ADAPTATION FUND

CONCEPT NOTE FOR A REGIONAL PROJECT/PROGRAMME

PART I: PROJECT/PROGRAMME INFORMATION

Title of Project/Programme:	**Risk Reduction Management Centers: local adaptation response to national climate and early warning information in the Caribbean**
Countries:	Cuba, Dominican Republic, Jamaica
Thematic Focal Area:	Disaster risk reduction and early warning systems
Type of Implementing Entity:	MIE
Implementing Entity:	United Nations Development Programme
Executing Entities:	**Cuba:** Ministry of Science, Technology and Environment (CITMA) in collaboration with the National Civil Defense (EMNDC), National Meteorological Institute (INSMET) and Environmental Agency (AMA) **Dominican Republic:** Ministry of Environment and Natural Resources (MENR), in collaboration with the National Commission of Emergencies (CNE), Dominican Federation of Municipalities (FEDOMU) and the National Meteorological Office (ONAMET) **Jamaica**: Ministry of Local Government & Community Development (MLGCD) in collaboration with the Office of Disaster Preparedness & Emergency Management (ODPEM) and Meteorological Service of Jamaica (MET)

Amount of Financing Requested: **4,969,367 (in U.S Dollars Equivalent)**

Project Background and Context

1.1 Problem to be addressed

1. Latin America and the Caribbean (LAC) is exposed to a wide variety of natural hazards including earthquakes, storms, extreme temperatures, droughts, floods, and landslides, many of which are regularly exacerbated by climate variability. Changes in regional temperature and precipitation regimes, including shifts in the frequency and intensity of extreme climate-related events, will affect population health, livelihoods, economies, the environment and natural resource availability across national borders. Sea level rise, already observed in recent decades, will likely lead to greater inundation, coastal erosion, saltwater intrusion and greater susceptibility to storm surge[1].

2. According to the CAF[2] study on LAC vulnerability to climate change, exposure to climate change and extreme climate-related events in the LAC region varies considerably with more than half of the Caribbean nations facing 'extreme' exposure risks. The study ranks the Caribbean nations of **Jamaica, Dominica and Cuba** as facing extreme and high-risk vulnerability to climate change (see Fig.1)**.**[3]

[1] Vulnerability Index to Climate Change in the Latin American and Caribbean Region, CAF, 2014
[2] Andean Development Corporation – Development Bank of Latin America
[3] Vulnerability Index to Climate Change in the Latin American and Caribbean Region, CAF, 2014

Figure 1 Climate Change Vulnerability Index for LAC[4]

Climate Change Vulnerability Index for the LAC region

Country	Rank	Score	Risk category
Haiti	1	0.58	extreme
Guatemala	2	0.75	extreme
El Slavador	3	0.79	extreme
Honduras	4	0.92	extreme
Dominican Republic	5	1.01	extreme
Nicaragua	6	1.19	extreme
Jamaica	7	1.50	extreme
Paraguay	8	1.58	extreme
Belize	9	2.25	extreme
Bolivia	10	2.48	extreme
Venezuela	11	3.64	high
Ecuador	12	3.76	high
Dominica	13	3.85	high
Cuba	14	3.90	high
Guyana	15	4.23	high
Colombia	16	4.30	high
Mexico	17	4.47	high
Peru	18	4.98	high
Panama	19	5.57	medium

3. The Caribbean possesses inherent geographical, economic and social characteristics which intensify vulnerability and limit ability to respond to catastrophic events. These include geographic isolation, small populations located in hazard prone areas, coastal positioning of critical and economic infrastructures, prevalence of poverty, limited capacity and resources, fragile ecosystems and undiversified economies vulnerable to shocks; weather-dependent economic sectors, such as agriculture and tourism, create greater risk of negative impact of climate related events and conditions.

