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Strengthening Climate Services in the Caribbean

Through the

Sectoral Early Warning Information Systems Across

Climate Timescales (EWISACTs)

Regional Roadmap and Plan of Action (RPA) 2020-2030

Prepared by:

The Caribbean Institute for Meteorology and Hydrology (CIMH)
The Caribbean Agricultural Research & Development Institute (CARDI)
The Caribbean Water and Wastewater Association (CWWA)
The Caribbean Disaster Emergency Management Agency (CDEMA)
The Caribbean Public Health Agency (CARPHA)
The Caribbean Centre for Renewable Energy and Energy Efficiency (CCREEE)
The Caribbean Tourism Organization (CTO)
The Caribbean Hotel & Tourism Association (CHTA)

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Following the eighth principle of the Global Framework Climate Services, as well as, the principle underpinning Priority 4 of the Sendai Framework for Disaster Risk Reduction, the Sectoral EWISACTs Regional Roadmap and Plan of Action (RPA) 2020-2030 has emerged from two years of dialogue and collaboration with sectoral, national, regional, and other relevant representatives. The development of the Sectoral EWISACTs RPA 2020-2030 was coordinated by the Caribbean Regional Climate Centre team of Adrian Trotman, Roché Mahon, Cédric Van Meerbeek and Jodi-Ann Petrie with inputs from David Farrell, Cisne Pascal, Shawn Boyce, Johnathan Cox, Grahame Niles, Daison Lowe and Damien Prescod. Several designated representatives from Consortium partner and Observer organisations have made significant strategic inputs including:

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FOREWORD

"Climate change in the Caribbean is, among other things, resulting in significant variability in seasonal and sub-seasonal climates across the region that are negatively impacting the performance of climate sensitive sectors. In recent years, many islands have experienced droughts and/or prolonged periods of low rainfall; periods of significant and intense rainfall leading to extensive flooding and landslides; and periods of exceptional heat associated with the growing number of heat waves reported for the region. These manifestations are currently negatively affecting lives, livelihoods, communities and national economies. As a result, building the region's resilience to climate shocks is urgent and requires that climate sensitive sectors become more resilient to shocks. The Caribbean Early Warning Information System Across Climate Timescales (EWISACTs) Partner Consortium represents one modality, but an important innovative and transformational modality, for building the region's resilience to climate change by ensuring that the producers of climate services information and the users of climate services information work in concert to ensure that sector practitioners and those at risk have access to the best actionable climate information to risk inform their planning and decision-making processes. As a member of the Consortium, the CIMH remains committed to ensuring that the best climate information makes its way to all who need it. The EWISACTs Roadmap and Plan of Action 2020-2030 advances the operationalization of climate services in the region to improve decision making across all levels of Caribbean society. The CIMH therefore fully endorses the Roadmap and Plan of Action 2020-2030." – Dr. David Farrell, Principal, Caribbean Institute for Meteorology and Hydrology

"Given the highly challenging climate, CARDI recognizes the inextricable role that climate services must play in enhancing the sustainability and resilience of agriculture and food security in the Caribbean." - Mr. Barton Clarke, Executive Director, Caribbean Agricultural Research and Development Institute

"Strategic planning and investment in the water sector is a challenge due to the many uncertainties surrounding climate change and its impact on the hydrological cycle. The Sectoral EWISACTs framework provides the necessary tools and insight through climate services to water managers and policy makers to build much needed resiliency in this sector in the Caribbean region. This also ties in well with the Regional Strategic Action Plan (RSAP) of the CWWA, where reliable climatic and therefore hydrological forecasts - one of the pillars of water management - is central." – Mr. Wayne O. Williams, Executive Director, Caribbean Water and Wastewater Association

"EWS saves lives! CDEMA is therefore pleased to endorse the EWISACTs RPA as a critical modality for strengthening the region's EWS arsenal to deal with an increasingly challenging, and complex hazards landscape. The RPA complements the advisory and coordinating role of the Regional Early Warning Systems Consortium. It will support the achievement of regional priorities as articulated in the Comprehensive Disaster Management Strategy and Plan of Action (2020-2024), (regional outcome



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4.3) Community EWS integrated, improved and expanded. CDEMA also looks forward to the products that will emanate from the implementation of the RPA and support improved decision making (regional outcome 2.2). – Ms. Elizabeth Riley, Executive Director, CDEMA

“The Caribbean Public Health Agency (CARPHA) endorses the Sectoral EWISACTs Regional Road Map and Plan of Action (2020-2030). This initiative aligns with CARPHA's Strategic Plan and regional commitments under the Caribbean Cooperation in Health (CCHIV). The collaboration with Consortium partners will build on existing work of the Agency, which speaks to strengthening health systems through the integration of climate factors into disease and environmental health surveillance.” - Dr. Joy St. John, Executive Director, Caribbean Public Health Agency

“The Sectoral EWISACTs RPA 2020-2030 will support the work of the CCREEE in transforming the energy landscape into a climate resilient, sustainable and affordable sector. The Centre looks forward to working with the Caribbean RCC and the larger Consortium of sectoral partners to integrate climate risk considerations into the transformation of the energy sector, in alignment with its focus on and interoperability among integrated resource and resilience planning, project preparation support and the operation of a Caribbean Energy Knowledge Hub (CEKH), for the benefit of the region.” – Dr. Gary Jackson, Executive Director, Caribbean Centre for Renewable Energy and Energy Efficiency

“The Sectoral EWISACTs Roadmap and Plan of Action 2020-2030 aligns with the Caribbean Tourism Organization's (CTO) Strategic Plan for Regional Tourism Development and the Caribbean Sustainable Tourism Policy and Development Framework (CSTPDF) 2020, which calls for climate smart action and supports measures to address climate and disaster resilience in the Caribbean. The CTO is pleased to endorse and work with other Partners to implement the Roadmap in the coming years, and commends the CIMH for championing this initiative that provides the framework for co-developing tailored climate information for the region’s most important industry.” – Mr. Neil Walters, Secretary-General (Ag.), Caribbean Tourism Organisation

“This Regional Roadmap is timely since it will support the CHTA's efforts to reduce the tourism sector's and by extension the wider Caribbean region's vulnerability to the physical and strategic impacts of climate variability, extremes and change through mainstreaming climate adaptation. The Sectoral EWISACTs RPA 2020-2030 also offers exciting opportunities for climate informed tourism planning, management and marketing.” – Mr. Frank J. Comito, CEO and Director General, Caribbean Hotel and Tourism Association



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ACRONYMS

AWS	Automatic Weather Stations
CARDI	Caribbean Agricultural Research & Development Institute
CariCOF	Caribbean Climate Outlook Forum
CariSAM	Caribbean Society for Agricultural Meteorology
CARPHA	Caribbean Public Health Agency
CIMH	Caribbean Institute for Meteorology and Hydrology
CCID	Caribbean Climate Impacts Database
CCREEE	Caribbean Centre for Renewable Energy and Energy Efficiency
CD	Capacity Development
CDEMA	Caribbean Disaster Emergency Management Agency
COTED	CARICOM Council for Trade and Economic Development
CRM	Climate Risk Management
CTO	Caribbean Tourism Organization
CHTA	Caribbean Hotel and Tourism Association
CMO	Caribbean Meteorological Organization
CWWA	Caribbean Water and Wastewater Association
CSIS	Climate Services Information System
EWISACTS	Early Warning Information Systems Across Climate Timescales
GFCS	Global Framework for Climate Services
ICT	Information, Communication and Technology
IT	Information Technology
IWRM	Integrated Water Resources Management
LoA	Letter of Agreement
MER	Monitoring, Evaluation and Reporting
MoU	Memorandum of Understanding
NCOF	National Climate Outlook Forum
NMHSS	National Meteorological and Hydrological Services
OA	Outcome Areas
OSCAR	Observing Systems Capability Analysis and Review
RCC	Regional Climate Centre
RMP	Research, Modelling and Prediction
R&D	Research and Development
RPA	Roadmap and Plan of Action
SIDS	Small Island Developing States
UIP	User Interface Platform



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EXECUTIVE SUMMARY

Weather and climate-related hazards are the most frequently occurring natural hazards in the Caribbean that have historically incurred significant damage and loss. Climate services are critical to the effective management of climate-related disasters and adaptation to climate extremes, variability and change. Since 2013, the Caribbean Institute for Meteorology and Hydrology in its role as the World Meteorological Organization (WMO) Regional Climate Centre for the Caribbean¹ has invested in regional implementation of the WMO-led Global Framework for Climate Services (GFCS) in collaboration with partners responsible for a range of climate-sensitive sectors in the Caribbean. Guided in part by the GFCS philosophy, the Caribbean is now establishing its own consensus-based, regionally tailored framework for climate services.

At its broadest level, the Sectoral Early Warning Information Systems across Climate Timescales (EWISACTs) Regional Roadmap and Plan of Action (RPA) 2020-2030 is the platform for strategically advancing climate services in the Caribbean. It articulates the 11-year collective goal, outcomes, and outputs that guide the implementation of a coordinated, multi-sectoral climate services portfolio as seen below.

LEVEL	RESULTS				
Paradigm shift objective (30-year change)	To significantly reduce climate-related impacts in key socio-economic sectors in the Caribbean.				
Consortium mission	To support building the region’s climate resilience through the development, delivery and integration of climate services into the planning and decision-making of climate-sensitive sectors.				
Roadmap goal (11-year change)	Increased resilience of climate-sensitive sectors in the Caribbean.				
Roadmap objectives	<ol style="list-style-type: none"> 1. Strengthened institutional context for climate risk management (CRM) at regional, national and sectoral scales; 2. Enhanced and harmonised climate and sectoral information production systems across climate timescales; 3. Increased generation of tailored, sector-specific climate information at regional and national scales; and 4. Improved sectoral decision-making for CRM at regional and national scales. 				
Roadmap Outcome	OA 1: Enhanced mechanisms for	OA 2: Improved quality of climate	OA 3: Improved and harmonised	OA 4: Enhanced User Interface	OA 5: Strengthened

¹ Designated in 2017.



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Areas (11-year change)	the collection, management and dissemination of climate and sectoral data	information and services through enhanced social science and interdisciplinary research	Climate Services Information Systems to support sectors at regional and national levels	mechanisms at regional, national and sectoral levels	Capacity Development and enabling environment for the provision and use of climate services at regional, national and sectoral levels
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The Sectoral EWISACTs RPA 2020-2030 is a large scale, capacity building programme that addresses several core needs in the region’s resilience building agenda. The 11 year timeframe from 2020-2030 is appropriate due to the complex nature of the process to develop applied climate information products and services and mainstream climate services into the planning and decision-making of climate-sensitive sectors. Moreover, the 2030 endpoint aligns well with the parallel processes being undertaken by Caribbean countries to implement commitments under international sustainable development and/or climate frameworks such as the United Nations Sustainable Development Goals and the Paris Agreement.

The Sectoral EWISACTs RPA 2020-2030 has been co-developed by the Consortium of Sectoral EWISACTs Regional Coordination Partners and will support strengthened climate services in the Caribbean. Going forward, each partner organisation contributes its mission, priorities, resources and disciplinary focus in selecting and supporting activities to be implemented vis-à-vis the RPA. The synergistic, inter-institutional collaboration furthers the goals of each Agency’s portfolio, as well as, regional and national priorities while avoiding duplication of efforts and investments. Importantly, the nature of the Consortium alliance facilitates amplification of the impact of Consortium supported interventions by broadening the scale and diversity of networks, partnerships and audiences for the co-design, co-development and co-delivery of climate services in the Caribbean.



1.0 THE CASE FOR CLIMATE RESILIENCE

Caribbean Small Island Developing States² (SIDS) are recognised to be one of the most climate-sensitive (see Appendix 1) and disaster prone regions in the world (IPCC, 2014; UNISDR, 2013). In an area of the world that has consistently been characterised as an area of low economic growth (IMF 2013; IABD 2014), most States bear a heavy public debt burden, brought on in large measure by recovery after major weather and climate-related events (CARICOM, 2017). Weather and climate-related hazards are the most frequently occurring natural hazards (CDEMA, 2013) and have historically incurred significant damage and losses, with a number of productive sectors such as Agriculture, Water, Health, Energy, and Tourism being severely affected by these events (Table 1).

Table 1. Snapshot of Selected Weather and Climate-related Impacts in the Caribbean

Year(s)	Event	Country: Damage and/or Loss
1988	Hurricane Gilbert	Jamaica: USD 700 million in damage from destroyed crops, buildings, houses, roads, and small aircraft
1998	Hurricane Georges	St. Kitts and Nevis: USD 1.5 billion dollars in crop losses
2004	Hurricane Ivan	Grenada: 200% of GDP Cayman Islands and Jamaica: severe tourism losses
2005	Floods	Guyana: 59% of GDP
2009/2010	Drought	Several countries: <ul style="list-style-type: none"> • reduced crop production • increased bushfires • widespread water shortages • increase in food prices
2010	Hurricane Tomas	Saint Lucia: 60% of GDP
2011	Floods	Guyana: 2143 farms affected
2012	Hurricane Sandy	Jamaica: 3 health facilities damaged; 460 water systems destroyed

² Including the non-island low lying States of Guyana, Belize and Suriname.



Year(s)	Event	Country: Damage and/or Loss
2013	Floods	St. Vincent and the Grenadines: USD 108.4 million in damages; 1 hospital severely impacted Saint Lucia: USD 99.88 billion in damages
2015	Tropical Storm Erika	Dominica: 96% of GDP
2016	Drought	Belize, Guyana and Haiti: increase in inflation
2017	Hurricanes Irma and Maria	10 Caribbean territories affected; USD 5.4 billion in damages; USD 1 billion lost in tourism revenue; 225% of GDP in Dominica; > 300% of GDP in the BVI
2019	Drought	Belize: Est. USD 25 million in crop losses Jamaica: Est. 5,600 farmers affected with losses of approx. 500 hectares
	Hurricane Dorian	Bahamas: 67 deaths with 282 persons still missing as of Oct 18, 2019, USD 2.5 billion in damages, USD 717.3 million in losses and USD 220.9 million additional costs
2020	Drought	Belize: cattle experienced an average weight loss of about 50 lbs per head; agriculture sector output losses of over \$35 million by October 2019; a rise in unemployment from 7.6% in April to 10.4% in September 2019 in the Corozal and Orange Walk Districts where agriculture is a major livelihood activity; fish die-off in New River due to low river levels, and other environmental factors St. Vincent and the Grenadines: two of the three hydro-power plants adversely affected by flow reductions in mainland St. Vincent resulting in significantly lower than average electricity generation; by 29 May 2020, the country was operating at 35% capacity over 5 of its major water systems, and continued with water rationing measures Saint Lucia: declared a water related emergency with effect from May 18, 2020 Barbados: low levels in aquifers supplying water to pumping stations in the east of the island, with no tap water supply in many parts of the eastern parish of St. John Jamaica: the Ministry of Industry, Commerce, Agriculture and Fisheries spent (Jamaican) \$15 million to assist affected farmers; bushfires across several parishes due to the high temperatures and dry conditions

Source: Caribbean Climate Impacts Dataset (CIMH 2020)

These impacts are reversing economic growth, exacerbating poverty and undermining the future prosperity of Caribbean countries (Granvorka & Strobl, 2013; International Monetary Fund, 2013; Strobl, 2012; UNISDR, 2013). Going forward, IPCC (2014) confirms with high



confidence and robust evidence that damage and loss from these events is likely to continue, making a compelling case for investing in regional resilience³.

2.0 CLIMATE SERVICES IN THE CARIBBEAN

Early Warning Systems are recognised by several regional frameworks including the *Implementation Plan for the ‘Regional Framework for Achieving Development Resilient to Climate Change’⁴*, the *Regional Comprehensive Disaster Management (CDM) Strategy and Programming Framework 2014-2024⁵*, and the *Caribbean Pathway for Disaster Resilience in the Caribbean Community⁶* as critical to the effective management of climate-related disasters and adaptation to climate extremes, variability and change. This aligns with major global climate reports (IPCC, 2012, 2014, 2018) which advocate for the provision of early warning information as a measure to manage risks in key climate-sensitive sectors. Climate services which involve the timely production, translation, provision and use of climate data, information and knowledge for informed societal decision-making regarding climate risks (WMO, 2014) can help facilitate the transition to a resilient future. This is the philosophy underpinning the Global Framework for Climate Services (GFCS) which was crystallised by the World Meteorological Organization (WMO) and its partners at the 3rd World Climate Conference in 2009. Guided in part by the GFCS, the Caribbean has sought to establish its own consensus-based, regionally tailored framework for climate services. The framework supports the regional programme for Early Warning Information Systems across Climate Timescales (EWISACTs) which seeks to deliver services across climate timescales (from sub-seasonal to seasonal to decadal and centennial), including extreme events (see Figure 1).

