenada. These yield some 54,600 m^3/day (12,010 gal./day) in the rainy season and a maximum of 31,800 m^3/day (6,995 gal./day) in the dry season. The water demand in the rainy season is 45,500 m^3/day (10,008 gal./day) and 54,600 m^3/day (12,010 gal./day) in the dry season.[18] The current gap between demand and yield of 22,800 m^3/day (5,015 gal./day) during the dry season clearly indicates the high risk of water shortages that Grenada already faces, in particular during a drought. Grenada's water resources comprise primarily surface water, with a groundwater potential to satisfy about 10 % of the present potable requirement. On the smaller islands (Carriacou and Petite Martinique), domestic water supply is obtained exclusively from rainwater catchments, while water for livestock is supplied from groundwater or rainwater. Grenada's average per capita water consumption is 155 litres/day/person (equivalent to 34 gal./person/day – estimates derived from NAWASA data, see Vulnerability Assessment). Households make up approximately two thirds of total potable water demand, businesses approximately 22 % and the public sector approximately 11 %.

Financial Aspects of the Water Sector

NAWASA as a public institution in Grenada is by law the only provider of potable piped water.

[12] Government of Grenada. (2015a). 2016 Budget Statement to the House of Representatives. St. George's: Government of Grenada.
[13] Kairi Consultants Ltd. (2008). Country Poverty Assessment: Grenada, Carriacou and Petit Martinique, vol. 1 - Main Report. Barbados: Caribbean Development Bank (CDB).
[14] Kairi Consultants Ltd. 2008.
[15] Government of Grenada 2015a.
[16] Simpson et al. 2012; Government of Grenada 2007c.
[17] NAWASA 2015.
[18] UN ECLAC 2011; GoG 2007c.

The price for water is set in NAWASA's tariff structure, which must be approved by the Cabinet of the Government of Grenada. The following table summarizes the current tariff structure:

Tariff Structure Imperial Gallons***/Month	Variable Rate (XCD/1,000 Imperial Gallons)	Fixed Monthly Charge* (XCD)**
Domestic Less than 2,800 (12,728 m^3) 2,800-5,500 Greater than 5,500 (25,003 m^3)	 8.10 (USD 3.00) 13.50 (USD 5.00) 20.25 (USD 7.50)	 10.80 (USD 4.00)
Non-domestic	21.35 (USD 7.90)	Below 2,800 gal.: 15.00 2,801-20,000 gal.: 33.75 20,001-100,000 gal.: 140.00 Over 100,000 gal.: 550.00
Ships	33.75 (USD 12.50)	

* The fixed monthly charge is calculated using the owner's average monthly consumption over the previous calendar year (or part thereof) and such fixed monthly charge shall be reviewed at the end of each year.

** XCD 2.70 = USD 1.00 (approximately EUR 0.90)

*** 1 imperial gallon = 4,546 litres

The NAWASA tariff structure has been discussed in all consultations undertaken during the development of the project. These discussions produced the following key findings, which are reflected and translated into the respective activities in C.3:

- Water tariffs have not been adjusted for inflation in the last decade.
- Major capital expenditures for infrastructure cannot be covered.
- The tariff system provides insufficient incentives for investment in water efficiency measures or rainwater harvesting by businesses.
- The cost for water, even for lower income groups, must remain well below 5 % of disposable income.
- Tax incentives for devices such as high efficiency showerheads, water-saving aerators, drip irrigation systems and rainwater harvesting systems will have strong advocacy in the future. This was also mentioned in UN ECLAC 2011, which states that import duties on such devices are on average 26.5 %.

C.2. Project Objective against Baseline

The main objective of the G-CREWS project is to increase systemic climate change resilience in Grenada's water sector. The project aims to achieve this by applying a multi-level approach addressing resilience at the level of water governance, households, businesses and the water supply system.

The proposed project responds to the challenges that climate change poses to Grenada's water sector: without decisive action to enhance the water sector's climate resilience, the people and ecosystems of Grenada will face increasingly serious climate-induced water scarcity over the next three decades.

Water Sector's Vulnerability to Climate Change

The assessment of the vulnerability to climate variability and change of Grenada's water sector (see Vulnerability Assessment in Annex) categorized the exposure of Grenada's water sector as high, its sensitivity as high, and its adaptive capacity as medium to low. Therefore, GIZ assessed the water sector's overall vulnerability as medium-high.

The main climate impacts affecting the water sector in Grenada are changes in temperature, precipitation, tropical storms and sea level rise. Based on recent climate impact projections, GIZ's Vulnerability Assessment arrives at the following conclusions:

- Temperature projections provide robust guidance with clear signals for warming trends (+1.16°C to +2.17°C until 2050s).
- Projections point towards decreasing precipitation trends with a reasonable level of confidence, robust across all the scenarios (erratic and decreasing by up to -20 % until 2050s with seasonal extremes of -40 % from June to August).
- Projections of future tropical storms provide limited guidance. Based on past trends and available regional climate change studies, however, a decrease in total numbers but an increase in severe storms can be expected.
- Grenada is expected to face sea level rise of 0.5m and 1m by the mid and end of century respectively.

It is important to note that Grenada's water sector is already exposed and sensitive particularly to shock-like climate impacts linked to drought and heavy rainfall or tropical storms. These impacts are already a daunting reality in Grenada today and are likely to be aggravated further by climate change in the coming decades.

Data

Confidence in climate projections and available data for Grenada are comparatively high. GIZ based its vulnerability assessment on data provided by Grenadian authorities and on recent (2017) climate model projections obtained from a Global Climate Model (GCM) ensemble, comprising five suitable GCMs from the Coupled Model Inter-comparison Project (CMIP5) used for the IPCC's fifth assessment report (AR5). The projections based on RCP 4.5 and RCP 8.5 scenarios produced satisfactory results (robust or reasonably clear signals) and showed a marked increase in temperature and decrease in precipitation for the middle of the 21st century.

The GIZ assessment results are in agreement with publicly available vulnerability indices, for example:

- The 2015 Notre Dame Global Adaptation Country Index (ND-GAIN Index) ranks Grenada at 61st among the world's nations with a declining trend (down from 43rd in 1995).
- Standard & Poor's Global Market Intelligence ranked Grenada's vulnerability as 96th among 116 nations.

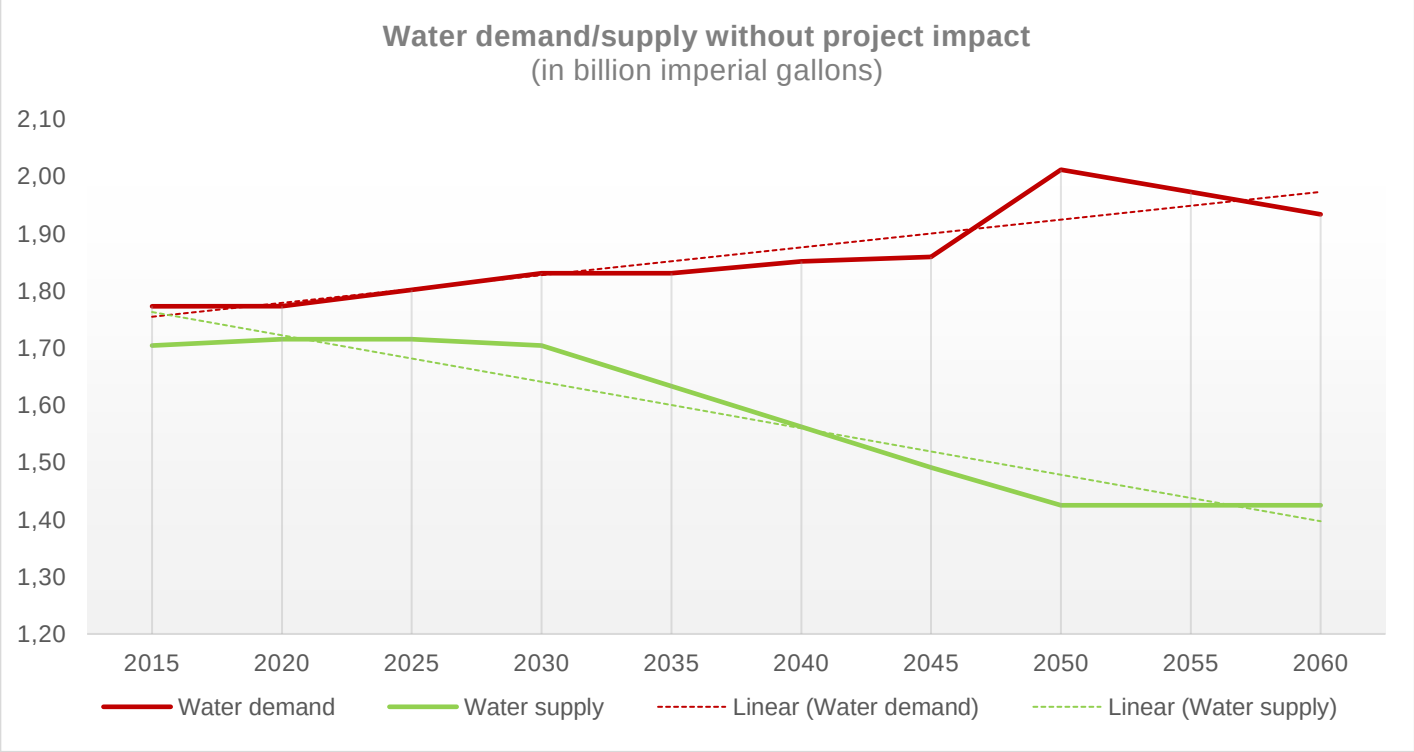
The results are also in agreement with earlier vulnerability assessments of Grenada, such as UN ECLAC 2011, NASAP 2015, and Wallingford 2017.

In general, the available data from projections and Grenadian authorities are deemed sufficient for the project to operate on the proposed baseline scenario and theory of change.

Baseline Scenario

It is assumed that declining precipitation, in conjunction with rising average temperature, will have the highest impact on water availability, because 90 % of water on Grenada's mainland is collected from rainwater.

Currently, under normal conditions, NAWASA produces approximately 2.41 billion imperial gallons of water per year (11,000,000 m^3/year) – mainly rain-fed. Experts estimate real water loss at 29 %. In recent years, this left NAWASA with between 1.66 and 1.75 billion imperial gallons (7,546,000-7,955,000 m^3) available for customers. Total water demand on average is approximately 1.74 billion imperial gallons per year – often exceeding supply. On average, water users demand approximately 36 imperial gallons (165 litres) per day per person. Under 2009-2010 drought conditions, annual supply dropped to approximately 1.42 billion imperial gallons (6,455,000 m^3) while demand rose to 2 billion imperial gallons (9,092,000 m^3), creating a supply gap of more than 25 %. The Vulnerability Assessment concluded that 2009 drought conditions are comparable to Grenada's projected climate in 2050. If the current business-as-usual scenario remains unaddressed, NAWASA's ability to provide potable water to Grenada's citizens, businesses and public services would progressively deteriorate over the next 30 years due to climate change impacts. The Vulnerability Assessment projected a gap of approximately 600 million imperial gallons (2,727,600 m^3) by 2050 due to reduced rainfall.



The following data inputs to the baseline scenario will require periodical review in order to avoid undetected shifting baselines: population and population projections, household income, poverty indicators with relevance for the water tariff reform, precipitation data at higher altitudes, precipitation projections for Grenada's 2050s, household water consumption, water consumption for commercial purposes, NAWASA's real water loss.

Barrier Assessment

To prevent a shortage scenario, Grenada needs a climate change resilient water sector. In its essence, a climate resilient water sector requires (i) higher water efficiency stabilizing demand for potable water at a climate resilient level, and (ii) resilient water production and supply systems that reliably produce enough potable water to meet Grenada's demand at any time defying climate risks. Currently, the following barriers prevent Grenada from achieving that goal:

Barrier 1 - Governance: There is a lack of regulatory mechanisms. Grenada lacks a Water Resources Management authority that would manage water abstraction rights to remain under a resilient level. The current water tariff systems do not sufficiently incentivise efficient and climate-responsive water use. Insufficient consideration of climate change impacts in policies with relevance for the water sector aggravate the water resources management problem, for example due to inappropriate farming practices along rivers or protection of forest resources.

Barrier 2 - Users/demand: Households and businesses like hotels and farms often use water inefficiently and neglect potentials for rainwater harvesting. This puts unnecessary pressure on the scarce water resources, in particular during the dry season, when most tourists visit Grenada and farms intensify irrigation. Public instruments for promoting water efficiency and rainwater harvesting can be increased particularly through targeted regulation and fiscal incentives.

Barrier 3 - Infrastructure: There is a lack of storage, both in terms of raw water and treated water capacity, which does not allow for bridging supply gaps caused by long dry spells or after heavy rainfall events. The lack of interconnections between different areas of Grenada's water distribution system leads to inflexibility between supply schemes, which prevents an optimal use of available water resources in certain regions of the island. This results in problems of water supply management in dealing with greater rainfall fluctuations and overall reduced precipitation as well as with extreme events.

Barrier 4 – Public finance: Due to the current water tariff, revenue streams for NAWASA are too low to finance long-term investments in climate resilient infrastructure. In addition, Grenada's public debt constraints prevent public investment in the sector.

Project Impact and Targets

Based on the vulnerability and barrier assessment, the project focuses on the following key areas of action:

- Improved water governance as a prerequisite for the paradigm shift towards climate-resilience
- Feasible and necessary reductions in per capita water demand (households and businesses)
- Feasible and reasonable resilience improvements to the water system infrastructure
- Efficiency in NAWASA's system

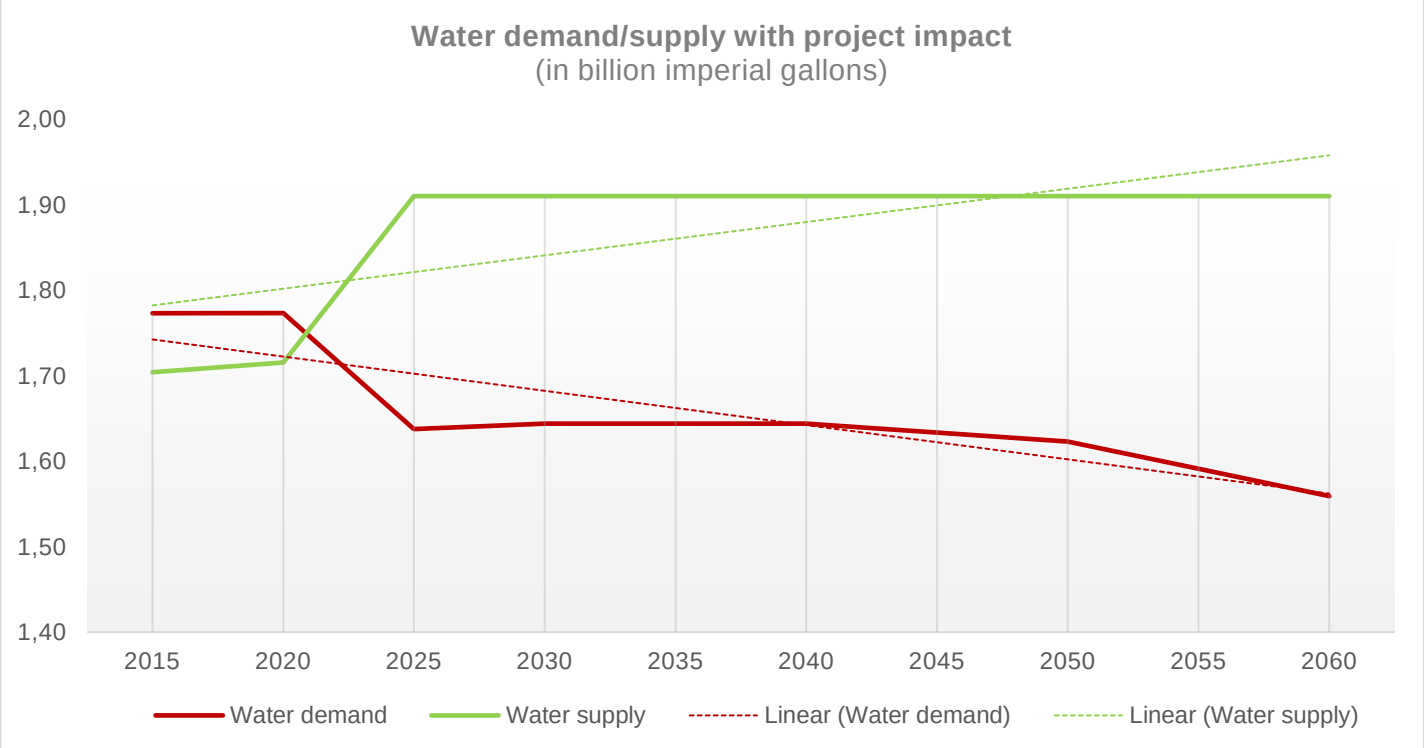
After the implementation of those action areas, a climate resilient water sector in Grenada would be characterized by (i) higher water efficiency stabilizing demand for potable water from households and businesses at a climate resilient level, and (ii) resilient water production and supply systems that reliably produce enough potable water to meet Grenada's demand at any time.

Climate-resilient demand:

Supported by an improved enabling environment and regulative framework, the project expects to reduce individual demand to approximately 135 liters (29.7 gal.) per person per day, in contrast to presently 165 liters (36.3 gal.) per person per day in the business as usual scenario until 2050. This takes into account that households consume roughly two thirds of NAWASA's water supply and that they will have reduced their water demand by 18 % compared to 2009 levels. The project will also contribute to reducing demand from businesses by approx. 18%. Efficiency gains of 18 % in water demand are ambitious but realistic targets, according to NAWASA water engineers and other experts consulted during stakeholder engagement. In addition, NAWASA will have to manage a reduction of real water losses in its water distribution systems of at least 4 % from currently 29 % down to 25 % without dedicated GCF support.

Climate-resilient production and supply:

A climate-resilient water sector will rely on a NAWASA system capable of producing approximately 2.36 billion imperial gallons (10.728.000 m^3) per year before real water losses under the drier "new climate normal" conditions of the year 2050 that will see reduced annual rainfall by approximately 20 % on average. NAWASA would supply 1.77 billion imperial gallons (8.046.000 m^3) to Grenada's population after 25 % of real water losses. Approximately 145 million imperial gallons (660.000 m^3) of added storage capacity would allow for servicing temporary peaks in demand due to extreme events or disasters such as droughts or storms. The NAWASA annual water production capacity (before losses) would have to be raised by approximately 354 million imperial gallons (1.568.000 m^3) – mainly through increased raw water storage – and treated water storage capacity would have to be added.



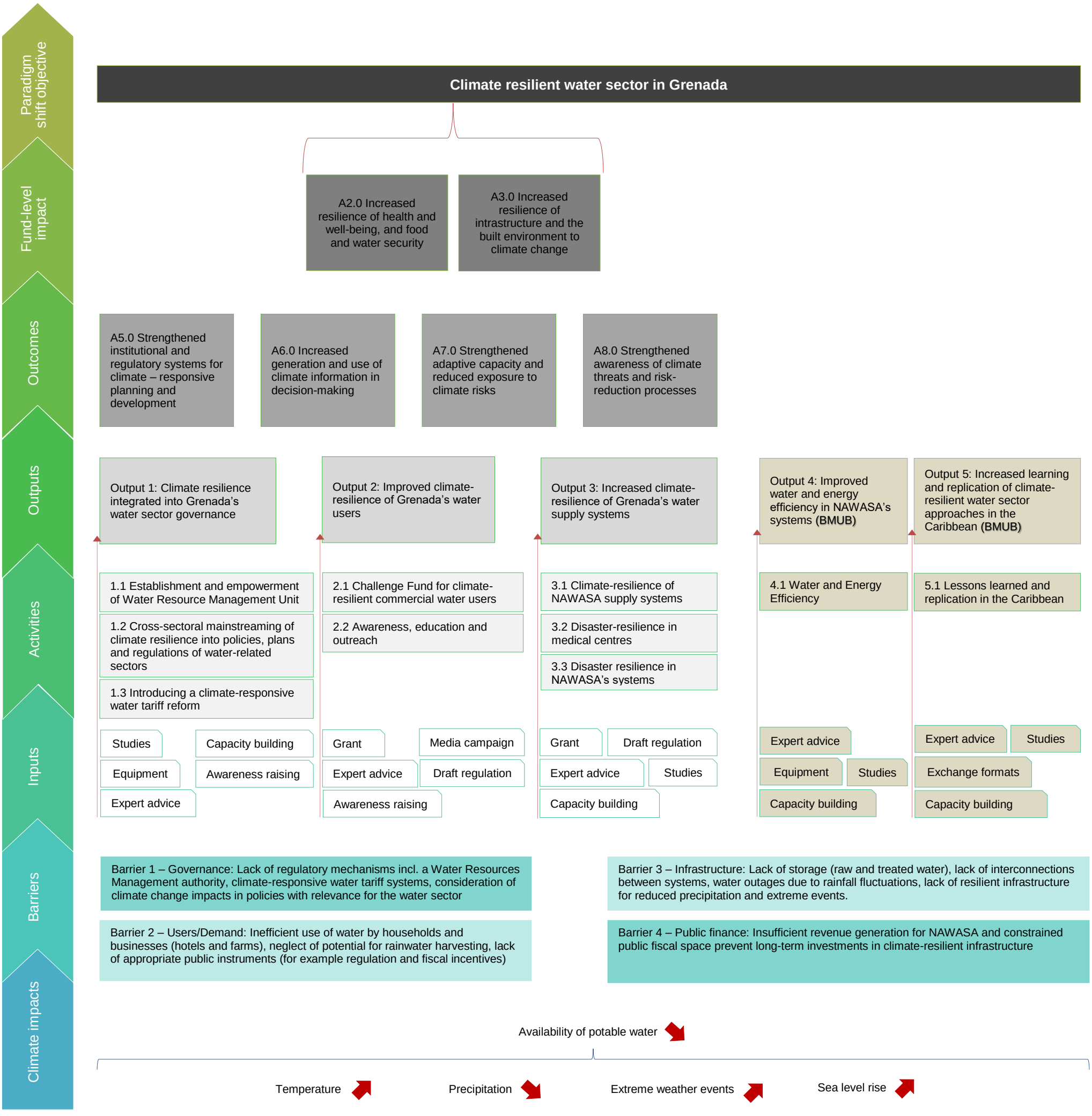
Project Outcomes

To achieve resilient levels of water demand and water supply, the sector would have to undergo a comprehensive transformation on multiple levels (paradigm shift). The paradigm shift would need behavioural change triggered through appropriate governance, regulation, incentives and awareness raising, the participation of citizens and businesses in becoming more water-efficient, and the provision of sufficient and reliable water infrastructure.