4. Changes in the rainfall regime and sea level rise are the key risk drivers in the Caribbean. Decreasing rainfall over the Caribbean is likely to be accompanied by an increase in the occurrence of heavy rainfall events, affecting the frequency and intensity of both floods and droughts. A high proportion of land area of many Caribbean islands is near sea level, resulting in susceptibility to future sea level rise. Though highly uncertain, climate change may act to decrease the overall number of tropical cyclones (hurricanes) but increase the frequency of the most intense storms in the Caribbean region. [5]

5. These driving forces affect important ecosystems and ecological processes in the region. Human-induced soil erosion is affecting up to 2.23 million square kilometers of land in LAC, and river networks transport these sediments and other land-based sources of pollution to the oceans, impacting coastal ecosystems. The World's Water Quality Assessment (2016) states that about one-quarter of all river stretches in LAC fall in the severe pollution class; and the number of rural people coming into contact with polluted surface waters is estimated to be as high as 25 million.[6]

Cuba

6. The Cuban archipelago is formed by the island of Cuba, the Isle of Youth and more than 1,600 islands, islets and cays, covering a surface area of 110,922 km. Most of the Cuban territory has a tropical climate with a rainy season in summer. The average annual temperature ranges from 24°C to 26°C and higher in the lowlands and on the eastern coast, with temperatures lower than 20°C in the highest parts of the Sierra Maestra. Despite its tropical climate, seasonal characteristics are present in its thermal regime, with two marked seasons: summer (rainy season) from May to October, July and August being the warmest months; and winter (less rainy season) from November to April, January and February being the coolest months. The national average rainfall record is 1,335 mm; however, droughts occur frequently and can persist for several years. Tropical cyclones and severe local storms (tornadoes, waterspouts and linear winds exceeding 90 km/h) are the most hazardous meteorological phenomena.[7]

7. Since the second half of the 20th century Cuba has been experiencing changes in climate manifested in the rise of air surface temperature to 0.9 °C and increase of average minimum temperature to 1.9°C; decrease of daily temperature oscillation; increased frequency of prolonged and severe droughts, especially during

[4] Source: Ibidem
[5] Ibidem
[6] Global Environment outlook GEO-6: Regional Assessment for Latin America and the Caribbean, UNEP, 2016
[7] II national Communication of Cuba to the UN Framework Convention of Climate Change

the summer; increased precipitation during the dry season and shortening of the rainy months; increase in rainfall associated with greater precipitation characteristic of winter; and, moderate to strong coastal inundation[8].

8. According to the projections of the Cuban hydro-meteorological services, by the end of the 21st century the climate in Cuba will undergo the following changes: the average air temperature will rise by 4°C accompanied by the decreased annual precipitation, which, according to scenarios, will oscillate between 14-63% and will be accompanied by increased evaporation. The drylands of the Eastern part of the island will increase and extend progressively towards west, transforming the humid tropical climate into sub-humid dry, with a possible desertification hazard. According to some estimates, increase in the temperature of the sea surface and of the lower layer of the troposphere will stimulate the rapid intensification of hurricanes in the Caribbean, as was the case of the Hurricane Sandy (October 2012), which caused damages and losses worth up to US$ 4,700 million. In addition to the effects of Sandy, Cuba has incurred more than US$ 20,500 million due to the impacts of extreme meteorological events over the last 15 years[9].

9. Expected impacts of climate change in Cuba include the increased risk of hydro meteorological phenomena, decreased availability and deterioration of water quality, and prolonged and more frequent droughts. Water resources will be among the most severely affected, having major implications on other sectors and resources. In general, all climatic scenario demonstrates a significant reduction of water resources.

10. Estimates reported by the IPCC in 2014 point to a sea level rise of 0.5 to 0.6 m by 2100, while there will be a trend of overall annual decrease in precipitation of about 5-6 % in the Caribbean, signaling potential future problems for agriculture and water availability[10] The combined effects of sea-level rise and precipitation decrease will aggravate the potential availability of fresh water, due to the intrusion of salt water in coastal aquifers. This will imply a significant reduction in the replenishment of subterranean aquifers and their eventual disappearance as a result of salinization. The drought will also affect public health, given the potential increase of vectors and plagues, and the deterioration of sanitary and hygienic conditions, related primarily to the disruption of water supply.