The Sectoral EWISACTs Regional Roadmap and Plan of Action (RPA) 2020-2030 builds on more than 50 years of investment in regional observational network infrastructure, capacity building, as well as climate data, information and services delivered by the Caribbean Institute for Meteorology and Hydrology (CIMH), its regional network of National Meteorological and

³ Resilience as articulated here follows the definition provided in CDEMA (2018). It is defined as “...the ability of a system, community or society exposed to hazards to resist, absorb, accommodate to and recover from the effects of a hazard in a timely and efficient manner, including through the preservation and restoration of its essential basic structures and functions (UNISDR, 2009). For the Caribbean, resilience also connotes being able to bounce forward quickly in a manner that reduces susceptibility (increased liability to additional harm) to the impact of the same hazard. Resilience ensures that lives and livelihoods are protected and assets safeguarded. In that context, resilience also includes mitigation, to minimise the impact of hazards and embodies an ability to respond to the hazards which threaten the Caribbean region”.

⁴ Developed by the Caribbean Community Climate Change Centre (CCCCC) in 2011.

⁵ Developed by the Caribbean Disaster Emergency Management Agency (CDEMA) in 2014.

⁶ Developed by the Caribbean Disaster Emergency Management Agency (CDEMA) in 2018.



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Hydrological Services (NMHSs) and its multiple international, regional and national partners (see Appendix 2).

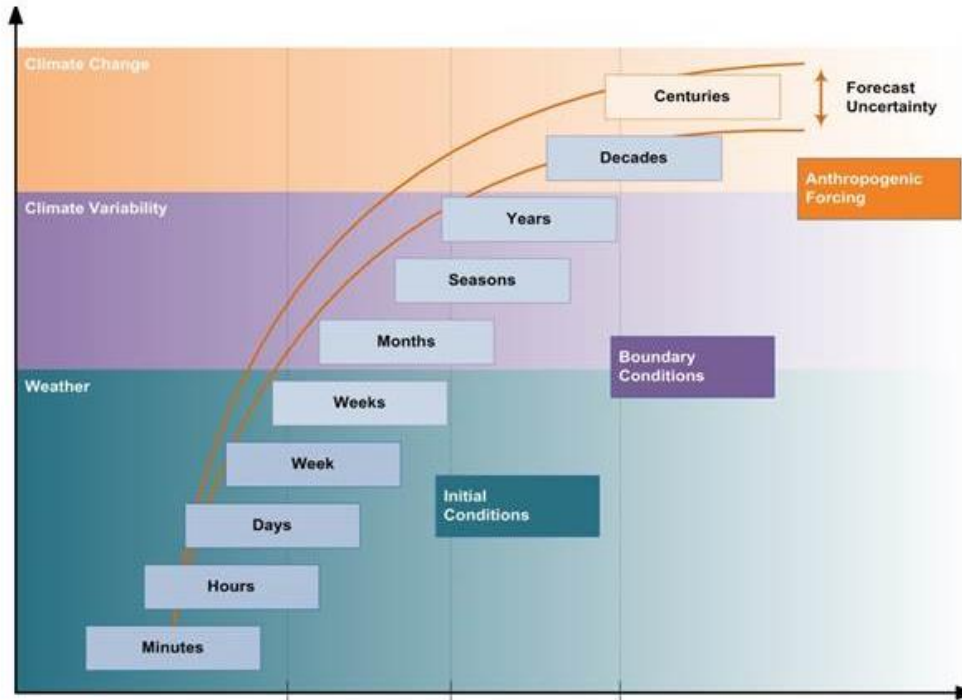


Figure 1. Weather and Climate Prediction Framework. Source: US National Oceanic and Atmospheric Administration

The Caribbean EWISACTs programme is coordinated by the WMO designated Regional Climate Centre (RCC) for the Caribbean hosted by the CIMH and embraced by several key regional institutions responsible for a range of climate-sensitive sectors in the Caribbean. The Caribbean approach embraces all five pillars (Observations and Monitoring; Research, Modelling and Prediction; Climate Services Information System; User Interface Platform and Capacity Development) of the GFCS, that underpin the production and use of climate early warning information to five global priority sectors (Agriculture and Food Security, Water, Health, Disaster Risk Reduction, and Energy). The Caribbean framework also prioritises services to the tourism sector which is of significant economic importance to the region⁷ (CDB 2017; WTTC, 2020). In this way, for the region, this is a sixth priority sector (GFCS+). Future targeted sectors include the regional finance, construction, insurance, transportation, natural resource management, entertainment and sport sectors, as well as the military.

The Caribbean has formalised a highly participatory approach to the co-design, co-development and co-delivery of user-driven climate early warning information with the GFCS+ sectors. This is

⁷ In 2019, travel and tourism contributed 13.9% to regional GDP - the highest regional level contribution in the world.



significant since parallel and/or cascading ecological, economic, and social impacts due to climate variability and extremes affect multiple sectors simultaneously. As a result, climate problems cannot be viewed as intra-sectoral challenges but must be viewed as cross-sectoral and inter-disciplinary (Mahon et al. 2018). Fully established in 2017⁸, the Consortium of Regional Sectoral EWISACTs Coordination Partners is a multi-sectoral alliance for climate resilience in the Caribbean. As a regional inter-agency governance and implementation mechanism, the Consortium leverages the expertise of lead sectoral organisations such as the:

- Caribbean Institute for Meteorology and Hydrology (CIMH);
- Caribbean Water and Wastewater Association (CWWA),
- Caribbean Agricultural Research & Development Institute (CARDI),
- Caribbean Disaster Emergency Management Agency (CDEMA),
- Caribbean Public Health Agency (CARPHA),
- Caribbean Centre for Renewable Energy and Energy Efficiency (CCREEE),
- Caribbean Tourism Organization (CTO), and
- Caribbean Hotel and Tourism Association (CHTA).

Individual Consortium members serve several hundred sectoral practitioners through multi-faceted initiatives in the agriculture and food security, water, disaster risk reduction, health, tourism and energy sectors, and as such, are well positioned to inform and influence sectoral decision-making at regional and national levels (CIMH, CARDI, CDEMA, CARPHA, CTO, CHTA and CWWA, 2016).

The work of the Consortium is enhanced by a number of Observer organisations including the:

- CARICOM Secretariat,
- Caribbean Community Climate Change Centre (5Cs),
- Commission of the Organisation of Eastern Caribbean States (OECS),
- Climate Studies Group of the University of the West Indies, Mona campus (UWI CSGM),
- Pan American Health Organization (PAHO), and
- Agricultural Alliance of the Caribbean (AACARI).

⁸ Under the USAID supported Building Regional Climate Capacity in the Caribbean (BRCCC) Programme (2014-2017).



3.0 GAPS AND PRIORITIES IN SECTOR-SPECIFIC CLIMATE SERVICES IN THE CARIBBEAN

The need for a strategic framework is demonstrated by the emergent status of tailored climate information production by the network of Caribbean climate information providers, as well as, the embryonic application of climate information (particularly on sub-seasonal and seasonal climate timescales) in climate-sensitive sectors in the Caribbean. Recent assessments of climate services capacity in the Caribbean (Mahon & Trotman, 2018; CIMH 2018b; Mahon et al., 2019) revealed that there are several gaps on both the end-user and provider sides of the capacity spectrum, as well as, within the overarching institutional context for the delivery of climate services across the five GFCS pillars at regional and national levels (Table 2).

Table 2: Gaps across GFCS pillars in the Caribbean

GFCS Pillar	Description	Current gaps
Observations and Monitoring (OBS & MON)	Scientific and technical systems that ensure that climate observations and other data, including metadata, required to meet the wants and needs of end users are collected, managed, disseminated and its utility assessed	<ol style="list-style-type: none"> 1. Need to expand and maintain the climate monitoring system vis-à-vis sectoral climate services needs; 2. Limited quality controlled, historical and real-time sectoral data at appropriate spatial and temporal scales; and 3. Limited data sharing and exchange across the climate community and sectors.
Research, Modelling and Prediction (RMP)	Scientific and technical systems that foster research towards continually improving the scientific quality of climate information and services, providing an evidence base for the impacts of climate extremes, variability and change and for the value of using climate information	<ol style="list-style-type: none"> 1. Insufficient climate, environmental and social science research to inform the generation of tailored, sector-specific climate information at regional, national and community scales; 2. Lack of interdisciplinary demand-driven climate services research and innovation; and 3. Lack of sector-specific and cross-sectoral research on impacts-based forecasting.
Climate Services Information System (CSIS)	The mechanism through which information about climate (past, present and future) is routinely collected, archived and processed to generate and deliver operational products and services that inform often	<ol style="list-style-type: none"> 1. Disconnect in information platforms across climate timescales (i.e., weather, variability, change); 2. Limited functionality and integration of decision-support platforms and tools to support sector-specific and cross-sectoral impacts-based forecasting.



GFCS Pillar	Description	Current gaps
	complex decision-making	
User Interface Platform (UIP)	A structured means for users, climate researchers and climate information providers to interact at all levels	<ol style="list-style-type: none"> 1. Technical complexity (eg. language, graphics) and limited tailoring of information to user needs; 2. Limited stakeholder engagement at regional and national levels; and 3. Limited dissemination channels (use of existing channels and diversity across existing channels especially at the national level).
Capacity Development (CD)	Mechanisms that support the interpretation, translation and use of climate information to support decision making; identified in the other pillars	<ol style="list-style-type: none"> 1. Insufficient legislative, policy and planning framework for climate services at national, sectoral and regional levels for climate services development and delivery⁹; 2. Limited user and provider capacity for climate service use and development; 3. Limited sustainability planning; and 4. Lack of monitoring, evaluation and reporting (MER) frameworks for measuring progress on climate services development.

Source: WMO (2014); Mahon & Trotman (2018); CIMH (2018b); Mahon et al. (2019)

4.0 THE SECTORAL EWISACTS REGIONAL ROADMAP AND PLAN OF ACTION 2020-2030

Given the limitations and gaps within the provider and sectoral user communities related to the development and use of climate services, the immediate challenge is to design and implement a regional capacity building programme that addresses these core needs. The Sectoral EWISACTs RPA is a large scale, resilience building programme that articulates the main components of the Consortium’s proposed cross-agency portfolio of climate service initiatives for the period 2020-2030¹⁰. The model defines the 11-year collective goal, outcomes, and outputs that guide the implementation of a coordinated, multi-sectoral climate services portfolio. Its main focus is to address the gaps in meeting the needs of six climate-sensitive sectors in five (5) Outcome Areas (OAs):

⁹ Due to recent introduction of the concept.

¹⁰ The 11 year timeframe from 2020-2030 is appropriate due to the complex nature of the process to develop applied climate information products and services. Moreover, a 2030 endpoint aligns well with the parallel processes being undertaken by Caribbean Meteorological Organization Member States to implement commitments under international sustainable development and/or climate frameworks such as the United Nations Sustainable Development Goals and the Paris Agreement.



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1. Enhanced mechanisms for the collection, management and dissemination of climate and sectoral data;
2. Improved quality of climate information and services through enhanced scientific and interdisciplinary research;
3. Improved and harmonised Climate Services Information Systems to support sectors at regional and national levels;
4. Enhanced User Interface mechanisms at regional, national and sectoral levels; and
5. Strengthened Capacity Development and enabling environment for the provision and use of climate services at regional, national and sectoral levels.

Each partner organisation contributes its mission, priorities, resources and disciplinary focus when selecting and supporting activities to be implemented. The synergistic, inter-institutional collaboration furthers the goals of each agency's portfolio, as well as, regional and national priorities while avoiding duplication of efforts and investments. Importantly, the nature of the Consortium alliance facilitates amplification of the impact of Consortium supported interventions by broadening the scale and diversity of networks, partnerships and audiences for the design, development and delivery of climate services in the Caribbean.



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5.0 ROADMAP GUIDING PRINCIPLES, GOAL, OBJECTIVES AND OUTCOME AREAS

LEVEL	RESULTS				
Paradigm shift objective (30-year change)	To significantly reduce climate-related impacts in key socio-economic sectors in the Caribbean.				
Consortium mission	To support building the region's climate resilience through the development, delivery and integration of climate services into the planning and decision-making of climate-sensitive sectors.				
Roadmap guiding principles	<ul style="list-style-type: none"> • Better use of existing data services and information platforms; • Synergy across climate and sectoral activities and structures to implement the climate services agenda; • Engagement and partnership to co-produce and evaluate services; and • An emphasis on communication to inform and influence the regional and national resilience agenda. 				
Roadmap goal (11-year change)	Increased resilience of climate sensitive sectors in the Caribbean.				
Roadmap objectives	<ol style="list-style-type: none"> 1. Strengthened institutional context for climate risk management (CRM) at regional, national and sectoral scales; 2. Enhanced and harmonised climate and sectoral information production systems across climate timescales; 3. Increased generation of tailored, sector-specific climate information at regional and national scales; and 4. Improved sectoral decision-making for CRM at regional and national scales. 				
Roadmap Outcome Areas (11-year change)	OA 1: Enhanced mechanisms for the collection, management and dissemination of climate and sectoral data	OA 2: Improved quality of climate information and services through enhanced social science and interdisciplinary research	OA 3: Improved and harmonised Climate Services Information Systems to support sectors at regional and national levels	OA 4: Enhanced User Interface mechanisms at regional, national and sectoral levels	OA 5: Strengthened Capacity Development and enabling environment for the provision and use of climate services at regional, national and sectoral levels



6.0 PLAN OF ACTION 2020-2030¹¹

OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
Outcome Area 1	1. Enhanced mechanisms for the collection, management and dissemination of climate and sectoral data	1A. # of GFCS+ sectors operationally sharing data with climate community for climate services development	1A. 0 GFCS+ sectors operationally sharing data with climate community for climate services development	-----	1A. 2 GFCS+ sectors operationally sharing data with climate community via an IT framework for climate services development	1A. 2 additional GFCS+ sectors operationally sharing data via an IT framework with climate community for climate services development	-----	CARPHA/CTO/CHTA/CARDI/CCREEE/CWWA/CIMH
Outcome Area 2	2. Improved quality of climate information and services through enhanced social science and interdisciplinary research	2A. # of interdisciplinary models co-developed and operationalised by GFCS+ sectors with climate community	2A. 2 interdisciplinary models ¹² co-developed and operationalised by GFCS+ sectors with climate community	2A. 1 interdisciplinary model co-developed and operationalised	2A. 2 interdisciplinary models co-developed and operationalised	2A. 1 interdisciplinary model co-developed and operationalised	2A. 1 interdisciplinary model co-developed and operationalised	CARPHA/CARDI/CTO/CHTA/CWWA/CIMH
Outcome Area 3	3. Improved and harmonised Climate Services Information Systems to support sectors at regional and national levels	3A. # of sectors operationally served by integrated Climate Services Information System(s)/ platform(s)	3A. 0 sectors operationally served by integrated Climate Services Information System(s)/ platform(s)	-----	3A. 1 sector operationally served by integrated Climate Services Information System(s)/ platform(s)	3A. 2 additional sectors operationally served by integrated Climate Services Information System(s)/ platform(s)	3A. 1 additional sector operationally served by integrated Climate Services Information System(s)/ platform(s)	CARPHA/CARDI/CTO/CHTA/CWWA/CIMH
		3B. # of new sector-specific climate products and/or services to inform GFCS+	3B. 0 new sector-specific climate products and/or services to inform GFCS+ decision-making	-----	3B. 1 sector-specific climate product(s)	3B. 2 additional sector-specific	3B. 1 additional sector-specific	CARPHA/CARDI/CTO/CHTA/CWWA/CIMH

¹¹ See Appendix 3, page 29 for a more detailed breakdown of the RPA Plan of Action.

