CTCN Technical Assistance

Request Submission Form

Guidelines:

- This Request Submission Form should be completed by the organisation requesting technical assistance from the Climate Technology Centre & Network (CTCN) in collaboration with the National Designated Entity (NDE) of the country in question
- The Form must be signed by the NDE. Please see updated contact list of NDEs here: http://unfccc.int/ttclear/support/national-designated-entity.html
- The Form can be submitted as a Word file containing a digital signature or as a signed and scanned PDF file in combination with an un-signed Word file
- For requests submitted by multiple countries, all the NDEs of the respective countries shall sign identical Forms before official submission to the CTCN
- NDEs have the opportunity to submit CTCN requests in collaboration with National Designated Authorities (NDAs) for the Green Climate Fund (GCF) if targeting the GCF Readiness Programme.

Requesting country or countries:	Antigua and Barbuda
Request title:	Technical assistance for resilience to climate variability in the Building Sector of Antigua and Barbuda
NDE	Diann Black-Layne Director, Department of the Environment Ministry of Health and the Environment
Request Applicant:	Diann Black-Layne Director, Department of the Environment Ministry of Health and the Environment Botanical Gardens, Factory Road, St. John's, Antigua Office: +1.268.462.4625 or +1.268.562.2568 Mobile: +1.268.464.6410 DOE@ab.gov.ag Diann.Black-Layne@ab.gov.ag; dcblack11@gmail.com

Climate objective:

- ☒ Adaptation to climate change
- ☐ Mitigation of climate change
- ☐ Combination of adaptation and mitigation of climate change

Geographical scope:

- ☐ Community level

☐ Sub-national

☒ National

☐ Multi-country

If the request is at a sub-national or multi-country level, please describe specific geographical areas (provinces, states, countries, regions, etc.).

Problem statement related to climate change (up to one page):

Antigua and Barbuda has experienced over 10 hurricanes in the past 20 years, the most recent events being Hurricane Gonzalo in 2014 and Hurricane Irma in 2017. After each event – in addition to the destruction of property, buildings, ecosystems and loss of lives – access to the electricity grid is often intermittent or not available for weeks, which has negative impacts on health, livelihoods and well-being, as well as the economic security of the country.

Hurricane Irma hit Antigua and Barbuda in September 2017 and caused an estimated US$150 million of damage in the country. Climate change impacts are expected to increase both the frequency and severity of hurricanes, and as a result the country is increasingly vulnerable to their impacts. Annual GP is just over USD 1 billion. Tourism is the most prominent economic activity in the country and is responsible for: i) 80% of the GDP; ii) 85% of all foreign exchange; and iii) employment for 70% of the population. The tourism industry draws almost one million visitors each year for the country; . Other prominent economic sectors are agriculture and industry, which contributed 2% and 18% respectively to the national GDP in 2016.

Climate change projections indicate that damages caused by climate-induced disasters are likely to increase across the Caribbean in the future.

Table 1. Hurricanes and associated economic losses in Antigua and Barbuda since 1995[1;2]

Year	**Event**	**Economic loss/damages** (US$)	**GDP** (US$)	**Economic loss of GDP** (%)
1995	Hurricane Luis	347 million	494 million	70
1998	Hurricane George	200 million	620 million	32
1999	Hurricane Jose and Lenny	247 million	652 million	38
2008	Hurricane Omar	49 million	1.4 billion	3.6
2010	Hurricane Earl	52 million	1.1 billion	4.6
2014	Hurricane Gonzalo	40 million	1.2 billion	3.3
2017	Hurricane Irma	*Information not currently available*[3]	*Information not currently available*	*Information not currently available*

Past and on-going efforts to address the problem (up to half a page):

This section should answer the question “what has been done or is currently being done to address the

[1] Third National Communication on Climate Change.
[2] The World Bank. 2017. The World Bank Data: Antigua and Barbuda. Available at: http://data.worldbank.org/country/antigua-and-barbuda [accessed 08.05.2017].
[3] During development of this GCF proposal (September 2017), Hurricane Irma was underway. Therefore, statistics were not readily available on the losses and damages.

problem?" Please describe past and on-going processes, projects or initiatives implemented in the country or region to tackle the climate problem as described above.