11. In summary, according to the existing climatic trends and climate scenarios for the next 100 years, the future climate in Cuba is expected to be more arid and characterized by more extreme events. The key impacts are likely to include severe deficit of water, prolonged and frequent droughts, increase in transmissible diseases and loss of solid ground in lower areas affecting coastal settlements.

12. These impacts are already being manifested in the province of Ciego de Avila (see figure 2), where the project will be implemented. The province is situated in the center of the island bordered by the Old Bahama Channel in the North, Caribbean Sea in the South, Camaguey province in the east and Sancti Spiritus province in the west. The total population of Ciego de Ávila is of 422,576 inhabitants with the population density of 60.08 persons per/Km² and gender structure of 50.9% male and 49.06% female. The degree of urbanization is 71.7%. There are 57 Popular Councils on the territory of the province, distributed in 10 Municipalities: Ciego de Ávila, Morón, Ciro Redondo, Venezuela, Baraguá, Majagua, Florencia, Bolivia, Chambas and Primero de Enero.

[8] Synthesis on climate change impacts and adaptation measures in Cuba ("Síntesis informativa sobre impactos del cambio climático y medidas de adaptación en Cuba"). Dr. Eduardo O. Planos Gutierrez,,2014, Basal Project of UNDP, EC, SDA, GEF, NEA, INSMET, MINAG, as well II national Communication of Cuba to the UN Framework Convention of Climate Change.

[9] Ibidem

[10] Small islands. In: Climate Change 2014: Impacts, Adaptation, and Vulnerability. Part B: Regional Aspects. Contribution of Working Group II to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change
http://www.ipcc.ch/pdf/assessment-report/ar5/wg2/WGIIAR5-Chap29_FINAL.pdf

Figure 2 – Map of the Province of Ciego de Avila

13. Ciego de Avila covers 6,320.92 km^2 and comprises adjacent cays and territorial surface characterized by few elevations and slight undulations. The absolute coast size is from 0.0 to 40 m, at times reaching up to 60 m, with small undulations to the north of the province that reach up to 210 m. Most of the coast is occupied by marshes from 0.0 to 10 m, of which the northern Morón and southern Itabo are located on impermeable quaternary formed from clay and peat. The hydrographic network is poor, and is formed by small lagoons, rivers and low-flow streams.

14. In its westernmost part, Ciego de Avila has a ridged relief with maximum values of 396 meters above sea level. The highest areas of the Chambas basin have the most extensive hydrographic network. In the middle and lower part of the basin, the drainage occurs through a network of channels designed for these purposes. The topography of the eastern part, where Fallas and Ranchuelo towns, as well as the municipalities of Morón, Ciro Redondo and Ciego de Ávila are located, is flat with predominant red ferralitic soils characterized by a high speed of filtration. Combined with a high concentration of karst, hydrographic network in this zone is extremely scarce, with water streams and rivers replenishing only during the periods of intense rains. Due to these characteristics, groundwater is the key water resource in this territory.

15. Climate vulnerability of the province is related to the reduction of precipitation, which affects directly the aquifers and reservoirs, as the only source of replenishment of water resource; rise of temperature; elevated indexes of superficial evaporation and the rise of sea level, with the associated coastal erosion and salinization of subterranean aquifers; increase of extreme meteorological phenomena locally, such as intense rains in 24 hour periods, thunderstorms and storms characterized by hail, strong linear winds, and tornados. Projections and anticipated impacts of climate change include the increased frequency, duration and intensity of droughts; rise of temperature; continuous elevation of sea level; and, continuous decrease of available water resources[11].