¹² 1 health-climate model developed for *Aedes Aegypti* proliferation; model not yet operationalised. 1 tourism-climate index, as well as 1 new optimisation model for Caribbean tourism developed.

OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
		decision-making generated annually by integrated Climate Services Information System(s)/ platform(s)	generated annually by integrated Climate Services Information System(s)/ platform(s)		and/or services to inform GFCS+ decision-making generated annually by integrated Climate Services Information System(s)/ platform(s)	climate products and/or services to inform GFCS+ decision-making generated annually by integrated Climate Services Information System(s)/ platform(s)	climate products and/or services to inform GFCS+ decision-making generated annually by integrated Climate Services Information System(s)/ platform(s)	MH
Outcome Area 4	4. Enhanced User Interface mechanisms at regional, national and sectoral levels	4A. # of new sectors and/or private sector organisations formally engaged at the regional Consortium level for which new sector-specific climate information is co-developed	4A. 0 new sectors and/or private sector organisations formally engaged at the regional Consortium level for which new sector-specific climate information is co-developed ¹³	4A. 1 new sector and/or private sector organisation formally engaged at the regional Consortium level for which new sector-specific climate information is co-developed	4A. 1 new sector and/or private sector organisation formally engaged at the regional Consortium level for which new sector-specific climate information is co-developed	4A. 1 new sector and/or private sector organisation formally engaged at the regional Consortium level for which new sector-specific climate information is co-developed	4A. 1 new sector and/or private sector organisation formally engaged at the regional Consortium level for which new sector-specific climate information is co-developed	Consortium Chair
		4B. # of countries with national climate services Committees collaborating on climate risk management	4B. Some GFCS+ climate services forums have been convened at regional and national levels as a result of inter-disciplinary work	4B. 10 GFCS+ climate services forums convened at regional and national levels as a result of inter-disciplinary work	4B. 10 GFCS+ climate services forums convened at regional and national levels as a result of inter-disciplinary work	4B. 10 GFCS+ climate services forums convened at regional and national levels as a result of inter-disciplinary work	4B. 10 GFCS+ climate services forums convened at regional and national levels as a result of inter-disciplinary work	All Consortium partners/NMHSs
		4C. # of countries with national climate services Committees collaborating on climate risk management	4C. 0 country with national climate services Committees collaborating on climate risk management	4C. 1 country with national climate services Committees collaborating for climate risk management	4C. 2 countries with national climate services Committees collaborating for climate risk management	4C. 2 countries with national climate services Committees collaborating for climate risk management	4C. 2 countries with national climate services Committees collaborating for climate risk management	4C. 1 country with national climate services Committees collaborating for climate risk management

¹³ Currently, there are 6 climate-sensitive sectors formally engaged at the regional Consortium level. New sector-specific climate information is currently co-developed for 3 of them.

OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
Outcome Area 5	5. Strengthened Capacity Development and enabling environment for the provision and use of climate services at regional, national and sectoral levels	5A. High-level endorsement of Sectoral EWISACTs RPA 2020-2030	5A. No high-level endorsement of Sectoral EWISACTs RPA 2020-2030	5A. High-level endorsement of Sectoral EWISACTs RPA 2020-2030	-----	-----	-----	All Consortium partners
		5B. # National Roadmaps for Climate Services being implemented by National Committees for Climate Services	5B. 0 National Roadmaps for Climate Services being implemented by National Committees for Climate Services	5B. 3 National Roadmaps for Climate Services being implemented by National Committees for Climate Services	5B. 3 additional National Roadmaps for Climate Services being implemented by National Committees for Climate Services	5B. 3 additional National Roadmaps for Climate Services being implemented by National Committees for Climate Services	5B. 2 additional National Roadmaps for Climate Services being implemented by National Committees for Climate Services	NMHSs/ National level Committees/CIMH
		5C. # of regional and national sectoral stakeholders trained in the use of new climate services for GFCS+ sectors	5C.0 regional and national sectoral stakeholders trained in the use of new climate services	5C.50 regional and national sectoral stakeholders trained in the use of new climate services	5C.100 regional and national sectoral stakeholders trained in the use of new climate services	5C.100 regional and national sectoral stakeholders trained in the use of new climate services	5C.100 regional and national sectoral stakeholders trained in the use of new climate services	All Consortium partners
		5D.# of regional climate service providers and NMHS representatives trained in the operational development of new climate services	5D.0 regional climate service providers and NMHS representatives trained in the operational development of new climate services	5D.30 regional climate service providers and NMHS representatives trained in the operational development of new climate services	5D.50 regional climate service providers and NMHS representatives trained in the operational development of new climate services	5D.50 regional climate service providers and NMHS representatives trained in the operational development of new climate services	5D.50 regional climate service providers and NMHS representatives trained in the operational development of new climate services	CIMH

7.0 LINKAGES WITH INTERNATIONAL, REGIONAL AND SECTORAL PRIORITIES

7.1 *International Linkages*

Sectoral EWISACTs RPA implementation contributes to the attainment of 11 of the 17 United Nations Sustainable Development Goals (SDGs)¹⁴ (UN 2014a); is aligned with Article 7, Sub-paragraph 7(c) of the Paris Agreement¹⁵; and supports the Caribbean’s implementation of the Global Framework for Climate Services (WMO 2014). The RPA further contributes to targets 18 (d), (e), (f) and (g) of the global targets of the Sendai Framework for Disaster Risk Reduction¹⁶ (UNISDR 2015); and several outcomes of the SIDS Accelerated Modalities of Action (SAMOA) Pathway¹⁷ (UN 2014b).

7.2 *Regional Linkages*

At its broadest level, the Sectoral EWISACTs RPA 2020-2030 is the platform for advancing climate services in the Caribbean. The CARICOM Council for Trade and Economic Development (COTED) endorsed the GFCS and further endorsed the need for the strengthening of Regional Institutions and in particular the WMO Regional Climate Centre for the Caribbean at CIMH to identify, develop and deliver targeted user-driven and user-friendly climate services to climate-sensitive sectors¹⁸ (CARICOM 2015). The Roadmap’s focus on building regional, national and sectoral resilience against climate hazards will contribute to mainstreaming the climate early warning component of the *Caribbean Community’s (CARICOM) Strategic Plan 2015-2019*; *CARICOM’s Liliendaal Declaration on Climate Change and Development (2009)*; the *CARICOM’s Implementation Plan for the Regional Framework for Achieving Development Resilient to*

¹⁴ Including SDG-1 (No poverty), SDG-2 (Zero hunger), SDG-3 (Good health and well-being), SDG-6 (Clean water and sanitation), SDG-7 (Affordable and clean energy), SDG-9 (Industry, Innovation and Infrastructure), SDG-11 (Sustainable cities and communities), SDG-13 (Climate Action), SDG-14 (Life Below Water), SDG-15 (Life on Land), and SDG-17 (Partnerships for the goals).

¹⁵ Article 7, Sub-paragraph 7(c) calls for “strengthening scientific knowledge on climate, including research, systematic observation of the climate system and early warning systems, in a manner that informs climate services and supports decision-making”.

¹⁶ By reducing damage to critical infrastructure including education and health by developing resilience by 2030; increasing the number of countries with national and local disaster risk reduction strategies by 2020; increasing the access of more people to climate early warning information systems by 2030 and enhancing international cooperation to developing countries to complement national actions for implementation of framework by 2030.

¹⁷ Outcomes 18 (SIDS efforts to implement the Barbados Programme of Action and the Mauritius Strategy), 23 (SIDS’ challenges), 32, 33 & 44 (SIDS’ vulnerabilities and their efforts to address climate change).

¹⁸ By COTED (Spec) 2015/53/DR decision. See Appendix 4 for more details.

*Climate Change 2011 - 2021*¹⁹; the *Regional Comprehensive Disaster Management (CDM) Strategy and Programming Framework 2014-2024*; the *Caribbean Pathway for Disaster Resilience in the Caribbean Community (2018)*; and the Organisation of Eastern Caribbean States (OECS) – *St. George’s Declaration of Principles for Environmental Sustainability (2006)*.

7.3 Sectoral Linkages

The Sectoral EWISACTs RPA 2020-2030 also contributes to the medium and long-term strategic plans of Consortium Partners.

It advances CARDI’s strategic goal of achieving food and nutrition security through the development of innovations that contribute to sustainable, climate resilient value chains, as well as the Institute’s implementation plan which emphasises investment in research and innovation that leads to the development of climate smart and resilient production systems. In addition, the RPA will support to the adoption of climate smart agricultural practices by pursuing effective partnerships and forging strategic linkages with R&D agencies, capacity building opportunities and information generation and dissemination. More specifically, in the short-term, the Sectoral EWISACTs RPA 2020-2030 supports CARDI’s *Strategic Plan 2018-2022: Building a Productive and Resilient Regional Agriculture Sector*²⁰.

In the case of the Caribbean water sector, the Sectoral EWISACTs RPA 2020-2030 supports the CWWA’s *Regional Strategic Action Plan (RSAP) for the Water Sector in the Caribbean to Develop Resilience to the Impacts of Climate Change: Governance and Building Climate Resilience*²¹ which focuses on mainstreaming climate resilience into water sensitive sectors including establishing baseline data; and capacity building in Integrated Water Resources Management (IWRM); information management; and disaster risk reduction.

The RPA aligns with the CDEMA-led *Regional Comprehensive Disaster Management (CDM) Strategy and Programming Framework 2014-2024*, specifically, Priority Area 1: Strengthened institutional arrangements for CDM; Priority Area 2: Increased and sustained knowledge management and learning for CDM; Priority Area 3: Improved integration of CDM at sectoral

¹⁹ Specifically, strategic element 2 of the Framework which seeks to “Promote the implementation of specific adaptation measures to address key vulnerabilities in the region.”

²⁰ Specifically, Strategic Programme 1: Value Chain Services and its Sub-Programme component: Climate Change Mitigation and Adaptation.

²¹ Support for the RSAP implementation was further established by Caribbean governments at the 15th High Level Forum for Caribbean Ministers responsible for water at the 28th CWWA Conference held October 2019 in St. Kitts. This was done through the signing of a ministerial agreement entitled: “The Declaration of Basseterre”.

levels; Priority Area 4: Strengthened and sustained community resilience, as well as, the ICT and Environmental Sustainability cross-cutting themes of the CDM Strategy and Programming Framework. Moreover, the RPA advances the Caribbean's early warning system capability and capacity vis-à-vis climate-related hazards.

For the Caribbean health sector, the RPA supports the CARICOM/CARPHA/PAHO Strategic Priority Areas of the Caribbean Cooperation in Health Phase IV (2016-2025), as well as, CARPHA's Strategic Plan 2018-2025. It will advance CARPHA's Strategic Priority 2: To facilitate CARPHA Member States' achievement of the Agenda 2030 targets related to Regional Health Security, Environmental Health²² and Tourism and Health. In particular, it will support and enhance the capacity of CARPHA Member States to advance targets of the Agenda 2030 related to the management of environmental health threats related to food, water, and air quality, as well as climate change and ecosystem degradation.

In the tourism sector, the RPA will support the CTO's five year Strategic Plan 2018-2022 focusing on sustainable product development. In addition, the RPA contributes to Goals 6 and 7 of the *Caribbean Sustainable Tourism Policy and Development Framework (CSTPDF) 2020* endorsed by the CTO and CHTA which seek to take climate smart action (Goal 6), and to address disaster risk management (Goal 7) in the Caribbean. The CSTPDF seeks to reduce the tourism sector's (and by extension the wider Caribbean region's) vulnerability to the physical and strategic impacts of climate variability, extremes and change through mainstreaming climate adaptation and comprehensive disaster management strategies. The Sectoral EWISACTs RPA 2020-2030 also addresses expanded opportunities for climate informed tourism planning, management and marketing.

The RPA will support the vision of the CCREEE to transform the energy landscape into a climate resilient, sustainable and affordable sector; focused on improving the lives of the region's people. The CCREEE serves as a catalyst for the implementation of sustainable energy projects that will have a direct impact on this transformation. Climate resilience is one of seven of the CCREEE's strategic programmes for the CARICOM region. The main goal of this strategic programme is to contribute to increasing climate change resilience of the CARICOM countries, including through an emergency response mechanism flagship project. The work of the CCREEE further aligns to the Sectoral EWISACTs RPA 2020-2030 since one of the objectives is to support CARICOM Member States to develop projects that improve their energy sectors taking potential climate change, environmental and social impacts into account. This requires factoring in environmental, social and climate change associated risks and adapt to potential consequences, where energy sector planning is concerned. The Sectoral EWISACTs RPA 2020-2030 also

²² Particularly targets addressing food, water, and climate change ecosystem degradation.

supports CCREEE’s integration of climate risk considerations into the climate driven sustainable energy sector and the traditional energy sector while supporting CCREEE’s assessments of the role of climate in driving energy demand and supply.

8.0 MONITORING, EVALUATION AND REPORTING FRAMEWORK

At this time, the Monitoring, Evaluation and Reporting (ME&R) architecture for the Sectoral EWISACTs RPA 2020-2030 is largely conceptual in nature. A long-term investment by all Consortium partners in a harmonised system of ME&R that requires all national and regional partners to routinely provide timely, complete and comparable reporting information will strengthen the ME&R architecture as it evolves over the 2020-2030 period (Table 3).

Table 3: Sectoral EWISACTs ME&R Architecture Evolution

Component	2020 Status	2025 Status	2030 Status
Roadmap and PoA	Yes	Yes	Yes
Impact statement	Yes	Yes	Yes
Outcome statements	Yes	Yes	Yes
Baselines	Yes (nascent)	Yes	Yes
Targets (at output, outcome and impact levels)	Yes (nascent)	Yes	Yes
Performance indicators (at output and outcome levels)	Yes (nascent)	Yes	Yes
RBM approach	Yes (nascent)	Yes	Yes
Programme-based approach	Yes (nascent)	Yes	Yes
ME&R mechanisms at national and regional levels	No	Yes (nascent)	Yes
Harmonised system of ME&R with Consortium partners	No	Yes (nascent)	Yes
Independent evaluation	No	Yes	Yes
Control group	X	x	x
Counterfactuals	x	x	x

Note: x = Considered but not applicable

The Results Based Management (RBM) approach is articulated in many different ways according to the system or organisation using it. What is common across these framings are the basic RBM principles that all these manifestations and articulations are rooted in. The Sectoral EWISACTs RPA 2020-2030 Logic Model follows a modified version of the Global Affairs Canada framing as the basis of its RBM approach²³. We expect that the results chain approach will evolve with time and practice as the Consortium implements its MER approach and learns from experience over time.

To facilitate comparable and harmonised reporting, the Sectoral EWISACTs RPA 2020-2030 logframe has established baselines, performance indicators, targets and timelines to measure and track progress associated with its Outcomes and Outputs. As far as possible, all monitoring and evaluation data will be disaggregated by gender, sector and country. Joint progress review will be conducted by the Consortium of Regional Sectoral EWISACTs Coordination Partners as well as, Observer organisations such as the CARICOM Secretariat and the OECS Commission at Consortium meetings. An independent third-party evaluation of implementation progress and impact of the Sectoral EWISACTs RPA is envisioned to be conducted every three years - in June 2022²⁴, June 2025, June 2028 and December 2030 respectively.

9.0 IMPLEMENTATION RISKS

Although there are several risks associated with the implementation of the 11 year Sectoral EWISACTs RPA, every effort will be made to minimise these risks in the following ways (Table 4):

Table 4. Sectoral EWISACTs RPA Implementation Risks and Mitigation Measures

Implementation risk	Mitigation measure(s)
<ul style="list-style-type: none"> Challenge of systematically resourcing the intervention over the long-term 	<ul style="list-style-type: none"> Supplementation of human and financial resources at regional and national levels through additional partnerships and engaging experts through partner, project and/or donor contributions

²³ The Canadian Government has advanced RBM theory and practice more than any other global entity. See its How-to-Guide here:

https://www.international.gc.ca/world-monde/assets/pdfs/funding-financement/results_based_management-gestion_axee_resultats-guide-en.pdf

²⁴ Optional depending on resources.