The National Designated Authority (NDA) to the GCF in Antigua and Barbuda has been working with UN Environment to develop a project, titled, *Resilience to Hurricanes, Floods and Droughts in the Building Sector in Antigua and Barbuda*.

The objective of the proposed project is to increase the climate resilience of public buildings in Antigua and Barbuda to hurricanes, droughts and extended dry periods, flooding and increased air temperatures. Project activities will: i) ensure that critical services remain operational during and following extreme climate events; and ii) will bring about reduced maintenance costs of buildings owing to the installed climate proofing interventions. Through the proposed project, the private sector will also gain access to funding for climate proofing of their buildings:

Output 1. Enhanced institutional and technical capacities for planning, implementing and monitoring of adaptation measures in the building sector.

- Activity 1.1. Support the mainstreaming of climate proofing measures into funding mechanisms, policies and standards for the building sector.
- Activity 1.2. Strengthen technical capacity for planning and monitoring climate proofing and other adaptation measures in the building sector.
- Activity 1.3. Identify barriers and develop operational guidelines and a research and monitoring programme to unlock private sector financing for adaptation in buildings.

Output 2. Climate proofing adaptation measures implemented in the public and community sectors.

- Activity 2.1. Climate proof identified public buildings to improve resilience to extreme climate events, including hurricanes and floods, and improve adaptation measures during droughts.
- Activity 2.2. Develop and implement plans for climate proofing activities and interventions in community buildings.

Specific technology[4] barriers (up to one page):

This section should answer the questions "what are the technology barriers that hinder national efforts described above" and "how will the CTCN technical assistance complement these efforts?" Building upon the problem statement and taking into consideration the existing efforts described above, please describe the specific technology barriers encountered by the requesting applicant to identify, assess or deploy climate technology(ies) in an effort to address the problem statement. The described barriers should be within the scope of the requested CTCN technical assistance (described in the section below).

GCF resources are being sought to invest in the public interest that will result from a paradigm shift from existing and dilapidated buildings that are increasingly exposed to the impacts of climate change towards the adoption of climate-resilient building approaches in Antigua and Barbuda. Through the proposed project, GCF resources will be used to address several barriers that constrain the

[4] *"**any equipment, techniques, practical knowledge and skills** needed for reducing greenhouse gas emissions and adapting to climate change" (Special Report on Technology Transfer, IPCC, 2000)*

implementation of such climate resilient measures, including limited technical, institutional and financial capacities for undertaking such actions.

The technology barriers that hinder national efforts to improve resilience in buildings is identifying what interventions are required to enable the buildings to withstand a Category 5 hurricane, extreme flooding, and extended drought, which the core economy and critical services can still function.

Indicative interventions to build resilience in buildings that have been identified at the Concept Note stage, which require additional analysis through this technical assistance, include:

- **Roof reinforcements.** For buildings in Antigua and Barbuda to withstand a Category 5 hurricane, roof structures should be reinforced by *inter alia* installing hurricane straps. Coupling roof reinforcing structures with air ventilation measures will also reduce the potential for roofs to be damaged and/or removed during extreme climate events like hurricanes.
- **Window and door strengthening.** Much like roof reinforcements, windows and doors need to be strengthened in Antigua and Barbuda to withstand a Category 5 hurricane. Reinforcing windows and doors will not only reduce the damage to buildings but will also protect people. This reinforcing and strengthening needs to be affordable such that it does not impact the daily running costs for a building. Window and door strengthening structures can be installed together with mosquito screens and air ventilation/cooling measures.
- **Water storage.** As per the Building Code, all buildings in Antigua and Barbuda are required to have rainwater harvesting systems in place. Harvesting rainwater benefits both the environment and people as it reduces run-off and flooding, and serves people during droughts and extended dry periods. There is also an economic benefit in that water utility bills are significantly reduced when using a rainwater tank for all internal building water needs.
- **Grid-interactive solar renewable energy systems + batteries.** Increased energy resilience through the provision of solar panels will allow electricity supply and communication channels to remain operational during and following extreme climate events. A grid-interactive system makes use of a battery back-up system to be used during power outages. An economic benefit of solar power is that the installation cost compared to the estimated life-span of the technology will to be approximately one third of the overall utility bills.
- **Solar water heaters.** Installing solar water heaters eliminates the need for electricity, gas or other fossil fuels for water heating. This in turn reduces electricity costs for buildings that can be diverted elsewhere – i.e. to overall maintenance. The installation of solar heating services needs to be secure to withstand strong winds and tropical storms. Solar water heaters are especially relevant to hospitals and clinics where regular sterilisation needs to take place, including during and following extreme climate events, when access to electrical water heating systems are often offline.
- **Energy-efficient appliances.** To reduce the total energy use of buildings – ~80–90% of which is owed to heating, cooling, lighting, ventilation and appliances – energy-efficient appliances can be retro-fitted. In particular, the replacement of appliances assists with 'load shedding' of energy supply and allows solar power to be directed towards other electrical needs of the building. Energy-efficient appliances benefit both the environment and people because of reduced energy bills and carbon emissions.
- **Central septic systems.** These central or community septic systems receive wastewater of more than 9,000 litres (2,500 gallons) per day, and can service two buildings per system. Having a central septic system allows for minimal land to be converted solely for the use of septic systems.
- **Green infrastructure/pervious surfaces.** Allowing water to absorb through ground surfaces reduces run-off and flooding during and following rainfall events. No costing has been done thus far on implementing green infrastructure or pervious surfaces around buildings in Antigua and Barbuda.
- **Mosquito screens and nets.** Installing screens and nets that prevent mosquitos from entering buildings helps to protect against the spread of vector-borne diseases, such as *inter alia* the

chikungunya and zika viruses. Windows and doors may need to be restructured in some instances to allow for mosquito screens to be fitted.

- **Indoor air quality.** The design, construction, operation and maintenance of buildings impacts the air quality, energy consumption of the building and human health. To mitigate potential negative health impacts, options include ensuring natural ventilation and shading, and fitting air conditioners/cooling systems. Implementing these measures helps to reduce the negative impacts of increasing indoor air temperatures such as heat stress. No costing has been done thus far on implementing natural ventilation or air cooling measures in buildings in Antigua and Barbuda.

The project is where possible seeking to learn from and contribute to the ongoing 10YFP. The proposed project is using the **10 YFP Programme on Sustainable Public Procurement (SPP)** for Activity 1.1 – support the mainstreaming of climate proofing measures into funding mechanisms, policies and standards for the building sector – which will ensure that project activities procure goods for all work and services in buildings using the new ISO standard for Sustainable Procurement. The SPP is led by UN Environment, co-led by Korean Environmental Industry and Technology Institute (KEITI) and Local Governments for Sustainability (ICLEI). Implementation of SPP under the proposed project will be used as a case study for the SPP.

Lessons learned from the proposed project will: i) build a case for SPP by improving the knowledge on SPP and its effectiveness as a tool to promote SCP, as well as to support greener economies and sustainable development; and b) support the implementation of SPP on the ground through increased collaboration and better access to capacity building tools and support from SPP experts.

The proposed project will also use the **10 YFP Programme on Sustainable Buildings and Construction**. Project activities will provide case studies for and advance the Programme goal(s) of: i) 'stakeholders involved in the planning, design, construction, commissioning, management operation and deconstruction of buildings have a common understanding of sustainable buildings and the knowledge, resources and incentives required to create, maintain and use them'; and ii) 'structures that are healthy to live and work in, that sustainably utilise energy, water, land and other key resources, respecting environmental limits, and ultimately have a minimally adverse impact on the natural world, supporting social and economic development'. This 10 YFP programme is led by Finland, and co-led by the World Green Building Council (WGBC), the Royal Melbourne Institute of Technology (RMIT) and UN Environment. The proposed project will work with these partners on the proposed project, particularly Activity 1.2 – strengthen technical capacity for planning and monitoring climate proofing and other adaptation measures in the building sector.

UN Environment is a key leader in the two 10 YFP programmes listed above. The proposed project will work closely with the 10 YFP to incorporate international best practices and demonstrate practical application of the sustainable procurement and the sustainable buildings and construction frameworks.