16. The occurring climate changes, manifested in the variation of the rain patterns, have already made water resources in Cuba quite scarce. Decreased precipitation and increased demand for water by humans and ecosystems have resulted in a drastic decrease of the available volume of water. In the recent years, the province has encountered recurrent droughts, which have affected the superficial and subterranean water reserves and taken a heavy toll on the provincial economy. Agriculture is the leading economic activity; 73% of all water resources are used for irrigation. 70% of the province's hydric potential comes from subterranean sources, presenting a major conservation and management challenge. The Municipalities of Ciego de Avila (Provincial Capital) and Morón face serious limitations in the use of subterranean waters, due to the high

[11] According to the Provincial Meteorological Center of Ciego de Avila, the intensity of the current drought will continue to increase during the next 6 months, which implies that the aquifers and reservoirs will not recover at least until April 2017 from the existing and projected rainfall deficit. This is due, among other causes, to the current and future condition of the neutral ENSO Event with a possibility of occurrence of a La Niña event. This situation will lead to the continuation of rainfall deficits and the intensification of drought processes in the province.

concentration of industrial and agricultural centers in the area. Morón supplies freshwater to the fourth most important touristic destination of the country, located in the northern cays, which is of high economic importance for the country. Chambas receives water from the reservoirs in the neighboring municipality of Florencia, which are in poor condition, threatening the stability of water supply for the population and agriculture.

17. In addition to droughts, the province's environment is threatened by the sea level rise, which causes coastal erosion, deterioration of mangroves and wetlands, and seawater intrusion in subterranean aquifers. According to the studies carried out by the Environmental Agency (AMA) of the Ministry of Science, Technology and Environment (CITMA), while different economic activities have affected the mangroves, the resilience threshold remains high. However, the sea level rise will likely affect the mangroves, as their margins will retreat landward where unobstructed. In addition, sea level rise is resulting in the salinization of subterranean aquifers, affecting the balance of freshwater and its supply for human consumption, economic activities, and ecosystems. The continuous salinization of freshwater in aquifers will require desalinization and purification measures.[12]

18. Socioeconomic well-being is linked to agricultural production, which suffers from drought-induced depletion of aquifers, reducing crop yield and increasing vulnerability. Ciego de Avila's agricultural production is important for national food security. Drought related water-shortage affects households, especially the most vulnerable segments, such as women-headed households, children, elderly and the disabled. Currently inadequate monitoring and observation technologies, insufficient capacities to project and model future climatic scenarios for the province will hamper the design and implementation of adaptation measures.

Dominican Republic

19. The Dominican Republic occupies two thirds of the Española Island, which it shares with Haiti. The country is situated between the Caribbean Sea and the Northern Atlantic Ocean; the territory is 48,442 km^2, making it the second largest country of the Antilles. Geographically, the Dominican Republic is located within the Antillean Archipelago between the longitude 68° y 72° east and latitudes 17° y 20° north. This geographical position places the country on the path of tropical hurricanes and storms. Hurricanes typically occur between June and November each year and originate in the proximity of Cabo Verde islands, following the trajectory towards the Antillean archipelago, frequently passing through the Dominican Republic and its surroundings on their way towards the US coast.

20. The climate in Dominican Republic is predominantly tropical. Rainfall may occur throughout the year, however, there are marked rainy and dry seasons in the majority of the country. Climate variability is dominated primarily by the intertropical convergence and oscillations in the Atlantic Ocean and El Niño/Southern Oscillation, which are manifested in cyclones and tropical storms, intense rains, flooding and occasional droughts. Impacts of Tropical Storms Isaac and Sandy of 2012 and the intense drought of 2014 - which affected the water availability for human consumption and cattle ranching sector, confirmed the relationship between the climate and disasters. Due to the increase of temperatures of tropical seas, the frequency and intensity of hurricanes has also increased as well as the occurrence of floods and landslides, caused by river overflow and/or prolonged intense rains. A number of epidemiological hazards, such as the Chikungunya virus in 2014 and the coffee rust in 2013, have emerged in the same period.