Suggested outcomes:

- Outcome 1: Resilient governance and institutions
- Outcome 2: Resilient water users
- Outcome 3: Resilient water supply systems
- Outcome 4: Increased water and energy efficiency in NAWASA's system (financed by BMUB, Germany)
- Outcome 5: Regional learning and replication (financed by BMUB, Germany)

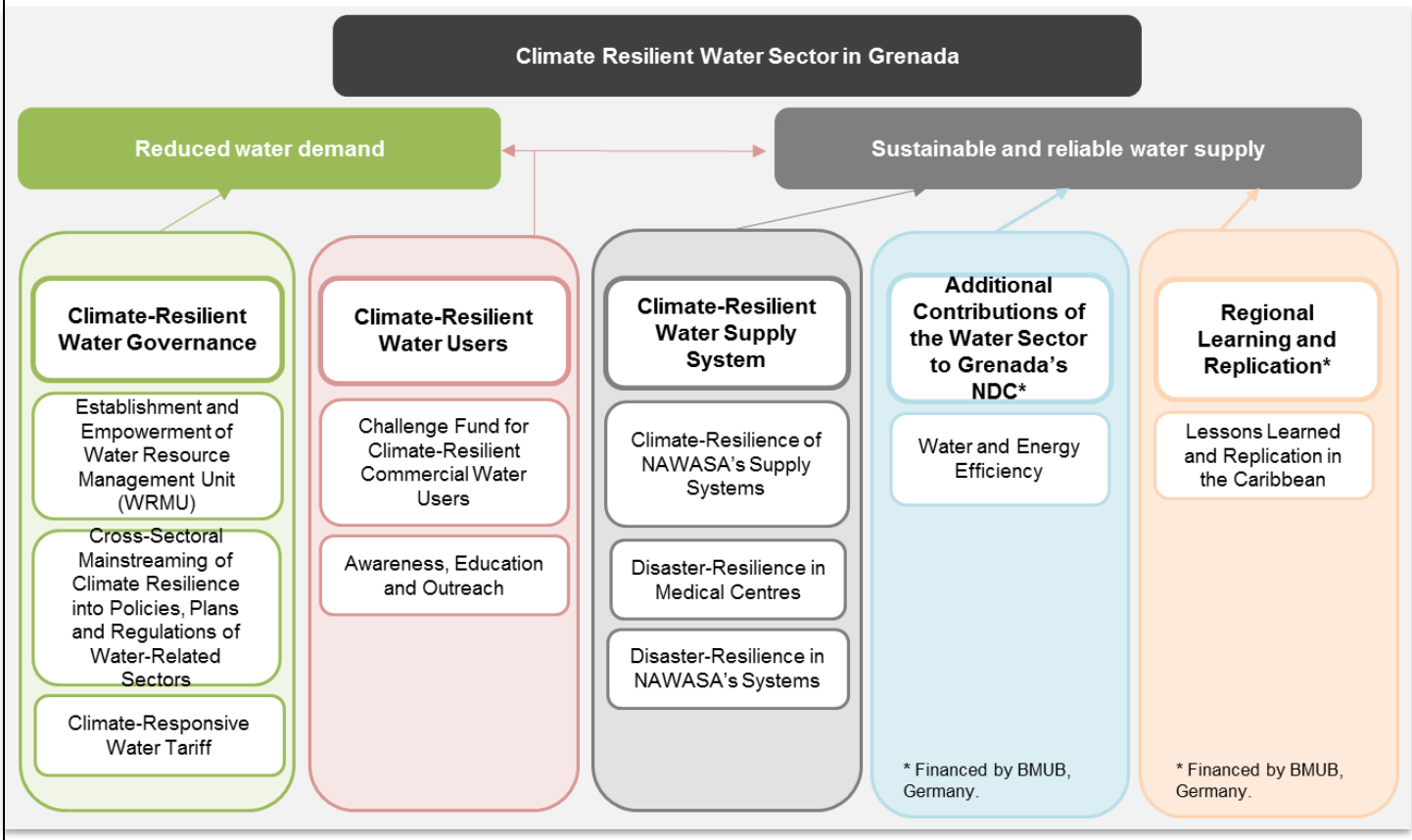
The relationship of these outcomes with climate change impacts as well as exposures, sensitivities and adaptive capacities in Grenada's water sector is illustrated in the figure below:


Paradigm shift objective
Climate resilient water sector in Grenada
Fund-level impact
A2.0 Increased resilience of health and well-being, and food and water security
A3.0 Increased resilience of intrastructure and the built environment to climate change
Outcomes
A5.0 Strengthened institutional and regulatory systems for climate – responsive planning and development
A6.0 Increased generation and use of climate information in decision-making
A7.0 Strengthened adaptive capacity and reduced exposure to climate risks
A8.0 Strengthened awareness of climate threats and risk-reduction processes
Outputs
Output 1: Climate resilience integrated into Grenada's water sector governance
Output 2: Improved climate-resilience of Grenada's water users
Output 3: Increased climate-resilience of Grenada's water supply systems
Output 4: Improved water and energy efficiency in NAWASA's systems (BMUB)
Output 5: Increased learning and replication of climate-resilient water sector approaches in the Caribbean (BMUB)
Activities
1.1 Establishment and empowerment of Water Resource Management Unit
1.2 Cross-sectoral mainstreaming of climate resilience into policies, plans and regulations of water-related sectors
1.3 Introducing a climate-responsive water tariff reform
2.1 Challenge Fund for climate-resilient commercial water users
2.2 Awareness, education and outreach
3.1 Climate-resilience of NAWASA supply systems
3.2 Disaster-resilience in medical centres
3.3 Disaster resilience in NAWASA's systems
4.1 Water and Energy Efficiency
5.1 Lessons learned and replication in the Caribbean
Inputs
Studies
Capacity building
Equipment
Awareness raising
Expert advice
Grant
Media campaign
Expert advice
Draft regulation
Awareness raising
Grant
Draft regulation
Expert advice
Studies
Capacity building
Expert advice
Equipment
Studies
Capacity building
Expert advice
Studies
Exchange formats
Capacity building
Barriers
Barrier 1 – Governance: Lack of regulatory mechanisms incl. a Water Resources Management authority, climate-responsive water tariff systems, consideration of climate change impacts in policies with relevance for the water sector
Barrier 2 – Users/Demand: Inefficient use of water by households and businesses (hotels and farms), neglect of potential for rainwater harvesting, lack of appropriate public instruments (for example regulation and fiscal incentives)
Barrier 3 – Infrastructure: Lack of storage (raw and treated water), lack of interconnections between systems, water outages due to rainfall fluctuations, lack of resilient infrastructure for reduced precipitation and extreme events.
Barrier 4 – Public finance: Insufficient revenue generation for NAWASA and constrained public fiscal space prevent long-term investments in climate-resilient infrastructure
Climate impacts
Availability of potable water
Temperature
Precipitation
Extreme weather events
Sea level rise

C.3. Project Description

In order to avoid critical climate-induced water shortages in the future, this projects supports Grenada's water sector in both (a) reducing its water demand and (b) increasing its water supply to the point that resilience to present-day climate variability and expected future climate change is ensured until 2050. To do this, the project supports the sector in transforming itself on multiple levels, which represents a nationwide 'paradigm shift' for Grenada's overall resilience. The paradigm shift in Grenada's water sector will include citizens and businesses as water users, and the public sector as provider of potable water and infrastructure. Behavioural changes will be triggered through new institutional structures to support appropriate water governance, regulation and awareness raising.

The figure below shows the components and respective activities in which the project is divided into:



Component 1: Climate-Resilient Water Governance

Component 1 increases Grenada's adaptive capacity at the regulatory framework level in order to cope with reduced and erratic rainfall, increased temperatures, extreme weather events including tropical storms, and sea level rise. The component supports the integration of climate-resilience into Grenada's water sector governance (Output 1) by establishing a dedicated Water Resource Management Unit (WRMU), by mainstreaming climate resilience in water sector related policies, plans and regulations as well as introducing a climate-responsive water tariff. It leads eventually to a strengthened institutional and regulatory system for climate-responsive planning and development (Outcome A5.0). Strengthening of the collection and management of water resources and climate change data leads to increased use of climate information in decision-making (Outcome A6.0).

Activity 1.1: Establishment and Empowerment of Water Resource Management Unit (WRMU)

Activity 1.1 contains the following key interventions:

Supporting the Implementation of Water Legislation to Establish the WRMU

In 2007, a number of policies, strategy papers and acts were prepared to improve water sector governance. While the Water Policy was approved by the Cabinet in November 2007, implementation of the Water Resources Management Unit faced considerable delays, mainly due to the lack of financing and understanding about the relevance of such a unit to a comprehensive and climate-oriented protection of water resources. However, with climate change threatening the availability of potable water at a national level, the GoG increasingly recognises the need to improve institutional structures for monitoring and regulating water abstraction and water resources management on the tri-island state. This was confirmed by all recent climate change and water sector assessments, e.g. NASAP 2015 and Wallingford 2017.

In order to build on available documents while ensuring the integration of climate resilience into the new legislation and policies in the water sector, the project will support a careful review of the existing policies, regulations and draft acts in coordination with the Legislative Drafting Unit in the Attorney General's Chambers. The proposed legislative approach will ensure that the legislation and regulations are addressed concurrently, to enable timely progress on the administrative arrangements for the establishment of the WRMU.

Supporting the Capacity Building for WRMU

The creation of a new dedicated government unit – the WRMU – will ensure sound and climate-responsive regulation of water resource management. Through the establishment of the WRMU, and ongoing technical assistance for this new entity, the project will achieve the following benefits:

- Development of climate-responsive regulations to protect water resources and improve efficiency in water use
- Limitation of water abstraction from different resources, depending on impacts of climate variability and climate change on the hydrological regimes, as well as on ecosystems
- Priority setting for water uses (domestic, ecosystems, agriculture, commercial)
- Upgrade and improvement of the existing climate and water information system currently managed by NAWASA (will be transferred to WRMU)

The WRMU is expected to report to the Minister in charge of Public Utilities and will be able to issue regulations and directives to prevent actions with negative impacts on water resources. Before creating the WRMU, the project will support a Cabinet-appointed Water Policy Steering Committee - comprising key representatives of government, the private sector and NGOs - in reviewing the recommendations of the relevant policy documents and briefs, making recommendations to the Cabinet on final institutional structures, functions and responsibilities, and overseeing the launch of WRMU operations. Capacity building for the launch of WRMU operations will include:

Staffing and Equipment: The initial staff of the WRMU will include four people: a director, two technicians/officers (water resources/hydrogeology and IT/data collection) and one assistant. The project will, through the contribution of the GoG, support salaries for the WRMU for the first two years of its existence, after which other institutional arrangements will be made. Different financing mechanisms are in principle possible, the currently preferred option being a levy/fee for the water abstraction licences. The details of the implications of the various mechanisms will be developed in a study, 'Sustainable Financing of the WRMU', as one of the first activities of Component 1. The Cabinet's approval of a sound financing mechanism when the initial two-year GCF support ends is a prerequisite for the establishment of the WRMU.

Training activities will include on-the-job training and practical learning in international water resources agencies for the director as well as short, specialised courses for the hydrology officer and IT officer. All training sessions will have a particular focus on the nexus of climate change risk management and water resources management, for example analysing results from climate change models and integrating them into water resources decision-making.

Later in WRMU's operations the capacity building will shift to the improvement of climate-responsive *regulation for water resource protection*, for example water abstraction rights, restriction of economic activities or harmful practices that have a negative impact on water quality or quantity, regulation of agricultural practices, building code amendments, water quality regulations, and sector priorities during droughts.

Strengthening the Collection and Management of Water Resources and Climate Change Data

The Vulnerability Assessment identified a lack of meteorological and hydrological data and climate information as a challenge for Grenada's adaptation planning. The Grenada Water Sector Review identified poor hydrological and hydrogeological data as a critical issue facing the water sector.[19] This activity aims to improve the existing climate and

[19] GoG 2007b, Chap. 6.

water information system that is currently managed by NAWASA's Water Resources Unit and will be transferred into the mandate of the new WRMU. The project will procure a basic inventory of hydrological and hydrogeological gauges, meters and related equipment, and climate and water resources data management software. The WRMU will feed the collected data into a periodically updated 'climate change and hydrology model' for Grenada. The model will provide WRMU with a critically important climate service product for future adaptation planning and addressing water-related information needs across public services, businesses and households.

Detailed activities in 1.1:

Establishment of WRMU:

- Concept development for WRMU
- Study on the 'Sustainable Financing of the WRMU'
- Implementation of water regulations for establishment of WRMU
- Recruitment/staffing
- Training of staff; in particular regarding water allocation, water resources management and climate change scenarios
- Procurement of equipment
- Launch of new WRMU
- Operation of WRMU

Improvement of legal and regulative framework for water resources:

- Review and amendment of existing document, in particular concerning resilience to climate change impacts in the water sector
- Public consultations
- Media awareness campaign
- Drafting and finalisation of submission to Cabinet
- Implementation of new policies and laws

Strengthening the Collection and Management of Water Resources and Climate Change Data:

- Procurement of basic hydrological/hydrogeological equipment and data management software
- Data collection and feed-in into data management software and climate change and hydrology model

Activity 1.2: Cross-Sectoral Mainstreaming of Climate Resilience into Policies, Plans and Regulations of Water-Related Sectors

This activity strengthens the water sector's climate resilience by integrating climate change considerations into sectoral policies, plans and regulations relevant to the water sector focusing on forestry, land use, agriculture, taxation and customs, and housing. This includes, for example, the updating of building codes and tax breaks for the promotion of rainwater harvesting in residential and commercial properties.

Detailed activities in 1.2:

- Identification of relevant policies, plans and regulations (tourism, economic development, coastal management, buildings codes etc.).
- Review and amendment of the identified documents to ensure the climatic impacts on the water resources are sufficiently covered and considered for policy conclusions.
- Public consultations.
- Drafting and finalisation of submissions to Cabinet.

Activity 1.3: Introducing a Climate-Responsive Water Tariff

The purpose of this activity is to improve the resilience of the water sector by supporting the development and implementation of a climate-responsive tariff structure for NAWASA. A climate-responsive tariff has two effects:

1. Climate-responsive price signals for water users depending on water availability.
   The current water tariff in Grenada does not provide incentives for heavy water users (residential or commercial) to invest in water efficiency or rainwater harvesting. It also does not allow for responding to climate change induced changes in water availability – especially drought conditions. The project will address this through a tariff reform. It is noteworthy that Grenada 's Government Assistance Programme, a social safety net for the poor, covers water connection fees and monthly water bills for the poor. This enables the G-CREWS project to ensure that tariff reforms affect only the higher user segments in the existing iterative block tariff and that access to water resources is ensured for the poor and most vulnerable.
2. Sufficient financial resources for NAWASA to upgrade infrastructure climate resilience and ensure that water production, storage and distribution happens at climate-resilient levels.
   To enable NAWASA to allocate adequate resources for maintenance and capital expansion, and to react to climate-induced changes in water availability, a new tariff is imperative. Because of climate change impacts, NAWASA needs to regularly replace, upgrade and expand or amend its infrastructure and systems. The project will support this (see Component 3). NAWASA will require additional financial resources to sustainably operate and maintain these upgrades and extensions. NAWASA will also need to build up financial resources for coping with environmental hazards and disasters and for future investments to enhance the resilience of its infrastructure and systems after 2050.

Detailed activities in 1.3:

- Analysis of the performance of the existing tariff
- Assessment of NAWASA's future revenue requirements and cost of services
- Assessment of the effectiveness of the social safety net in conjunction with the proposed new tariff systems
- Determination of the objectives of the new tariff
- Establishment of adjustments to the tariff structure and levels required to meet the objective
- Assistance to NAWASA in gaining approval for the new tariff

Component 2: Climate-Resilient Water Users

The aim of component 2 is to increase the resilience of water users (Output 2). It contributes to strengthened adaptive capacity and reduces the exposure of households, farmers and tourism businesses (Outcome A7.0) to erratic precipitation, higher temperatures and extreme weather events. It also strengthens the awareness of climate threats and risk-reduction processes (Outcome A8.0).

According to the Vulnerability Assessment, there is considerable potential for water efficiency gains in Grenada (see C.2 Baseline scenario) – particularly in households on Grenada mainland, the tourism industry and agriculture. The G-CREWS project dedicates a substantial share of the project budget to this component, which focuses on the following key initiatives:

- Establish a Challenge Fund for climate-resilient commercial water users in the agricultural and tourism sectors (the two major water-using sectors). The Challenge Fund will provide post-investment grant subsidies for implementation of water efficiency measures and rainwater harvesting.
- Strengthen the understanding and awareness of the public, the private sector and political decision makers about the challenges the water sector faces due to climate change.

This component relies on synergies with the impacts of Component 1, particularly the cross-sectoral mainstreaming of climate resilience into policies, plans and regulations of water-related sectors and introduction of a climate-responsive water tariff.

Activity 2.1: Challenge Fund for Climate-Resilient Commercial Water Users

The purpose of the Challenge Fund is to increase the resilience of Grenada's top two commercial sectors: tourism and agriculture. Both are highly vulnerable to projected climate change impacts such as reduced precipitation and droughts. The Challenge Fund promotes the adoption of water-efficient solutions in the agriculture and tourism sectors by using GCF grants to facilitate water auditing, solution design and implementation and to incentivise significant private co-finance for the purchase of water-efficient equipment. Both sectors rely heavily on the availability of water resources. In the dry

season, farmers experience a significant reduction in productivity or are unable to farm. Hotels and guesthouses suffer from unreliable water supply, rationing, water trucking costs and guest dissatisfaction.

Technical solutions to improve the availability of water include the following:

- For farmers: install efficient irrigation systems or upgrade irrigation technologies that are more efficient (micro-sprinklers and drip irrigation), install rainwater harvesting systems, shadehouses or hydroponics.
- For hotels/guesthouses: upgrade bathrooms with more water-efficient showers, toilets and faucets, install rainwater harvesting systems and recycle greywater for cleaning, laundry and gardens.

The current implementation of these technical solutions is suboptimal. Of approximately 2,100 full-time Grenadian farmers, only 400 irrigate, mostly with inefficient overhead sprinklers or ditches. Another 600 meet the requirements to irrigate (crops, farm layout and position).[20] Penetration of rainwater harvesting, shadehouses and hydroponics is low. Of the 90 hotels and guesthouses in Grenada, 85 small ones are behind in bathroom refitting and greywater recycling, while the 5 large ones have implemented more comprehensive measures.

Several barriers prevent the widespread installation of water efficiency solutions. For farmers, high upfront investment (vs. comparatively low farmer income), unpredictable internal rate of return (IRR) due to highly volatile crop prices, limited water cost savings,[21] limited technical knowledge and very limited access to finance.[22] For hotels/guesthouses, relatively small water cost savings due to low NAWASA tariffs, limited access to finance, especially if real estate has already been pledged as collateral, the preference for 'cosmetic' renovations (e.g. furniture) and broad renovations rather than specific interventions, and the lack of mandatory water efficiency audits. The Challenge Fund is designed to overcome these barriers through the following mechanisms:

- *Water audit grants* to hire technical experts to (i) comprehensively audit the water efficiency of farmers and hotels/guesthouses, (ii) recommend specific solutions and (iii) certify installation.
- Purchase of *equipment grants* to cover part of the initial investment incurred by farmers and hotels/guesthouses for equipment facilitating efficient water usage and collection. This improves the cost/benefit analysis for farmers and hotels/guesthouses as part of the investment decision. It also reduces credit risk for commercial lenders, facilitating their involvement as providers of co-finance.

The Fund will be managed by GDB and will operate through two separate funding windows to reflect unique sector features: the Challenge Fund for Agriculture (CFA) and the Challenge Fund for Tourism (CFT).

The proposed fund size is EUR 2.98 million, including EUR 2.63 million for the CFA and EUR 0.35 million for the CFT. The two windows will have different procedures and technical staff for water audits and different terms, sizes and conditionality for grants:

- Challenge Fund for Agriculture (CFA)
  - *Audits* by an international irrigation expert, working with the Land Management Unit and Extension Division at the Ministry of Agriculture, Lands, Forestry, Fisheries and the Environment (MALFE). These will be fully financed by G-CREWS.
  - *Equipment* costs will be subsidized by grants (up to 50%, subject to caps).
- Challenge Fund for Tourism (CFT)
  - *Audits* by a recognized plumbing expert, working with the Grenada Tourism Authority. These will be fully financed by G-CREWS.

[20] It is likely that farmers will increasingly be forced to irrigate due to changing rain patterns. It is therefore important to offer them efficient irrigation systems, including to farmers who meet irrigation requirements but do not yet irrigate.

[21] Most farmers use river water, which is free of charge. Increased and uncontrolled use could limit availability for other users.

[22] Lenders have a high perceived risks associated to the extension of loans to the agriculture sector. If loans are extended, they are usually highly collateralised via land or vehicles and carry high interest rates.

- *Equipment* costs will be subsidized by grants (up to 40%, subject to caps).

The grant coverage ratio of the equipment is defined based on the restrictions on both sectors mentioned above, including the limited access to other financial sources. The ratio also takes into consideration achieving a positive IRR, leading to investment incentives. Prior equipment installation will be a condition for grant disbursement. The beneficiary has to prefund the entire investment. If external capital is required, it will be easier to convince financial institutions to close financing gaps, as they can be assured of the substantial post-investment subsidy by the G-CREWS project. Other provisions to minimize fraud risk include joint auditing by the experts and government representatives, issuance and electronic filing of audit certificates (available to lenders to verify use of loan proceeds) and installation certificates (required for grant disbursement). It is projected that 85% of the total grant financing (EUR 2.55 million) will be used for the purchase of equipment. The equipment will reach the following coverage among the target groups:

- CFA: 50% of farms not yet irrigating but suitable for irrigation adopt micro-sprinklers or drip; 50 % of farms currently irrigating with inefficient equipment switch to micro-sprinklers or drip; 20 % of farms already irrigating or starting irrigation through CFA also install rainwater harvesting systems, 5 % adopt shadehouses and 1 % adopt hydroponics.
- CFT: 25 % of the rooms in large hotels and 50 % of the rooms in small hotels/guesthouses will have bathrooms upgraded with water-efficient fittings; 10 % of small hotels/guesthouses and 2 of 5 large hotels install greywater recycling.[23]

The Water Audit Grant (EUR 0.43 million) will fund the recruiting of the two international experts, three years for CFA and one year for CFT, in line with the expected length of the audit process in the two sectors. The co-finance ratio for purchase of equipment from private sources is 1.0x for CFA (based on 50% grant) and 1.5x for CFT (based on 40% grant). Including audit grants, which are fully financed by G-CREWS, co-finance ratios are diluted to 0.9x for CFA and 1.0x for CFT.
GDB is deemed the most suitable Executing Entity to manage the Challenge Fund. GDB's mandate is to manage concessional development funds and finance the agriculture and hotel sector in its normal course of business. It ran a grant-based program for hotel energy efficiency in 2013-2016 and was nominated as direct access entity for the GCF. A management committee, comprising GDB's General Manager and two senior loan officers, housed at GDB headquarters in Grenada, will be responsible for grant screening and approval. A supervisory board, comprising one nominee each from GDB, GIZ, the Ministry of Agriculture and the Grenada Tourism Authority, will be responsible for monitoring the sound application of procedures for audit, grant approval and disbursement. Both the Due Diligence report on Grenada Development Bank and the feasibility study on the Challenge Fund provide more detailed information (see attached).
The project expects positive spillover effects of the increased offer and installation of water efficiency measures as well as infrastructure provision, including rainwater collection by the service provider in Grenada. The project also eases the adoption of such measures for other commercial sectors, private households and the public sector.

Detailed activities in 2.1:

- Development of concept, including sustainability strategy
- Establishment of committee for fund steering structure
- Support of development of guidelines for technical, environmental and financial eligibility requirements for applications
- Development of monitoring system for application of guidelines
- Development of information material for potential beneficiaries and partners from the private sector
- Approval of concept, guidelines, monitoring system
- Launch and promotion of Challenge Fund
- Operation and implementation of Challenge Fund
- Technical support to GDB

[23] Note that, while these estimates are useful in determining the size of the Purchase of Equipment Grant, actual grant allocation between different solutions and technologies will be driven by the audits and the demand in the agriculture and tourism sector.

Activity 2.2: Awareness, Education and Outreach

The purpose pf this activity is to make households, businesses, hotels and farmers aware of challenges related to climate change and available solutions through the government and G-CREWS project to reduce water consumption.

To this end, a communication strategy will be designed and implemented to complement and support the climate resilience of water users in Grenada, as well as create awareness about the actions of the project itself, in order to reach the following goals:

- Create a broad understanding about the specific climate-induced limits and challenges regarding the availability of water resources in Grenada.
- Support behavioural change activities of water users and decision makers.
- Boost support from high-level decision makers and the general public for the measure to support climate resilience of water governance structures in Grenada, including institutional amendments and financial sustainability.
- Support regional learning and rollout based on the experience of G-CREWS in Grenada.

The goals will be achieved through four campaigns (details are described in Annex 2):

- Campaign 1: Enhancing knowledge about the water sector and the impacts of climate change
- Campaign 2: Providing education and increasing awareness about efficient water use and rainwater harvesting
- Campaign 3: Building trust in the new water governance structures, including the necessity and impacts of new water tariffs
- Campaign 4: Building awareness about the G-CREWS project

All four campaigns will use the three-step approach that includes the publication plan (brochures, flyers, etc.), public relations plan (meetings, consultations, fairs and school events, TV and radio appearances and spots, etc.) and social media plan. In addition, in particular for the regional dimension of campaign 4, close and long-term links will be established between GIZ, GoG and NAWASA with the Organisation of East Caribbean States, the Caribbean Community Climate Change Centre, the Caribbean Water and Sewage Association or the Caribbean Community (CARICOM), in order to make optimal use of regional events.

To assess the impacts of the G-CREWS project on the links between water and climate change, a study of the knowledge, attitudes and practices (KAP) of the Grenadian public in relation to these topics will be done before organising major communication events. By gathering baseline data at the beginning of the project, this KAP survey will help focus the different campaigns in formulating key messages, addressing the different audience segments and using the right communication channels and timing for the respective audience segments. The KAP study at the start of the communication activities will be used as a baseline against which a midterm KAP study will be measured to identify impacts and needs for adjustment. A final KAP study towards the end of the G-CREWS project will provide a way to measure the success of its awareness and education activities.

The project will implement the activities in close cooperation with the Grenadian project partners as well as the climate change focal point of MALFFE's Environment Division.

Detailed activities in 2.2:

- Baseline customer survey (KAP)
- Implementation of campaign 1: Enhancing knowledge about water sector and impacts of climate change
- Implementation of campaign 2: Providing education and awareness about efficient water use
- Implementation of campaign 3: Building trust in new water governance structures, including necessity and impacts of new water tariffs
- Implementation of campaign 4: Building awareness about G-CREWS project
- Final customer surveys (KAP)

Component 3: Climate-Resilient Water Supply Systems

Component 3 will strengthen the climate resilience of the water supply system and infrastructure (Output 3). This includes (a) retrofitting selected physical assets to cope with extreme weather events (tropical storms and heavy rainfalls) and (b)

expanding existing or building new physical assets to accommodate for reduced or erratic precipitation, increased temperature and salt-water intrusion due to sea level rise. The G-CREWS project will focus on the following three areas:

- Increase the capacity of NAWASA's water supply (raw and freshwater storage, groundwater resources) to provide the required potable water resources despite climate change. Increased storage and more in-built flexibility through the interconnection of pipelines and sustainable groundwater systems will enhance NAWASA's availability to react to dry spells when less surface water is available, as well as to the increased frequency of heavy rainfall events with local impacts.
- Installation of larger on-site storage capacities at critical infrastructure like medical centres to reduce exposure to climate-induced scarcity of piped water.
- Improvements in the ability to respond to heavy rainfall and other disaster events through disaster-proof infrastructure and comprehensive emergency response plans, which will help to ensure that water supply interruptions are minimised.

These activities contribute to strengthened adaptive capacity and reduced exposure to climate risks of the water supply system in Grenada (Outcome A7.0).

Activity 3.1: Climate-Resilience of NAWASA's Supply Systems

The purpose of this activity is to invest in the necessary infrastructure to reach climate-resilient levels of water production in the future and to overcome climate-induced water shortages through the following measures:

- Increase in water storage capacities and installation of required connections to the network.
- Rehabilitation of wells for sustainable use of groundwater resources.
- Development of a maintenance plan for the NAWASA system.
- Construction of communal rainwater harvesting systems.