Implementation risk	Mitigation measure(s)
<ul style="list-style-type: none"> • Difficulty coordinating implementation across a multiplicity of regional and national level organisations each with interdisciplinary and operational differences 	<ul style="list-style-type: none"> • Closer collaboration with sectoral partners and their stakeholders, as well as, deeper institutionalisation of the RPA work programme at the regional level • Development of flexible and shared workplans, timelines and ME&R frameworks
<ul style="list-style-type: none"> • Current level of absorptive capacity of regional and national level organisations may mean that there will be limits to the fulfillment of new demands 	<ul style="list-style-type: none"> • Capacity building of existing staff to use new tools and resources • Maximising regional expert pools to support and back-stop national activities through partner, project and/or donor contributions • Encouraging national governments to expand and/or upgrade climate services personnel
<ul style="list-style-type: none"> • Force majeure (e.g., a hurricane strike during the annual Atlantic hurricane season) which would command the time and resources of Consortium partners and the NMHSs, as well as damage key equipment and infrastructure • A significant global event (e.g., the COVID-19 pandemic) which would cause disruption to everyday activities and inhibit implementation progress 	<ul style="list-style-type: none"> • Assess the situation and determine the course of action • Re-prioritising implementation workplans • Identify opportunities with the donor and funding community where climate plays a role in global catastrophic events • Advocate for a balanced view of the impacts of significant global events vis-à-vis the long term effects of climate change
<ul style="list-style-type: none"> • Change in the leadership or priorities of regional governments, donors and/or sectoral partners 	<ul style="list-style-type: none"> • Utilising existing initiatives and priorities on DRR and CCA as a footing for the Sectoral EWISACTs RPA • Consortium partners commitment through the multilateral LoA • Ensure that the Sectoral EWISACTs RPA is aligned with the goals of development partners • Strong communication and outreach strategy including frequent communication with national and regional leadership • Demonstration/case studies of the value of the programme to national outcomes

10.0 SUSTAINABILITY

The Caribbean’s implementation of the GFCS has received strong endorsement from the CARICOM’s Council on Trade and Economic Development – the Ministerial Body which promotes trade and economic development of the Caribbean Community (CARICOM) and oversees the operations of the Single Market and Economy. This provides a favourable context for continued investment and implementation.

The involvement of a range of regional public and private sector institutions, with mandates related to the RPA's objectives, and proven track records strengthens the sustainability of the Consortium and its objective to derive sustained benefits from the implementation of the GFCS in the region. It is expected that all Consortium partners will continue to derive significant benefit from EWISACTs and, as a result, will strengthen their commitment to the long-term integration of the sectoral EWISACTs development process into their work programmes with outputs continuously integrated into their regional and national routine operations. For example, CARDI continues to conduct experimental trials to identify selected drought tolerant agricultural commodities in Member States. This technical work supports further crop modelling and can be used in the development of agriculture-specific climate information.

While there has been significant progress made by the Consortium growing and integrating climate services into the operations of public sector entities, the ability of the Consortium to integrate the private sector into its membership and to co-design, co-develop and co-deliver commercial revenue generating climate services with the private sector remains a limitation that needs to be addressed if the sustainability of the Consortium and the implementation of the GFCS in the region are to be further strengthened. Initiatives such as the Weather Enterprise which represents a partnership between the WMO, the private sector and academia provide an overarching framework for the inclusion of the private sector into the Consortium. The inclusion of revenue generating services removes the traditional dependence of funding the development and delivery of climate services through public and development partner mechanisms which can be unreliable at times.

The growth and sustainability of the Consortium will depend on bringing new climate-sensitive sectors into the arrangement. While the region has been able to add tourism to its list of climate service partners, other potential partners exist that can both contribute to and benefit from the partnership. Examples of such sectors include the financial sector (inclusive of the banking sector), the insurance sector, and the security sector. The RPA will explore bringing these sectors into the partnership and the types of products and services that can be developed to address their needs.

It is estimated that successful implementation of the Sectoral EWISACTs RPA 2020-2030 will require an estimated total investment of USD 20 million over the 11 year period, with USD 5 million required for each of the RPA's 4 implementation periods (2020-2022, 2023-2025, 2026-2028, 2029-2030). Consortium partners have already leveraged their stakeholder networks (including national and regional partners and international development partners) in their pursuit to implement climate services in their respective sectors. All partners have signaled their continued commitment to this action under the RPA with all signaling an additional

commitment to explore (and/or expand existing) resource mobilisation options including co-developing joint funding proposals for submission to international and regional Funds; as well as other possible revenue generation activities.

As mentioned above, some partners have already garnered resources to advance work in their particular sector. For example, in 2017, the CTO secured funding from the Caribbean Development Bank through the African-Caribbean-Pacific European Union Natural Disaster Risk Management in CARIFORUM countries Programme (ACP-EU-NDRM) to conduct a feasibility study on the need for and potential benefit of the development and use of a tourism-climate productivity index/indices, and validate an approach for tourism-climate modelling for the Caribbean. More recently, the CARPHA has secured funding under the Investment Plan for the Caribbean Regional Track of the Pilot Program for Climate Resilience, as well as the European Development Fund's "Strengthening Climate Resilient Health Systems in the Caribbean" Action to among other things, integrate climate variability into the surveillance, prevention and control of vector-borne diseases.

The sustainability of the Consortium and its programmes will also be dependent on how Members approach the unique opportunity for multilateral approaches to address climate challenges in their respective sectors. For example, if bi-lateral arrangements between the climate provider and individual sectors become the dominant mode of interaction, then Consortium Partners will fail to effectively maximize the opportunity presented as such arrangements could be effectively achieved outside of the Consortium framework. If on the other hand, true multilateral arrangements involving the open sharing of data between partners, as well as the co-design, co-development and co-delivery of climate products and services between Partners (inclusive of the climate service provider), then it is expected that the quality of the products and services emanating from the partnership will lead to multi-sectoral planning and decision-making, the quality of which exceeds that currently observed. This in turn will lead to an increased demand for products and services from the partnership, which should trigger increased investment.

Moreover, opportunities to promote technology and knowledge transfer, as well as, other appropriate actions, will be continually identified and optimised by the CIMH and Consortium Partners to facilitate the programme outputs. In particular, virtual platforms will be used for meetings and capacity building exercises to reduce cost, where possible and appropriate.

Finally, it is expected that a comprehensive Sustainability Plan identifying strengths, weaknesses, opportunities and threats for RPA implementation will be developed by 2022.

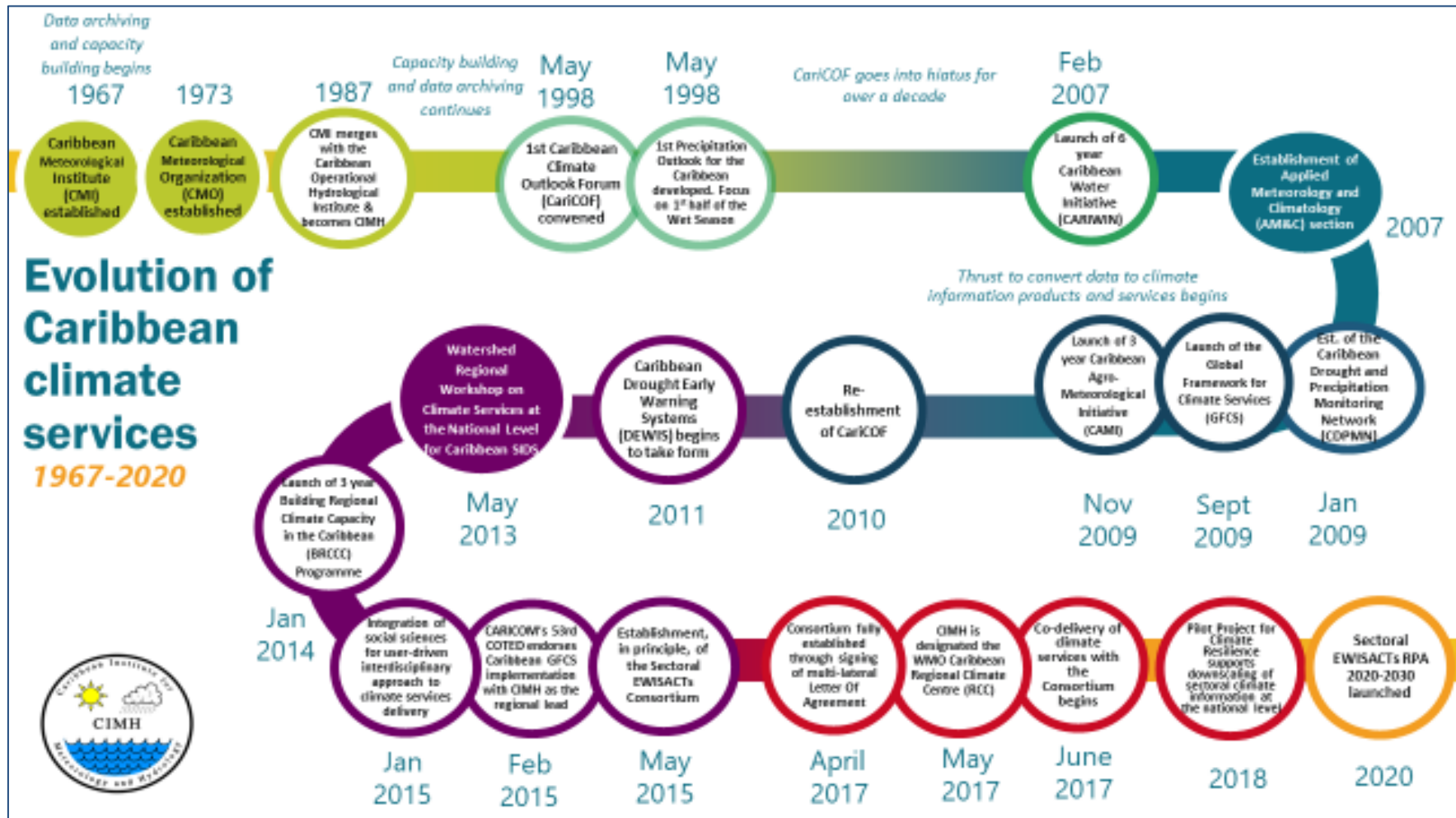
APPENDICES

Appendix 1. Characteristics of Caribbean Climate

Timescale	Characteristics of Caribbean Climate
Historic Climate Trends	<p>Land temperature: Day and night time temperatures have been increasing, diurnal temperature ranges became smaller, cold extremes decreased and warm extremes increased in frequency and intensity.</p> <p>Rainfall: Annual rainfall totals have remained essentially unchanged throughout the region over the past 50 years. That said, the proportion of these totals from heavy rainfall events has been significantly rising over the past 25 years, as has the average intensity of rainfall on wet days. In some areas, more intense rainfall has been recorded interrupted by longer dry spells, which might indicate increased occurrence of flooding.</p> <p>Sea level rise (SLR): Sea level in the Caribbean Sea has been rising for the period 1993–2010 with a basin average of $2.5 \pm 1.3 \text{ mm yr}^{-1}$</p> <p>Sea surface temperature (SST) have warmed since 1906, that is $1.32 \pm 0.41 \text{ }^\circ\text{C}$ per century for the Antilles and $1.08 \pm 0.32 \text{ }^\circ\text{C}$ per century for the Wider Caribbean, with a more intensified warming during the last four decades.</p>
Usual Seasonal Patterns	<p>Temperature: Fairly consistent temperatures throughout the year, with an annual temperature range of from less than 2°C (extreme south) to about 5°C at high elevations in far north, and with heatwaves possible from May to September (the Bahamas, Belize and the Greater Antilles) or October (Lesser Antilles) and from August to November (Guianas).</p> <p>Rainfall: Throughout Belize and the Caribbean Islands, There is one dry and one wet season. In The Bahamas, Belize, the Greater and Lesser Antilles, the wet season runs from May/June to November/December, the dry season during the other half year, whereas in the ABC Islands (Aruba, Bonaire and Curaçao), which are much drier than the remainder of the region, there is a short wet season from October to January. In the Guianas, the northern and eastern parts experience two wet and two dry seasons annually, whereas in the southwestern parts, there is only one wet and one dry season. Extreme rainfall events typically do not occur from January to March in Belize and the islands and they are rare between September and the middle of November in the Guianas. By contrast, dry spells of 7 to 15 days can and do frequently occur at any time of the year in areas westwards of Puerto Rico, whereas eastwards of Puerto Rico their frequency tends to increase towards the end of the dry season and decrease in the early wet season.</p>
Interannual Variability	<p>Rainfall is affected by El Niño Southern Oscillation (ENSO). El Niño years typically experience a drier rainy season with diminished tropical cyclone activity and a drier winter season in the southern islands and the Guianas. La Niña conditions are usually associated with more rainfall and enhanced tropical cyclone activity. Note that the north-western most areas see the opposite rainfall impacts of El Niño and La Niña during winter, i.e. wetter and drier, respectively.</p> <p>Temperature tends to be more elevated from a number of months into an El Niño due to reduced cloudiness and less cases of cooler, rainy days and progressively warmer sea surface temperatures, with the anomalous warming continuing into most of the following year due to</p>

Timescale	Characteristics of Caribbean Climate
	more frequent fair weather.
Extreme Climate and Weather Events	<p>Hurricanes: A statistically significant increase observed in the frequency and duration of recent hurricanes in the Caribbean region, and a general increase in the wind speeds and precipitation intensity of major hurricanes in this region over the last 30 years, probably to a large part a feature of multidecadal variability in Atlantic Ocean temperatures.</p> <p>Droughts and extreme rainfall: Episodes of drought and excessive rainfall are inherent features of Caribbean climate. Though drought can occur at any time of the year, the worst drought impacts tend to occur towards the end of the dry season. Their socio-economic impacts have been increasing in recent decades. The increasing temperature trend of the past decades may be contributing to the rise in drought impacts, with two of the worst regional droughts occurring in 2009-2010 and 2014-2016, associated with El Niño.</p>
Future projections	<p>Land temperature: Regional projections of temperature suggest increases between 1°C and 5°C in the Caribbean, with a best estimate of 2.0°C increase by the end of this century relative to 1981-2010.</p> <p>Rainfall: Climate models suggest that rainfall in the Caribbean is likely to decrease by more than 10%, with reduced early wet season – in particular in the Greater Antilles – and late wet season rainfall. Combined with increasing temperatures, this will lead to more frequent and more intense droughts. By contrast, many areas may see an increase in extreme wet spells, with potential implications for the occurrence of flooding.</p> <p>Sea surface temperatures: Sea surface temperatures are projected to continue warming by around 1 to 1.5°C by the 2050s and 1.5°C to more than 2°C by the 2090s compared to an observed period of 2000 to 2009.</p> <p>Sea level rise: The projections suggest a sea level rise in the region of 0.5m to 0.6m by the year 2100.</p>

Appendix 2. Evolution of Caribbean Climate Services 1967-2020



Appendix 3. Sectoral EWISACTs Plan of Action 2020-2030^{25 26}

OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
Outcome Area 1	1. Enhanced mechanisms for the collection, management and dissemination of climate and sectoral data	1A. # of GFCS+ sectors operationally sharing data with climate community via an IT framework for climate services development	1A. 0 GFCS+ sectors operationally sharing data with climate community via an IT framework for climate services development	-----	1A. 2 GFCS+ sectors operationally sharing data with climate community via an IT framework for climate services development	1A. 2 additional GFCS+ sectors operationally sharing data via an IT framework with climate community for climate services development	-----	CARPHA/CTO/CHTA/CA RDI/CCREEE/C WWA/CIMH
Observation and Monitoring (OBS & MON) Gap	Output(s)	Performance Indicator(s)	Baseline	2022 Target(s)	2025 Target(s)	2028 Target(s)	2030 Target(s)	Responsible
<i>Need to, expand and maintain the climate monitoring system vis-à-vis sectoral</i>	1.1 Guidance document(s) for conducting a gap analysis towards the optimisation of observational networks <i>vis-à-vis health, energy and tourism climate services needs</i> developed	1.1.a. # of guidance document(s) for conducting an observing gap analysis towards the optimisation of observational networks <i>vis-à-vis health, energy and tourism climate services needs</i> developed and available	1.1.a. 0 guidance document(s) for conducting an observing gap analysis towards the optimisation of observational networks/observations <i>vis-à-vis health, energy and tourism climate services needs</i> available ²⁷	1.1.a. 1 guidance document developed and available (Health)	1.1.a. 1 guidance document developed and available (Tourism)	-----	-----	CARPHA/CTO/CHTA/CIMH

²⁵ NB. This Logframe recognises that previous climate-related work may have been done by Consortium Partners, Observers and others operating in the Caribbean prior to the start of RPA implementation in 2020. However, the baselines used in the RPA Logframe, report on past outputs co-developed by Consortium partners (since 2015), as well as by CIMH, its network of NMHSs and other partners (since 2007), and therefore are not exhaustive in scope. Going forward, only future outputs co-developed by the Consortium grouping and its Members will be measured by the RPA Logframe. Climate services outputs developed at the national level by the NMHSs individually or in collaboration with national sectors during the 2020-2030 timeframe may also be measured under this Logframe.