21. There is a general increasing trend in average annual values of minimum temperature between 2°C and 3°C, manifested in increasingly warm conditions in the mornings. The average annual values of maximum temperature also show a tendency to rise from 1°C to 3°C, which implies increasingly hot temperatures during the hours of greater daily insolation. This is an essential feature that evidences a more intensified and warmer diurnal temperature cycle, accompanied with more frequent occurrence of extreme events. Different models consistently indicate that by 2050, the minimum temperatures will be warmer and may vary from 1- 4°C. By 2070, the changes will increase between 2°C to 6°C. The greatest changes in temperature will be recorded in the provinces of Barahona, Monte Plata, La Romana, Hato Mayor and San Juan.

[12] Hazards and vulnerabilities of Cuba's marine-coastal zoned: current state and projections till 2200 in view of Climate Change, Manuel A. Iturralde-Vinent, HErminia Serrano Mendez, 2015

22. By 2050, total annual precipitation across the national territory is expected to decrease by 15%, reaching 17% by 2070, as compared to the average baseline of 1961-1990. There is an 87% consistency between the models under a Radiative Forcing of 8.5 W / m2 on the conditions of decrease of the annual precipitation. There is general agreement that the total monthly rainfall during the dry season may decrease drastically between 2050 and 2070. The southern and western regions of the country will be most affected by this decrease in precipitation, while the eastern and northern regions could show some minor increase. The annual rainfall cycle shows a more intensified pattern in times of rainfall and with increased occurrence of extreme events. There is a generalized increasing trend from 20% and 30% and in some cases, even higher with respect to the number of intense rain events, over the course of the last two decades. These extreme events occur between May and October and record greatest precipitation within the annual cycle.

23. The variability in precipitation patterns is compounded by drought events as well as the effects of strong waves, which are likely to intensify due to increasing ocean temperatures and sea level.

24. The climate vulnerability assessment carried out with the IPCC methodology that includes consideration of Exposure, Sensitivity and Adaptive Capacity (Field, 2014) in the 8 Territorial Division Zones, indicates that the provinces with very high vulnerability are: Azua, Bahoruco, Pedernales, Monte Cristi and Valverde. The provinces of Santiago, Independencia, Elías Pina and Santiago Rodríguez are characterized by high vulnerability.

25. In terms of vulnerability of marine coastal resources, the country's vulnerability is high given the length of the sea coast (1,470 km), of which 750 km are on the Caribbean side. Storm surges are causing severe flooding in low-lying coastal areas, especially when combined with extreme rainfall. More intense storms will increase wave impact, adding additional stress to marine environments - such as soft bottom habitats, coral reefs and mangroves - contributing to further erosion of beaches. The increase in extreme weather phenomena will also have a significant influence on the tourism industry and may result in significant losses to national economy.

26. Several river basins and watersheds/sub-watersheds have been prioritized for integral management of their natural and environmental resources, and to guarantee their socio-economic and environmental sustainability. The following basins are listed in order of their importance and priority: Yaque del Norte, Yaque del Sur, Yuna, Nizao, Camú, Ozama, Isabela, Las Cuevas, Artibonito, Higuamo, Maguaca, Chacuey, Macasía, Guayubín, Nizaíto and Nigu. These basins have a population of more than 5 million inhabitants, and host a total of 14 dams, (of which 6 are hydroelectric) and 88 aqueducts. In addition, there are 50 protected areas, including national parks, scientific reserves, national recreational areas, green belts, wildlife refuges, forest reserves and biological reserves, among others.