The water supply improvement measures financed by the G-CREWS project include the following:

Climate-Resilience of NAWASA's Water Supply through Additional Storage

The G-CREWS project, through the Project Coordination Unit (PCU) in MoFE, will support the procurement of turn-key construction by using the appropriate competitive tendering process and project engineering services for five water storage infrastructure investments. The investments are based on findings of feasibility studies undertaken by international donors in recent years, which have been applied now in various locations. All cost estimates have been internally generated by NAWASA's Planning and Development Department, Engineering Division, and are based on the World Bank-funded Regional Disaster Vulnerability Reduction Project (World Bank 2011), which is currently being implemented. The PCU, in close cooperation with NAWASA, will implement the respective water supply infrastructure measures, including final design and tendering supervision. For more detailed information on the following five infrastructure investments, see Chapter 9.4. of the Feasibility Study.

(1) Mirabeau Water System Resilience: This water system improvement will ensure a climate-resilient supply from the Mirabeau water system (Grand Bras River) for almost 9 % of Grenada's population, as well as for medical stations, schools and a large number of businesses in Grenville, a bustling commercial centre on the east coast. Based on a study by Stantec (2001), this should be achieved by increasing the storage capacity of the system from 690 m^3 to almost 3,000 m^3, and substituting supply to a section of the traditional Mt. Horne demand zone (see Stantec 2001, sect. 8), which allows for additional flexibility if water shortages occur. Mirabeau was ranked as the second most critical water supply system in Grenada with regard to water storage.[24]

(2) Les Avocats/Petit Etang Water System Resilience: This water system improvement, to be implemented in the parishes of St. David and St. George, will facilitate optimisation of the use of the Les Avocats and Petit Etang water systems. As a result, the treated water storage capacity of the combined systems will increase by a factor of 3.6, the raw water storage capacity of the Petit Etang system will increase by a factor of 20 (from 2,500 m^3 to 52,000 m^3), and the raw water storage capacity of the small Les Avocats dam will increase by a factor of 4.5 (from 3,300 m^3 to 15,000 m^3). This measure, which

[24] GIZ 2015.

will bring climate-resilient supply to approximately 5,000 people, is based on a feasibility study performed by Exarchou & Nikolopoulos (ENB) in 2005.[25]

(3) Vendôme Water System Resilience: This water system improvement, to be implemented in the Parish of St. George, will increase storage capacity in the Vendôme water supply system, which serves approximately 7,500 people and a number of schools, medical stations and businesses. This measure, which will allow for a storage increase of 4,000 m^3 and hence covers service interruptions of up to four days, is based on a feasibility study by Gaudriot in 2003.[26]

(4) Resilience of Small-Scale Systems in Various Parishes:, Gouyave, Tufton Hall, Peggy's Whim and Morne Rouge: This water system improvement, to be implemented in the Parishes of St. Patrick's, St. John's and St. Mark's, will ensure a climate-resilient sustainable water supply to communities served by the Peggy's Whim Water Treatment Plant, Douglaston Water Treatment Plant and Tufton Hall Water Treatment Plant. This sustainable supply should be able to cope with reduced overall water availability as well as more frequent supply interruptions due to climate change by increasing storage capacities and associated infrastructure. This is to be achieved through the installation of additional storage tanks with a total capacity of almost 6,000 m^3, providing 2-3 days' supply during plant shutdown and/or dam cleaning due to tropical storm impacts, and the installation of required connection pipes and valves. In GIZ's Storage Assessment Study (2015), these systems were ranked among the locations most urgently needing storage upgrade. This measure is expected to support a climate-resilient supply to more than 19,000 people in the various parts of Grenada.

(5) Carriacou Water System Resilience: This water system improvement, to be implemented on the island of Carriacou, will extend the reticulated water supply system to the main communities on the northern half of the island from the salt water reverse osmosis (SWRO) plant located at Beauséjour. The proposed elements, identified in an earlier master plan study, comprise force mains from the SWRO plant to various high points on the island and the installation of storage tanks at strategic locations.[27] The measure is expected to provide improved supply to approximately 3,500 people.

Complementary Activity: Concorde Water Supply Expansion by UK AID: In addition, as a parallel activity, the Concord water supply expansion will be implemented under separate funding provided by UK AID (and is therefore not part of this funding proposal). This activity facilitates the expansion and optimisation of the use of the Concord water system (Black Bay River) by increasing water production capacity by a factor of 2.5 (water treatment plant and increased storage) and substituting supply (piping system) to the southwest sector of the traditional Annandale/Woburn demand zones. For more detailed information, see chapter 9.3 of the Feasibility Study.

Sustainable Use of Groundwater Resources

The rationale for this measure is to secure the currently used groundwater resources for the medium- and long-term future. This would allow for backup resources, in particular for the southeast of the island. This measure, which includes the rehabilitation of existing wells and replacing three old wells with new ones, drilling of three new wells, including the determination of the optimal abstraction rates and groundwater protection zones, the definition and implementation of a regular operation plan and a monitoring system to ensure sustainable operation of the wells. This measure is based on various studies (e.g. DIWI (1996), Ministry of Finance (2001), Gassen (2013) and on technical assessments done by GIZ in 2013, a study done in 2013 (Gassen 2013) and a technical assessments by GIZ in 2013. For more detailed information on these measures, see chapter 9.5 of the Feasibility Study.

Development and Implementation of a Maintenance Plan for Existing and New Infrastructure

Maintenance is a prerequisite for sustainable operation of water infrastructure. This is of particular importance for small surface-water systems, which are increasingly subject to extreme rainfall and drought. It is well established that a properly organized preventive maintenance management plan can yield benefits, including increased reliability and life expectancy of system components; minimised service interruptions, major repairs and downtime; increased system performance; and reduced and controlled maintenance costs. A short-, medium- and long-term maintenance management plan will be formulated, including a mechanism that also ensures budgeting for such maintenance costs. This plan will inform the tariff study and be integrated in the new tariff, which is meant to ensure NAWASA's financial sustainability. The G-CREWS project will support procurement of a basic inventory of pipeline repair fittings and plant equipment spares and system

[25] ENB 2005, sect. 3.
[26] Gaudriot 2003, sect. 2.
[27] Stantec 2001.

maintenance software, and it will provide technical support in analysing, amending and documenting maintenance processes.

Investments in Communal Rainwater Harvesting (RWH) Systems

Beside RWH on a household level, larger-scale systems are used to augment or sustain supply to whole communities in order to cope with reduced or erratic precipitation. Larger-scale systems supply households via a piped system, enabling the introduction of centralized operations by NAWASA and hence consider RWH as one source, which feeds into the national piped supply network. Based on the experience of a communal RWH system in Blaize, G-CREWS will support the installation of four larger-scale, community-based RWH systems in Grenada (Brooklyn, Clozier) and Carriacou (Dover, Mt. Royal) to be operated and maintained by NAWASA. Blaize is an example of a catchment that was constructed for municipal supply (120persons), since the existing supply source was not reliable anymore, and alternative supply options were too costly. In this system, a large catchment surface collects rainwater and fills a built-in concrete tank, where it is chlorinated and afterwards distributed to the consumers. The pilot systems has showcased how centralized systems address and overcome challenges with maintenance, water quality, financial resources, and lack of technical experience and expertise at the individual and community levels.

Detailed activities in 3.1:

- Design, tendering supervision of supply structure
- Preparation of preliminary and final design for the different lots (see B.3 and I.1 and Annex 1 (time schedule) for details)
- Tendering and procurement of contractors of the different lots
- Construction of infrastructure
- Supervision/monitoring of progress, technical quality and costs
- Handing over of infrastructure

Activity 3.2: Disaster-Resilience in Medical Centres

The purpose for this activity is to increase existing potable water storage capacity in community health facilities by over 50% in order to improve their resilience to extreme weather events and droughts. The activities will be implemented in four parishes in Grenada and the sister island of Carriacou, and will include drinking water storage tanks and improve plumbing and/or rainwater harvesting infrastructure at 16 community health facilities and related services. With the implemented measures, the community health centres will fulfil the Pan-American Health Organization (PAHO) storage requirements of five days' average consumption, if, for example, water supply is interrupted by heavy rainfalls, storms or dry spells. The facilities together accommodate an estimated 2,200 patient visits per week.

Detailed activities in 3.2:

- Final design of rainwater harvesting infrastructure in 16 community health facilities
- Procurement and installation of tanks and equipment

Activity 3.3: Disaster-Resilience in NAWASA's Systems

The purpose of this activity is to reduce disruptions in Grenada's water supply system, which are caused by climate-induced environmental hazards such as extreme rainfall events and tropical storms. This activity focuses on the following key interventions:

Check Dams and River Intake Retrofits

The rationale for this measure at 12 river intake locations in all parishes of Grenada is to promote more efficient sediment management through construction of sediment-retaining weirs or silt traps immediately upstream of the intakes, and/or retrofitting of the water intake mechanisms. This will be based on a pilot project implemented by NAWASA in 2014.

Remote Monitoring and Control (SCADA) Systems

The rationale of this measure is to utilize modern information and communication technology to enable remote monitoring of water quality parameters, and control of water inflows/outflows, at 14 water treatment plants and 2 boreholes. This will reduce disruptions in the water systems (such as after heavy rainfall events), resulting in a more climate-resilient water supply for approximately 45,000 residents.

Emergency Response Plan

The rationale of this measure is to provide the basis for efficient management of Grenada's water supply and sewerage systems in emergency situations to ensure that minimum demands are met during a disaster and in its immediate aftermath.

Detailed activities in 3.3:

- Undertake final design and implementation of works at various treatment plants, including silt traps, river intake retrofits; sediment retaining weirs and plant intake retrofits
- Procure and install remote monitoring & control (SCADA) systems
- Update/review NAWASA's current emergency response plan
- Approval and implementation of reviewed emergency response plan

Component 4: Additional Contributions of the Water Sector to Grenada's NDC (financed by BMUB, Germany)

The G-CREWS project will improve the water and energy efficiency in NAWASA's systems (Output 4) and thus unlock additional contributions to the project's objective and Grenada's NDC. The component is designed to complement the project and stimulate climate action in other sectors. This will be achieved by (i) exploring and implementing solutions for powering NAWASA operations with renewable energy (e.g. solar powered water pumping, solar powered water treatment, hydropower micro turbines within the piped network) and (ii) implementing measures to support NAWASA's water loss reduction strategy (e.g. water audits, GIS-based infrastructure and customer management system and selected replacements of leaking pipes). The component will contribute to strengthened institutional and regulatory systems for climate – responsive planning and development (Outcome 5.0) and strengthened adaptive capacity and reduced exposure to climate risks (Outcome 7.0).

Activity 4.1: Water and Energy Efficiency

The assumption is that reducing water losses allows for reduced water production. This reduces Grenada's dependency on water, which reduces exposure of the water supply system to climate impacts and risks (Outcome A7.0). It also reduces or replaces the use of imported fossil fuels, which reduces CO_2 emissions. In addition, NAWASA also benefits from cost efficiency gains through lower energy costs per gallon of potable water, which pays into the financial sustainability of the project. It is planned to replace pressure-reducing valves in the water distribution network with micro-turbines to produce energy and to reduce the operational costs of NAWASA.

Detailed activities in 4.1:

- Implementing NAWASA water loss reduction strategy including:
  - Introduction and implementation of a water balance approach to monitor non-revenue water
  - Introducing a GIS-based infrastructure and customer management system to comprehensively reduce non-revenue water
  - Selected replacement of leaking pipes at hot spots identified with the GIS-based management information system
- Development of an emissions inventory for the water sector in coordination with the NDC process in Grenada
- Assessment and implementation of selected renewable energy technology options for NAWASA
  - Identification and assessment (both technical and financial) of suitable locations for the installation of micro-turbines to replace pressure-reducing valves in the water distribution network, and of solar PV systems to power water treatment and pumping operations.
  - Development of an operations and maintenance concept for such micro-turbines and solar PV systems
  - Tender process to procure and install micro-turbines and solar PV systems

Component 5: Regional learning and replication (financed by BMUB, Germany)

The G-CREWS project will increase learning and replication on the two subjects of GCF project preparation and climate-resilient water sector approaches in the Caribbean through BMUB co-funding (Output 5). The component unlocks the regional potential for learning and replication in the Caribbean, because the paradigm shift potential at the national level of Grenada is almost exhausted due to the project's national scale. The component is designed to complement the project and stimulate climate action as well as engagement with the GCF in other Caribbean countries. It will contribute to strengthened institutional and regulatory systems for climate-responsive planning and development (Outcome 5.0) and strengthened awareness of climate threats and risk-reduction processes of government institutions (Outcome 8.0) in the Caribbean.

Activity 5.1: Lessons learned and replication in the Caribbean:

Most Caribbean SIDS face similar vulnerabilities in the water sector, and the lessons learned from the G-CREWS project in Grenada could contribute to paving the way for improved water sector resilience also in other countries. A number of Caribbean SIDS would also benefit from Grenada's experience and lessons learned with preparing GCF projects. This can be facilitated by exchange platforms on the sub-regional and regional levels, using the Organisation of East Caribbean States (OECS) and the Caribbean Community (CARICOM) as hosts for the exchange. There are already established exchange platforms, such as in the OECS Council of Environment Ministers, or the CARICOM Ministers of Environment exchange, which take place on an annual basis. In addition, regional workshops and conferences, including those hosted by the GCF can support not only the regional visibility of the G-CREWS project but also regional learning and knowledge exchange. Finally, the project will support specific initiatives in at least 3 other countries to replicate the Grenada approach and engage with the GCF. The activities will commence immediately after the GCF project starts.

Detailed activities in 5.1:

- Preparing lessons learned
- Development of replication models
- Implementation of conferences and exchange platforms (e.g. OECS Council of Environment Ministers; CARICOM Ministers of Environment exchange)
- Implementation of trainings and webinars
- Support in reviewing similar initiatives in Caribbean states (e.g. GCF concept notes for funding proposals)

C.4. Background Information on Project/Programme Sponsor (Executing Entity)

Grenada's NDA

The DETC is Grenada's National Designated Authority (NDA) for the Green Climate Fund.

Role within the G-CREWS project: The DETC will represent Grenada as the national beneficiary of this GCF-funded project and ensure alignment of the project implementation with national policy objectives and goals.

Executing Entities (EE)

The project will work with 3 Executing Entities: MoFE, GDB and GIZ Grenada.

The Executing Entities MoFE (PCU) and GDB will sign subsidiary agreements with the AE based on GIZ standard operating procedures for contracts for financing. Contracts for financing establish the legal basis on which the AE makes funding available to the Executing Entities for specific purposes to help them carry out certain measures.

- **Ministry of Finance, Energy, Economic Development, Planning & Trade represented by the Project Coordination Unit**

  The PCU is a specialised project management unit within the ministry of Finance and Energy with appropriate procurement and fiduciary handling capacity gained through several years of experience in managing World Bank and other donor projects.

  The arrangements allow for utilisation of the existing resources (a particularly important aspect for small island developing states), assuring consistency of approaches across projects, and achieving economies of scale. Strengthened by its experience working with the World Bank, the PCU will establish a sound financial management system to produce accurate and timely reports.

  The PCU will work closely with all beneficiary institutions, in particular NAWASA and the future Water Resources Management Unit. The PCU will provide guidance on compliance with fiduciary procedures and handle the

procurement of works, goods and services as well as all financial transactions as they relate to its project components.

Role within the G-CREWS project: MoFE/ PCU will be the Executing Entity in charge of procurements and management for the infrastructure components of the project. This includes the procurement of equipment for Activity 1.1 (equipment for Water Resources Management Unit), Activity 2.3 (NAWASA water meters) and the complete Component 3. The total volume of investment handled by the PCU will be EUR 22.7 million. The PCU will be supported by NAWASA and GIZ Grenada on technical and engineering specifications.

- **Grenada Development Bank**

The Grenada Development Bank (GDB) is a public statutory financial institution, which was established by the Grenada Agricultural and Industrial Development Act, 1976 for the purpose of granting loans and providing other forms of financial assistance for industrial and tourism development, housing, higher education, agricultural development and other development projects. The Grenada Development Bank (GDB) is a public statutory financial institution established in 1996 under the Grenada Development Bank Act.

The GDB's vision mission is to be an innovative and viable development organization, providing high quality financial and related services to the state of Grenada, with the aim of fostering socio-economic development. The GDB specializes in providing funding to small and medium enterprises (SMEs), using funds provided by external development organizations like the Caribbean Development Bank (CDB) or the Caribbean Development Fund (CDF).

The GDB was nominated by the Government of Grenada and the NDA as Grenada's Direct Access Entity (DAE) or National Implementing Entity (NIE) candidate for the Green Climate Fund and is currently receiving assistance from GCF's Readiness Support Programme delivered by GIZ. The readiness support activities support the GDB's accreditation process as an NIE. The GDB's involvement in the G-CREWS project as a financial intermediary enables the bank to gain valuable insights and experiences in engaging with GCF and its implementation modalities. This will support the institutional strengthening process towards the GDB's 'GCF Readiness'.

Role within the G-CREWS project: The GDB will be the Executing Entity for the implementation of the grant-based Challenge Fund for Climate-Resilient Commercial Water Users, Activity 2.1 of the G-CREWS project.

- **GIZ Grenada**

Commissioned by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety GIZ has been working in Grenada for the last four years with a number of various ministries, public and organisations, NGOs and communities. It enjoys an excellent and close working relationship with all key stakeholders relevant to the implementation of the G-CREWS project.

GIZ was requested by the Government of Grenada to support the Government by setting up a GCF proposal and to act as one of the executing entities.

This request is a result of close working relationship between GIZ Grenada and all relevant key stakeholders in the Grenadian water sector. GIZ´s Grenada key role as EE is to provide state of the art international know how and technical support in those areas where Grenadian partners need advice and national structures need to be fostered. After a careful assessment, this role is defined only for those areas where no suitable national solution could be established. GIZ Grenada will fulfill its responsibilities aiming at ensuring that during programme implementation national sectoral structures and know how are established in a way that ensures full long-term sustainability.

GIZ Grenada therefor **supports the introduction of a new dedicated government unit** to ensure sound and climate-proof regulation of the management of water resources as well as improving the legislative and institutional framework, mainstreaming climate change policies in the water sector, and introducing a climate-resilient water tariff reform.

Role within the G-CREWS project: GIZ Grenada focuses on Component 1: Integrating Climate Resilience into Grenada's Water Governance (except for procurement of equipment for the Water Resources Management Unit) and Activity 2.2: Household and Community Awareness and Education.

Main tasks include:

- advise on institutional capacity building, including the setup of WRMU according to international best practice and the financial sustainability of NAWASA,

- support sector transformation towards climate resilience (e.g. Rainwater harvesting policy development, including awareness, promotion and technical implementation, shift towards water demand management within NAWASA and its customers),
- Support studies and data assessment as well as establishing a state of the art monitoring structure for the national counterparts,
- Contract, coordinate and oversee (international) technical expertise on climate & water to ensure timely and efficient implementation,
- Apply international best practice to disaster risk reduction and climate resilience,
- Support of Climate Change (CC) Mainstreaming CC into Policies and regulations (coordinated with Grenada's CC Focal point and other line ministries, with which GIZ is already in close contact due to the ICCAS project),
- Support communication & awareness as well as behavioural change.

Additionally, GIZ Grenada will offer technical **support and capacity development to MoFE and GDB** in line with the findings of the due diligence to facilitate a smooth implementation of the envisaged project activities.

- This will include for MoFE/PCU in particular (i) increase of the PCU project team by human resources with know-how in project lead and project management, procurement as well as expertise in water/construction/infrastructure and (ii) setting up of an on-site GIZ team to build up the PCU resources and accompany the project implementation. (iii) GIZ team will implement a project risk management within the PCU, introduce project management mechanisms and support the project management. It will closely accompany cost control procedures and budget monitoring and implement an internal control system. (iv) GIZ Team will furthermore customize guidelines and procurement procedures to the requirements of GIZ and GCF by developing and implementing the "CREWS Operations Manual".
- This will include for GDB in particular (i) support to further develop and implement important policy reforms regarding i.e. the areas of risk management and procurement, which will among others strengthen the capabilities regarding the compliance with GCF's environmental and social safeguards and standards. (ii) GIZ Grenada will accompany the set-up of the structures and processes regarding the Challenge Funds and support the development and utilization of a tailor-made operationalization and monitoring plan providing sufficient information on the financial transactions conducted. (iii) Where needed, capacity of GDB staff will be strengthened in project management including the administration, monitoring and reporting of the project's activities.

For more details refer to Supporting Documents N° 08.

A project management committee (PMC) will be responsible for the execution of the proposed GCF project in collaboration with GoG, MoFE and GDB. The PMC meets weekly to define, monitor and coordinate work plans as well as provide for information exchange and synergies between the programme components and the other EEs of the project.

Main project sponsors:

- **National Water and Sewerage Authority (NAWASA)**

  NAWASA is the sole provider of piped water to domestic and non-domestic water users in Grenada and is also responsible for the provision of sanitation services. NAWASA's mission is to provide customers with a safe, adequate and reliable water supply and safe disposal of wastewater, in a viable and efficient manner that meets and exceeds customer expectations, and ensures the development of its organisation.

  Role within the G-CREWS project: NAWASA will be the agency responsible for the day-to-day implementation of most of the technical components of the project, in cooperation with the PCU and the GDB and is considered the main beneficiary.

- **Ministry of Works and Public Utilities (MoWPU)**

  The MoWPU provides oversight for NAWASA's activities as a water utility. It is also in charge of regulating other utility sectors, like telecommunications and electricity. Through its Physical Planning Unit, it is also responsible for approval of construction planning documents and issuance of permits, e.g. based on compliance with building codes.

  Role within the G-CREWS project: The MoWPU plays a key role in amending standards and developing new regulations with regard to buildings. This includes any requirements for water efficiency standards or requirements for mandatory rainwater collection systems for new buildings. In addition, the foreseen new Water Resources Management Unit could be established as part of the MoWPU.

C.5. Market Overview (if applicable)

Not applicable.

C.6. Regulation, Taxation and Insurance (if applicable)

The project is in compliance with the laws, policies and regulations of Grenada. The project will apply GIZ standard operating procedures including grant funding, procurement and environmental and social safeguards. A number of approvals need to be obtained for implementing and operating the project activities and outputs, including the following:

(i) Cabinet and (partially) Parliament approvals for

- Amendments of water sector regulations, building codes, etc.;
- Establishment of a Water Resources Management Unit;
- A new water tariff structure; and
- Any land use issues arising from the implementation of infrastructure works.

(ii) Approvals are required from the Physical Planning Unit (PPU) for

- Storage increase and pipeline constructions; and
- Improvements of water intakes.

(iii) Coordination with the following entities needs to take place, and their no-objections need to be provided:

- Ministry of Health for infrastructure works to improve water storage at medical stations; and
- National Disaster Management Authority (NADMA) for the development and implementation of NAWASA's emergency response plan.

GIZ and the PCU will apply for all relevant approvals, permits and no-objections on schedule.

GIZ standard operating procedures require contractors to ensure required insurance cover. GIZ staff is insured through company policies. Grenada is a member of the regional risk pool Caribbean Catastrophe Risk Insurance Facility (CCRIF). CCRIF offers parametric insurance products that provide coverage for hurricanes (tropical cyclones), earthquakes and excess rainfall.

The current bilateral project ICAAS, implemented by GIZ, is exempt from all taxes and duties through an exchange of verbal notes between the Government of Grenada and the Government of Germany. The Government of Grenada has indicated that this could also be the case for the implementation of the G-CREWS project, but formal agreements would only be available after the project has been approved. No exchange regulations are applicable.

C.7. Institutional/Implementation Arrangements

During the project implementation, GIZ will act in the double function as an **Accredited Entity** (AE) and as an **Executing Entity** (EE).

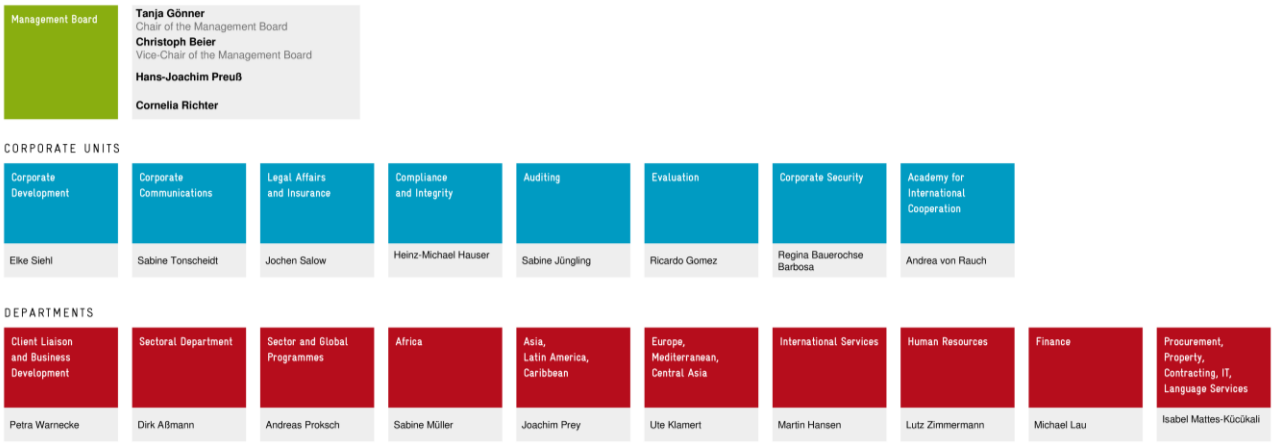
As **Accredited Entity** (AE) GIZ will take oversight responsibility for the overall project as defined in the Accredited Master Agreement between GCF and GIZ. As AE GIZ will administer the funds on behalf of GCF and will provide oversight guidance and quality assurance through its relevant HQ units for the Executing Entities, including overall financial management, project monitoring and evaluation, oversight reporting and knowledge-management oversight.