²⁶ NB. Although some sectors have been prioritised by consensus in specific Performance Periods for intensive activities leading to sector-specific outputs, work can be done with any sector at any time should the opportunity arise. All sectors continue to benefit from general research and capacity building activities throughout the duration of the RPA.

²⁷ 2 WMO guidance documents for conducting an observing gap analysis towards the optimisation of observational networks/observations *vis-à-vis water and agriculture* climate services needs available. 0 guidance documents for conducting an observing gap analysis towards the optimisation of observational networks/observations *vis-à-vis health, energy and tourism* climate services needs available.

OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
<i>climate services needs</i> <i>Limited quality controlled, historical and real-time sectoral data at appropriate spatial and temporal scales</i>	1.2 Observing system gap analyses report(s) ²⁸ which prioritise(s) options for network repair, expansion and/or enhancements, including the need for automatic weather stations (AWS), rain gauges, soil probes etc. <i>vis-à-vis sectoral climate services needs</i> conducted	1.2.a # of observing gap analyses report(s) <i>vis-à-vis sectoral climate services needs</i> developed and available	1.2.a. 0 observing gap analyses report(s) <i>vis-à-vis sectoral climate services needs</i> available ²⁹	1.2.a. 2 integrated observing system gap analyses report that considers the observation needs of GFCS+ sectors (Health, Water)	1.2.a. 3 additional integrated observing system gap analyses report that considers the observation needs of GFCS+ sectors (Agriculture, Water, Tourism)	-----	-----	CARPHA/CTO/ CHTA/CARDI/ CWWA/CIMH
	1.3 Assessment(s) of datasets (specifically climate-sensitive variables and their metadata) and platforms for GFCS+ sectors completed	1.3.a. # of regional assessment(s) of datasets (specifically climate-sensitive variables and their metadata) and platforms for GFCS+ sectors	1.3.a. 0 regional assessment(s) of datasets (specifically climate-sensitive variables and their metadata) and platforms for GFCS+ sectors ³⁰	1.3.a. 1 regional assessment(s) of datasets (specifically climate-sensitive variables and their metadata) and platforms for GFCS+ sectors available (Health)	1.3.a. 1 regional assessment(s) of datasets (specifically climate-sensitive variables and their metadata) and platforms for GFCS+ sectors available (Agriculture)	1.3.a. 2 regional assessment(s) of datasets (specifically climate-sensitive variables and their metadata) and platforms for GFCS+ sectors available (Tourism, Water)	-----	CARPHA/CTO/ CHTA/CARDI/ CWWA/CIMH
	1.4 Based on assessment(s) ³¹ , regional data rescue project(s) of relevant hardcopy sectoral data ³² for GFCS+ sectors designed and implemented	1.4.a. # of sectors with data rescue projects conducted	1.4.a. 0 sectors with data rescue projects ³³ conducted	-----	1.4.a. 2 sector with data rescue project conducted (Health, Agriculture)	1.4.a. 2 additional sectors with data rescue projects conducted (Tourism, Water)	-----	CARPHA/CTO/ CHTA/CARDI/ CWWA/CIMH

²⁸ Observing system gap analyses will be conducted in accordance with WMO Observing Systems Capability Analysis and Review (OSCAR) Tool (see: <https://www.wmo-sat.info/oscar/>). One observing system gap analyses report can possibly cover more than 1 sector.

²⁹ Past observing system gap analyses driven largely by hydro-meteorological concerns exist. However, past gap analyses only partially consider the observation needs of some GFCS+ sectors, namely agriculture and water.

³⁰ Sectoral partners individually manage sector-specific datasets. Limited historical and real-time sectoral data (quality controlled, spatial and temporal) in a central repository for integrated modelling. eg. limited tourism (arrivals and departures), health (NCD) and agriculture (meat and crop production) datasets available in the CIMH DataLake. 4th quarter of 2019: PPCR supported Consultancy on Caribbean Climate-Arbovirus Data Audit Project in 3 pilot countries (Saint Lucia, Jamaica, and Haiti). No other known comprehensive assessment of datasets (of climate-sensitive variables) and platforms for GFCS+ sectors available.

³¹ In Output 1.3.

³² I.e. climate-sensitive statistics such as crop yield, vector data, heat stress cases, population demographics.

³³ Data rescue projects expected to be conducted in the agriculture, water and health sectors under the ACP-EU Climate Services and Applications Project for the Caribbean.

OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
	1.5 GFCS+ sector datasets available for integrated modelling	1.5.a. # of approach(es) ³⁴ for accessing datasets between Consortium partners enhanced/developed	1.5 a. 0 approach(es) for accessing datasets between Consortium partners enhanced/developed	-----	1.5 a. 2 approaches for accessing datasets between Consortium partners enhanced/developed (Health, Agriculture)	1.5 a. 2 approaches for accessing datasets between Consortium partners enhanced/developed (Tourism, Water)	-----	CARPHA/CTO/ CHTA/CARDI/ CWWA/CIMH
		1.5.b. # of sectors with climate-sensitive datasets accessible via an IT framework	1.5.b. 0 sectors with climate-sensitive datasets accessible via an IT framework	-----	1.5.b. 2 sectors with climate-sensitive datasets accessible via an IT framework (Health, Agriculture)	1.5.b. 2 additional sectors with climate-sensitive datasets accessible via an IT framework (Tourism, Water)	-----	CARPHA/CTO/ CHTA/CARDI/ CWWA/CIMH
	1.6 Assessment(s) of relevant satellite and other remotely sensed data ³⁵ for sector-specific product development	1.6.a. # of assessments of the potential use of relevant satellite and other remotely sensed data for sector-specific product development	1.6.a. 0 assessments of the potential use of relevant satellite and other remotely sensed data for sector-specific product development	1.6.a. 1 assessment(s) of relevant satellite and other remotely sensed data for sector-specific product development	-----	-----	-----	All relevant Consortium Partners
		1.6.b. # of supplementary satellite and other remotely sensed data used to support operations, where applicable	1.6.b. Limited use of supplementary available satellite and other remotely sensed data accessed and applied in climate and sector-specific product development	-----	1.6.b. Supplementary satellite and other remotely sensed data accessed and applied in sector-specific climate product development	-----	-----	All relevant Consortium Partners

³⁴ By “approach”, we refer to a consensus-based ICT methodology and associated infrastructure for accessing climate-sensitive datasets across the data platforms of Consortium partners.

³⁵ For example, from EUMETSAT’s Satellite Application Facility: <https://www.eumetsat.int/website/home/Satellites/GroundSegment/Safs/index.html>. Potential relevant satellite and other remotely sensed climate data include land use, soil moisture, Normalised Difference Vegetation Index, fire detection and monitoring, among others.

OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
	1.7 Feasibility study of Caribbean Climate Impacts Monitoring Network ³⁶	1.7.a. # of feasibility studies of Caribbean Climate Impacts Monitoring Network completed	1.7.a. 0 feasibility studies of Caribbean Climate Impacts Monitoring Network completed	-----	1.7.a. 1 feasibility study of Caribbean Climate Impacts Monitoring Network (DRM)	-----	-----	CDEMA/CIMH
	1.8 Caribbean Climate Impacts Database (CCID) content and functionality improved ³⁷	1.8.a. # of new, quality assured, geo-referenced impacts records ingested into the CCID	1.8.a. 0 new, quality assured, geo-referenced impacts records ingested into the CCID ³⁸	1.8.a. 2500 new, quality assured, geo-referenced impacts records ingested into the CCID	1.8.a. 500 additional new, quality assured, geo-referenced impacts records ingested into the CCID	1.8.a. 500 additional new, quality assured, geo-referenced impacts records ingested into the CCID	1.8.a. 500 additional new, quality assured, geo-referenced impacts records ingested into the CCID	CARPHA/CDEMA/CARDI/CCREEE/CWWA/CIMH
OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST-TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
Outcome Area 2	2. Improved quality of climate information and services through enhanced social science and interdisciplinary research	2A. # of interdisciplinary models co-developed and operationalised by GFCS+ sectors with climate community	2A. 2 interdisciplinary models ³⁹ co-developed and operationalised by GFCS+ sectors with climate community	2A. 1 interdisciplinary model co-developed and operationalised	2A. 2 interdisciplinary models co-developed and operationalised	2A. 1 interdisciplinary model co-developed and operationalised	2A. 1 interdisciplinary model co-developed and operationalised	CARPHA/CARDI/CTO/CHTA/CWWA/CIMH
Research, Modelling & Prediction (RMP) Gap	Output(s)	Performance Indicator(s)	Baseline	2022 Target(s)	2025 Target(s)	2028 Target(s)	2030 Target(s)	Responsible

³⁶ The Caribbean Climate Impacts Monitoring Network is envisioned to be a mechanism for the *routine and operational coordination* of climate impacts reporting at the regional level. Currently, there is no such mechanism

³⁷ This Output will support action on WMO Resolution 9 (CG-17): Identifiers for Cataloguing Extreme Weather, Water and Climate Events.

³⁸ As of 2019, there are a limited number (2476 records) of impact records currently in online CCID baseline dataset, however these records are neither quality assured nor georeferenced. An augmented CCID dataset of >9000 climate-related impact records for the period 1780-2017 in 29 Caribbean countries is currently available in Googlesheets, however, there is limited impacts data disaggregation and availability by sector. Internal quality assurance of dataset is in progress.

³⁹ 1 health-climate model developed for *Aedes Aegypti* proliferation; model not yet operationalised. 1 tourism-climate index as well as a new optimisation model for Caribbean tourism developed.

OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
<i>Insufficient environmental and social science research to inform the generation of tailored, sector-specific climate information at regional, national and community scales</i>	2.1 Assessment(s) of user needs ⁴⁰ conducted	2.1.a. # of user needs assessment report(s) available	2.1.a. 1 user needs assessment available ⁴¹	2.1.a. 1 user needs assessment available	-----	2.1.a. 1 additional user needs assessment available	-----	All Consortium partners
	2.2 Assessment(s) of provider skills and capacities ⁴² conducted	2.2.a. # of provider assessments available	2.2.a. 1 provider assessments available ⁴³	2.2.a. 1 provider assessment available	-----	2.2.a. 1 additional provider assessment available	-----	CIMH
	2.3 Valuation studies ⁴⁴ conducted	2.3.a. # of valuation study available	2.3.a. 1 valuation study available ⁴⁵	-----	2.3.a. 2 valuation studies available (Agriculture, Tourism)	2.3.a. 2 additional valuation studies available (DRM, Water)	-----	CDEMA/CARDI /CTO/CHTA/C WWA/CIMH
	2.4 Market assessment(s) conducted	2.4.a. # of market assessments ⁴⁶ available	2.4.a. 0 market assessments available	-----	2.4.a. 1 market assessment available (Agriculture)	2.4.a. 1 additional market assessment available (Tourism)	-----	CARDI/CTO/CHTA/CIMH
<i>Lack of interdisciplina</i>	2.5 Feasibility studies for the development of impacts-based forecasting indices and/or model(s) for	2.5.a. # of feasibility studies for the development of impacts-based forecasting indices and/or	2.5.a. 2 feasibility studies for the development of impacts-based forecasting indices and/or	2.5.a. 1 feasibility study for the	2.5.a. 2 feasibility studies for the	2.5.a. 2 feasibility studies for the	-----	CARPHA/CARDI /CTO/CHTA/C WWA/CIMH

⁴⁰ E.g., mapping of current and potential user requirements for climate products, including the climate services currently used; analysis of current and future user needs and capabilities, decision-making processes, existing barriers and enabling conditions associated with the uptake of climate services.

⁴¹ Inaugural assessment conducted in 2015/2016.

⁴² Especially for those working at the supply-demand interface, and those supporting the process-chain of climate services in the context of co-design, co-delivery and co-evaluation conducted.

⁴³ Inaugural assessment conducted in 2015/2016.

⁴⁴ These could be Socio-Economic Benefit (SEB) or Cost Benefit Analysis (CBA) studies.

⁴⁵ This study explored the economic impact of seasonal drought forecast information on farmer decision-making in Jamaica during the 2014-2016 drought. There have been limited valuation research conducted in other GFCS+ sectors to date.

⁴⁶ This is envisioned to be a Caribbean-centric market assessment of the actual and potential role of public provision of climate services, including assessment of the services that users are willing to pay for and those they expect to have access to as a public good, and associated climate services business models.

OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
<i>ry demand-driven research and innovation to support sector-specific and cross-sectoral impacts-based forecasting</i>	GFCs+ sectors conducted	model(s) for GFCs+ sectors conducted	model(s) for the health and tourism sectors conducted ⁴⁷	development of impacts-based forecasting indices and/or model(s) for 1 GFCs+ sector conducted (Health)	development of impacts-based forecasting indices and/or model(s) for 2 GFCs+ sectors conducted (Agriculture, Water)	development of impacts-based forecasting indices and/or model(s) for 2 GFCs+ sector conducted (Tourism, Water)		
	2.6 New impacts-based forecasting indices/models for GFCs+ sectors developed	2.6.a. # of new impacts-based forecasting indices/models for GFCs+ sectors developed	2.6.a. 1 new health-climate model developed ⁴⁸ ; 1 new tourism-climate model developed ^{49 50 51}	2.6.a. 1 new impacts-based forecasting indices/models for GFCs+ sectors developed (Health)	2.6.a. 2 new impacts-based forecasting indices/models for GFCs+ sectors developed (Agriculture, Water)	2.6.a. 1 new impacts-based forecasting indices/models for GFCs+ sectors developed (Water)	2.6.a. 1 new impacts-based forecasting indices/models for GFCs+ sectors developed (Tourism)	CARPHA/CARDI /CTO/CHTA/C WWA/CIMH
	2.7 Capacity built in interdisciplinary modelling and prediction	2.7.a.# of sectoral professionals trained in interdisciplinary modelling and prediction	2.7.a. 0 sectoral professionals trained in interdisciplinary modelling and prediction	2.7.a. 30 sectoral professionals trained in interdisciplinary modelling and prediction (Health)	2.7.a. 30 sectoral professionals trained in interdisciplinary modelling and prediction (Agriculture, Water)	2.7.a. 30 sectoral professionals trained in interdisciplinary modelling and prediction (Water)	2.7.a. 30 sectoral professionals trained in interdisciplinary modelling and prediction (Tourism)	CARPHA/CARDI /CTO/CHTA/C WWA/CIMH
Outcome Area 3	3. Improved and harmonised Climate Services Information Systems to support sectors at regional and national levels ⁵²	3A. # of sectors operationally served by integrated Climate Services Information System(s)/	3A. 0 sectors operationally served by integrated Climate Services Information System(s)/ platform(s)	-----	3A. 1 sector operationally served by	3A. 2 additional sectors operationally	3A. 1 additional sector operationally served by	CARPHA/CARDI /CTO/CHTA/C

⁴⁷ To date, feasibility studies have been conducted for the health-climate and tourism-climate portfolios.

⁴⁸ In 2018.

⁴⁹ In 2019.

⁵⁰ 1 research report describing new climate informed *Aedes Aegypti* proliferation model; 1 research report describing Holiday Climate Index (Beach) for Caribbean tourism.

⁵¹ 1 health-climate academic research paper describing new climate informed *Aedes Aegypti* proliferation model; and 2 tourism-climate academic research papers describing: 1) Holiday Climate Index (Beach) for Caribbean tourism, and 2) new optimisation model for Caribbean tourism.

⁵² Possibly in phases.

OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
		platform(s)			integrated Climate Services Information System(s)/ platform(s)	served by integrated Climate Services Information System(s)/ platform(s)	integrated Climate Services Information System(s)/ platform(s)	WWA/CIMH
		3B. # of new sector-specific climate products and/or services to inform GFCS+ decision-making generated annually by integrated Climate Services Information System(s)/ platform(s)	3B. 0 new sector-specific climate products and/or services to inform GFCS+ decision-making generated annually by integrated Climate Services Information System(s)/ platform(s)	-----	3B. 1 sector-specific climate product(s) and/or services to inform GFCS+ decision-making generated annually by integrated Climate Services Information System(s)/ platform(s)	3B. 2 additional sector-specific climate products and/or services to inform GFCS+ decision-making generated annually by integrated Climate Services Information System(s)/ platform(s)	3B. 1 additional sector-specific climate products and/or services to inform GFCS+ decision-making generated annually by integrated Climate Services Information System(s)/ platform(s)	CARPHA/CARDI /CTO/CHTA/C WWA/CIMH
Climate Services Information System (CSIS) Gap	Output(s)	Performance Indicator(s)	Baseline	2022 Target(s)	2025 Target(s)	2028 Target(s)	2030 Target(s)	Responsible
<i>Disconnect in information and information sharing</i>	3.1 Feasibility assessment(s) of the potential for the development of Integrated Climate Services Information System(s)/ platform(s) conducted ⁵³	3.1.a. # of feasibility assessment(s) conducted	3.1.a. 0 feasibility assessment(s) conducted	3.1.a. 1 feasibility assessment(s) conducted	-----	-----	-----	All Consortium partners/ CCCCC/CSGM

⁵³ This Output benefits from foundational work done on Output 1.3. It is envisioned to be an assessment of the potential for interoperability, overlaying and cross-analysis of existing climate, environmental and sectoral information and indicators on a common platform using an appropriate IT framework.

OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
<i>platforms across climate timescales</i>	3.2 Interdisciplinary teams using Integrated Climate Services Information System(s)/ platform(s) at regional and national levels	3.2.a. # of interdisciplinary teams producing new, operational integrated climate information products using Integrated Climate Services Information System(s)/ platform(s) at regional and national levels	3.2.a.0 interdisciplinary teams producing new, operational integrated climate information products Integrated Climate Services Information System(s)/ platform(s) at regional and national levels	-----	3.2.a. 1 interdisciplinary team producing new, operational integrated climate information products Integrated Climate Services Information System(s)/ platform(s) at regional and national levels (Health)	3.2.a. 2 interdisciplinary teams producing new, operational integrated climate information products Integrated Climate Services Information System(s)/ platform(s) at regional and national levels (Agriculture, Water)	3.2.a. 1 interdisciplinary team producing new, operational integrated climate information products Integrated Climate Services Information System(s)/ platform(s) at regional and national levels (Tourism)	CARPHA/CARDI /CTO/CHTA/C WWA/CIMH
	3.3 New integrated climate information products and/or services developed using the integrated CSIS	3.3.a.# of new integrated climate information products and/or services developed using the integrated CSIS	3.3.a. 0 new integrated climate information products and/or services developed using the integrated CSIS	-----	3.3.a. 1 new integrated climate information product(s) and/or service(s) developed using the integrated CSIS (Health)	3.3.a. 2 new integrated climate information product(s) and/or service(s) developed using the integrated CSIS (Agriculture, Water)	3.3.a. 1 new integrated climate information product(s) and/or service(s) developed using the integrated CSIS (Tourism)	CARPHA/CARDI /CTO/CHTA/C WWA/CIMH
	3.4 Capacity built in the use of integrated Climate Services Information System(s)/ platform(s)	3.4.a. # of practitioners trained in the use of integrated Climate Services Information System(s)/ platform(s) disaggregated by sector and country	3.4.a. 0 practitioners trained in the use of integrated Climate Services Information System(s)/ platform(s) disaggregated by sector and country	-----	3.4.a. 30 practitioners trained in use of common information platform disaggregated by sector and country (Health)	3.4.a. 30 practitioners trained in use of common information platform disaggregated by sector and country (Agriculture, Water)	3.4.a. 30 practitioners trained in use of common information platform disaggregated by sector and country (Tourism)	CARPHA/CARDI /CTO/CHTA/C WWA/CIMH
OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST-TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE

OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
Outcome Area 4	4.Enhanced User Interface mechanisms at regional, national and sectoral levels	4A. # of new sectors and/or private sector organisations formally engaged at the regional Consortium level for which new sector-specific climate information is co-developed	4A. 0 new sectors and/or private sector organisations formally engaged at the regional Consortium level for which new sector-specific climate information is co-developed ⁵⁴	4A. 1 new sector and/or private sector organisation formally engaged at the regional Consortium level for which new sector-specific climate information is co-developed	4A. 1 new sector and/or private sector organisation formally engaged at the regional Consortium level for which new sector-specific climate information is co-developed	4A. 1 new sector and/or private sector organisation formally engaged at the regional Consortium level for which new sector-specific climate information is co-developed	4A. 1 new sector and/or private sector organisation formally engaged at the regional Consortium level for which new sector-specific climate information is co-developed	Consortium Chair
		4B. # of GFCS+ climate services forums convened at regional and national levels as a result of inter-disciplinary work	4B. Some GFCS+ climate services forums have been convened at regional and national levels as a result of inter-disciplinary work	4B. 10 GFCS+ climate services forums convened at regional and national levels as a result of inter-disciplinary work	4B. 10 GFCS+ climate services forums convened at the regional and national levels as a result of inter-disciplinary work	4B. 10 GFCS+ climate services forums convened at the regional and national levels as a result of inter-disciplinary work	4B. 10 GFCS+ climate services forums convened at the regional and national levels as a result of inter-disciplinary work	All Consortium partners/NMH Ss
		4C. # of countries with national climate services Committees collaborating on climate risk management	4C. 0 country with national climate services Committees collaborating on climate risk management	4C. 1 country with national climate services Committee collaborating for climate risk management	4C. 2 countries with national climate services Committee collaborating for climate risk management	4C. 2 countries with national climate services Committee collaborating for climate risk management	4C. 2 countries with national climate services Committee collaborating for climate risk management	4C. 1 country with national climate services Committee collaborating for climate risk management
User Interface Platform (UIP) Gap	Output(s)	Performance Indicator(s)	Baseline	2022 Target(s)	2025 Target(s)	2028 Target(s)	2030 Target(s)	Responsible
<i>Limited (high level) stakeholder</i>	4.1 Climate services awareness built among high level decision-makers at regional and national levels ⁵⁵	4.1.a. # of sensitisation and advocacy sessions with high level decision-makers at regional and national levels	4.1.a. # of sensitisation and advocacy sessions with high level decision-makers at regional and national levels to be determined ⁵⁶	4.1.a. 6 sensitisation and advocacy sessions	4.1.a. 6 sensitisation and advocacy sessions	4.1.a. 6 sensitisation and advocacy sessions	4.1.a. 6 sensitisation and advocacy sessions	CDEMA/CCREE/CARPHA/CARDI/CTO/CHTA/

⁵⁴ Currently, there are 6 climate-sensitive sectors formally engaged at the regional Consortium level. New sector-specific climate information is currently co-developed for 3 of them.

⁵⁵ E.g., CARICOM COTED; OECS Ministers of Environment; the Caribbean Meteorological Council, Permanent Secretaries for GFCS+ sectors; Chief Medical Officers, Sustainable Tourism Technical Committee; Finance Ministers; media etc.

OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
<i>engagement at regional and national levels</i>		national levels		with high level decision-makers at regional and/or national levels	with high level decision-makers at regional and/or national levels	with high level decision-makers at regional and/or national levels	with high level decision-makers at regional and/or national levels	CWWA/CIMH
	4.2 Sectoral EWISACTs Consortium expanded to include new sectors and/or public/private partnerships (PPPs) ⁵⁷	4.2.a. # of new sectors and/or private sector organisations engaged in Consortium activities	4.2.a. 1 private sector organisation ⁵⁸ engaged in in Consortium activities	4.2.a. 1 new sector and/or private sector organisation engaged in Consortium activities	4.2.a. 1 additional new sector and/or private sector organisation engaged in Consortium activities	4.2.a. 1 additional new sector and/or private sector organisation engaged in Consortium activities	4.2.a. 1 additional new sector and/or private sector organisation engaged in Consortium activities	Consortium Chair
	4.3 Interface between regional Consortium and natural resource management community ⁵⁹ commenced	4.3.a. # of regional forum(s) with natural resource management organisations on climate services to support ecosystem management convened	4.3.a. 0 regional forum(s) with natural resource management organisations on climate services to support ecosystem management convened ⁶⁰	4.3.a 1 regional forum with natural resource management organisations on climate services to support ecosystem management convened ⁶¹	-----	-----	-----	OECS Commission/ All Consortium partners
<i>Limited stakeholder engagement at the regional level</i>	4.4 Sectoral EWISACTs Communications Strategy developed	4.4.a. # of Sectoral EWSIACTs Communications Strategy developed and available	4.4.a. 0 Sectoral EWSIACTs Communications Strategy developed and available	4.4.a. 1 Sectoral EWISACTs Communications Strategy developed and available	-----	-----	-----	All Consortium partners

⁵⁶ Some past ad-hoc sessions convened with high level decision-makers at regional (e.g., OECS Council of Ministers) and national (e.g., National Disaster Management Committee) levels.

⁵⁷ Potential Consortium Members include the regional finance, construction, insurance, natural resource management, transportation, military, entertainment and sport sectors.

⁵⁸ The CHTA.

⁵⁹ Dialogue with natural resource management organisations on climate services to support ecosystem management (coral reefs, forests) commenced.

⁶⁰ There are limited climate products tailored to natural resources management by the Consortium (e.g., Coral Reef Watch). Some climate products produced by other organisations operating in the Caribbean (e.g., CCRIF) but these products are not updated often.

⁶¹ Future targets to be determined from regional forum convened by 2022.

OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
	4.5 Sectoral EWISACTs Consortium meetings sustained	4.5.a. # of Consortium meetings per year	4.5.a. 2 Consortium meetings per year ⁶²	4.5.a. 2 Sectoral EWISACTs Consortium meetings per year	4.5.a. 2 Sectoral EWISACTs Consortium meetings per year	4.5.a. 2 Sectoral EWISACTs Consortium meetings per year	4.5.a. 2 Sectoral EWISACTs Consortium meetings per year	Consortium Chair
	4.6 Bi-annual CariCOF meetings sustained	4.6.a. # of face-to-face CariCOF meetings per year expanded by virtual participation	4.6. a. 2 face-to-face CariCOF meetings per year, 0 expanded by virtual participation ⁶³	4.6.a. 2 face-to-face CariCOF meetings per year expanded by virtual participation	4.6.a. 2 face-to-face CariCOF meetings per year expanded by virtual participation	4.6.a. 2 face-to-face CariCOF meetings per year expanded by virtual participation	4.6.a. 2 face-to-face CariCOF meetings per year expanded by virtual participation	All Consortium partners
<i>Limited stakeholder engagement at national levels</i>	4.7 User interface platforms established and/or enhanced at the national level	4.7.a. # of national consultations for climate services conducted	4.7.a. > 15 national consultations for climate services conducted ⁶⁴	4.7.a. 3 national consultations for climate services conducted	4.7.a. 6 national consultations for climate services conducted	4.7.a. 6 national consultations for climate services conducted	4.7.a. 4 national consultations for climate services conducted	NMHSs/All Consortium partners
		4.7.b. # of countries with multi-sectoral National Committees for Climate Services established and sustainable	4.7.b. 0 country with multi-sectoral National Committees for Climate Services established and sustainable ⁶⁵	4.7.b. 1 multi-sectoral National Committees for Climate Services established and sustainable	4.7.b. 2 additional multi-sectoral National Committees for Climate Services established and sustainable	4.7.b. 2 additional multi-sectoral National Committees for Climate Services established and sustainable	4.7.b. 1 additional multi-sectoral National Committees for Climate Services established and sustainable	NMHSs/All Consortium partners
<i>Limited integrated planning at national levels</i>	4.8 National integrated planning through National Climate Outlook Forums (NCOFs)/National Climate Forums (NCFs) improved	4.8.a. # of countries convening NCOFs/NCFs	4.8.a. 4 countries convening NCOFs/NCFs ⁶⁶	4.8.a. 1 additional country convening NCOFs/NCFs	4.8.a. 1 additional country convening NCOFs/NCFs	4.8.a. 1 additional country convening NCOFs/NCFs	4.8.a. 1 additional country convening NCOFs/NCFs	NMHSs/ National Committees for Climate Services/ All Consortium

⁶² Funding currently procured from donors for face-to-face Sectoral EWISACTs Consortium meetings. Variable participant numbers contingent on funding. Going forward, greater consideration to be given for approaches that integrate virtual meetings, as well as Consortium Members self-funding their participation in meetings, where possible and appropriate.

⁶³ CariCOF technical discussions convened virtually 10 months per year. Funding procured from donors for CariCOF meetings. Variable NMHS and sectoral participant numbers contingent on funding.

⁶⁴ 2013: National consultation workshops conducted in Belize, Trinidad and Tobago, Dominica, Suriname, and Guyana. 2015/2016: National Sectoral EWISACTs workshops conducted in Jamaica, Trinidad and Tobago, Dominica, Belize, Barbados. 2018: National consultation workshops conducted in Saint Lucia, St. Vincent and the Grenadines and Grenada. 2019: National consultation workshops conducted in Jamaica and Dominica.

⁶⁵ To date, discussions around placement of climate services portfolio in existing appropriate national committees has been explored in 10 countries. The Trinidad and Tobago Climate Services Panel established in 2014 is now defunct. The Saint Lucia Flood and Drought Management Committee does not yet function as a National Climate Services Committee.

⁶⁶ As of 2019.

OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
								partners
		4.8.a. # of countries issuing national climate outlooks with associated sectoral implications and proposed integrated response	4.8.a. 0 countries issuing national climate outlooks with associated sectoral implications and <i>proposed integrated response</i>	-----	4.8.a. 1 country issuing national climate outlooks with associated sectoral implications and <i>proposed integrated response</i>	4.8.a. 1 additional country issuing national climate outlooks with associated sectoral implications and <i>proposed integrated response</i>	4.8.a. 1 additional country issuing national climate outlooks with associated sectoral implications and <i>proposed integrated response</i>	NMHSs/ National Committees for Climate Services/ All Consortium partners
<i>Technical complexity (eg. language, graphics) and limited tailoring of information to user needs</i>	4.9 Usability of climate information products improved through testing exercises with endusers	4.9.a. # of climate information product testing exercises conducted	4.9.a. 15 climate information product testing exercises conducted ⁶⁷	4.9.a. 3 additional climate information product testing exercises conducted (Health, Tourism, Water)	4.9.a. 1 additional climate information product testing exercise conducted (Agriculture)	4.9.a. 2 additional climate information product testing exercises conducted (Health, Agriculture)	-----	CCREEE/CARPH A/CARDI/CTO/ CHTA/CWWA/ CIMH
OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST-TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
Outcome Area 5	5. Strengthened Capacity Development and enabling environment for the provision and use of climate services at regional, national and sectoral levels	5A. High-level endorsement of Sectoral EWISACTs RPA 2020-2030	5A. No high-level endorsement of Sectoral EWISACTs RPA 2020-2030	5A. High-level endorsement of Sectoral EWISACTs RPA 2020-2030	-----	-----	-----	All Consortium partners

⁶⁷ For the development of the Caribbean Agro-Climatic Bulletin, the Caribbean Health-Climatic Bulletin and the Caribbean Tourism-Climatic Bulletin. Limited product development and testing exercises have been conducted since 2017.

OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
		5B. # National Roadmaps for Climate Services being implemented by National Committees for Climate Services	5B. 0 National Roadmaps for Climate Services being implemented by National Committees for Climate Services	5B. 3 National Roadmaps for Climate Services being implemented by National Committees for Climate Services	5B. 3 additional National Roadmaps for Climate Services being implemented by National Committees for Climate Services	5B. 3 additional National Roadmaps for Climate Services being implemented by National Committees for Climate Services	5B. 2 additional National Roadmaps for Climate Services being implemented by National Committees for Climate Services	NMHSs/ National level Committees/CI MH
		5C. # of regional and national sectoral stakeholders trained in the use of new climate services for GFCS+ sectors	5C. 0 regional and national sectoral stakeholders trained in the use of new climate services	5C. 50 regional and national sectoral stakeholders trained in the use of new climate services	5C. 100 regional and national sectoral stakeholders trained in the use of new climate services	5C. 100 regional and national sectoral stakeholders trained in the use of new climate services	5C. 100 regional and national sectoral stakeholders trained in the use of new climate services	All Consortium partners
		5D.# of regional climate service providers and NMHS representatives trained in the operational development of new climate services	5D. 0 regional climate service providers and NMHS representatives trained in the operational development of new climate services	5D. 30 regional climate service providers and NMHS representatives trained in the operational development of new climate services	5D. 50 regional climate service providers and NMHS representatives trained in the operational development of new climate services	5D. 50 regional climate service providers and NMHS representatives trained in the operational development of new climate services	5D. 50 regional climate service providers and NMHS representatives trained in the operational development of new climate services	CIMH
Capacity Development (CD) Gap	Output(s)	Performance Indicator(s)	Baseline	2022 Target(s)	2025 Target(s)	2028 Target(s)	2030 Target(s)	Responsible
<i>Limited legislative, policy and planning framework for climate services at national, sectoral and</i>	5.1 Climate services policy briefs for GFCS+ policy-makers/decision-makers developed	5.1.a. # of climate services policy briefs for GFCS+ policy-makers/decision-makers developed	5.1.a. 0 climate services policy briefs for GFCS+ policy-makers/decision-makers developed	5.1.a. 3 climate services policy briefs for GFCS+ policy-makers/decision-makers developed (Health, Agriculture, Water, Energy)	5.1.a. 2 additional climate services policy briefs for GFCS+ policy-makers/decision-makers developed (Tourism, DRM)	-----	-----	CDEMA/CCREE/CARPHA/CARDI/CTO/CHTA/CWWA/CIMH

OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
<i>regional levels for climate services development and delivery</i>	5.2 National Roadmaps for Climate Services developed	5.2.a. # of multi-sectoral National Roadmaps for Climate Services developed	5.2.a. 0 Draft National Roadmaps for Climate Services developed ⁶⁸	5.2.a. 3 multi-sectoral National Roadmaps for Climate Services developed	5.2.a. 3 additional multi-sectoral National Roadmaps for Climate Services developed	5.2.a. 3 additional multi-sectoral National Roadmaps for Climate Services developed	5.2.a. 2 additional multi-sectoral National Roadmaps for Climate Services developed	NMHSs/ National level Committees/CIMH
<i>Limited user and provider capacity for climate service development and use</i>	5.3 Climate services training workshops convened	5.3.a. # of climate services training workshops convened (participants disaggregated by country, sector and gender)	5.3.a. 1 multi-sectoral ClimPACTs Workshop convened ⁶⁹ ; Pre-CariCOF climate services training workshops with NMHS representatives convened 2 times per year ⁷⁰	5.3.a. 1 climate services training workshop convened per year	5.3.a. 1 climate services training workshops convened per year	5.3.a. 2 climate services training workshops convened per year	5.3.a. 2 climate services training workshops convened per year	All Consortium partners
	5.4 Modular on-line and classroom climate services related course(s) for NMHS and sectoral practitioners offered as part of regularly scheduled CIMH training programmes	5.4.a. # of on-line and classroom climate services related course(s) developed and available	5.4.a. 0 on-line and classroom climate services related course(s) developed and available	-----	-----	-----	5.4.a. 1 on-line and classroom climate services related course(s) developed and available	All Consortium partners ⁷¹
		5.4.b. # of sectoral practitioners trained using on-line and classroom climate services related course(s)	5.4.b. 0 sectoral practitioners trained using on-line and classroom climate services related course(s)	-----	-----	-----	5.4.b. 50 sectoral practitioners trained using on-line and classroom climate services related course(s)	All Consortium partners
		5.4.c. # of NMHS representatives trained using on-line and classroom climate services related course(s)	5.4.c. 0 NMHS representatives trained using on-line and classroom climate services related course(s)	-----	-----	-----	5.4.c. 30 NMHS representatives trained using on-line and classroom climate services related course(s)	CIMH
<i>Limited sustainability planning</i>	5.5 Sectoral EWISACTs Sustainability Plan(s) developed and endorsed by Consortium partners	5.5.a. # of Sectoral EWISACTs Sustainability Plan(s) developed and endorsed by the Consortium	5.5.a. 0 Sectoral EWISACTs Sustainability Plan developed and endorsed by Consortium partners	5.5.a. 1 Sectoral EWISACTs Sustainability Plan	-----	-----	-----	All Consortium partners

⁶⁸ As of 2019, draft National Roadmaps for Climate Services being developed for 5 Caribbean countries (Saint Lucia, St. Vincent and the Grenadines and Grenada, Dominica and Jamaica).

⁶⁹ Convened in Feb 2016.

⁷⁰ Other face-to-face climate services related training Workshops supported by projects (e.g., PPCR national Climate Services Toolkit and Climate Products Training Workshops).

⁷¹ CIMH will lead the co-development of this course.

OUTCOME AREA	RESULT	PERFORMANCE INDICATOR(S)	BASELINE (2020)	FIRST TERM TARGET(S) (2022)	EARLY MID-TERM TARGET(S) (2025)	LATE MID-TERM TARGET(S) (2028)	END-OF-TERM TARGET(S) (2030)	RESPONSIBLE
		partners		developed and endorsed by Consortium partners				
	5.6 Joint resource mobilisation proposals across climate providers and GFCS+ sectors at regional and national levels developed	5.6.a. # of joint multi-institutional resource mobilisation proposal(s) developed and available	5.6.a. 0 joint multi-institutional resource mobilisation proposal(s) developed and available ⁷²	5.6.a. 1 joint resource mobilisation proposal(s) developed and available	5.6.a. 1 additional joint resource mobilisation proposal(s) developed and available	5.6.a. 1 additional joint resource mobilisation proposal(s) developed and available	5.6.a. 1 additional joint resource mobilisation proposal(s) developed and available	All Consortium partners/CCCC C
	5.7 Joint triennial workplans ⁷³ developed	5.7.a. # of joint triennial workplans developed	5.7.a. 0 joint triennial workplans developed ⁷⁴	5.7.a. 6 joint triennial workplans developed	5.7.a. 6 joint triennial workplans developed	5.7.a. 6 joint biennial workplans developed	-----	All Consortium partners
	5.8 Regional Roadmap for Climate Services ⁷⁵ developed	5.8.a. # of Regional Roadmap and Plan of Action for Climate Services developed	5.8.a. 1 Regional Roadmap and Plan of Action for Climate Services 2020-2030 developed	-----	-----	-----	5.8.a. 1 Regional Roadmap and Plan of Action for Climate Services developed	All Consortium partners
<i>Lack of monitoring, evaluation and reporting (MER) frameworks for measuring progress on climate services development</i>	5.9 Triennial monitoring report on RPA Logframe implementation progress compiled	5.9.a. # of triennial monitoring reports on RPA Logframe implementation progress compiled	5.9.a. 0 triennial monitoring reports on RPA Logframe implementation progress compiled ⁷⁶	5.9.a. 1 triennial monitoring report on RPA Logframe implementation progress compiled	5.9.a. 1 triennial monitoring report on RPA Logframe implementation progress compiled	5.9.a. 1 triennial monitoring report on RPA Logframe implementation progress compiled	5.9.a. 1 triennial monitoring report on RPA Logframe implementation progress compiled	All Consortium partners/ /National Committees for Climate Services
	5.10 External evaluation reports for 2022, 2025, 2027 and 2030 implementation periods conducted	5.10.a. # of independent external evaluation reports completed	5.10.a. 0 independent external evaluation reports completed	5.10.a. 1 independent external evaluation report completed	5.10.a. 1 independent external evaluation report completed	5.10.a. 1 independent external evaluation report completed	5.10.a. 1 independent external evaluation report completed	Independent evaluator/ All Consortium Partners

⁷² Joint multi-institutional resource mobilisation and programming not currently widely practiced.

⁷³ These are intended to be 1-3 page documents outlining broad action areas for the triennial performance periods of 2020-2022, 2023-2025, 2026-2028, 2029-2030.

⁷⁴ Consortium partners currently ad-hocly work together on donor funded projects.

⁷⁵ Tentative timeline: 2031-2040.

⁷⁶ As of 2019, there is no harmonised inter-institutional ME&R system (including the use of analytics) to monitor climate services delivery, use and impact at regional and national levels established.



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Appendix 4. COTED Recognition of GFCS Implementation in the Caribbean

THE COTED:

Noted that the GFCS offers significant benefits to the Caribbean as the region adapts its systems and processes to address increasing hazards, vulnerabilities and development risks associated with climate change and increasing climate variability;

Called on the CIMH to conduct an economic analysis on the impact of drought on CARICOM Member States, including the relationship between drought and poverty and report to the next meeting of the COTED;

Also called on Member States to ensure that the GFCS-

- (a) is integrated into existing regional policies, frameworks and programmes;
- (b) does not duplicate existing regional programmes and mandates; and
- (c) addresses previously documented priorities including that of climate early warning;

Further called on the CIMH to facilitate greater levels of interaction at all levels between all stakeholders to support the development of more targeted user-driven and user-friendly products and services to key climate sensitive sectors to improve decision-making and drought forecasting in the Caribbean;

Called on Member States and the CIMH to seek partnerships to facilitate the strengthening of national institutions, and in particular NMHSs, to identify, develop and deliver targeted user-driven and user-friendly climate services through investments to support human capacity development;

Also called on Member States and the CIMH to facilitate increased technology transfers to enhance climate monitoring at the national scale (including refurbishment and expansion of national observation networks), increased access to climate data and related information from a range of regional and international sources and increased access to technology to support climate forecasting at the national level;

Recognised and **endorsed** the GFCS as a key initiative that supports the Region's adaptation to increasing climate variability and long-term climate change;

Also endorsed the need for the strengthening of regional institutions, and in particular the Regional Climate Centre at the CIMH, to identify, develop and deliver targeted user-driven and



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user-friendly climate services to climate sensitive sectors, National Climate Centres, Regional Institutions, donor institutions and global institutions (including development banks and Non-Governmental Organisations) through appropriate investments;

Further endorsed the need for drought forecasting to be integrated into National Development Plans and Policies and regional programmes.

Source: CARICOM (2015). Draft Report of the Fifty-Third Special Meeting of the Council for Trade and Economic Development (COTED) (Environment and Sustainable Development) 2-6 February 2015, pp 30-31.



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GLOSSARY OF TERMS

For a Glossary of climate terms, please visit: <http://rcc.cimh.edu.bb/glossary-of-terms/>



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About the Caribbean Institute for Meteorology and Hydrology (CIMH)

The CIMH is an Institution of the Caribbean Community (CARICOM) and the technical Organ of the Caribbean Meteorological Organization (CMO). The mandate of the CIMH is to assist in improving and developing the National Meteorological and Hydrological Services (NMHSs), as well as, providing the awareness of the benefits of Meteorology and Hydrology for the economic well-being of the CIMH Member States. This is achieved through training, research, investigations, and the provision of related specialized services and advice. The specific functions of CIMH include:

1. **World Meteorological Organization (WMO) Regional Training Centre (RTC):** CIMH trains professionals in operational meteorology and hydrology and the climate sciences. CIMH is also responsible for the delivery of courses for the completion of the BSc Degree in Meteorology at the University of the West Indies.
2. **Centre for research in Meteorology, Hydrology, Climatology and Associated Sciences:** The Institute is the leading institution in the English-speaking Caribbean engaged in focused and inter-disciplinary research in tropical meteorology, tropical climatology, hydrology and water resources management. This often necessitates collaboration with other relevant regional national and international organisations.
3. **Regional Climate and Hydrological Data Centre:** Since its inception, the Institute has been used by Member States of the CMO as a location for the region's climate data archive. As part of this responsibility, the Institute is responsible for collecting the region's climate data, quality assuring the data, archiving the data and disseminating the data to regional and international stakeholders.
4. **WMO Regional Instrument Centre (RIC):** In its capacity as the RIC for Member States of the CMO, the Institute supports instrument calibration, instrument maintenance and repair, identification of appropriate instruments for the region and instrument procurement and installation. In addition, the Institute conducts training programmes in instrument maintenance and calibration for persons from and outside of the region. The Institute is also active in research and development leading to the development of new instruments and better instrument maintenance programmes.
5. **WMO Regional Centre of Excellence for Training in Satellite Meteorology:** CIMH is one of the network of thirteen training Centres of Excellence worldwide established by WMO that actively participating in the Virtual Laboratory for Training and Education in Satellite Meteorology (VLab) programme. These Centres are working together to improve the utilization of data and products from meteorological and environmental satellites.
6. **Regional Climate Centre:** CIMH has already established itself as the primary provider of climate services and products to the several socio-economic sectors in the Caribbean. Seeking to establish itself as a WMO Regional Climate Centre for the Caribbean, CIMH launched the Demonstration Phase in April 2013. In May 2017, the CIMH was designated by the WMO RCC for the Caribbean.
7. **Caribbean Centre for Climate and Environmental Simulations (CCCES):** The CCCES was established in 2014 at the CIMH through support from the USAID BRCCC Programme. The CCCES is part of the region's strategy to build and sustain regional resilience to the risk posed by climate change, increasing climate variability, extreme weather and increasing environmental degradation and change. The CCCES addresses resilience in these areas by providing CARICOM scientists, engineers and researchers with state-of-the-art computations resources to conduct complex simulations and analyses within and across disciplines on a range of scenarios (cover varying spatial and temporal scales) to adequately identify, bound and mitigate the drivers of risk to the social and economic development of the Caribbean.
8. **WMO SDS-WAS Regional Node for Pan-America:** The CIMH hosts the WMO Sand and Dust Storm Warning Advisory and Assessment System (SDS-WAS) Regional Center for the Americas. The CIMH provides regional seven-day forecasts of surface dust, PM2.5, PM10 and ozone (O3) concentrations for the greater



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Caribbean region and provides information for global SDS-WAS forecasts and other monitoring tools. Following the aims of the SDS-WAS, the Barbados Centre is a node for collaboration across the Americas, working with other SDS-WAS Centres to develop, refine and distribute to the global community products that are useful in reducing the adverse impacts of SDS, and to assess the impacts of SDS on society and nature.



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About the Caribbean Agricultural Research & Development Institute (CARDI)

The Caribbean Agricultural Research & Development Institute (CARDI) was established in 1975 by the Heads of Governments of the Caribbean Community (CARICOM) to serve the agricultural research and development needs of the member states of CARICOM.

CARDI is positioned to “increase agricultural and food production and productivity through the use of science, technology, innovation, information resources and sustainable natural resources management, thereby increasing the competitiveness of the agri-food sector and enhancing food and nutrition security” and thus improving the quality of rural life.

The vision of the Institute is to be the Centre of Excellence in the Caribbean for the provision and application of research for development in agriculture that contributes to the creation of wealth and the competitiveness of the sector in the Region.

Its Mission is to contribute to the sustainable development of Caribbean people by the generation, transfer and application of appropriate technologies through agricultural research for development.

CARDI has as part of its Medium Term Plan (MTP) committed to the strengthening of collaboration and partnerships with national, regional and international organisations. The MTP also articulates a programme in climate change which is aimed at the implementation of the Region’s agricultural research and development initiative to adapting to and mitigating global climate change. A part of these two important components is collaboration with agencies and programmed which provide climate services to the agriculture sector.

In this regard, CARDI has had a proud record of collaboration with the Caribbean Institute for Meteorology and Hydrology (CIMH) viz:

- CARDI has attended every session of Caribbean Climate Outlook Forum (CariCOF) since its re-introduction into the Region in 2010;
- CARDI in collaboration with the CIMH, the World Meteorological Organization (WMO) and National Meteorological and Hydrological Services (NMHSs) of ten Caribbean member States also executed the programme entitled Caribbean Agro-Meteorological Initiative (CAMI) which was funded by the Organisation of African Caribbean and Pacific States (ACP) Science and Technology (S&T) Fund to provide training and information to agricultural stakeholders in the region over the period 2010 -2013;
- CARDI has taken a very serious interest in all matters pertaining to the provision of climate services to the agricultural community including participation in the Global Framework for Climate Services (GFCS) Meeting (Trinidad, May 2013); and
- CARDI is a member of the Building Regional Climate Capacity in the Caribbean (BRCCC) Programme Steering Committee.