Sectors:

Please indicate the main sectors related to the request:

☐ Coastal zones	☐ Early Warning and Environmental Assessment	☒ Human Health	☒ Infrastructure and Urban planning
☐ Marine and	☐ Water	☐ Agriculture	☐ Carbon fixation

Fisheries

☒ Energy Efficiency ☐ Forestry ☐ Industry ☒ Renewable energy

☐ Transport ☐ Waste management

Please add other relevant sectors:

Cross-sectoral enablers and approaches:

Please indicate the main cross-sectoral enablers and approaches

☐ Communication and awareness ☒ Economics and financial decision-making ☒ Governance and planning ☐ Community based

☒ Disaster risk reduction ☐ Ecosystems and biodiversity ☐ Gender

Technical assistance requested (up to one page):

The objective of this technical assistance is to enable the Government of Antigua and Barbuda to submit a small-scale funding proposal to the GCF for the proposed project with UNEP as an accredited entity.

This technical assistance is being requested from CTCN to:

- Conduct technical assessments of beneficiary buildings and their service inputs (food, water, electricity)
- Identify the detailed interventions required to make the buildings resilient to the impacts of climate change and variability, including: a Category 5 hurricane, extreme flooding, severe drought (the technical assistance will further define the exact climate parameters)
- Comprehensive costing of the adaptation interventions
- Recommendations for policy and standards e.g. the Building Code; and other recommendations for the project to best achieve its climate resilience goals

The list of public sector beneficiary buildings targeted for the GCF project are:

1. Hannah Thomas Hospital, Barbuda
2. Police Office, Barbuda
3. Fire Station, Barbuda
4. Mount St John's Medical Centre (MSJMC), Antigua
5. Royal Police Force of Antigua and Barbuda (RPFAB) Headquarters, Antigua
6. St John's Fire Station, Antigua
7. All Saints Clinic (part of the All Saints Complex) , Antigua
8. All Saints Fire Station (part of the All Saints Complex) , Antigua
9. All Saints Police Station (part of the All Saints Complex) , Antigua
10. Royal Antigua & Barbuda Defence Force, Antigua
11. Clarevue Psychiatric Hospital, Antigua
12. Fiennes Institute, Antigua
13. National Office of Disaster Services (NODS), Antigua

14. Department of Environment Office, Antigua
15. Meteorological Office, Antigua
16. Antigua State College, Antigua
17. Her Majesty's Prison, Antigua

In addition, technical assistance in being requested for assessments in 10 – 15 schools and clinics that have been earmarked to receive grid-interactive Solar PV systems with support from the Global Environment Facility (GEF), however the Caribbean Development Bank as executing entity requires that post-hurricane building assessments are required prior to endorsement:

1. Bendals Clinic, Antigua
2. Bolans Clinic, Antigua
3. Fiennes Institute, Antigua
4. Good Shepherd Home for Children, Antigua
5. Holberton Hospital - Childrens Ward, Antigua
6. Holberton Hospital – Hospice, Antigua
7. Nyahbinghi Theocracy School, Antigua
8. Old Road Clinic, Antigua
9. Parham Clinic, Antigua
10. Potters Clinic, Antigua
11. Swetes Clinic, Antigua
12. Victory Centre, Antigua
13. Willikies Clinic, Antigua

Expected timeframe:

2 months

Anticipated gender and other co-benefits from the technical assistance:

Please describe the activities with gender linkages as well as the anticipated gender and other co-benefits (e.g. biodiversity, economic, social, cultural, etc.) that are likely to be generated as a result of the technical assistance.

For more information you can find guidelines on the CTCN's website here:
https://www.ctc-n.org/technologies/ctcn-gender-mainstreaming-tool-response-plan-development

Further reading on gender can be found on the CTCN website here:
https://www.ctc-n.org/technology-sectors/gender

Key stakeholders:

Please list the stakeholders who will be involved in the implementation of the requested CTCN technical assistance and describe their role during the implementation (for example, government agencies and ministries, academic institutions and universities, private sector, community organizations, civil society, etc.).