GIZ has a long history in technical cooperation in the areas of climate change adaptation and low emissions' energy and a close working relationship with all relevant key stakeholders in the Grenadian water sector. Due to these experiences, and the challenges posed by the G-Crews-Project, the Government of Grenada requested GIZ to act as one of the **Executing Entities** (EE). As Executing Entity GIZ´s operational structure in Grenada will provide technical cooperation and capacity building to improve the current institutional structure in the water sector. GIZ supports the introduction of a new dedicated government unit to ensure climate-proof regulation of the management of water resources, as well as the improvement of the legislative and institutional framework, the mainstreaming of climate change policies in the water sector, and the introduction of a climate-resilient water tariff reform.

GIZ will ensure a **clear and strict separation between the two different roles.** The AE and the EE roles of GIZ will be assumed by different units within GIZ´s organizational structure. While quality assurance and oversight functions pertaining to GIZ's AE role are assumed by GIZ´s headquarter corporate structure the EE role will be assumed by GIZ´s operation EE structure in Grenada. Both structures are strictly separated and are accountable to different management structures within GIZ. While corporate units report directly to GIZ management board, GIZ Grenada reports to the regional

office in the Caribbean in Santo Domingo, the one that reports to the regional Head Office Department *Asia, Latin America, Caribbean* in Head Office.

Below you find the GIZ Organization Chart:



AE

The Head Office based AE team will be responsible for

- overall responsibility and oversight for the project, including project preparation and implementation,
- continuous communication with the GCF
- receiving the GCF proceeds as well as disburse, administer and process the funds (financial management)
- ensuring the proper use of the GCF proceeds
- supervising each programme activity
- assessing the integrity and capacity of the EEs
- setting up a subsidiary agreement with the EEs
- monitoring the subsidiary agreements and the performance of EEs
- securing EE's procurement according to AEs rules and policies
- keeping adequate documentation and reporting towards the GCF
- establishing internal control routines
- ensuring a continuous project risk assessment
- providing financial reports to the GCF
- evaluating the programme.

Oversight and quality assurance is guaranteed in cooperation with the specific highly qualified departments in GIZ's Head Office:

- Finance department - responsible for strategic and operational financial control of the company; maintaining standards of financial management, financial control, accounting, elaboration of annual statements of accounts, etc.
- Procurement department – responsible for procurement, contracting, setting up the financing agreements with the executing entities; the execution and monitoring of tender processes through the procurement plan, etc.
- Compliance and Integrity
- Legal Affairs and Insurance
- Auditing
- Evaluation
- Risk Management Unit.

EE

The **function of the Executing Entity (EE)** is assumed by the GIZ G-CREWS team in Grenada accountable to the Regional GIZ Office in Santo Domingo.

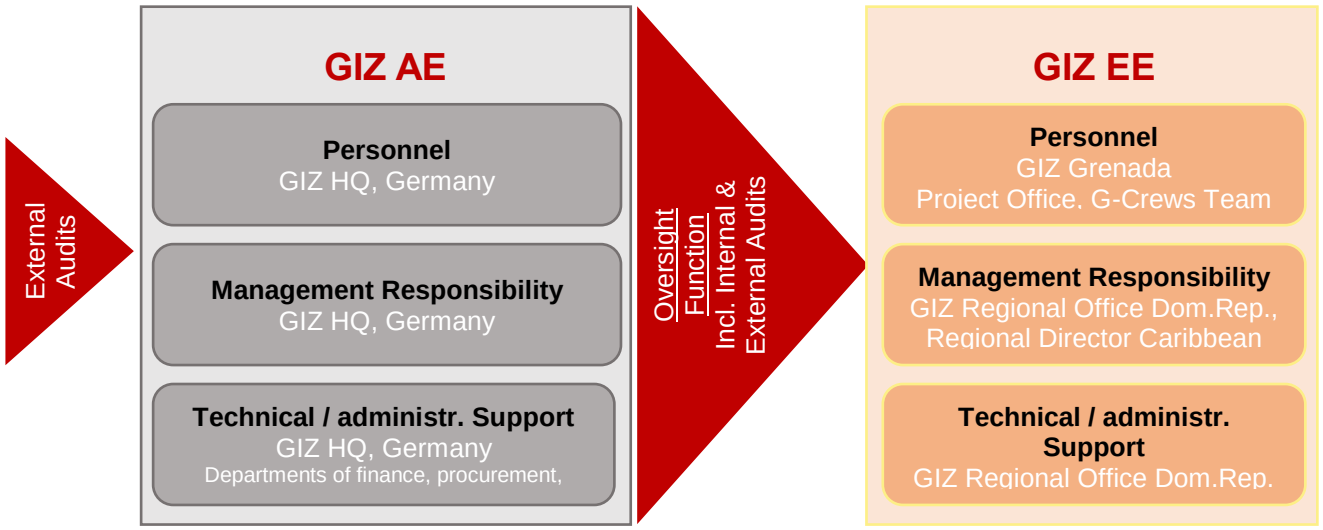
GIZ Offices are the central element of GIZ's field structure. GIZ national or regional offices ensure the application of GIZ professional standards and a high-level quality management of all GIZ projects executed in a country or region. The Regional Office in Santo Domingo is headed by a Regional Director, who has the management responsibility for all Technical Cooperation projects in the region. GIZ Offices provide staff, consultancy and commercial support services for programs and projects in their areas.

In the function of EE GIZ is responsible for the following activities within the project implementation:

- support of the introduction of a new dedicated government unit
- technical support and capacity development to MoFE and GDB
- support studies and data assessment as well as establishing a state of the art monitoring structure for the national counterparts,
- contract, coordinate and oversee (international) technical expertise on climate & water to ensure timely and efficient implementation,
- apply international best practice to disaster risk reduction and climate resilience
- support of Climate Change (CC) Mainstreaming CC into Policies and regulations (coordinated with Grenada's CC Focal point and other line ministries
- support communication & awareness as well as behavioural change

For an overview of how GCF proceeds will flow from GCF to the Funded Activity and the contractual and legal arrangements that facilitate the flow of funds, please refer to the diagrams provided in Annexes 3 and 4. Further details on financial management and procurement are provided in section F.4.

Separation of function and responsibility of GIZ as AE an EE



NDA

The DETC of MoFE will represent Grenada as the national beneficiary of this GCF-funded project and ensure alignment of the project implementation with national objectives and goals.

GIZ has carried out a comprehensive assessment of the institutions that are involved in project implementation and operation. As a result, local government and community-based organisations are expected to be capable of implementing their tasks under the Project if supported by GIZ Grenada. For information on the roles and responsibilities of the two EE, MoFE, represented by PCU and GDB, please refer to section C.4.

This section C.7.1. describes the implementation arrangements of the organizations involved in Grenada.

Main recipient institutions

- **NAWASA**

  NAWASA will be the agency responsible for day-to-day implementation of the technical components of the project, in cooperation with the PCU, and is the main beneficiary.

- **Ministry of Public Utilities and Works**

  The MoWPU plays a key role in amending standards and developing new regulations with regard to buildings. This includes any requirements for water efficiency standards or requirements for mandatory rainwater collection systems for new buildings. In addition, the foreseen new Water Resources Management Unit could be established as part of the MoWPU.

Overall assessment

GIZ has years of tested cooperation experience with the institutions involved. An independent due diligence confirmed that these organisations are capable of implementing their tasks within the G-CREWS project and in compliance with applicable GIZ procedures. However, the due diligence showed that additional capacity development through an experienced partner is required as well as desired by the partner.

Implementation Arrangements

Project Steering Committee (PSC)

A PSC will be established and chaired by MoFE, represented by the permanent secretary. The Project Steering Committee includes the following members:

- Grenada's National Designated Authority for GCF;
- One representative of the National Climate Change Committee
- The National Climate Change Focal Point for the UNFCCC
- One representative of the Ministry of Works and Public Utilities;
- One representative of the Ministry of Agriculture, Lands, Forestry and Fisheries
- One representative of the Grenada Chamber of Industry
- One representative of the Grenada Hotel and Tourism Association or the Grenada Tourism Authority
- One representative of the Inter Agency Group of Development Organisations, as the umbrella organisation of NGOs in Grenada
- One representative of the Grenada National Organisation of Women
- One representative of the Grenada Development Bank
- The Project Coordinating Unit under MoFE
- NAWASA
- GIZ Head Office (AE) as observer

A complete list of the Steering Committee's members and their designated alternates will be provided in the inception report. The PSC will meet twice per year and has the following tasks:

- Provide overall guidance to the project, in particular regarding aspects of targeting the most vulnerable, gender balance and sustainability.
- Provide review, feedback and approval of annual work plans, annual reports and audits.
- Ensure programme synergy and coherence with the evolution of the international and national context, including overall national adaptation planning.
- Review programme adherence with safeguards.
- Support the coordination of project activities across different line ministries and between private sector, public sector and civil society.

The Steering Committee will closely cooperate with the Grenada Water Stakeholder Platform (G-WASP), founded in 2016 to reduce local water risks for the private sector through tripartite partnerships (private, public and civil society), to ensure that local communities also benefit from the proposed solutions. Towards the end of the G-CREWS project, the functions of the Steering Committee which go beyond the project monitoring are expected to be assumed by G-WASP. This will ensure sustainability of the approaches implemented by the G-CREWS project.

Project Management Committee

On operational level, the establishment of a PMC will help ensure stringent and smooth implementation of the various project activities and across the project components.

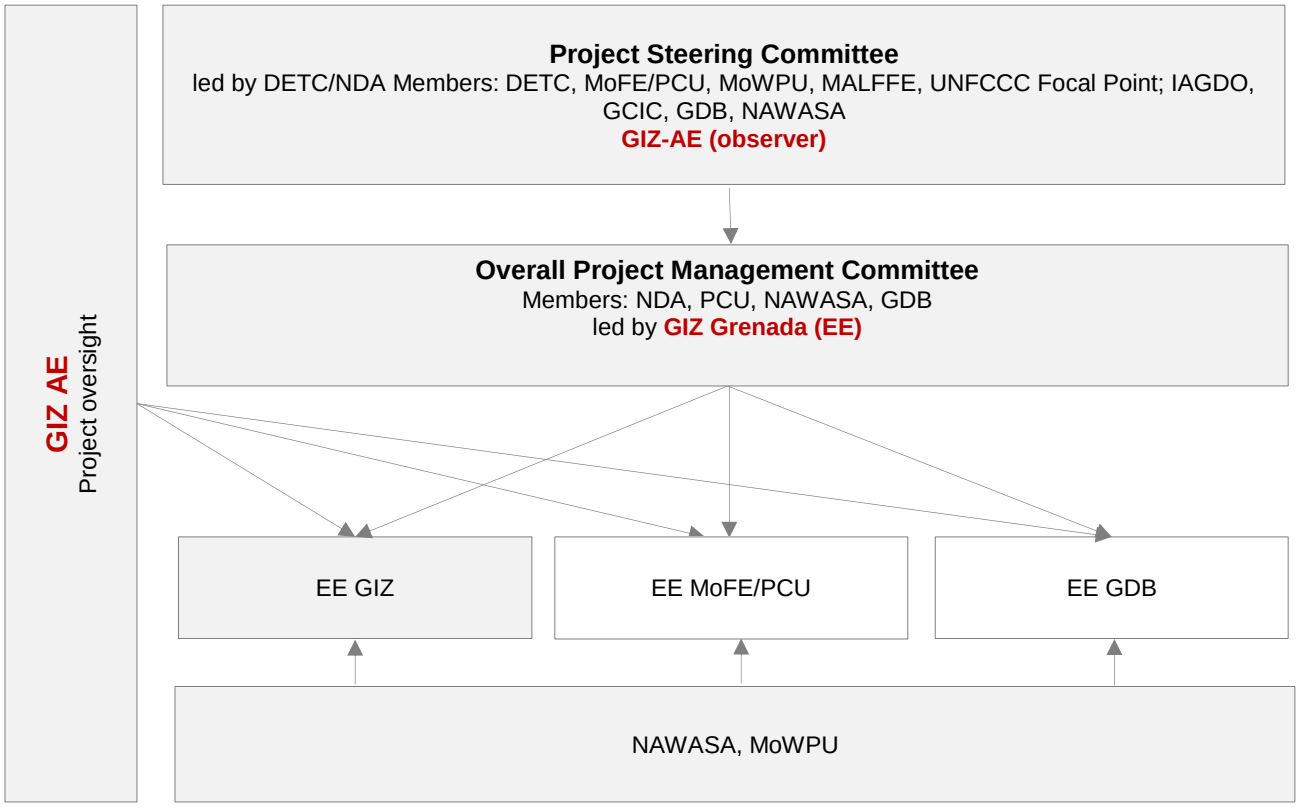
The PMC consists of the following members:

- The GDB's project manager
- The PCU's project manager
- NAWASA's project manager
- GIZ's head of project in Grenada (EE)
- Other relevant partners, according to need

The PMC will meet weekly with the following tasks:

- Define, monitor and coordinate work plans
- Ensure that budgets and work plans are on track and monitor project progress
- Identify and resolve bottlenecks and implementation challenges relevant on project level
- Monitor adherence to environmental, social and fiduciary safeguards
- Identify issues required to be brought to the attention of the PMC and/or political decision makers
- Provide for information exchange and synergies between programme components
- Agree on terms of reference, recruitment of experts

Organigram on the governance structure of G-CREWS Project



All construction and supervision works will be based on FIDIC standards as well as on recommendations of the ESMP and monitored by the PCU and NAWASA.

C.8. Timetable of Project/Programme Implementation

Please find the Timetable of Project/Programme Implementation in Annex 1.

D.1. Value Added for GCF Involvement

Grenada, as a small island developing state, is severely impacted by climate change. Water availability is one of the most vulnerable factors. As noted in the chapters above (see C.2 and C.3), the GoG is establishing the policies and strategies necessary for climate adaptation. However, without GCF involvement to complement ongoing efforts and address financial gaps, Grenada's water sector will not be able to effectively tackle the projected negative impacts of climate change and achieve urgently needed resilience. The Green Climate Fund is so far the only available climate finance mechanism that is able to contribute at the necessary scale for Grenada to achieve the following goals:

- *A Paradigm Shift towards a Climate-Resilient Water Sector*. Classic development partners usually focus on regional projects in order to curb transaction costs, which are inherent to operations at SIDS, and are reluctant to commit large investments to individual islands. Regional activities, by nature, face difficulties implementing holistic approaches on an individual island. Regional projects tend to focus on selected interventions, addressing either water governance, or water users, or the supply system, but do not maximize climate resilience through a holistic, coordinated and transformational approach while allowing for sufficiently long project durations. In addition, these classic parallel sectoral interventions often miss synergies and effectiveness, especially when it comes to actions that require considerable activity and presence on a local level. This applies to the combination of planning, awareness-raising and educational measures or the setting up of climate-resilient water governance structures with larger-scale investments to build climate-resilient infrastructure.
- *Bringing together Stakeholders and Knowledge from Various Sectors.* This is crucial for the project's success since interventions must be coordinated across different sub-sectors and partner organisations.
- *Feeding Lessons Learned into the Sectoral and National Planning Systems*.

The GCF is in a unique position to provide all elements required for the successful implementation of the G-CREWS project:

- Strengthening highest country ownership.
- Providing sufficient volumes of grant funding from international climate finance sources.
- Promoting cross-sectoral broad approaches that support a long-lasting paradigm shift towards a climate-resilient water sector.
- Implementing a resilient development path.

The GCF funding will ensure that one of Grenada's most vulnerable sectors significantly and systematically improves its resilience to climate-related shocks and climate-induced diminishment of available water resources, and that lessons learned can be fed into the national and regional agenda for climate adaptation.

D.2. Exit Strategy

Apart from the infrastructure investments, the G-CREWS project creates (a) conditions for long-term climate resilience of the water sector (beyond the project implementation phase and after 2050) and (b) sustainability of the project's impacts. This includes an enabling and incentivizing institutional environment, long-term (including climate-adapted) thinking by the various stakeholders and sound financial structures. The project design supports a systemic increase in the resilience of the water sector and the various stakeholders, which will ensure sustainable operation of the sector's institutions and infrastructure. The main features of the exit strategy thus are (i) institutional structures, (ii) behavioural change, (iii) financial sustainability within the water sector and (iv) cross-cutting measures.

(i) Institutional Structures

The establishment of a dedicated and independent WRMU to oversee and manage the country's water resources is an important pillar of the long-term sustainability of a climate-resilient water sector. The technical assistance for setting up and capacitating the new WRMU enables the institution to manage its processes sustainably throughout the project implementation phase and beyond. The key factor for long-term institutional success, however, is the cooperation

network that will be established through various interactions between line ministries, NAWASA, private sector organisations (e.g. the Grenada Industrial Development Corporation, the tourism sector), NGOs and the WRMU.
The WRMU's mandate will give it a clear impact on the climate resilience of the water sector, contributing to long-term institutional change towards more resilient water governance structures in Grenada. A strong governance and cooperation structure is the basis for the country's preparedness for future actions in the water sector to respond to climate change. The country focuses not only on new investments to overcome climate-induced water resource problems but also on overall reduction in water demand; flexible, climate-dependent water abstraction schemes and clear priority setting between sectors in case of water shortages. The paradigm shift brought by an improved water resources management structure will strengthen Grenada's ability to react to climate-induced water issues, far beyond the implementation of the G-CREWS project.

(ii) Behavioural Change

Water users are currently not aware of the saving potential and results of inefficient water usage. Through considerable investments in public awareness, education, regulation, capacity building and the Challenge Fund, the G-CREWS project will enable major behavioural changes on the part of water users (see C.3 for details). Eventually, the perception of water as an almost free good will transform into an understanding of water's true value in a world of climate change, an increased willingness to pay for water, and widespread use of water-efficient equipment and alternative water resources. Such behavioural change is essential to enable Grenada to react flexibly to future, currently only vaguely predictable challenges in the water sector. Water users will accept measures such as reduced pressure on water resources, creating more flexibility to react to future challenges.

(iii) Financial Sustainability

The current tariff structure does not provide sufficient funding for major infrastructure investments, which compromises NAWASA's ability to react to climate change. By establishing adequate tariffs for water supply, NAWASA will also become able to pay for future infrastructure development investments, such as the maintenance and replacement of the infrastructure built as part of the G-CREWS project. This will enable the sustainability of the G-CREWS project approach far beyond its implementation.
By carefully selecting technologies and measures, which do not increase but instead could even reduce NAWASA's operational costs, the G-CREWS project contributes to NAWASA's financial long-term sustainability. More flexible, seasonally adaptive water tariffs additionally allow for setting right incentives corresponding to the water availability.
The introduction of a long-term maintenance plan for NAWASA's physical assets will support timely and cost-efficient maintenance and repair of infrastructure, thus extending the assets' technical life and reducing the need for costly, large-scale early replacement. NAWASA will integrate revenues from the water-saving measures into a long-term financing strategy that allows for stable planning. The selected technological approaches to make the water sector climate-resilient should reduce NAWASA's operational costs, making long-term maintenance after the G-CREWS project financially and technically feasible.

(iv) Cross-Cutting Measures

The improved collection and management of climate and water data contribute to better decision-making and adaptation planning in the water sector after G-CREWS project is finished. On water demand side, the Challenge Fund for Resilient Commercial Water Users creates an understanding that water-efficient behaviour can save money, so replication can be expected. Furthermore, the Fund supports the development of a long-term technology market in Grenada (see E.2.3).
As a part of the Exit Strategy of the Challenge Fund, it is foreseen that water audits will become a mandatory element of the tri-annual audit by the Grenada Tourism Authority, to create a base for funding of water projects in the agricultural sector. Water efficiency will become a standard, which in turn reduces the need, urgency and investment costs for new infrastructure development. Mainstreaming of climate-resilience into policies, plans and regulations of water-related sectors ensure a long-term anchoring of adaptive approaches in a wider regulators framework, thus sustaining climate-

resilience beyond the project (see E.2.4). The knowledge management and learning approach to improve the capacities of the institutions and contribute to their sustainability is a key element of the G-CREWS project (see E.2.2).

E.1. Impact Potential

Potential of the project/programme to contribute to the achievement of the Fund's objectives and result areas

E.1.1. Mitigation/adaptation impact potential

The following table provides statistical data on beneficiaries of improved resilience brought about by the G-CREWS project:

Component	Beneficiaries	Adjustment factor	Calculated beneficiaries	Comments/justification of adjustment factor
1. Climate-Resilient Water Governance	Whole population (46.41 % female)	1	Approximately 107,317[28] 46.41 % female)	Whole population of Grenada, Carriacou and Petite Martinique will benefit from climate-resilient framework
2.1 Challenge Fund for Climate-Resilient Commercial Water Users	350 farmers 40 small hotels/ guesthouses 4 large hotels (share of female persons within target groups depends on individual investment decisions)	1	350 farmers with families, total estimate 1,500 persons 44 hotels and guesthouses with employees	No. of farmers and hotels: based on findings of the Challenge Fund Design Report (see Annex). Note: some farmers and hotels might invest in more than one technology outlined in the Challenge Fund Design Report, so the numbers stated here are rounded.
2.2 Awareness, Education and Outreach	Whole population (46.41 % female)	0	Approximately 107,317 (46.41 % female)	Whole population of Grenada mainland will benefit from climate-resilient framework, but already included above
3.1 Climate-Resilience of NAWASA's Supply Systems	Approximately 45'000 (46.41 % female)	0	Approximately 45,000 (46.41 % female)	Population supplied by the relevant water systems will benefit, but already included above
3.2 Disaster-Resilience in Medical Centres	Whole population (46.41 % female)	0	Approximately 107,317 (46.41 % female)	Whole population will benefit from incentives and improved regulations for rainwater harvesting
3.3 Disaster-Resilience in NAWASA's Systems	Approximately 27,000 (46.41 % female)	0	Approximately 27,000 (46.41 % female)	Population supplied by the relevant water systems will benefit, but already included above
4 Additional Contributions of the Water Sector to Grenada's NDC (funded by BMUB, Germany)	Whole population (46.41 % female)	0	Approximately 107,317 (46.41 % female)	Whole population will benefit from reduced water loss and operational cost of NAWASA
Total beneficiaries			**Approximately 107,317**	**This represents the whole population of Grenada, Carriacou and Petite Martinique.**

Note: The relative share of women in the total population masks their important role in domestic water management. Most single households are headed by women, and women bear an additional burden during water shortages, often

[28] Based on World Bank data: https://data.worldbank.org/indicator/SP.POP.TOTL?locations=GD

having to stay at home until water supply resumes. Women will thus benefit significantly from the increased resilience supported by the project.

Other adaptation impacts include the following:

- The G-CREWS project strengthens resilience on the governance level, contributing to enhanced climate-proof regulation and water resources management. The establishment of a Water Resources Management Unit as a national regulator and platform for exchange on water issues will enhance national adaptation planning capacities, as will the development of climate-proof policies, building codes and other regulations relevant to the water sector. The cross-sectoral representation on the Project Steering Committee will also facilitate inter-sectoral exchange and learning. Overall, the whole population of Grenada, Carriacou and Petite Martinique will benefit from these activities.
- Using a comprehensive communications, awareness and education approach to promote water users' climate resiliency, the project aims to promote and support climate-resilient behaviour patterns by the Grenadian population regarding water usage. It will do so by offering practical examples of how each person can conserve water. The effectiveness of the communications approach is supported by the link to the measures implemented as part of the G-CREWS project and the lessons learned, in both technical and financial terms. Again, the beneficiaries will be the whole population of Grenada, Carriacou and Petite Martinique.
- Through enhanced monitoring and measurement of rainfall and streamflow data, linked to other weather data, the G-CREWS project contributes to increased generation and use of climate information in national and water sector decision making. The installation of automated equipment linked to an online data system will provide the opportunity for systematic data collection, management and exchange among the various stakeholders, including NAWASA, the Water Resources Management Unit, the Forestry Division, researchers, etc.

E.1.2. Key impact potential indicator

Provide specific numerical values for the indicators below.

Other relevant indicators	The G-CREWS project will contribute to improved adaptive capacity and reduced exposure to climate risks for the whole population of Grenada. While the infrastructure component directly benefits those who are served by the respective infrastructure, more efficient use and reduced leakage also will benefit those in other geographical areas. The same holds for improved water resources management, a key issue on the national scale. Reduced vulnerability of the infrastructure to disaster risks also will be highly beneficial to all people in Grenada, since it ensures a faster re-start of the public water supply system and hence reduced costs for alternative supplies and reduced health risks.

E.2. Paradigm Shift Potential

Degree to which the proposed activity can catalyse impact beyond a one-off project/programme investment

E.2.1. Potential for scaling up and replication (Provide a numerical multiple and supporting rationale)

To achieve resilient levels of water demand and water supply, the sector has to undergo a comprehensive transformation on multiple levels. The G-CREWS project approach of combining interventions towards climate-resilient water governance, resilient water users and resilient water supply systems will help to achieve the necessary reduction in water demand and sustained water supply. It will hence enable the required paradigm shift to ensure the climate resilience of Grenada's water sector.

The G-CREWS project's potential for scaling up and replication within the tri-island state is almost exhausted due to the project's comprehensive scope, which already covers most of the critical issues regarding the climate resilience of the water sector of the entire country. However, follow-up investments, both from commercial users after sharing the lessons

learned from the Challenge Fund for private sector resilience and also through NAWASA's improved financial possibilities (e.g. additional rainwater collection and storage tanks in Carriacou and Grenada), have been identified as potential replications derived from G-CREWS. The pre-feasibility studies have identified six locations with an additional investment need of approximately EUR 600 000, which could be funded through NAWASA.