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About the Caribbean Water and Wastewater Association (CWWA)

The CWWA was established by an Act of Parliament of Trinidad and Tobago in 1991. It is located in Trinidad and housed at the Headquarters of the Water and Sewerage Authority of Trinidad and Tobago (WASA). It is the only regional, professional body representing the water and waste management sectors in the Caribbean. Its membership comprises water and waste professionals/experts, companies in the private sector, other professional water and waste management associations within the hemisphere, students and regional organisations.

The CWWA is governed by an Executive Board drawn from its Membership and the day to day operations are managed by the Secretariat headed by an Executive Director. The Association has embarked on the implementation of a 3 year Strategic Plan spanning 2020 to 2022. Some elements of the plan include the further enhancement of 1. programme development through technical cooperation with donor and development agencies; 2. expansion of its training portfolio; 3. expansion of its membership base and development of national sections; 4. resource mobilisation and 5. building of partnerships.

The CWWA has a strong network of partners who have supported it and or with whom it has collaborated. These include the Pan American Health Organisation (PAHO), the UNESCO International Hydrological Programme (UNESCO-IHP), the Inter-American Development Bank (IDB), UN Habitat, United Nations Environment Programme (UNEP), the Inter-American Association of Sanitary and Environmental Engineering (AIDIS) (Spanish: Asociación Interamericana de Ingeniería Sanitaria y Ambiental), the Global Water Operator's Partnership (GWOPA), the Caribbean Water and Sewerage Association (CAWASA), the Caribbean Development Bank (CDB), Caribbean Desalination Association (CaribDA), the Global Water Partnership–Caribbean (GWP-C) and the Pacific Waterworks Association (PWA). It is also unofficially recognised by the CARICOM Secretariat as well as the OECS Commission as a voice for water for the region.

Since 2004, the CWWA has organised the High-Level Forum (HLF) (formerly High-Level Session) of Caribbean Ministers Responsible for Water and in 2017 an equivalent forum for waste was established. At these sessions, discussions of policy and political issues regarding the water sector are addressed by Government officials, technical agencies and development partners. In recent years, these have included the issues of climate and its impact on the water sector, wastewater, investment and financing, to name a few. The Annual Conference and Exhibition of the CWWA is held on a rotating basis in member countries and is usually supported by the national water utility and waste management company. This is its flagship event, attracting close to 400 persons in the sector, sponsors and exhibitors. The Conference is the largest such gathering of water and waste management professionals in the Caribbean.

The work of the CWWA has focused on training of its membership and capacity building. It has signed a Memorandum of Understanding (MOU) with CAWASA for the joint Secretariat of the CariWOP or Caribbean Water Operators Partnership which is a platform for twinning of Utility Companies with a view to exchanging expertise, joint training, information-sharing and generally supporting each other in their development. The CWWA also sits on technical committees of regional projects such as the Caribbean Regional Fund for Wastewater Management (CreW+) and the Integrated Water and Ecosystems Project (IWEco), both of which are funded by the Global Environment Facility (GEF), executed by UNEP and other partners.

The CWWA recognises the significance of Climate Change to the sector and has committed to working with relevant agencies to have the impacts mitigated against and build resiliency in the water sector. The recent Regional Strategic Action Plan (RSAP) for the Governance and Building Climate Resilience in the Water Sector and overall management and financing of water in the Caribbean has been approved by government Ministers responsible for water and wastewater throughout the region, and it serves as a platform for action in those sectors.



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About the Caribbean Disaster Emergency Management Agency (CDEMA)

The Caribbean Disaster Emergency Management Agency (CDEMA) was established in 2001 as the Caribbean Disaster Emergency Response Agency (CDERA) by the Heads of Government of the Caribbean Community (CARICOM) as the lead regional Agency to provide guidance and oversight of disaster management in the Caribbean. In this regard, the Agency must make an immediate and coordinated response to any disastrous event affecting any Participating State, once the State requests such assistance. The Agency transitioned in 2009 to CDEMA, having recognized the need to officially expand its mandate to include a focus on the promotion of disaster loss reduction and mitigation in the Participating States.

CDEMA's objectives as articulated in the Agreement Establishing CDEMA are as follows:

- a) Mobilising and coordinating disaster relief;
- b) Mitigating or eliminating, as far as practicable, the immediate consequences of disasters in Participating States;
- c) Providing immediate and coordinated response by means of emergency disaster relief to any affected Participating State;
- d) Securing, coordinating and providing to interested inter-governmental and nongovernmental organisations reliable and comprehensive information on disasters affecting any Participating State;
- e) Encouraging – i) The adoption of disaster loss reduction and mitigation policies and practices at the national and regional level; ii) Cooperative arrangements and mechanisms to facilitate the development of a culture of disaster loss reduction; and
- f) Coordinating the establishment, enhancement and maintenance of adequate emergency disaster response capabilities among the Participating States.

CDERA, now CDEMA, spearheaded the adoption of a strategic CDM framework in 2001 in collaboration with stakeholders. The strategic objective of CDM is the integration of disaster management considerations into the development planning and decision-making processes of Participating States (PSs). The CDM Strategy is now in its third iteration for the period 2014-2024 which was informed by findings from a review of the progress made on the Strategy 2007-2012 through extensive broad-based stakeholder consultations, which lasted over one year. The goal of the CDM Strategy 2014-2024 is to realise "Safer, more resilient and sustainable CDEMA Participating States through Comprehensive Disaster Management." This goal is supported by four (4) global high level priority outcomes and sixteen (16) specific final outcomes.



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About the Caribbean Public Health Agency (CARPHA)

The Caribbean Public Health Agency (CARPHA) combines the functions of five former Caribbean Regional Health Institutions (RHIs) into one single agency. These include The Caribbean Environmental Health Institute (CEHI), The Caribbean Epidemiology Centre (CAREC), The Caribbean Food and Nutrition Institute (CFNI), The Caribbean Health Research Council (CHRC) and The Caribbean Regional Drug Testing Laboratory (CRDTL). These institutions had, and continue through CARPHA, to possess a long history of technical cooperation with its Member States and partners, to provide expertise in health systems and support for country-level implementation. Given the disparity in size and resources across the region the principles of solidarity in health have been practiced for several decades, and within this collective system CARPHA has several comparative advantages. This includes: mechanisms to work with states and territories in the Caribbean; convening role; development and implementation of health policies, strategies, standards and guidelines; the ability to connect the Region to global experts and technical resources through its various networks and partners.

CARPHA provides strong regional leadership, technical cooperation and promotes evidence-based decision making to its Member States as they pursue the goals of the current (fourth) iteration of the Caribbean Cooperation for Health (CCH IV). As the public health agency for CARICOM, CARPHA is mandated to lead strategic collaborative efforts among Member States and other partners to promote equity in health, to combat disease, and to improve the quality of the lives of the peoples of the Caribbean. CARPHA aims to be the major regional catalyst for ensuring that all peoples of the Caribbean enjoy optimal health, and that we contribute to the well-being of their families and communities. In this regard, CARPHA is well-positioned to be the mechanism through which the objectives of this project can be achieved.

This project is fully consistent with CARPHA's current activities in the area of environmental health as well as public health. CARPHA Member States include a number of vulnerable Small Island Developing States (SIDS) and low-lying coastal states. These SIDS face significant challenges to their sustainable development as a result of climate change, natural and environmental disasters and other global threats. Our Environmental Health and Sustainable Development Department (EHSD) is based in St. Lucia. This department supports the Caribbean's sustainable development agenda by playing a lead role in key areas related to environmental management for optimal public health.

CARPHA also has an excellent track record in the implementation and execution of projects, and as a regional centre works with Member States, and other key partners, to protect and promote the health of people in the Caribbean. Since its formal operationalisation in 2013, CARPHA has been awarded multi-million dollar project funding from development partners to respond to the priorities and needs of CARPHA Member States.

CARPHA will provide the technical leadership for the health components in the execution of the project. CARPHA is headquartered in Port of Spain, Trinidad and Tobago. It is responsible for regional initiatives and providing the necessary technical cooperation to CARICOM to advance the regional health agenda. Our Environmental Health and Sustainable Development Department will spearhead this project.



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About the Caribbean Centre for Renewable Energy and Energy Efficiency (CCREEE)

The CCREEE is an institution of CARICOM, established in the framework of the Global Network of Regional Sustainable Energy Centres (i.e. the GN-SEC) and its sub-network for small island developing states (SIDS) in Africa, the Caribbean, the Indian Ocean and the Pacific. It builds on the regional intervention logic of other GN-SEC centres, creating integrated and inclusive regional markets for sustainable energy products and services by mitigating existing barriers through various tools and methodologies. The CCREEE is the implementation hub for sustainable energy activities and projects within the CARICOM region and was operationalised with the signing and ratification of the Agreement establishing the CCREEE in May 2018.

The CCREEE has a clear vision, mission and mandate which are fully aligned with the CARICOM's vision, mission and core values: *"A Caribbean Community that is integrated, inclusive and resilient; driven by knowledge, excellence, innovation and productivity; a Community where every citizen is secure and has the opportunity to realise his or her potential with guaranteed human rights and social justice; and contributes to, and shares in, its economic, social and cultural prosperity; a Community which is a unified and competitive force in the global arena"*.

Mandate of CCREEE

The CCREEE, a specialized agency with an official CARICOM and SIDS DOCK mandate to promote renewable energy (RE) and energy efficiency (EE) investments, markets and industries in the Caribbean, identified three strategic priorities:

Create: A market intelligence repository – knowledge hub aimed at enhancing capacity within the regional energy sector;

Optimise: Support and accelerate innovative applications of technology, policy and finance through the development of tools;

Embed and Transform: Utilise sustainable energy as a means to advance the wellbeing of at risk and vulnerable groups

Through these priorities, the Centre aims at improving access to modern, affordable and reliable energy services, energy security and mitigation of negative externalities of the energy system (e.g. local pollution and GHG emissions).

CCREEE has a technical mandate and provides action- and service-oriented services to a broad range of public and private partners and clients. Under its governance structure, the CCREEE works closely with the CARICOM Energy Unit, and each part of the structure has defined responsibilities and tasks. The main decision-making elements of the structure are the Executive Board, the Technical Committee and the Secretariat (in Bridgetown). They work in close collaboration with National Focal Institutions, the Regional Universities Network, and a group of Thematic Hubs who address topics of particular interest for the energy market.

The CCREEE acts at the regional level as a hub for articulating, complementing and coordinating the efforts from the international community to respond to the CARICOM Secretariat and Member States' needs since it was conceived to support the overall objective of pursuing a low-carbon path and fulfilling regional and national goals for all Member States.

The technical portfolio of the Centre is composed of strategic programmes intended to address barriers to the introduction and development of certain sustainable energy technologies and solutions. Barriers are often related to policy and regulatory frameworks, capacity, knowledge and data availability, awareness, financing tools, as well



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as the promotion of innovative ideas and entrepreneurship. These strategic programmes include knowledge management and transfer, energy access, sustainable industry and business, sustainable transport, finance and project support, climate resilience, and sustainable buildings.

The geographic scope of intervention of CCREEE is defined as follows. The Centre (...):

- Supports and executes RE&EE activities and projects which cover one or more CARICOM Member States; however, the Centre is also disposed to supporting the wider Caribbean.
- Focuses primarily on activities and projects with regional impact or national projects which demonstrate high potential for scaling-up or regional replication.
- Works in urban and rural areas, due to the high relevance of decentralized RE&EE technologies and services for rural areas linked with the agricultural sector.

The Centre promotes all appropriate and sustainable renewable energy and energy efficiency technologies, including also partly renewable energy-based hybrid systems and mini-grids. The Centre considers important cross-cutting issues such as mainstreaming of environmental assessments and standards in project planning and approval procedures, the energy-water-food nexus, gender mainstreaming, the decommissioning and recycling of RE&EE technologies.



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About the Caribbean Tourism Organization (CTO)

The Caribbean Tourism Organization (CTO), with headquarters in, is the Caribbean's tourism development agency comprising membership of 24 countries and territories including Dutch, English, French and Spanish, as well as a myriad of private sector allied members.

Vision and Purpose

The CTO's vision is to position the Caribbean as the most desirable, year round, warm weather destination and our purpose is Leading Sustainable Tourism – One Sea, One Voice, One Caribbean.

Objectives

The primary objective of the Caribbean Tourism Organization is to provide to and through its members the services and information necessary for the development of sustainable tourism for the economic and social benefit of the Caribbean people by:

- providing an instrument for close collaboration in tourism among the various territories, countries and other interests concerned;
- developing and promoting regional travel and tourism programs to and within the Caribbean;
- providing members with opportunities to market their products more effectively to both the Caribbean and the international tourism marketplaces;
- assisting member countries, particularly the smaller member countries with minimal promotional budgets, to maximize their marketing impact through the collective CTO forum;
- carrying out advertising, promotions, publicity and information services calculated to focus the attention of the public upon the Caribbean as one of the world's outstanding tourist destinations;
- providing a liaison for tourism matters between member countries;
- providing a sound body of knowledge on tourism through data collection, collation and research;
- creating processes and systems for disseminating and sharing tourism information;
- providing advice, technical assistance and consultancy services with respect to tourism
- providing training and education for Caribbean nationals and for international travel agents;
- seeking to maximize the contribution of tourism to the economic development of member countries and the Caribbean through programs likely to increase foreign exchange earnings, increase employment, strengthen linkages between tourism and other economic sector like manufacturing and agriculture, and to reduce leakages from Caribbean economies;
- encouraging coordination with respect to research and planning and the efficient allocation of local, regional and international resources at both government and non-governmental levels in tourism development;
- researching and identifying the ecological effects of tourism with a view to recommending and /or initiating action aimed at minimizing the negative and enhancing the positive effects;
- promoting the consciousness of the need to preserve both the natural and man-made beauty of the Caribbean environment and demonstrating its direct relationship to the development of an attractive tourism product;
- developing a tourism product which is essentially Caribbean and which, through maximizing economic benefits, has minimal adverse social and psychological effects on the integrity of Caribbean peoples.



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About the Caribbean Hotel & Tourism Association (CHTA)

CHTA's Mission Statement

To facilitate the full potential of the Caribbean hotel & tourism industry by serving member needs and building partnerships in a socially responsible and sustainable manner.

The Caribbean Hotel & Tourism Association is a Federation of Associations, encompassing 32 national hotel associations from around the region. The diversity that characterises the federation of CHTA throughout the Caribbean offers its members the opportunity to benefit from the strengths of its colleagues from other countries and other national hotel associations.

CHTA is headquartered in Miami, Florida and a project office in Barbados. The Association is governed by a board of directors elected by the member national hotel associations, according to their size. Two directors are elected to represent airlines, five to represent other allied members, one to represent chain hotels, and one each to represent the Caribbean Society of Association Executives (CSHAE), the Caribbean Association of Industry and Commerce (CAIC), the Caribbean Council (CC), and the Caribbean-Central American Action (C-CAA). The Caribbean Tourism Organization (CTO) appoints three representatives to the CHTA board.

About CAST

CAST serves as an initiative of CHTA to provide tourism enterprises with sustainability resources, best practices and work alongside CHTA committees to provide support for the advocacy of sustainability within the region.

Strategic Focus & Services

- Information & Resources: providing detailed studies of sustainability examples, lessons learned and resources to make the case for sustainability throughout tourism enterprises. To work in partnership with aligned groups and organizations throughout the region.
- Advocacy: promoting responsible environmental and social issues within the Caribbean tourism sector and representing the interests and successes of the sector at key regional and international forums; reporting on meeting outcomes to the sector. Contribution to influence governance and decision making regarding sustainability within the sector.
- Sustainability Training & Special Projects: through the use of toolkits, special publications & projects (Resource Guides), training programs and modules.

Objectives

- To serve as a first step resource to tourism enterprises in the area of information and education for sustainable tourism implementation.
- To provide tangible results to tourism enterprises through sustainability training and education. Assist with certification guidance, vendor and products information.
- Develop synergies and strategic partnerships with sustainable tourism efforts to ensure a cohesive solution to sustainability within the region.



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