Stakeholders	Role to support the implementation of the technical assistance
National Designated Entity	Diann Black-Layne, Director, Department of the Environment
Request Applicant	Diann Black-Layne, Director, Department of the Environment
Development Control Authority	Capacity building for Building Inspectors to improve climate change

	assessments

Alignment with national priorities (up to 2000 characters including spaces):

Please describe how the technical assistance is consistent with national climate priorities such as: Nationally Determined Contribution, national development plans, poverty reduction plans, technology needs assessments, Low Emission Development Strategies, Nationally Appropriate Mitigation Actions, Technology Action Plans, National Adaptation Plans, sectorial strategies and plans, etc.

Reference document (please include date of document)	**Extract** (please include chapter, page number, etc.).
Nationally Determined Contribution (NDC)	This project will contribute to Antigua and Barbuda's Nationally Determined Contribution (NDC) adaptation target on page 2: By 2030, all buildings are improved and prepared for extreme climate events, including drought, flooding and hurricanes. http://www4.unfccc.int/submissions/INDC/Published%20Documents/Antigua%20and%20Barbuda/1/INDC_Antigua_Barbuda.pdf
Technology Needs Assessment	This has not been completed for Antigua and Barbuda yet. This technical support will assess preliminary needs in the public building sector
National Adaptation Plans	This has not been completed for Antigua and Barbuda yet.
Nationally Appropriate Mitigation Actions	
Add others here as relevant	

Development of the request (up to 2000 characters including spaces):

Antigua and Barbuda's Department of Environment has been working to develop the USD 45 M project titled, *Resilience to Hurricanes, Floods and Droughts in the Building Sector in Antigua and Barbuda*. There have been extensive consultations and in-country missions to support the preparation of the Concept Note, and this study will be a key input into the full funding proposal.

Background documents and other information relevant for the request:

- National Vulnerability Impact Analysis for Antigua and Barbuda http://www.environmentdivision.info/UserFiles/File/1Draft_National_VIA_for_Antigua_and_Barbuda__24_10_14.pdf
- Climate Change Risk Profile for Antigua and Barbuda http://bit.ly/2xVJTvS
- Antigua and Barbuda Third National Circumstances http://unfccc.int/resource/docs/natc/antnc3.pdf
- Concept Note for the Project (email Lia.Nicholson@ab.gov.ag for the document)
- Engineering designs for Cashew Hill waterway, including rainfall intensity duration frequency (IDF) curve (email Lia.Nicholson@ab.gov.ag for the document)

OPTIONAL: Linkages to Green Climate Fund Readiness and Preparatory Support

The CTCN is collaborating with the GCF in order to facilitate access to environmentally sound technologies that address climate change and its effects, including through the provision of readiness

and preparatory support delivered directly to countries through their GCF NDA. These actions are in line with the guidance of the GCF Board (Decision B.14/02) and the UNFCCC, particularly paragraphs 4 and 7 of 14/CP.22 that addresses Linkages between the Technology and the Financial Mechanisms[5].

The CTCN is therefore implementing some of its technical assistance using GCF readiness funds accessed via the country's NDA. Any application for GCF support, including the amount of support provided, is subject to the terms and conditions of the GCF and should be developed in conjunction with the NDA.

Please indicate whether this request has been identified as preliminarily eligible by the NDA to be considered for readiness support from the GCF.

☐ Initial engagement: The GCF NDA of the requesting country has been engaged in the design of this request and the NDA will be involved in the further process leading to an official agreement for accessing GCF readiness support.

☐ Advanced engagement (preferred): The GCF NDA of the requesting country has been directly involved in the design of this request and is a co-signer of this request, the signature indicating provisional agreement to use readiness national funds to support the implementation of the technical assistance.

NDA name:

Date:

Signature:

Monitoring and impact of the assistance:

By signing this request, I affirm that processes are in place in the country to monitor and evaluate the technical assistance provided by the CTCN. I understand that these processes will be explicitly identified in the CTCN Response Plan and that they will be used in the country to monitor the implementation of the technical assistance following standard CTCN procedures.

Signature:

NDE name:	Diann Black-Layne Director, Department of the Environment Ministry of Health and the Environment
Date:	October 2, 2017
Signature:	

[5] Please see:
https://unfccc.int/files/meetings/marrakech_nov_2016/application/pdf/auv_cop22_i8b_tm_fm.pdf

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THE COMPLETED FORM SHALL BE SENT TO THE CTCN@UNEP.ORG

The CTCN is available to answer all questions and provide guidance on the application process.