Some residual potential lies in its regional replication, in particular as a best practice case for other small island developing states in the Caribbean and possibly also the Pacific. Most Caribbean SIDS face similar vulnerabilities in the water sector, and the lessons learned from the implementation of the G-CREWS project in Grenada could contribute to an approach that can be replicated throughout the region, thus paving the way for improved water sector resilience also in other countries. This can be facilitated by exchange platforms on the sub-regional and regional levels, using the Organisation of East Caribbean States (OECS) and the Caribbean Community (CARICOM) will facilitate such an as hosts for the exchange. There are already established exchange platforms, such as in the OECS Council of Environment Ministers, or the CARICOM Ministers of Environment exchange, which take place on an annual basis (see component 5).

E.2.2. Potential for knowledge and learning

The comprehensive approach to knowledge and learning is a key element of the G-CREWS project. The capacity building of the new Water Resources Management Unit (WRMU) will contribute to knowledge creation and exchange across the various partners involved in the water sector.

On the level of climate information and data, the WRMU will undertake intensive efforts to compile, process, analyse and match hydro-geographic data with climate data to better understand the interdependencies and processes of the Grenadian water resources with climate variability. This will create sound evidence for strategic decision-making in the entire water supply sector.

The WRMU also supports knowledge and learning on a broader level, since it will act as the climate change and water resource information platform for all stakeholders in Grenada, in particular farmers, households and private businesses. This supports the creation of climate-resilient water users as one key element of a climate-resilient water sector, and it will improve the transparency in the sector in the broader public interest. This process will have strong synergies with awareness campaigns, education and capacity-building efforts to create awareness on water supply challenges and on solutions for improved water users' behaviour.

The link to agriculture and tourism within the Challenge Fund will support cross-sectoral learning and knowledge transfer. This is further supported through the management, steering and reporting structure of the project, which will ensure the participation of national institutions like the National Climate Change Committee (NCCC) or umbrella organisations of private sectors and civil society. This will contribute to build other sectors' and stakeholders' capacity for adaptation planning.

Finally, knowledge and learning is an important feature supporting regional replication through the establishment of a learning and exchange platform in cooperation with regional organisations like the OECS and CARICOM (see component 5).

E.2.3. Contribution to the creation of an enabling environment

The G-CREWS project introduces for the first time in Grenada a funding scheme for water-efficient solutions and technologies in two of the main commercial sectors: tourism and agriculture. By providing incentives for auditing services and equipment procurement, the Challenge Fund supports the creation of an enhanced market for efficient irrigation systems, rain-water harvesting systems, shadehouses, greywater recycling facilities and efficient bathroom equipment. The information and awareness campaigns additionally support an improved market environment by educating potential buyers of above mentioned equipment on respective benefits such as water and cost savings.

The new coordination mechanisms ensure broad participation of public actors of various sectors in decision-making on a climate-resilient water supply system. The G-CREWS project will put an emphasis on sustaining the cross-agency cooperation beyond the programme in order to have in the long-term a reliable decision-making system for additional adjustments to the water supply system in the future.

E.2.4. Contribution to regulatory framework and policies

The G-CREWS project play an important role in developing and implementing a new and modern regulatory framework, which (a) improves water governance and the water sector policies, and (b) mainstreams climate-resilience into water-related sector policies, plans and regulations. This includes the finalisation and approval of a new water resources management act and corresponding policies. This will establish WRMU as a regulatory body outside NAWASA, thereby ensuring the abolition of any potential conflict of interest between water resources abstraction and water supply tasks. The G-CREWS project also supports the mainstreaming of climate resilience into water-related sector policies, plans and regulations, such as forestry, land use, agriculture and housing. Eventually, these changes to the regulatory framework and policies lead to an improved water sector governance and the integration of climate resilience into all water-related sectors in Grenada. Specifically, the inclusion of water efficient equipment for households and business and rain-water harvesting as a new requirement in the building codes sustains the technology market development, even beyond the project timespan. This is further supported by the introduction of tax breaks for above mentioned technologies.

The envisaged climate-responsive water tariff reform sets additional new incentives for water saving and contributes to the financial sustainability of the water supplier NAWASA, thus increasing the long-term stability of the entire water system and its operator.

E.3. Sustainable Development Potential

Wider benefits and priorities

E.3.1. Environmental, social and economic co-benefits, including gender-sensitive development impact

Economic Co-benefits

Tourism and agriculture are two of the biggest contributors to Grenada's GDP and employment. Both economic sectors depend heavily on reliable water supply and water resources management. Shortages in water supply will have major negative impacts on tourism, a sector highly reliant on water. Declining rainfall and more frequent droughts translate into decreasing agricultural yields, which leads to reduced income for farmers and declining food security. The agricultural sector also provides food and agricultural products for the tourism sector, further intensifying that sector's vulnerability. Records show, that two major droughts in 1995 and between 2009 and 2010 caused substantial losses in these two sectors. Providing water supply and water resources management will support economic growth, create jobs, raise the average income and thus increase purchasing power. It will also support food security and promote agriculture. The G-CREWS project addresses substantial future economic losses due to climate-induced and natural hazards. In an assessment of the economic impact of climate change on the water sector in Grenada, a UN ECLAC (2011) study estimated that in 2050, adverse climate change impacts could cause costs and damages 61 times higher than the costs of adaptation measures.

Social Co-benefits

The project reduces the population's vulnerability to water scarcity in general, in particular that of low-income groups without access to piped drinking water and storage facilities. The population of Grenada already faces water scarcity today, mainly around the end of the dry season. Low-income households not connected to the supply network or with no or very small storage capacities are highly vulnerable to droughts and interruptions in supply. The project therefore contributes to social development by expanding access to drinking water for vulnerable groups. The project also contributes to public health by reducing water-related diseases, because protection and safeguarding of water sources, covering of water storage facilities, and faster leak repair in the distribution network prevent contamination. The project focuses on increasing the water-related resilience of medical centres, as these were assessed as highly vulnerable.

Environmental Co-benefits

Grenada's environment will generally benefit from implementing the G-CREWS project, in particular because water efficiency measures will considerably reduce water loss and water wastage. In order to satisfy the water demand of the

economy and population, less ground- and surface water will need to be extracted, thus decreasing stress on the overall water regime and making it more climate-resilient. As a result, local flora and fauna will benefit from a more natural water balance and will be less subject to water stress during water scarcity. Additionally, improved distribution facilities will lead to reduced pumping requirements from groundwater sources, thus reducing electricity consumption and greenhouse gas emissions. Moreover, the climate-resilient water governance approach leads to environmental benefits, since it ensures that environmental issues will be considered, for example, when abstraction licences are issued or adjusted during longer dry spells. Whereas previously the potential conflict between water abstraction and environmental protection had to be dealt with by the utility, whose objective is to provide water, a separate regulator could also enforce abstraction limits and hence force water users to focus more on water efficiency and not only on additional abstractions.

Gender Sensitive Development Impact

See Gender Analysis in Chapter F3.

Project Contributions to the Sustainable Development Goals (SDGs)

SDG-1 End poverty in all its forms everywhere.
Through contributions to protecting the poor and vulnerable against climate-induced and natural hazards, promoting economic growth.

SDG-2 End hunger, achieve food security and improved nutrition and promote sustainable agriculture.
Through improving the resilience of the agricultural sector against climate variability and change.

SDG-3 Ensure healthy lives and promote well-being for all at all ages.
Through health-benefits of a climate-resilient water sector in general and improving drinking water storage capacities in health centres.

SDG-6 Ensure availability and sustainable management of water and sanitation for all.
Through increasing the systemic climate resilience of Grenada's water sector.

SDG-9 Build resilient infrastructure, promote inclusive and sustainable industrialisation and foster innovation.
Through upgrading, retrofitting and increasing the systemic climate resilience of NAWASA's water supply infrastructure and systems.

SDG-11 Make cities and human settlements inclusive, safe, resilient and sustainable.
Through targeted measures for improving the resilience of the water sector against natural and climate-induced disasters and shocks.

SDG-12 Ensure sustainable consumption and production patterns.
Through promoting sustainable water demand of households and businesses at a level that contributes to climate resilience.

SDG-13 Take urgent action to combat climate change and its impacts.
Through this project's main goal of being an adaptation project.

SDG-14 Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, halt and reverse land degradation and halt biodiversity loss.

Through reducing future stress caused by over-abstraction of groundwater, and through supporting the establishment of a Water Resources Management Unit to manage and monitor water extraction permits and implement water-related environmental impact assessments.

SDG-16 Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels.
Through supporting institutional reform through the establishment of a Water Resources Management Unit and additional monitoring and reporting of water-related data, which improves checks and balances between public mandates for water production and demand management.

E.4. Needs of the Recipient

Vulnerability and financing needs of the beneficiary country and population

E.4.1. Vulnerability of country and beneficiary groups (Adaptation only)

GIZ assessed Grenada's vulnerability as medium with a trend towards high. This is in agreement with publicly available vulnerability indices: The Notre Dame Global Adaptation Index, for example, ranked Grenada at 61 with a declining trend (down from rank 43 in 1995).

Negative climate change impacts are likely to become more pronounced in the coming decades – particularly due to projected declining trends in precipitation (up to -20 % annual mean in the 2050s), more droughts and heavy rainfall events, and more intense storms.

If Grenada is not able to increase its resilience soon, negative climate change impacts will increasingly affect the entire population. The main impacts will include reduced availability of water, increasing heat stress and environmental hazards caused primarily by droughts, heavy rainfall events and tropical storms. These impacts are already a reality in Grenada today. In 2009 and 2010, a prolonged drought caused widespread disruption in the water sector, resulting in substantial losses in crops and livestock. Some communities on the island saw their water supply decline by over 40 %. Two hurricanes hit Grenada directly, Ivan in 2004 and Emily in 2005. The storms brought catastrophic destruction to Grenada's population, economy, and public sector. Over 40 lives were lost, 90 % of the islands' homes destroyed and the damages exceeded 200 % of Grenada's GDP.

Among Grenada's population, low-income households, women-led households, the elderly as well as women and girls in general are particularly vulnerable. One underlying reason is the segregation of roles for women, men, and children resulting in, for example, unequal access to financial resources and decision-making about natural resources as well as increased burdens for women in managing the household especially in times of droughts or disasters.

Grenada's economy is vulnerable, because it relies heavily on tourism and agriculture (see C.1). Both sectors depend on water availability, favourable weather, infrastructure, and coastal ecosystems.

In addition, Grenada's public finances are constrained by a severe debt burden and are unable to provide the necessary fiscal space for investments in enhancing the islands' resilience (see B.1 for details).

E.4.2. Financial, economic, social and institutional needs

<u>Addressing of Economic and Social Development in Grenada</u>

Grenada has a very high poverty level, as outlined in Chapter C1. Low-income groups are highly vulnerable to the water-sector related impacts of climate change. Since they cannot afford private storage tanks, insufficient and frequently interrupted supply are heavily affecting them. In this regard, investments in improved water resources management, additional storage at NAWASA systems and improved water facilities at medical stations will be particularly beneficial for low-income groups. The integration of social and poverty considerations in the determination and structuring of the new water tariff will ensure that low-income groups remain protected from an un-affordable water tariff.

In addition, the support for water efficiency measures will help to mitigate water availability risks and business risks for the tourism and water sector. Since these sectors directly account for approximately 20 % of the jobs in Grenada, with many more jobs in the supply chain of the tourism industries, there are positive effects in terms of secured employment.

<u>Fiscal Gap, Concessionality and Local Capital Markets</u>

The capital market in Grenada is not in a position to finance such a project like G-CREWS. NAWASA has limited ability to provide the funding itself and local banks and credit unions in general are small and lack management capacity. For the end users, especially farmers, access to finance is difficult. Banks and credit unions consider farming a high-risk sector, due to weather dependency, lack of insurance against extreme climate events, crop diseases, production gluts and volatile prices. They thus are unwilling to provide financing for such purposes. Furthermore, under the current water tariff systems, the saving potential does not lead to sufficient positive results for cash flow of potential lenders. Given the level of risks and impacts and the country's economic and financial situation Grenada is not in a position to fund necessary adaptation

measures. There is therefore a strong need for investments and other interventions to make Grenada's water sector resilient to climate change. The G-CREWS project approach of combining interventions towards climate-resilient water governance, resilient water users and resilient water supply systems addresses this need. It fosters a paradigm shift in Grenada's water sector towards climate resilience and helps overcome the challenges in meeting the quantity and quality of water needed to meet social and economic development needs in times of climate variability and change.

Strengthening Institutions

Institutional strengthening needs will be addressed by creating a department within the government, which is dedicated to the management of Grenada's water resources. Currently, the management of Grenada's water is a responsibility of NAWASA, the country's water supplier. An objective of the G-CREWS project is to delegate the authority for water resources management from NAWASA to a yet-to-be-founded department of government to avoid strategy conflicts. The newly created department of government will be responsible for protecting water sources, monitoring water sources and water quality, and issuing water abstraction licences. This new division as well as NAWASA will undergo major capacity-building programmes in order to be fully prepared for the challenges in making Grenada's water sector climate-proof. In addition, the Executing Entities, GDB and PCU, will benefit from capacity building to prepare themselves for similar projects in the future. This is particularly relevant for GDB, which has been nominated as Grenada's potential Direct Access Entity (DAE) to the GCF, and hence will benefit from the involvement and capacity building in the G-CREWS project.

E.5. Country Ownership

Beneficiary country (ies) ownership of, and capacity to implement, a funded project or programme

E.5.1. Existence of a national climate strategy and coherence with existing plans and policies, including NAMAs, NAPAs and NAPs

Grenada's Climate Change Policies and Strategies

The G-CREWS project is aligned to national priorities concerning climate change adaptation (compare feasibility study/VA). The Government of Grenada and all relevant stakeholders fully agree that climate-resilient water supply is a priority for the country's survival. This can be seen in the role the water sector plays in the following key national documents when it comes to climate change:

Initial National Communication (INC 2000)

Grenada's Initial National Communication to the UNFCCC, submitted in the year 2000, included a comprehensive vulnerability assessment of 'what is currently known about Grenada's vulnerability' (INC 2000). The INC clearly identified Grenada's water sector as an adaptation priority based on a plausible vulnerability assessment taking a then-limited data situation and scientific uncertainty into account.

National Climate Change Policy and Action Plan 2007-2011 (NCCP-AP 2007)

Grenada produced the NCCP-AP in 2007. Concerning Grenada's vulnerability, the NCCP-AP mostly referred to the INC's assumptions and assessments, including global climatic trends obtained from the contemporary IPCC reports, very limited national data, stakeholder consultations and regional studies for the Caribbean. It also identified the water sector as one of Grenada's most vulnerable sectors, confirming the water sector as a policy priority.

(Intended) Nationally Determined Contribution (2015)

In 2015, Grenada submitted its Intended Nationally Determined Contribution (NDC 2015) to the UNFCCC Secretariat in the wake of negotiations for the Paris Agreement. Grenada signed and ratified the Paris Agreement on 22 April 2016. The NDC is thus an essential cornerstone of Grenada's climate change policy. Grenada's NDC identified water resources management as one of four priorities for adaptation action (NDC 2015). The rationale is that a resilient water sector is 'crucial to the long term development of Grenada as a nation' and that 'improved capture, storage, distribution and conservation of water increases the adaptive capacity of individuals and communities'.

National Adaptation Plan (NAP 2017 draft)

In May 2017, a final draft of Grenada's National Adaptation Plan (NAP 2017 draft) was ready to be forwarded to the Cabinet for approval. Its function is to provide a strategic, coordinating framework for building climate resilience in Grenada, recognizing the need to develop the enabling environment for climate change adaptation as well as programmatic priorities. It is a five-year plan (2017-2021) with 12 multi-sectoral programmes of action (PoAs). The NAP dedicates the entire PoA 3 to 'Water availability', including a detailed and budgeted list of recommended activities and a budget estimate of approximately USD 50.2 million. All activities foreseen within the G-CREWS project are included in the PoAs.

National Climate Change Policy for Grenada, Carriacou and Petite Martinique 2017-2021 (NCCP 2017 Draft)

The NCCP-AP 2007-2011 was revised in 2016 and is in the process of submission to the Cabinet as of June 2017. One of the objectives of the new National Climate Change Policy for the period 2017-2021 is to build climate resilience in the following priority thematic areas: water supply and sewage management; agriculture, agri-business and food security; biodiversity and ecosystems; and human health and coastal zone management. The NCCP 2017 aims to support the reduction of water outage times during flooding and droughts, increased domestic and corporate usage of water conservation/efficiency measures, and reduced incidence of incompliant surface, sub-surface and coastal water quality.

Conclusion

The water sector is clearly a climate change policy priority for the Government of Grenada. It was underscored as a vulnerable sector and a priority area for adaptation action in all existing climate change policies. In addition, two specific vulnerability assessments for the water sector were undertaken.[29] Hence, it can be stated that the policy-related leadership and ownership of the Government of Grenada was high and provides a strong justification for preparing the G-CREWS project.

In addition, Grenada started to embark on a process to mainstream climate change in national policy some years ago. Since 2013, supported by the German-Grenadian pilot programme ICCAS, a number of activities in this regard have been accelerated. Climate change is mainstreamed in the National Growth and Poverty Reduction Strategy and in the new National Development Strategy 2015-2030, which is currently being developed. Also, a more systematic approach to climate risk assessments based on the Caribbean Climate Online Risk and Adaptation Tool (CCORAL), developed by the Caricom Community Climate Change Centre (CCCCC), has been introduced and is now mandatory for all new project proposals which are put into the national budget. A new Coastal Zone Policy has been developed in a very consultative process, with more than 200 stakeholders and individuals contributing to it. More than 30 stakeholders from the private and public sectors, civil society and government have participated in training courses on climate finance readiness.

E.5.2. Capacity of accredited entities and executing entities to deliver

GIZ is one of the largest international providers of capacity development and technical assistance on climate change worldwide. More than 12 million people around the world have gained access to sustainable and climate-friendly energy through the Energising Development Programme initiated by Germany and the Netherlands. Examples of large-scale changes supported by GIZ include the integration of adaptation to climate change into an internationally funded development strategy for Morocco, involving investments of more than USD 1.2 billion. In Mexico, GIZ developed one of the world's first NAMAs. GIZ has supported several countries in preparing their NDC. With its interventions, GIZ also builds prerequisites for large-scale investments by public and private banks and investors. GIZ is currently carrying out over 300 climate-related projects with a combined funding of over USD 1.9 billion. Mitigation and adaptation are reflected with equal shares in the GIZ portfolio supplemented by activities on climate financing. A significant part of GIZ's work is implemented in least developed countries and small island developing states.

GIZ has been working in the Caribbean for more than 30 years. Within the scope of several projects, GIZ is supporting the efforts of Caribbean states to cope with challenges especially in adaptation to climate change, reduction of greenhouse gas emissions, sustainable use of natural resources and renewable energy, natural resource conservation and coastal

[29] UN ECLAC 2011; NASAP 2015.

zone management. In addition to the German Federal Ministry for Economic Cooperation and Development (BMZ), other donors, including the German Federal Ministry for Environment, Nature Conservation, Building and Nuclear Safety (BMUB) and the European Union, are also involved in cooperation with this region. The GIZ country office in the Dominican Republic primarily manages transnational programmes with regional partners, including the Caribbean Community and Common Market (CARICOM), cooperation with Haiti and cross-border measures involving the Dominican Republic and Haiti.

GIZ has been implementing projects in Grenada for the past 20 years, mostly as part of larger regional approaches. However, since 2013 GIZ is active in Grenada on a bilateral level, focusing on climate change projects, especially climate change adaptation and climate finance. The daily cooperation with the Grenadian counterparts allowed for the building and supporting of local capacity. This cooperation is based on openness and trust across ministerial borders – a key to implementation of a project bringing a paradigm shift in a sector, closely interlinked with many other sectors. Grenada itself has considerable experience in implementing climate change projects, including larger scale approaches like the Disaster Risk and Vulnerability Project (DVRP), which is part of a regional PPCR approach funded by the Climate Investment Funds (CIF)/World Bank. This project is implemented by the MoFE through the Project Coordination Unit (PCU), especially set up for this project. Since 2013, the Environment Division of the Government of Grenada has been implementing the ICCAS project jointly with GIZ and the UNDP. This technical assistance project, which also supports the establishment of a Community Climate Change Adaptation Fund, has an overall project volume of EUR 6.8 million, funded by the German Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety (BMUB) under the International Climate Initiative (IKI). Grenada is about to embark on improving its climate finance readiness. It recently submitted to the GCF Secretariat a Readiness Support Request, which it plans to implement with GIZ as the delivery partner. Grenada has also nominated GDB as its potential Direct Access Entity for GCF, and GIZ is supporting key steps towards the accreditation of GDB.

For more information on executing entities, see Chapter C.4.

E.5.3. Engagement with NDAs, civil society organisations and other relevant stakeholders

Stakeholder Engagement

The NDA of Grenada and NAWASA have been involved from the beginning of the G-CREWS project's design and development phase as a potential GCF project and as part of the Grenadian Water Programme. Both entities contributed to the technical and institutional design of the G-CREWS project and closely collaborated with GIZ in finalising the project proposal.

The project idea has been proposed as an outcome of a climate-finance readiness mission by GIZ and the CDB that included consultations with approximately 100 stakeholders in Grenada. Since then, it has been discussed with various stakeholders, including NGOs, and was presented in various stakeholder meetings, including a training session on accessing climate finance with participants from the public sector, private companies, national funding institutions and civil society. Drafts of the project proposal have been presented in meetings of the Sustainable Development Council (SDC), a nationwide open platform to discuss critical climate change, sustainability and environmental issues. The private sector, public sector, civil society and schools form part of the SDC. These meetings took place in October 2015 in St. George's; on 2 March 2016 in Sauteurs (in the northern part of the country); on 9 March 2016, again in St. George's; and on 15 March 2016 in Grenville (east coast).

During the consultations for the Environmental and Social Impact Assessment, representatives from various ministries, NGOs, private sector and other donors and implementing entities discussed the project's approach and content. These consultations took place on 5 and 19 May 2017. In addition, approximately 20 bilateral meetings with key stakeholders have been held. All consultations and workshops' meetings included members of the NCCC, which is composed of 13 members of different public authorities and ministries, chaired by the permanent secretary of the Environment Division of the Ministry of Education, Human Resource Development, and the Environment and managed by Grenada's climate change focal point. The discussion with the NCCC also included co-opted members of the NCCC's Adaptation Sub-committee. The proposal also has been discussed with the Grenada Chamber of Commerce and Industry and the Grenada

Tourism and Hotel Association. For the development of the Challenge Fund element of the proposal, approximately 45 persons have been consulted, mainly from the agricultural, tourism and financial sectors.
In all discussions, the project was perceived highly positively, and it was given the highest priority by the Grenadian Cabinet.

Plan for Multi-stakeholder Engagement

Grenada's NDA has developed a draft plan for consultations with key stakeholders with regard to GCF processes. According to that plan, non-governmental stakeholders will be regularly informed (such as in meetings of the SDC), about the project's approach and progress. In addition, regular reporting to the NCCC will ensure effective information flow to all relevant governmental stakeholders as well as to other climate change projects currently implemented. The Project Steering Committee's diverse membership, which includes a wide range of stakeholders, will also contribute to the dissemination of information about the G-CREWS project to various target groups, as well as the reception of feedback from them. Many of these groups are also represented in the G-WASP, founded in 2016 to reduce local water risks for the private sector through tripartite partnerships (private, public and civil society), to ensure that local communities also benefit from proposed solutions. Finally, based on the comprehensive awareness and education activity, numerous activities are foreseen to inform the public about the G-CREWS project.

E.6. Efficiency and Effectiveness

Economic and, if appropriate, financial soundness of the project/programme

E.6.1. Cost-effectiveness and efficiency

The G-CREWS project's strong focus on Cost-Effectiveness and Efficiency manifests in a number of elements:

- The Project includes an optimized mix of interventions for a paradigm shift towards a climate-resilient water sector: policy and governance measures, involvement of private sector for water efficiency, support for infrastructure investments and broad communication and awareness activities. This combination allows the maximization of synergies and minimization of costs. In particular, it ensures that the full population benefits from the project through increased resilience, while hard infrastructure measures are kept to the minimum.
- A strong focus on resilience through water demand reduction helps avoiding investments in often costly additional water production capacities. This is particularly important when considering the trend towards reduced precipitation – which could result in the adoption of costly technologies like desalination for drinking water supply.

The investment costs for the climate-resilient water sector are approx. 350 EUR per capita. These costs can be deemed as acceptable, considering the broad range of interventions (technical assistance, awareness building, private sector involvement, capacity building, infrastructure and institutional development), and the generally high per-capita costs of project implementation in SIDS due to small population.

International competitive bidding for most infrastructure and consultancy works and national competitive bidding for some small-scale applications ensure that selection of contractors is quality- and cost-based, and that funds are spent efficiently.

The GoG is seeking grant-funding to alleviate severe climate-induced risks related to drinking water availability for the entire population of Grenada, including particularly poor and vulnerable groups, and the two largest and highly vulnerable economic sectors: tourism and agriculture.

The GCF grant is used to overcome the Government's recent constraints to source public funding or assume additional debt to invest in urgently needed adaptation measures for the water sector. The landfall of two hurricanes, Ivan in 2004 and Emily in 2005, came as catastrophic shocks to both the people and the economy of Grenada, with an estimated damage equivalent to 200 % of GDP. In addition, Grenada's tourism-based economy was heavily hit by a decrease in the number of visitors during the global financial crisis. These series of shocks led to the tri-island state's inability to service its debt in 2013, leading to a lengthy debt restructuring process assisted by the Extended Credit Facility Support Programme of the International Monetary Fund (IMF). According to the IMF, the Government was able to reduce debt from 114 % of GDP to 83.4 % in 2016. Despite Grenada's impressive achievements in fiscal consolidation, the IMF noted

a number of outstanding challenges: public debt is still considerably high and Grenada remains vulnerable to shocks. Therefore, Grenada has to stay on the current fiscal path of fiscal prudence until various reforms yield expected results. This means Grenada must continue avoiding any burden on public debt. The GoG has formulated a clear commitment to continue reducing its debt to 60% of GDP in the coming years.

The limited public financing available and the constraints regarding Grenada's ability to take on additional debt are hindering the country's implementation of long-term adaptation measures in its water sector. The Government of Grenada, with a current debt burden of around 900 million USD, seeks maximum concessionality from the GCF (100 % grant) to undertake the proposed adaptation investments.

E.6.2. Co-financing, leveraging and mobilized long-term investments (mitigation only)

Not applicable.

E.6.3. Financial viability

As can be seen from the Economic and Financial Analysis, while G-CREWS produces significant environmental and social benefits, the same cannot be said for financial returns. Therefore the Government of Grenada and NAWASA decided to provide co-financing, mostly for the water resource management unit and land acquisition, but also in-kind thorough own staff input. In addition, GoG and NAWASA will purchase improved water meters to support higher accuracy in water billing, which has positive impacts on financial and environmental terms.

The project's outputs are focusing mostly on public goods (see Economic Analysis) and therefore do not entail sufficient revenues to ensure full cost recovery. The only portions of the project that lend themselves to revenue generation are activities 3.1 and 3.3, which involve cost recovery via tariffs.

The financial analysis shows that these activities produce negative financial IRR in the base case. Only when using more optimistic assumptions, in particular a significant reduction in capex costs, financial IRR becomes only slightly positive (approx. 1.8%). A poor financial IRR supports the need for a grant, especially considering the positive economic rate of return of the project.

For the details of the economic and financial analysis, please refer to section F.1.

Financial Sustainability of new Infrastructure (Activity 3.1 and 3.3)

In parallel with infrastructure investments, G-CREWS envisages the study and implementation of a water tariff reform. This will be crucial for the long-term sustainability of new water infrastructure.

By supporting the development and implementation of a new tariff structure for NAWASA a transformative shift in pricing – with more flexible water tariffs responding to temporary scarcity – would be supported. Block tariffs will ensure that the poor are not affected and heavy users are taxed more effectively. The planning and implementation of capital investments required due to climate change impacts will no longer be governed by the availability of external funding. Hence, NAWASA can more flexibly integrate challenges due to climate change in their infrastructure planning. This allows for a sustainable water management in the long run. In addition, a transparent and effective tariff structure will help, in parallel to the introduction of a mix of respective regulations, incentives and showcases to further catalyze private financing beyond the project lifetime.

New tariffs will require several years to be introduced. During the first 2 years of the project, it is assumed that existing tariffs will continue to apply. On this basis, NAWASA will realize an additional gross margin from the new infrastructure (tariff revenues and WRMU abstraction fees less operating costs) of approx. EUR 200,000, significantly lower than infrastructure depreciation of approx. EUR 700,000 p.a. (based on 30-year useful life of equipment). Only much later in the project period, when tariffs increase, will margins increase to a level that covers depreciation. For instance, assuming a 35% tariff increase in year 3 (in line with the percentage increase implemented in 2010) and a subsequent 12% increase every 5 years to match inflation, only in year 13 would gross margin roughly equate depreciation charges. During this entire period, the project would not generate any additional surplus to allow for debt service (interest payment and

amortization of principal). On this basis – and reiterating that all other project components do not generate any revenues whatsoever – a grant is deemed as the most appropriate GCF tool for G-CREWS.

The objective of G-CREWS project is to initiate a paradigm shift also in the way the sector's infrastructure investments are funded in the future. A first tariff increase is planned to be introduced in year 3 of the project, after all necessary studies have taken place, and after first investments have contributed to a more sustainable and less frequently interrupted water service, even in times of scarcity and after heavy rainfall events. These investments will help to create additional acceptance by the customers as well as by the decision-makers for higher tariffs, which are the first step towards long-term full cost recovery. The initial grant is necessary to initiate this virtuous circle of better service, increased tariff acceptance, higher revenues and enhanced ability of NAWASA to fund future long-term investments.

Financial Sustainability of WRMU (Activity 1.1)

Setting up and running a Water Resources Management Unit (WRMU) induces additional annual costs, which either have to be borne by the budget of the Government of Grenada (GoG), or some other sources.

The establishment of the WRMU in terms of concept development, support for legislative amendments, capacity building and equipment is mainly covered through the G-CREWS project, and the initial staffing through the GoG budget.

However, medium-term operational costs, including staffing costs, would have to be financed independently from development partners or government budgets. Instead, in order to ensure sustainability, the funding for the WRMU should come from within the water sector. This can be achieved by charging an abstraction license fee per gallon of water to the institutions and persons requesting such a license.

The budget for the WRMU totals EUR 0.255 million p.a. Given that NAWASA is abstracting 2.4bn gallons annually, the WRMU cost per 1,000 gallons is approx. 0.32 XCD, or 1.7% of the current average sales price per 1,000 gallons. The water abstraction of other stakeholders in the sector, including agriculture and beverage companies, is not known yet. However, if they are included as payers for the WRMU, the additional cost burden compared to the current average water tariff would further decrease. But even without this, it is assumed that costs of 1.7% of the current average sales price would not negatively affect the ability to pay by the NAWASA customers. Sustainability of the funding for the WRMU is more likely ensured through this approach than, for instance, government budget funding in the long term.

E.6.4. Application of best practices

The G-CREWS project combines in an innovative way institutional development, financial sustainability, technological solutions and private sector involvement to achieve the transformational change required to make Grenada's water sector climate-resilient. The combination of such a multi-level approach to adaptation has been tested in the BMUB-funded project Integrated Climate Change Adaptation Strategies and has proved very effective in a small-island state like Grenada. The project also benefits from links with the International Water Stewardship Programme (IWASP), which successfully cooperates with the private sector, public sector and civil society in a number of countries, including Grenada, to reduce water risks.

Technically, the project is in line with industry best practices. The proposed technologies for water production and storage are reliable, appropriate and used in Grenada. The operation of the installations is simple and cost-optimised.

However, best practices also will be considered in the non-technological components. The separation of the roles for the water utility (in particular water supply to the customers) and water resources management (in particular assessing and monitoring the quality and quantity of water resources, issuing licences, etc.) is based on best regulatory practice in many countries worldwide. The same holds true for the adjustments to the water tariff structure to allow for full-cost recovery (while integrating social safeguards to protect the most vulnerable), which in turn allows for long-term investments in capital projects from NAWASA's own financial resources.

For a detailed discussion of the technology, see F2.

F.1. Economic and Financial Analysis

Economic Analysis

Incremental Economic Rate of Return (IERR)

Based on the severe vulnerability, investments which make Grenada's water sector climate resilient show in principle a high economic return. Bueno et al (2008), cited in UN ECLAC (2011), computed an economic return for water sector investments in Grenada of 3.2 USD for each USD invested, for the period up to 2025, using an investment of 45 million USD to avoid climate change costs of 141 million USD. These climate change costs include water shortage and respective costs, health costs, agricultural costs etc. However, many of these benefits cannot be easily monetized and used for cost recovery. Hence, whilst the overall economic and social viability of G-CREWS as an adaptation project in the water sector is good, the Financial Analysis shows low financial rate of returns.

The economic analysis compares a "with project" and a "without project" scenario over a 30-year period to identify the incremental costs and benefits associated with the infrastructure investment elements of the project. Without the project, NAWASA will be unable to provide a safe and reliable water supply in Grenada in the medium to long-term, considering the impacts of climate change on water resources. People in Grenada will be affected by the inadequacy of water supply, both in terms of supply intermittency and water quality, which would result in using alternative sources and in potential health impacts. In addition, farmers do not have sufficient water for irrigation, resulting in major crop losses.

The assessment of the economic benefits of the G-CREWS project are based on the benefits from having a sustainable access to safe water supply also under a climate change scenario. Due to limited data availability, the Economic Analysis concentrates on savings in three key areas: (i) Reduced health costs, (ii) Reduced costs for trucking water, (iii) Reduced drought costs in agriculture.

(i) Reduced Health Costs

G-CREWS will ensure a sustainable water supply for the population of Grenada even under climate change conditions as indicated in the Vulnerability Assessment, thus reducing the likelihood of water-borne diseases. During the wet season in particular, poor water quality with high turbidity after heavy rains is the most critical aspect. During the dry season, limited freshwater availability and intermittent supply pose the biggest challenges. Data from Grenada showed a correlation between heavy rainfall and Acute Gastroenteritis (AGE), and various international studies highlight the link between AGE and higher temperatures and more severe dry conditions (GoG 2017).) A study looking at the burden of AGE in Grenada (Glasgow et al 2013) revealed that approx. 11% of the population is being affected, with an incidence rate of 1.4 episodes per person per year. Based on costs for treating AGE cases in Grenada which were calculated between 15 and 52 USD (depending on means of transport, physician, laboratory serves and medication), the total annual economic burden on patients for treating AGE was estimated to range from approx. 700,000 USD to 2.4 million USD. In addition, productivity losses for patients unable to attend work were estimated to range from 33 to 90 USD per person per episode, resulting in additional annual economic losses of between 550,000 USD and 1.5 million USD. In total, between 1.2 and 3.9 million USD is the range of the estimated economic burden of AGE in Grenada.

Whilst not all of the cases can be attributed to public water supply, there are clear benefits of a sustainable access to safe water, which is jeopardized in the future due to climate change. If in the "without project" scenario the cases of AGE would in the future with more frequent heavy rainfall and less overall precipitation double, this would result in additional economic losses of 1.2 to 3.9 million USD. Using a thirty years horizon, the economic benefits of the "with project" scenario alone from the average AGE costs would result in savings of 76.5 million USD.

(ii) Reduced Costs for Trucking Water - Alternative Supply Tourism Sector

The frequent shutdowns associated with high rainfall events as well as the insufficient supply of during dry season are beside a health concern also a major inconvenience to customers and could lead to sever financial losses in

particular in the tourism sector. During the 2009/2010 drought, hotels had to truck water at prices as high as 28.15 USD per cubic meter (Peters, 2015), or approx. 126 USD per 1000 gallons), resulting in additional cost of 119 USD per 1,000 gallons. Since detailed financial statements are not available, the following estimates are being used to calculate the overall cost impact for the hotel sector: total water consumption per guest per night is approx. 200 gallons, of which approx. 50 gallons is being used in the guestroom. Based on statistics of the Grenada Tourism Authority, there were approx. 650,000 overnight stays in Grenada in 2016. Assuming, based on the climate change 2050 scenario, the hotels would need to supply during 30% of the year the 50 gallons per night per guest, the annual costs would be 1.16 million USD, over 30 years (without consideration of inflation) approx. 35 million USD.

In addition, there are other costs, which however are hard to quantify, e.g. potential customer dissatisfaction leading to customer discounts, damage to gardens due to insufficient irrigation, etc.

(iii) Reduction of the Drought Costs in Agriculture - Crop Loss in Agriculture

Another sector which was heavily impacted by the 2009/2010 drought was agriculture, with a crop loss of 0.556 million USD only for the first 3 months of 2010 (Peters 2015). Assuming that under the new climate normal scenario this would happen for 6 months on annual basis, the “without project” scenario accumulates costs of 33 million USD. Assuming that the “with project” scenario with its water efficiency improvements in agriculture would reduce the “damage period” to 3 months, total savings of 16.5 million USD would occur.

Additional, more difficult to quantify costs include higher costs for imports (with negative impacts on Grenada’s trade balance), potentially poorer nutrition especially for low-income groups due to rising prices or the need for bulk customers like hotels to replace local with imported supplies, which might lead to long-term changes in the supply chain at the detriment to local farmers.

Results

The base for the Economic Analysis is the total costs of the G-CREWS project plus the cost for the Concord project, since both projects contribute to the achievement of the overall resilience goal. Considering the three components of the above mentioned discussion, which are subject to an inflation rate of 2% annually over 30 years, the Economic Incremental Rate of Return of the project is approx. 11.8%, which indicates the substantial value of the project to Grenada. Also, the absolute value of the envisaged avoided climate change impacts – approx. 169 million Euro – confirms the computation of Bueno et al (2008), that each dollar invested in the water sector creates three times that benefit.

The Financial Analysis only looks at direct revenues generated by the new infrastructure by way of higher water sales but does not capture the value of positive externalities generated by better water infrastructure. As explained below, the financial IRR in the base case is negative, which argues for maximum concessionality.

Financial Analysis

Definition of the Base Case

The Financial Internal Rate of Return (FIRR) was estimated by calculating the discount rate at which the total present value of benefits and the total present value of costs are equalized. The FIRR was calculated for the resilient infrastructure components, which are Activities 3.1 and 3.3. Other project components do not generate revenues and have therefore an implicitly negative financial return.

The total water supply resilience investment in freshwater and raw water storage, groundwater improvements, rainwater harvesting and improved intakes is 22.7 million Euro.

The net financial benefits and costs in the analysis were derived by comparing the 'with' and 'without' scenarios. The benefits from the water supply investments comprise:

- Increased revenue due to improved and more reliable water resources availability due to additional water storage capacities. This benefit is valued at the current tariff for 1'000 gallons of water, which is 18.53 XCD or 6.21 EUR.
- Capital investment costs are calculated on the basis of the underlying feasibility studies, which are based on or were undertaken for various donors, including the Caribbean Development Bank, AFD and the EU. The current prices were derived through an adjustment of unit prices based on current experience of water infrastructure projects in Grenada, as provided by NAWASA's Planning and Development Department and local water engineering experts. Construction will be implemented by international lead contractors, largely with imported materials and equipment. The financial calculations are therefore made in Euro and at constant prices of 2017. As base to determine exchange rates, the EU portal "InfoEuro" was used[30]. The exchange rate used is the averaged monthly exchange rate between November 2016 and October 2017 stated in the portal mentioned above.
- Operations costs for additional production due to additional raw water availability during operation are calculated according to the projected additional water production, using NAWASA's direct cost of 2015. For the new investments, 1.75% of the investment cost has been used as additional annual operations costs, based on NAWASA estimates. The improvement at the intakes as well as the emergency shutdowns option in the new limited SCADA system would even allow for a slight reduction in operation costs, since blockages and siltation at dams, intakes and treatment stations will occur less frequent, and staff time to reach the often remote systems is reduced. However, since these savings are difficult to quantify, they have not been considered in the financial analysis.

The financial analysis used a 30-year horizon for the water resilience investments. It was assumed that the investments would be implemented within 4 years. This also means that only in year 5 the full additional costs and benefits apply. The financial model is based on a tariff increase in year 3 of the project (estimated at +35%, based on the previous tariff increase in 2010), and tariff adjustments by +12% every 5 years thereafter. Inflation was estimated at 2% annually for the next 30 years, which is almost exactly the average annual inflation rate between 1995 and 2015. Population growth was treated as negligible, based on the scenario used in the climate vulnerability analysis.

Major results of the base case

The financial analysis shows that the water supply investments have a negative Financial Internal Rate of Return (FIRR).

Sensitivity analysis

Two main factors influencing the FIRR have been identified: (i) investment costs and (ii) overall volume of available water due to additional raw water storage.

The model tests a variation (+10%/-30%) of investment costs, as well as a share of 75% of the additional foreseen water resources actually become available.

The following table indicates the results of the sensitivity analysis.

	Investment Cost		Share of additional water
	+10%	-30%	75%
FIRR	Negative FIRR	1.8%	Negative FIRR

[30] http://ec.europa.eu/budget/contracts_grants/info_contracts/inforeuro/index_en.cfm

Justification for concessionality (grant funding)

GCF grants are requested due to the following characteristics of Grenada:

Vulnerability: The G-CREWS project is urgently needed to alleviate severe climate-induced risks related to drinking water availability for almost the entire population of the small island developing state, including particularly poor and vulnerable population groups, and Grenada's two largest highly vulnerable economic sectors tourism and agriculture (see Feasibility Study).

Public debt constraints: The G-CREWS project is expected to increase the resilience of basic in-country drinking water availability, one of the most crucial pre-conditions for sustainable development on a SIDS, a human right since 2010, and an essential role of the public hand in Grenada. The GCF grant is used to overcome the Government's recent constraints to allocate public funding or take up additional debt to invest in urgently needed adaptation measures for the water sector. Several series of shocks, e.g. hurricanes, led to the tri-island state's inability to service its debt in 2013 and in consequence to a debt relief and a lengthy debt restructuring process with its creditors assisted by the International Monetary Fund's (IMF) Extended Credit Facility Support Programme. According to the IMF, the GoG was able to reduce the initial debt of 114 % of GDP to 83.4 % in 2016 (IMF Country Report No.17131 05/2017). Despite Grenada's impressive achievements in fiscal consolidation, the IMF noted a number of outstanding challenges: Public debt is still considerably high and the tri-island state remains vulnerable to shocks. Therefore, Grenada has to stay on the current fiscal path of fiscal prudence until various reforms yield expected results. This means Grenada is encouraged to continue avoiding any burden on public debt.

The project accommodated for Grenada's constraints by including activities to increase efficiency and revenues with Grenada's public water utility NAWASA. It has to be specified that NAWASA is able to cover occurring costs for operations and maintenance (see Feasibility Study), but is unable to invest. The same holds for the GoG, which in the case of debt financing would need to cut funding for other priority development needs (compare NAP 2017 draft) or add to public debt distress.

Further considerations: Grenada, as a SIDS, is especially exposed and sensitive to climate change impacts and will very likely face dangerous levels of climate change impacts in the coming decades (see Feasibility Study). Grenada's contribution to global greenhouse gas emissions on the other hand can be considered as inconsequential with its tiny population of just above 100 000 and comparatively low carbon footprint of 2 874 metric tons of CO_2 per capita.[31]

Conclusion

As a conclusion of the financial analysis, the Project bears negative financial returns in the base case. Only when using quite optimistic assumptions about investment costs, the FIRR becomes mildly positive. Once more, all other project components aside from 3.1 and 3.3 are not amenable to the generation of financial returns.

This, coupled with the considerable economic benefit of the G-CREWS project, is a clear indication that grant-funding of the investments is necessary.

F.2. Technical Evaluation

The G-CREWS project comprises inter-related technical solutions in the fields of climate-resilient water supply and water demand. The technical concept is a flexible approach that enables response to changes in demand and requirements due to unpredictable developments like climate change and the economics of the agricultural and tourism sectors. The options regarding the most appropriate water efficiency measures are based on the individual situation of the beneficiary, who will have to co-invest and hence to ensure, based on mandatory water audits, that the selected solution is technically and financially sound and appropriate to their adaptation needs. The technical solutions for the

[31] World Bank 2013.

water supply systems are selected based on cost-effectiveness and sustainability, regarding both investment and operation costs.

A key element of the G-CREWS project is the increase in available storage capacity through additional glass fused-to-steel bolted water tanks/ reservoirs in selected locations, jointly with pipes and valves to connect to the network. These tanks are known to be very cost-effective way to make freshwater storage on the distribution side more climate resilient, since they help to increase supply times during dry spells, but also provide additional buffer in case of a production system failure, such as after heavy rainfall events.

The locations for the additional storage have been selected based on detailed GIS-based modelling, which included water supply and demand data as well as network data and climate change assumptions, in order to identify the most critical areas where storage needs to be improved to ensure climate-resilient water supply in the medium- to long term.[32] The findings of this assessment were checked and verified by NAWASA's Planning and Development Division.

The final major technological approach to make NAWASA's water supply system more climate-resilient is to increase the raw water storage. This is done for the Les Avocats and Petit Etang water systems. For Les Avocats, an increased storage volume will be achieved by rebuilding a small dam with a height of 7.8m at a distance of 20m downstream of the existing dam on the Baillie's Bacolet River. This has been assessed in the respective feasibility study as the economically and technically preferred option compared to a restauration and increased level of the current dam. The additional impoundment as raw water storage at Petit Etang is also a low-cost measure, both regarding investment and operation costs. It entails installation of 5,000 m^2 of impermeable surface; and construction of a 700m x 2.4m high earthfill embankment, lined, to create an impoundment of 50,000 m^3. A feasibility study has compared various options for the ideal location. The selected location, which includes the use and rehabilitation of an old, currently unused pond, means that the overall environmental footprint and impact on agriculture is minimal. This was also confirmed in the Environmental and Social Impact Assessment.

A focus on low-cost storage capacity, RWH, water efficiency and water loss reduction (funded outside the G-CREWS project by NAWASA and GoG) will help provide low-cost solutions to increase the climate resilience of the supply system. Potential alternative measures to increase the production capacity by adding larger scale dams and water treatment plants or even embarking on larger-scale desalination would not only entail much more greater investment costs, but also would burden NAWASA with additional operations costs – in addition to the often relatively large environmental footprint. The Feasibility Studies on which the investment measures are based undertook an economic and financial analysis of different options, including desalination to increase water availability, and the simple technologies like small-scale dams and rainwater harvesting were seen as most beneficial.

F.3. Environmental, Social Assessment, including Gender Considerations

Environmental and Social Assessment and ESMP

Independent experts prepared an environmental and social assessment in compliance with the GIZ's and GCF's environmental and social policies. The GCF uses an interim Environmental and Social Policy based on the Performance Standards (PS) of the International Finance Cooperation (IFC), which is compatible with GIZ's Safeguards + Gender Management System (S+G).

The PS that apply to the project are:

- PS1: Assessment and management of environmental and social risks and impacts
- PS2: Labour and working conditions
- PS3: Resource efficiency and pollution prevention
- PS4: Community health, safety and security
- PS5: Land acquisition and involuntary resettlement

[32] Bornemann 2015.

- PS6: Biodiversity conservation and sustainable management of living natural resources
- PS8: Cultural heritage

Following the assessment, mitigation and/or compensation measures were developed. These measures were included in the Environmental and Social Management Plan (ESMP) for the project. The findings of the assessment and the ESMP were validated with the relevant stakeholders. The project is categorized as 'Category B' or 'medium' in terms of E&S risks. The project will have a positive environmental and social impact on all the inhabitants of Grenada by increasing resilience to climate variability and climate change and improving water supply, while at the same time having a positive impact on the environment by setting up water resources management, protecting ecosystems and improving the environmental management capacity of relevant organisations. Potential adverse environmental and social impacts of the project will mostly be site-specific, not irreversible or complex in nature, and readily addressed through mitigation or compensation measures.

Summary of Potential Adverse Impacts and Proposed Mitigation and Compensation Measures

Impacts of Construction Works and Proposed Measures: The civil works included in the project are of limited extent and mostly concern existing infrastructure so that the potential risks and impacts that are typical of civil works are limited. The only 'greenfield' components are some of the new storage tanks (since some of them are planned at existing NAWASA sites), the new pipes to connect the new storage tanks and the new groundwater wells. All water pipes are of small diameter (max. 200 mm) and do not require wide trenches. The construction of sixteen relatively small storage tanks and three new groundwater wells to replace old wells, as well as the augmentation of the pond at Petit Etang, may require permanent acquisition of a maximum estimated area of 5.3 ha of land by NAWASA, part of which is already government land. The project requires minor temporary land occupation, and minor creation of rights-of-way for the new pipelines. Limited sections of the new pipelines, all well below a length of 4 km, may have to cross forest area. A biodiversity survey will be carried out to verify if these areas should be considered as Critical Natural Habitats. Other project components do not encroach upon protected, rare or critical natural habitats. The ESMP includes the preparation of a land acquisition and an occupation management framework to ensure compliance with Performance Standard 5 for Land Acquisition and avoid any negative impacts on land users and land owners from the project's activities.

Impacts on Water Flows and Proposed Measures: The project is not expected to lead to an increase in freshwater use as it essentially relies on improved storage and improved efficiency in use. NAWASA currently does not monitor abstracted freshwater quantities, but will be through the project. The quantities of piped water will also be monitored. The use of piped water in the households could increase in the dry season, as there will be less interruptions in supply, but could be balanced by water demand management and water saving measures. Due to the planned increase in storage volume at Petit Etang and Les Avocats, the project may lead to a reduction in dry season flow in two small rivers. There is no reduction in the yearly flow or in floods, which are beneficial to the ecosystems. No hydrological or biodiversity data are available, but the catchment at Petit Etang is expected to yield a water volume of 0-3 l/s in the dry season and not to form a proper stream. At Les Avocats, the project could decrease the dry season flow by 0-10 l/s. This impact is minor, as the stream is already impacted by the existing reservoir, and already sees dry periods. Both Petit Etang and Les Avocats watersheds have tributaries replenishing them a little further downstream. Critical aquatic ecosystems will not be affected. River intakes are present on many streams in Grenada, with similar impacts that are currently not being assessed. The ESMP includes an assessment of flows, aquatic biodiversity and water uses in the catchments for a detailed impact assessment of the increase of the storage capacities. Such an assessment will also set an example in Grenada and raise awareness about the need to protect river ecosystems. Both storage systems at Petit Etang and Les Avocats will be equipped with the option to let through a minimum flow if required and possible during the dry season.

Impacts on Water Quality and Proposed Measures: There is no comprehensive data on the quality of water supplied by NAWASA and no data on source water quality. Independent monitoring of drinking water quality is currently non-functional in Grenada. According to NAWASA's annual report and according to information gathered during

consultations, drinking water quality is occasionally degraded. NAWASA's reservoirs generally show a high risk of eutrophication and oxygen depletion and this can have impacts on treated water quality as well as on ecosystems. The G-CREWS project includes the setup of independent monitoring and reporting on water quality. The ESMP includes measures for NAWASA to improve the management of the quality of raw water in the reservoirs, especially targeted at the reservoirs of Petit Etang and Les Avocats, which are part of the G-CREWS project. This measure also includes management of sediment from silt traps and reservoirs. During consultations, wastewater management has emerged as an issue of concern. Most wastewater in Grenada is treated by septic tanks. But the denser coastal zone in the south west of the island has two sewerage systems, which currently discharge untreated wastewater in the sea. Impacts of the project on wastewater management are expected to be insignificant, as the project does not significantly increase water use and as only about 5 % of Grenada's population is connected to a sewer system. A better continuity of flow could theoretically improve the condition of the water and wastewater networks, but this impact is not considered significant either. NAWASA is currently committed to rebuild an offshore sewer outfall in the next few years, but options for sewage treatment should also be investigated. The ESMP includes a feasibility study for improved wastewater management in Grenada.

Other Measures Required to Reach Conformity with the E&S Performance Standards

The ESMP includes measures to upgrade NAWASA's environmental and social management system and its health and safety management. The water tariff review (see C.3 Sub- component 1.3) provides the opportunity to include the cost of the non-urgent measures in NAWASA's future budget. The ESMP includes a stakeholder engagement plan (SEP) complementing the communication component (see C.3 Activity 2.2) of the G-CREWS project, and therefore mainly concentrating on construction activities. Stakeholders evaluated the water tariff review as a subject of concern during the consultations. The Performance Standards do not formally provide specifications, which would apply to a review of water tariffs, except for the requirement, under PS1, to report to communities about actions of concern to them. There is a strong commitment from the G-CREWS project to ensure affordability of drinking water for the most vulnerable households. Grenada already has a 'social safety net' where the state funds the water bills of the poorer households. This system will be assessed during a tariff study and, if required, additional measures will be included to extend the affordability of water for all. The stakeholder engagement plan includes a specific measure whereby the relevant stakeholders will be engaged to participate in the tariff study by being regularly informed and consulted.

Overview of the ESMP

The ESMP will be implemented by NAWASA, the relevant ministries and the construction contractors (and sub-contractors), with assistance and monitoring of the PCU and GIZ. An annual ESMP report will be submitted to the GCF. The total additional cost of the ESMP for the G-CREWS project is EUR 680,000 or less than 2 % of project costs.

	Action	Reference	Responsible entities
1a	ESMP implementation, enforcement, monitoring and reporting	PS1	NAWASA, PCU, GIZ
1b	Reinforced monitoring of safeguards compliance, access to water, and gender issues by Project Steering Committee	PS1	GIZ, PCU; Ministries
2	Environmental, social, health and safety risk assessment of NAWASA's activities	PS1, PS2, PS4	NAWASA
3	Certified quality, environment, health and safety management system for NAWASA (ISO 9001, ISO 14001 and ISO 45001 or OHSAS 18001)	PS1, PS2, PS4	NAWASA (with technical assistance)
4	NAWASA health and safety management	PS2, PS4	NAWASA

5	NAWASA waste management	PS3	NAWASA
6	Contractor management and mitigation of environmental and social construction impacts	PS1, PS2, PS3, PS4, PS5, PS6, PS8	GIZ, PCU, NAWASA, contractors, sub-contractors
7	Land acquisition and occupation framework	PS5	GIZ, PCU, NAWASA, GoG
8	Les Avocats and Petit Etang hydrology, biodiversity and water use assessment + design of intakes to include option to release minimum flow + biodiversity survey for forest areas where new pipes are laid (if any)	PS3, PS6	GIZ, WRMU (with technical assistance)
9	Water quality management of river water reservoirs	PS4	NAWASA, Min. of Health
10a	Construction Stakeholder Engagement Plan	PS1	GIZ, PCU, NAWASA, (sub-)contractors
10b	Tariff Review Stakeholder Engagement Plan	Consultations, PS1	GIZ, PCU, GoG
11	Wastewater treatment feasibility study	Consultations, PS3	GIZ, NAWASA, GoG (with technical assistance)

Consideration of Gender Aspects in the Project

During the preparation of the G-CREWS project, an in-depth gender analysis was undertaken in three phases:

- A desk review of relevant national, regional and international websites of the GoG and statistical online databases have been reviewed.
- Consultations with government and civil society representatives in Grenada in the framework of a five-day mission to Grenada concluded by a stakeholder workshop.
- Further desk research and finalisation of the draft report.

Findings, Key Principles and Recommendations

As in many countries, there is a strong interlinkage between gender issues and climate change and there is the risk that climate change may worsen gender inequalities. Men and women are differently affected by and able to adapt to impacts of climate change due to their specific socio-economic roles and responsibilities. Therefore, contributing to gender equality is a significant objective. Based on the findings of the gender analysis, the following key principles on gender consideration within the G-CREWS project have been derived:

1) Commitment to gender equality and equity.

2) Inclusiveness in access and applicability to all the activities.

3) Accountability for gender and climate change results and impacts.

4) Improvement of national policies and priorities, and inclusive stakeholder participation.

5) Equal competencies throughout the institutional framework.

6) Equitable resource allocation so that women and men benefit equitably from the adaptation measures.

These key principles are reflected in the following gender-sensitive approaches and recommendations that the G-CREWS project plans to address:

- Training of communities on household water use and collection systems to implement these water efficiency measures at the household and neighbourhood level to engage in local and national decision-making on water use.

- Involvement of women, including women's organisations and female businesspeople in related consultation processes, surveys, assessments and especially the water tariff study.
- Consultation of disadvantaged groups such as poor households, female-headed households and people with disabilities - from rural and urban areas.
- Integration of sex-disaggregated data into the monitoring system, reporting and evaluation of project activities.
- Elaboration and operationalisation of existing international, regional and national policies and strategies on gender-responsive water management in the Caribbean and Grenadian context.
- Coordination with the Division of Gender and Family Affairs and the gender focal points of ministries and institutions relevant to the CREWS-project as drivers of change in the design and implementation of gender-responsive policies and strategies in the water sector.
- Information sharing and equal access for men and women on financing schemes to support water efficiency measures.
- Addressing women and men at household level equally in the consultations as well as the planning and design of awareness-raising campaigns and educative measures.
- Training of women as adviser and change agents in e.g. water-saving techniques, rainwater harvesting and water use for home gardening.
- Hiring policies and human resource development regarding gender competencies for the new G-CREWS-project staff.

F.4. Financial Management and Procurement

Procurement and financial management will be implemented as follows (in line with the general arrangements as described in Section C.7 and Annex 4 (Flow of Funds)):

- The Executing Entities - MoFE (PCU) and GDB - will sign subsidiary agreements with GIZ, based on GIZ standard operating procedures for contracts for financing.
- Contracts for financing establish the legal basis on which GIZ makes funding available to the Executing Entities for specific purposes to help them carry out certain measures.
- The Executing Entities are responsible for implementing and administering the measures in accordance with GIZ standard operating procedures.

Procurement

In case of procurement by GIZ, GIZ will follow its own procurement guidelines. GIZ is required to comply with the relevant contracting rules as established in the German Act against Restraints of Competition (GWB), the German Regulation on the Award of Public Contracts (VgV) and, if applicable, the Contracting Rules for the Award of Public Service Contracts (VOB and VOL) when procuring services, construction works and supplies. When awarding contracts for supplies and services (including consultancy services) to be financed in full or in part from the contract for financing, the external Executing Entities - MoFE and GDB - will observe the Grenada Public Procurement Act but will in any case comply with the GIZ minimum standards. An overview of these minimum standards is available at: https://www.giz.de/de/downloads/giz2017-en-Annex%204a-Award-Procedure.pdf.

GIZ assesses adherence of submitted procurement documents to GIZ procurement regulations at defined stages in the process.

Financial Management

The financial management of the project will follow GIZ's internal rules and regulations. GIZ has bank accounts with Deutsche Bundesbank and Commerzbank. GIZ will not open a specific bank account for GCF proceeds and other GCF funds but will ensure that all funds provided are clearly identifiable from GIZ's other funds by setting up separate cost units exclusively for the funds disbursed by the GCF for each funded activity (ledger accounts). Funds received and

expenditures incurred will be booked to the respective cost unit according to generally accepted accounting principles and procedures accepted by the German Government. As a general principle, GIZ disburses funds to the recipients in accordance with the progress of the project. The Executing Entities have to prove the proper use of funds and the defined progress as a prerequisite for any further disbursement.

Independent external auditors will perform annual financial audits of the project in line with International Auditing Standards.

G.1. Risk Assessment Summary

The physical components of the Project deal primarily with minor infrastructure developments and improvements of the existing water supply system. There are no unusual risks. No negative irreversible environmental impacts are expected. The main risks of the G-CREWS project is the timely construction of the infrastructure and the uptake of the water efficiency measures and alternative supply options for farmers and hotels. Overall, taking into account the mitigating measures as described below in G.2, the level of impacts of risks to the G-CREWS project is low to medium, with a low to medium probability.

G.2. Risk Factors and Mitigation Measures

Selected Risk Factor 1

Description	Risk category	Level of impact	Probability of risk occurring
Improved technical availability of water resources might lead to higher consumption and higher levels of wastewater.	Social and environmental	Medium (5.1-20% of project value)	Medium

Mitigation Measure(s)

The G-CREWS project puts a strong focus on water resources management. This will help to ensure that abstraction levels are within the sustainable yield limits, and that the current and additional wastewater will be disposed of safely. In addition, component 2 of the G-CREWS project has its focus on water demand management, and as such will help to reduce the stress on the scarce water resources, particularly during dry season.

The mitigation measures contribute to reducing the probability that the risk occurs towards ‘low’.

Selected Risk Factor 2

Description	Risk category	Level of impact	Probability of risk occurring
Increased protection of catchment areas and their use for the water supply might induce user conflicts.	Social and environmental	Low (<5% of project value)	Low

Mitigation Measure(s)

In order to mitigate that risk, the G-CREWS project will establish an independent water resources management unit, run awareness campaigns and support water user platforms and roundtables to deal with potential user conflicts.

This mitigation measure will contribute to reducing the probability that the risk occurs, even though it is already ‘low’.

Selected Risk Factor 3

Description	Risk category	Level of impact	Probability of risk occurring
Due to delays in the political process, there is the risk that legislation is not being enacted within the requisite timeframe.	Technical and operational	Low (<5% of project value)	Medium

Mitigation Measure(s)
The water sector and its vulnerability is a key concern of the political decision makers. Given the frequency of longer dry spells and even droughts in the past years, Grenada has already started to develop respective policies and legislation regarding water resources management. However, due to the lack of resources a full implementation was not possible. The G-CREWS project will therefore also support the capacity building by setting up improved institutional structures which help to ensure the approval of the policies and the legislations. In addition, due to the combination of infrastructure funding and enabling framework activities (including legislation and regulation), the G-CREWS project has sufficient leverage to ensure a rapid enactment of the new legislator and regulatory framework. The mitigation measures contribute to reducing the probability that the risk occurs towards 'low'.

Selected Risk Factor 4			
Description	Risk category	Level of impact	Probability of risk occurring
Due to limited regional availability of consultants with required skills and expertise, there is a risk that procurement of highly competent consultants and skilled contractors will take longer than expected and there is a risk to the completion of the works within the requisite time and budget.	Technical and operational	Medium (5.1-20% of project value)	Low

Mitigation Measure(s)
Given the consultancy support requirements in each of the components, it is expected that the tenders for such support will be on an international level. In addition, the proposal has foreseen a realistic financial budget which will ensure sufficient funds even for globally experienced consultants. The mitigation measures will also contribute to reducing the probability that the risk occurs, even though it is already 'low'.

Selected Risk Factor 5			
Description	Risk category	Level of impact	Probability of risk occurring
Construction delay risks: For the G-CREWS project there is, as in all projects with infrastructure elements, a risk for delays in the actual implementation.	Technical and operational	Medium (5.1-20% of project value)	Medium

Mitigation Measure(s)
The project duration of six years provides sufficient flexibility for implementation. In addition, the G-CREWS project will work closely with a team of experienced engineering companies, as well as with engineers from the PCU and NAWASA to come up with a realistic schedule and an effective monitoring process for time, cost and quality of the implementation. The mitigation measures will also contribute to reducing the probability that the risk occurs towards 'low'.

Selected Risk Factor 6			
Description	Risk category	Level of impact	Probability of risk occurring
Due to natural disasters like tropical storms, the new infrastructure is exposed to both construction and operation risks.	Technical and operational	High (>20% of project value)	Medium
Mitigation Measure(s)			
The design and construction of the new infrastructure will be done using state of the art climate proofing tools to reduce the risk that the operation of the new infrastructure will be negatively affected by natural disasters. This includes strict construction designs and operational guidelines. The mitigation measures will also contribute to reducing the probability that the risk occurs towards 'low'. The project mitigation of that risk is also for existing infrastructure with focused interventions.			
Other Potential Risks in the Horizon			

** Please expand this sub-section when needed to address all potential material and relevant risks.*

H.1 Logic Framework

H.1.1. Paradigm Shift Objectives and Impacts at the Fund Level

Paradigm shift objectives	
Increased climate-resilient sustainable development	The project's objective is to increase systemic climate change resilience in Grenada's water sector.

Expected Result	**Indicator**	**Means of Verification (MoV)**	**Base-line**	**Target**		**Assumptions**
				Midterm (end of year 3)	Final	
Fund-level impacts						
A2.0 Increased resilience of health and well-being, and food and water security	A2.3 Number of males and females with year-round access to reliable and safe water supply despite climate shocks and stresses	Gender-sensitive household surveys on Grenada mainland and Carriacou, NAWASA annual reports, WRMU annual reports, water quality readings	<73% (2009)	83%	100%, of which 49.7% are female (106,000 people in total)	Baseline assumption for A2.3: Around ¼ of population does not have safe water supply / ¼ of population was affected by extreme event in 2009 and did not have safe water supply. Grenada is not hit by extreme weather events (droughts, hurricanes). Political consensus for improving the legislative and institutional framework of the water sector remains strong after elections, decision makers not distracted by new and urgent events. Updated regulations and tariff provide sufficient incentives for households to invest in rainwater harvesting and water efficiency. All procurement and construction activities can be completed on time.
A3.0 Increased resilience of intrastructure and the built environment to climate change	A3.1 Number and value of physical assets made more resilient to climate variability and change, considering human benefits (reported where applicable)	Project progress reports of PCU and NAWASA to GIZ, construction site inspections	0	10 infrastructure projects/ physical assets	37 infrastructure projects/physical assets	

H.1.2. Outcomes, Outputs, Activities and Inputs at Project level

Expected Result	Indicator	Means of Verification (MoV)	Base-line	Target		Assumptions
				Midterm (end of year 3)	Final	
Project outcomes	**Outcomes that contribute to Fund-level impacts**					
A5.0 Strengthened institutional and regulatory systems for climate – responsive planning and development	A5.1 Institutional and regulatory systems that improve incentives for climate resilience and their effective implementation.	NAWASA project progress reports, act establishing WRMU and annual reports, Cabinet decisions concerning updated water regulation and tariff, climate-related updates of sector policies (agriculture, forestry, land use, etc.)	0	2 policies, plans, and regulations	5 policies, plans and regulations	Political consensus for improving legislative and institutional framework of the water sector remains strong after elections, decision makers not distracted by new and urgent events WRMU is established and operational.
A6.0 Increased generation and use of climate information in decision-making	A6.1 Use of climate information products/services in decision-making in climate-sensitive sectors	Annual reports of WRMU, user statistics on WRMU website, peer-group surveys (agriculture, forestry, land use etc.), household surveys	0	1 climate and hydrology data acquisition network	1 climate and hydrology data acquisition network	WRMU is established and operational.
A7.0 Strengthened adaptive capacity and reduced exposure to climate risks	7.1 Use by vulnerable households, communities, businesses and public-sector services of Fund supported tools, instruments,	Gender-sensitive household surveys on Grenada mainland and Carriacou, NAWASA annual reports, GDB Challenge Fund reports, WRMU annual reports	0%	Households: No Mid-term target applicable due to ongoing construction of majority of	Households (through new water tariffs, water supply infrastructures): 100% of population, of which 49.7% is female	Updated regulations and tariff provide sufficient incentives for households and businesses to invest in rainwater harvesting.

	strategies and activities to respond to climate change and variability.			assets at that time. Farms: 10% of farms (efficient irrigation system) 5% of farms (additional rainwater harvesting) 1% of farms (shadehouses) 0% of farms (hydroponics) Hotels: 5% of large hotels / 10% of small hotels and guesthouses (efficient fittings) 0% of small hotels and guesthouses / 20% of large hotels (greywater recycling plants)	Farms (through Challenge Fund): 50% of farms (efficient irrigation system) 20% of farms (additional rainwater harvesting) 5% of farms (shadehouses) 1% of farms (hydroponics) Hotels (through Challenge Fund): 25% of large hotels / 50% of small hotels and guesthouses (efficient fittings) 10% of small hotels and guesthouses / 40% of large hotels (greywater recycling plants)	

A8.0 Strengthened awareness of climate threats and risk-reduction processes	8.1 Number of males and females made aware of climate threats and related appropriate responses	Questionnaires from training sessions, awareness campaign, WRMU website user statistics, household surveys	Baseline to be established in year 1 of project (including gender-disaggregated data for farm and hotel owners)	To be defined after baselines is established	Households: 20% of total population, of which 49.7% is female. Hotel owners and operators: 75% of all hotels Farmers: 30% of all famers	Broad participation in awareness campaign and effective multiplication effects
Project outputs	**Outputs that contribute to outcomes**					
Output 1: Climate resilience integrated into Grenada's water sector governance	I1.1: Water Resources Management Unit (WRMU) established and empowered	Documentation of Cabinet and Parliament decision	0	1 Cabinet approval 1 Act passed by Parliament	1 Cabinet approval 1 Act passed by Parliament (by end of year 3)	Political consensus for improving legislative and institutional framework of the water sector remains strong after elections, decision makers not distracted by new and urgent events
	I1.2: Climate and hydrology data acquisition network installed	Project progress reports of PCU and WRMU to GIZ, site inspections, published data and knowledge management products	0	1 network installed	1 network installed	
	I1.3: WRMU achieved update of selected regulations and policies in cooperation with	Documentation of Cabinet or Minister decisions	0	Draft regulation and consultations completed	2 approvals of water resource documents (promotion of rainwater harvesting in building codes, tax	

	other government agencies				breaks for retrofitting, etc.) 3 approvals of climate-resilient sector policies (agriculture, forestry, land use, public works, etc.)	
	I1.4: Updated climate-responsive water tariff system approved by Cabinet	Documentation of Cabinet and Parliament session	0	1 Approval (end of year 3)	1 Approval	
Output 2: Improved climate-resilience of Grenada's water users	I2.1: Water demand (per capita per day) reduced to climate-resilient levels	NAWASA annual reports, WRMU annual reports, household surveys	150 litres per capita per day	145 litres per capita per day (end of year 3)	135 litres per capita per day	Updated regulations and tariff as well as Challenge Fund provide sufficient incentives for households and businesses to invest in water efficiency measures. Grenada is not hit by drought or tropical storms.
	I2.2: CFA: 50% of farms suitable for (but currently not) irrigating will adopt efficient irrigation systems; 50% of farms currently irrigating with inefficient equipment will switch to efficient systems; 20% of farms already irrigating or adopting irrigation as part of the program will also install rainwater harvesting systems,	GDB project progress report	0%	10% of farms (efficient irrigation system) 5% of farms (additional rainwater harvesting) 1% of farms (shadehouses) 0% of farms (hydroponics) (subject to flexibility	50% of farms (efficient irrigation system) 20% of farms (additional rainwater harvesting) 5% of farms (shadehouses) 1% of farms (hydroponics) (subject to flexibility between technologies, as described in the Challenge Fund)	

	5% will adopt shadehouses and 1% will adopt hydroponics			between technologies, as described in the Challenge Fund)		
	I2.3: CFT: 25% of large hotels and 50% of small hotels and guesthouses will upgrade their bathrooms with efficient fittings; 10% of small hotels and guesthouses and 40% of large hotels (2 out of 5) will install greywater recycling plants	GDB project progress report	0%	5% of large hotels / 10% of small hotels and guesthouses (efficient fittings) 0% of small hotels and guesthouses / 20% of large hotels (greywater recycling plants) (subject to flexibility between technologies, as described in the Challenge Fund)	25% of large hotels / 50% of small hotels and guesthouses (efficient fittings) 10% of small hotels and guesthouses / 40% of large hotels (greywater recycling plants) (subject to flexibility between technologies, as described in the Challenge Fund)	The Challenge Fund is known to hotels, provides accurate risk/reward ratios and application procedures are efficient.
	I2.4: Improved awareness by stakeholders (particularly households, hotels and farmers) of climate impacts in	Documentation of campaigns, training sessions, workshops, stakeholder surveys (households, businesses), website	Baseline to be established in year 1 of project	To be defined after baseline is established	20% of population, of which 49.7% is female 30% of farmers 75% of hotels (by 2022)	

	Grenada and the need for water efficiency	statistics, press clippings	(including gender disaggregated data for farms and hotels)			
Output 3: Increased climate-resilience of Grenada's water supply systems	I3.1: Total annual water production before losses is increased to climate-resilient levels	NAWASA annual reports, WRMU annual reports, household surveys, water audits and post-installation inspections of hotels and farms	2.41 billion imperial gallons (NAWASA average 2005-2016),	Mid-term assessment not applicable, due to ongoing construction of majority of assets at that time.	2.77 billion imperial gallons	All procurement and construction activities can be completed on time. Grenada is not hit by a major drought or tropical storms during final year of implementation. NAWASA needs to add 354 million imperial gallons to its production to operate at a climate-resilient level. UK AID Concorde is successful and on time in delivering 146,000,000 imperial gallons of additional production.
	I3.2: Construction activities for vulnerable infrastructure upgrades and retrofits completed	Handing Over Reports signed by NAWASA	0 assets completed	10 assets completed	37 physical assets completed	
Output 4: Improved water and energy efficiency in NAWASA's systems	I4.1: NAWASA water losses reduced from 29 % to 25%	NAWASA annual reports, GIS-based infrastructure and customer management system	29%	28% (end of year 2)	25% (end of year 6)	All procurement and construction activities can be completed on time. Grenada is not hit by a major drought or tropical storms during final year of implementation.

Output 5: Increased learning and replication of climate-resilient water sector approaches in the Caribbean	I5.1: Lessons learned from improving climate resilience in Grenada's water sector are shared in 3 similar initiatives in the Caribbean (e.g. GCF concept note development)	Documentation of events and trainings,	0 initiatives	1 initiatives after year 3	3 initiatives after year 4	

Activities	Description	Inputs	Description
1.1 Establishment and Empowerment of Water Resource Management Unit (WRMU)	Establishment of WRMU: • Concept development • Study on the 'Sustainable Financing of the WRMU' • Implementation of water regulations for establishment of WRMU • Recruitment/staffing • Training of staff; in particular regarding water allocation, water resources management and climate change scenarios • Procurement of equipment • Launch of new WRMU • Operation of WRMU	• Technical expertise • Funding for salaries (start-up only, medium-term self-financing through abstraction fees is targeted), training, travel cost, procurement • Trainer/training material • Funding for training/training material, travel cost • Procurement • Workshop costs	• Consultant/experts (regulation/water resources) for concept development and recruitment process in cooperation with NAWASA and Ministry staff • Workshops/training courses on the job and abroad • Implementation by relevant Ministry
	Improvement of legal and regulative framework for water resources: • Review and amendment of existing document, in particular concerning resilience to climate change impacts in the water sector • Public consultations	• Technical expertise • Funding for public consultations • Funding for awareness campaign	• Consultant/experts (regulation/legal) for final review and amendments, as well as for support of the submission process • NAWASA and MALFFE staff support the technical and legal amendment process and are in charge of implementation

	• Media awareness campaign • Drafting and finalisation of submission to Cabinet • Implementation of new policies and laws Collection and management of water resources and climate change data • Procurement of basic hydrological/hydrogeological equipment and data management software • Data collection and feed-in into data management software and climate change and hydrology model	• Technical expertise • Procurement	• Experts support PR/communication campaign • Consultant/experts (hydrology/ water resources management/ data management and modelling) for concept of data requirement, acquisition and management, as well as specification of equipment • Workshops/training courses on the job • Implementation by relevant Ministry
1.2 Cross-Sectoral Mainstreaming of Climate Resilience into Policies, Plans and Regulations of Water-Related Sectors	• Identifying relevant policies, plans and regulations (tourism, economic development, coastal management, building codes, etc.) • Contributing to the development of identified policies, plans and regulations to ensure the climatic impacts on the water resources are sufficiently covered and considered for policy conclusions • Contributing to public consultations • Contributing to drafting and finalisation of submission (including to Cabinet)	• Technical expertise • Funding for consultations • Awareness campaigns • Publication material (print, poster, social media, video, etc.)	• Consultant/experts for the contributions to the identified policies and documents, for the consultations and for the submission process • PR/communication expert
1.3 Introducing a Climate-Responsive Water Tariff reform	• Analysis of the performance of the existing tariff • Assessment of NAWASA's future revenue requirements and cost of service • Assessment of effectiveness of social safety net in conjunction with the proposed new tariff system • Determination of the objectives of the new tariff	• Technical expertise • Funding for consultation • Accompanying publication material • Media campaign	• Consultant/experts for the development of the tariff study • NAWASA and MALFFE staff support the process • Workshop and stakeholder consultation

	• Establishment of adjustments to tariff structure and levels required to meet objectives • Assistance to NAWASA in gaining approval for new tariff		
2.1 Challenge Fund for Climate-Resilient Commercial Water Users	• Develop concept, including sustainability strategy • Establish committee for fund steering structure • Support development of guidelines for technical, environmental and financial eligibility requirements for applications • Develop monitoring system for application of guidelines • Develop information material for potential beneficiaries and partners from the private sector • Approval of concept, guidelines, monitoring system • Launch and promotion of Challenge Fund • Operation and implementation of Challenge Fund • Technical support to GDB	• Technical expertise • Funding for consultation • Information material • Media campaign • Workshops	• Consultant/experts for development for Challenge Fund • NAWASA, GDB and MoFE staff support the process • Workshop and stakeholder consultation • PR/communication experts
2.2 Awareness, Education and Outreach	• Baseline customer surveys (KAP) • Implementation of campaign 1: Enhancing knowledge about water sector and impacts of climate change • Implementation of campaign 2: Providing education and awareness about efficient water use • Implementation of campaign 3: Building trust in new water governance structures, including necessity and impacts of new water tariffs	• Technical expertise • Funding for training/workshop and media/air space • Funding for material	• Consultant/experts to develop media awareness and narrowcasting campaign • Consultant to develop content for training sessions/workshops and customer surveys • NAWASA to support development and implementation

	• Implementation of campaign 4: Building awareness about G-CREWS project • Baseline customer surveys (KAP)		
3.1 Climate-Resilience of NAWASA Supply Systems	• Design, tendering supervision of supply structures • Preparation of preliminary and final design for the different lots (see B.3 and I.1 and Annex 1 (time schedule) for details) • Tendering and procurement of contractors of the different lots • Construction of infrastructure • Supervision/monitoring of progress, technical quality and costs • Handing over of infrastructure	• Technical expertise • Investment funding	• Consultant/experts for development of supply system • Engineering companies to do studies, support procurement and supervision/monitoring • NAWASA engineers and technicians to support finalisation of studies, procurement and supervision/monitoring • Executing entity to manage and coordinate procurement of engineering companies and contractors and monitor overall implementation • UK AID project activities on Concord water supply system are complementary to this activity area (for details, see section C.3)
3.2 Disaster-Resilience in Medical Centres	• Final design of rainwater harvesting infrastructure in 16 community health facilities • Procurement and installation of tanks and equipment	• Investment funding • Technical expertise	• Engineering companies to do studies, support procurement and supervision/monitoring • Executing entity to manage and coordinate procurement of engineering companies and contractors and monitor overall implementation.
3.3 Disaster Resilience in NAWASA's Systems	• Undertake final design and implementation of works at various treatment plants, including silt traps, river intake retrofits; sediment retaining weirs and plant intake retrofits • Procure and install remote monitoring & control (SCADA) systems • Update/review NAWASA's current emergency response plan	• Technical expertise • Funding for equipment	• Consultant/experts for the assessment • Executing entity to manage and coordinate procurement of engineering companies and contractors and monitor overall implementation. • Consultant for review and amendment of and training on emergency response plans

	• Approval and implementation of reviewed emergency response plan		
4.1 Water and Energy Efficiency	Implementing NAWASA water loss reduction strategy including: • Introduction and implementation of a water balance approach to monitor non-revenue water • Introducing a GIS-based infrastructure and customer management system to comprehensively reduce non-revenue water • Selected replacement of leaking pipes at hot spots identified with the GIS-based management information system Development of an emissions inventory for the water sector in coordination with the NDC process in Grenada Assessment and implementation of selected renewable energy technology options for NAWASA: • Identification and assessment (both technical and financial) of suitable locations for the installation of micro-turbines to replace pressure-reducing valves in the water distribution network, and of solar PV systems to power water treatment and pumping operations. • Development of an operations and maintenance concept for such micro-turbines and solar PV systems	• Technical expertise • Investment funding	• Consultant/experts for the water balance and the implementation of the management system • assessment • Consultant/expert for the emissions inventory • Consultant for renewable energy systems assessment • and amendment of and training on emergency response plans • Executing entity to manage and coordinate procurement of equipment for pipe replacement and renewable energy systems and monitor overall implementation. • Consultant for O&M concept

	• Tender process to procure and install micro-turbines and solar PV systems		
5.1 Lessons learned and replication in the Caribbean	• Preparation of lessons learned • Development of replication models • Implementation of conferences and exchange platforms (e.g. OECS Council of Environment Ministers; CARICOM Ministers of Environment exchange) • Implementation of trainings and webinars • Support in similar initiatives in Caribbean states (e.g. GCF concept notes for funding proposals)	• Technical expertise • Funding for trainings, conferences and exchange platforms • Information material	• Consultant/experts for the analysis and replication model development • Consultants/experts for trainings and webinars • Consultant/experts for review of additional regional initiatives

H.2. Arrangements for Monitoring, Reporting and Evaluation

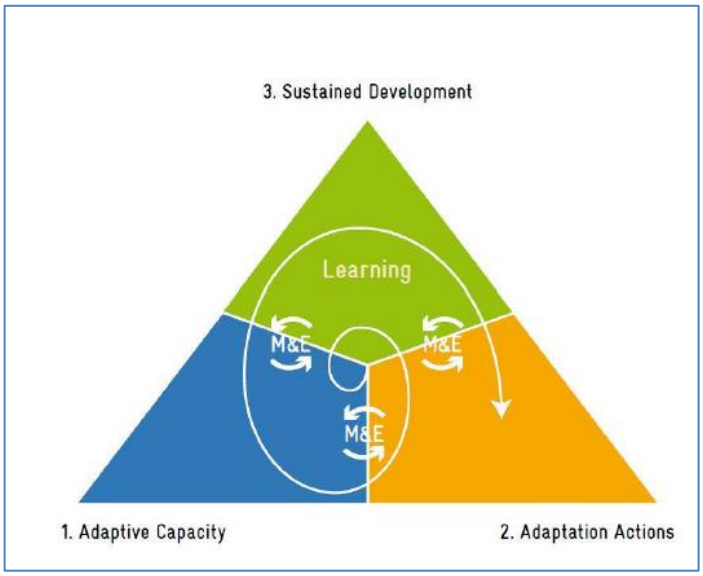
Monitoring, reporting and evaluation arrangements will comply with the relevant GCF policies (as stipulated in the AMA or Project Agreements etc.). The project will introduce a results-based monitoring scheme, measuring activities (on a milestone basis), outputs and impacts. For this purpose a results framework will be developed, building on the baseline of the Vulnerability Assessment. Environmental and Social Monitoring will be done to verify whether predicted impacts have actually occurred, to check that mitigation actions recommended in the project are implemented and to verify their effectiveness. The results-based monitoring will also identify any unforeseen impacts that might arise from project implementation. The monitoring will be documented via Excel-based monitoring sheets addressing the process over time and consisting of the following information:

- Assessing the adaptation context of the project.
- Monitoring milestones to take stock of the progress made towards the intended results.
- Monitoring output indicators.
- Monitoring outcomes and impacts.

The monitoring instrument consists of three dimensions: *Dimension 1* denotes the building of adaptive capacity, such as creating or strengthening the abilities of the relevant actors in the water sector to better respond to climate variability and change. *Dimension 2* comprises adaptation actions, like the concrete measures for reducing risks and vulnerabilities defined in the three components of the project outline. These are the interventions that directly lead to adaptation while activities in Dimension 1 only create the potential for effective adaptation to take place but are key to achieve the paradigm shift. *Dimension 3* encompasses the attainment of sustainable development in spite of the adverse effects of climate change.

In order to achieve sustainable development goals, both adaptive capacity and adaptation actions are necessary. This is why all three dimensions complement each other.

Graph - GIZ 2016 Handbook of the Monitoring Tool for Climate Adaptation Projects



The Steering Committee of the G-CREWS project - in collaboration with the National Climate Change Committee (NCCC) and the NDA - will provide overall strategic oversight for the project.

Monitoring schedule and content: GIZ undertakes semi-annual reviews to assess the progress of project implementation and compliance with covenants and project agreements, to monitor progress in achieving project outputs and to monitor evidence of use of funds. A mid-term review is carried out in year three of the project or at any time that GIZ, the NDA and/or the Steering Committee consider necessary. GIZ competitively selects and assigns an independent consultant for this task. The mid-term review includes (i) a review of the institutional, administrative, organisational, environmental, social, economic, technical and financial aspects of the project based on the assumptions and risks included in the design and monitoring framework; (ii) a review of covenants to assess whether they are still relevant or need to be changed or waived due to altered conditions; (iii) a review of the achievement of planned impacts; (iv) an assessment of the need to restructure or reformulate the project and the effects of such restructuring on the project's objective and long-term goals. Upon completion of the G-CREWS project, GIZ carries out a project completion mission, in which the implementation of the project based on the project and financing agreements, the delivery of outputs and the achievement of project targets are monitored. In addition, the Executing Entities will submit quarterly and annual progress reports to GIZ on the project. Actual performance indicators are reported and compared to the expected results. Wherever necessary, adaptation of operational structures is proposed, discussed and implemented. The details will be stipulated in the financing agreements. At the time of the project's physical completion and commissioning, and before the expiry of the guarantee period, MoFE/PCU and GDB will submit a final report on the measures carried out.

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Annex 1 Timetable of Project/Programme Implementation

Please refer to the activities as numbered in Section H. In the case of outputs, please mark when all the required activities will be completed.

Task	Q 1	Q 2	Q 3	Q 4	Q 5	Q 6	Q 7	Q 8	Q 9	Q 10	Q 11	Q 12	Q 13	Q 14	Q 15	Q 16	Q 13	Q 14	Q 15	Q 16	Q 17	Q 18	Q 19	Q 20
Project implementation support/overall coordination																								
Personnel procurement																								
Component 1: Climate-Resilient Water Governance																								
Output 1: Climate resilience integrated into Grenada's water sector governance: WRMU operational / Water tariff approved / Climate resilience mainstreamed in sector policies, regulations and plans																COMPLETED								
Activity 1.1: Establishment and Empowerment of Water Resource Management Unit (WRMU)																								
Supporting the Implementation of Water Legislation to Establish the Water Resources Management Unit																								
Documentation review																								
Public consultations																								
Media awareness campaign																								

Drafting & finalisation of Cabinet submission and implementation of new policies and laws																								
MILESTONE: Cabinet and Parliament approval for WRMU establishment									⇨ Pre-condition for capacity building activities for WRMU															
Supporting the Capacity Building for WRMU																								
Concept development (⇨ input for WRMU Cabinet approval)																								
Study on the 'Sustainable Financing of the WRMU' (⇨ input for WRMU Cabinet approval)																								
Staffing/recruitment																								
Training																								
Equipment procurement																								
MILESTONE: Launch of new WRMU											⇨ Pre-condition for data collection and management and for mainstreaming of climate resilience into sector documents													
Operation of WRMU																								
Strengthening the Collection and Management of Water Resources and Climate Change Data																								
Equipment procurement to strengthen collection & management of WR data																								

MILESTONE: Climate and hydrology data acquisition network installed																								
Data collection and feed-in into data management software and climate change and hydrology model																								
Activity 1.2: Cross-Sectoral Mainstreaming of Climate Resilience into Policies, Plans and Regulations of Water-Related Sectors																								
Identifying relevant policies, plans and regulations																								
Contributing to development of identified policies, plans and regulations																								
Contributing to public consultations																								
Contributing to drafting and finalisation of submission (including to Cabinet)																								
MILESTONE: 5 policies, plans and regulations approved by respective body																								
Activity 1.3: Climate-Responsive Water Tariff																								
Analysis of performance of existing tariff																								
Assessment of NAWASA's future revenue requirements and cost of service																								
Assessment of effectiveness of social safety net in conjunction with the proposed new tariff																								
Determination of objectives of new tariff																								

Establishment of adjustments to tariff structure and levels required to meet objectives																								
Assistance to NAWASA in gaining approval for new tariff																								
MILSTONE: New water tariff approved by Cabinet													⇨ Tariff provides (a) incentives for farmers/hotels to invest in water efficiency/rainwater harvesting (Activity 2.1: Challenge Fund), and (b) financial resources for NAWASA for maintenance of new infrastructure and future upgrades (component 3)												
Component 2: Climate-Resilient Water Users																								
Output 2: Improved climate-resilience of Grenada's water users: Farmers and Hotels implemented measures via Challenge Fund / Awareness increased																								COMPLETED
Activity 2.1: Challenge Fund for Climate-Resilient Commercial Water Users																								
Development of concept, including sustainability strategy																								
Establishment of committee for the fund-steering structure																								
Support for development of guidelines for technical, environmental and financial eligibility requirements for applications																								

Development of monitoring system for application of guidelines																								
Development of information material for potential beneficiaries and partners from the private sector																								
Approval of concept, guidelines, monitoring system																								
MILESTONE: Launch of Challenge Fund																								
Promotion of Challenge Fund																								
Operation and implementation of Challenge Fund																								
MILESTONE: Funds disbursed as stated in mid-term targets of logframe																								
Technical support to GDB																								
Activity 2.2: Awareness, Education and Outreach																								
Baseline customer survey (KAP)																								
Campaign 1: Enhancing knowledge about water sector and impacts of climate change																								
Campaign 2: Providing education and awareness about efficient water use (⇨ supports implementation of Challenge Fund)																								

Campaign 3: Building trust in new water governance structures, including necessity and impacts of new water tariffs (⇨ campaign supports activity 1.3: Water Tariff Reform)																								
Campaign 4: Building awareness about G-CREWS project																								
Mid-term and final customer surveys (KAP)																								
Component 3: Climate-Resilient Water Supply Systems																								
Output 3: Increased climate-resilience of Grenada's water supply systems: Infrastructure assets constructed / maintenance and emergency plans developed																		COMPLETED						
Activity 3.1: Climate-Resilience of NAWASA's Supply Systems																								
Climate-Resilience of NAWASA Water Supply through Additional Storage																								
Implementation Mirabeau																								
Implementation Les Avocats/Petit Etang																								
Implementation Vendôme																								
Implementation Morne Rouge																								

Implementation Gouyave																								
Implementation Peggy's Whim																								
Implementation Tufton Hall																								
Implementation Carriacou																								
MILESTONE: All additional storage assets in operation																								
Sustainable Use of Groundwater Resources																								
Determination of optimal abstraction rates and groundwater protection zones																								
Rehabilitation of existing wells																								
Drilling of 3 wells to replace old wells																								
MILESTONE: All existing wells rehabilitated and new wells built																								
Definition and implementation of regular operation plan																								
Development and Implementation of a Maintenance Plan for Existing and New Infrastructure																								
Develop maintenance plan																								

Integration into new tariff (⇨ feeds into Activity 1.3)																									
MILESTONE: Maintenance plan available to NAWASA									⇨ Maintenance plan needed to support the sustainable operation of all NAWASA infrastructure																
Investments in Communal Rainwater Harvesting (RWH) Systems																									
Implementation Clozier																									
Implementation Brooklyn																									
Implementation Dover																									
Implementation Mt. Royal																									
MILESTONE: 4 communal rainwater harvesting systems constructed																									
Activity 3.2: Disaster-Resilience in Medical Centres																									
Final design of rainwater harvesting infrastructure in 16 community health facilities																									
Procurement of equipment and installation																									
MILESTONE: 16 rainwater harvesting infrastructures in community health facilities constructed																									

Activity 3.3: Disaster-Resilience in NAWASA's Systems																								
Check Dams and River Intake Retrofits																								
Silt traps																								
River intake retrofits																								
Sediment retaining weirs																								
Plant intake retrofits																								
MILESTONE: Check dams and river intake retrofits constructed																								
Remote Monitoring and Control (SCADA) Systems																								
System design and equipment procurement																								
Installation of equipment																								
MILESTONE: SCADA system operational																								
Emergency Response Plan																								
Update/review of NAWASA's current emergency response plan																								

MILESTONE: Approval of emergency response plan																								
Approval and implementation of reviewed emergency response plan																								
Component 4: Additional Contributions of the Water Sector to Grenada's NDC (financed by BMUB, Germany)																								
Output 4: Improved water and energy efficiency in NAWA's system																COMPLETED								
Activity 4.1: Water and energy efficiency																								
Implementing NAWASA water loss reduction strategy including:																								
Introduction and implementation of a water balance approach to monitor non-revenue water																								
Introducing a GIS-based infrastructure and customer management system to comprehensively reduce non-revenue water																								
Selected replacement of leaking pipes at hot spots identified with the GIS-based management information system																								
Development of an emissions inventory for the water sector in coordination with the NDC process in Grenada																								

Assessment and implementation of selected renewable energy technology options for NAWASA																								
Identification and assessment (both technical and financial) of suitable locations for the installation of micro-turbines to replace pressure-reducing valves in the water distribution network, and of solar PV systems to power water treatment and pumping operations																								
Development of an operations and maintenance concept for such micro-turbines and solar PV systems																								
Tender process to procure and install micro-turbines and solar PV systems																								
Component 5: Regional learning and replication (financed by BMUB, Germany)																								
Output 5: Increased learning and replication of climate-resilient water sector approaches in the Caribbean																COMPLETED								
Activity 5.1: Lessons learned and replication in the Caribbean																								
Analysis of lessons learned																								
Development of replication models																								

Implementation of conferences and exchange platforms (e.g. OECS Council of Environment Ministers; CARICOM Ministers of Environment exchange)																								
Implementation of trainings and webinars																								
MILESTONE: 3 initiatives identified																								
Support in reviewing similar initiatives in Caribbean states (e.g. GCF concept notes for funding proposals)																								

Annex 2 Campaigns in the Context of the Communication Strategy in Activity 2.2

Campaign 1: Enhancing knowledge about the water sector and the impacts of climate change

This includes issues like

- the hydrological cycle in Grenada;
- water availability, water demand and water shortage;
- the predicted impacts of climate change on the water sector;
- links between water, climate and health; and
- the disaster risk of the water supply system.

Campaign 2: Providing education and increasing awareness about efficient water use and rainwater harvesting

This includes, for example,

- information on the Challenge Fund;
- technical and financial information on options to reduce water consumption;
- technical and financial information on options to use alternative water sources, such as rainwater; and
- information on national, regional and international advisory bodies and technical consultants to support implementation of water efficiency and rainwater harvesting approaches, if required.

Campaign 3: Building trust in the new water governance structures, including the necessity and impacts of new water tariffs

This includes, for example,

- public consultation on and awareness of new policies, regulations and acts;
- public consultation on and awareness of the new tariff regime; and
- information on why a Water Resources Management Unit is needed, what its role and responsibilities are, and how the broader public can access data and information from the WRMU.

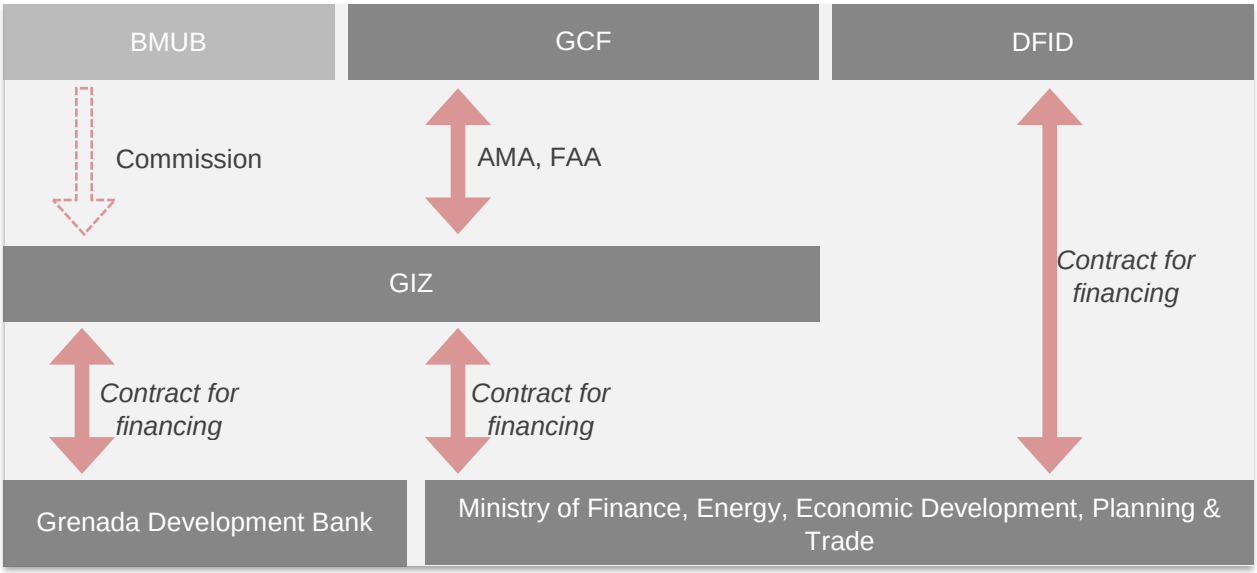
Campaign 4: Building awareness about the G-CREWS project

This includes, for example,

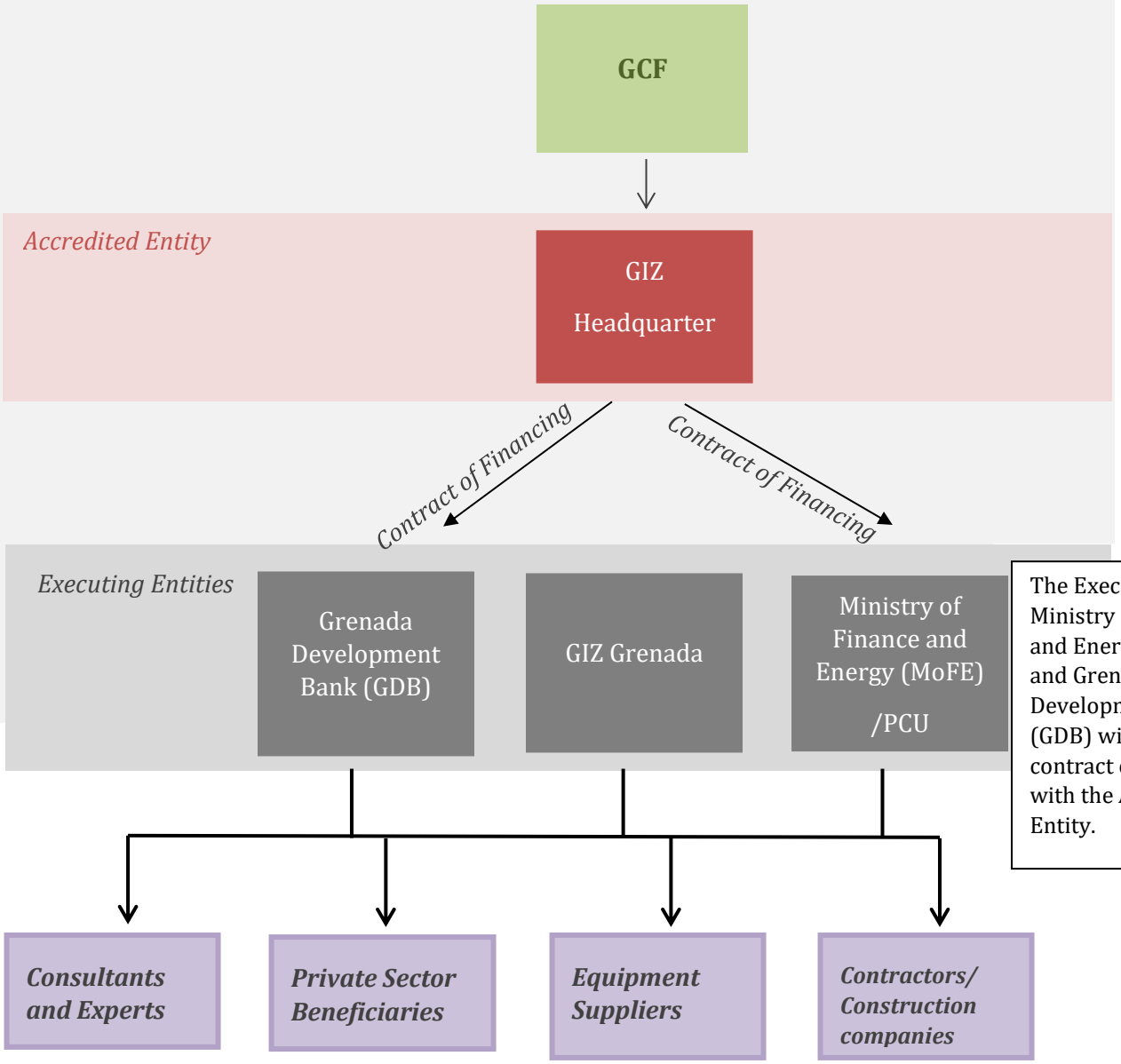
- the objectives, activities and benefits of the project;
- progress reports of the project ;
- highlighting major implementation steps; and
- organizing regional outreach and learning events, in close cooperation with the OECS, CCCC and/or CARICOM.

All four campaigns will make use of the three-step approach of a publication plan (brochures, flyers, etc.), public relations plan (meetings, consultations, fairs and school events, TV and radio appearances and spots etc.) and social media plan. In addition, in particular for the regional dimension of the Campaign 4, close and long-term links between GIZ, GoG and NAWASA with the OECS, CCCCC, the Caribbean Water and Sewage Association (CAWASA) and CARICOM will be established to make optimal use of regional events.

Annex 3 Contractual Arrangements



Annex 4 Flow of Funds



The Executing Entities Ministry of Finance and Energy (MoFE) and Grenada Development Bank (GDB) will sign a contract of financing with the Accredited Entity.