27. The Nizao River Basin (see Figure 3), which is the target area of the project - starts in the central Cordillera at a height of 2,560 meters above sea level and travels 118 kilometers. It flows 25 kilometers towards Estrechura at a height of 720 meters, 58 kilometers to Palo de Caja at a height of 437 meters and 83 kilometers towards El Ermitaño at a height of 135, finally discharging into Caribbean Sea. The area of the basin is about 1,023 square kilometers, which is equivalent of 2% of the national territory. The soils of the Nizao basin are characterized by steep slopes (more than 50% have slopes higher than 32% grade), which make them susceptible to physical degradation. There are 4 municipalities and a municipal district (Los Cacaos, Nizao, Yaguate, Rancho Arriba, La Ciénaga) in the Nizao river basin, encompassing a population of 88,955 inhabitants. These municipalities belong to 4 Provinces (La Vega, San José de Ocoa, Peravia and San Cristóbal) with a total population of 1,205,847.

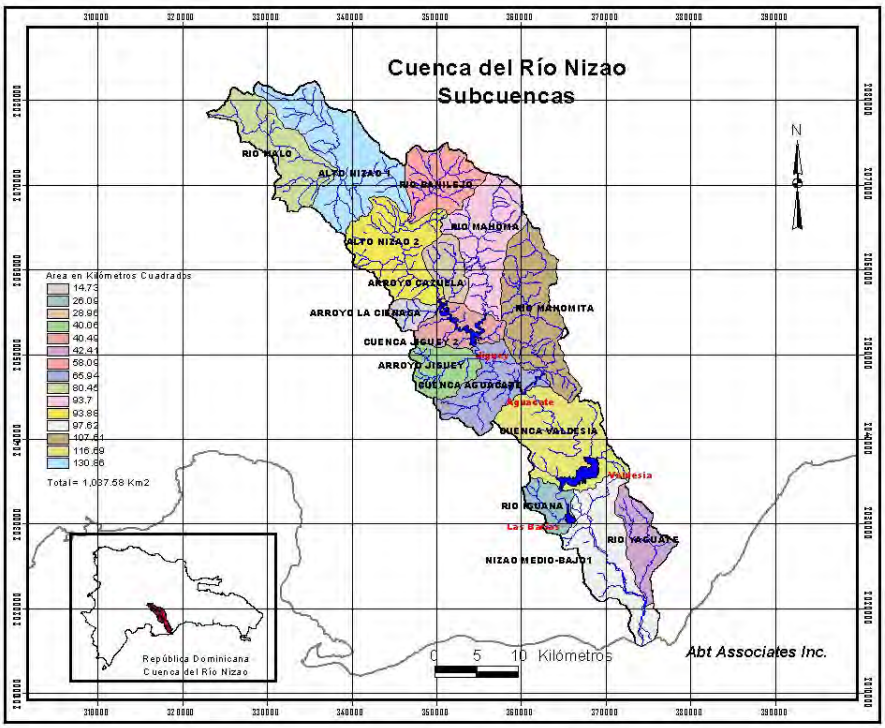

Figure 3 – The Nizao River watershed and its sub-watersheds

28. While only occupying 103,602 hectares (1,036 km2), the Nizao River basin is among the most important territories of the country due to its system of reservoirs used for power generation. The river supplies up to 40% of Santo Domingo drinking water and irrigates the 14,000 hectares in Baní and San Cristóbal[13]. The basin is home to 4 high-risk dams, 3 hydroelectric plants that generate 155 Mwh/year, and a counter-dam. In addition to water and energy production, the upper and middle basins are important coffee growing area and support significant infrastructure for coffee processing and drying. The local coffee and cocoa growing sector is represented by small-scale farmers, with a strong tradition of community organization. The area was one of the first to start proceedings for organic certification of local coffee production. In 2007, the communities suffered significant damages due to Tropical Storms Noel and Olga, with landslides destroying schools and crops.

29. In consultation with the Government of Dominican Republic, 4 municipalities, comprised of 8 municipal districts located in 3 provinces, have been selected for project intervention on the basis of the following criteria: 1) existence of previous interventions; 2) selected municipalities or municipal district with a Hydro-Meteorological Shock Vulnerability Index (IVACC) rating above the national average 3) cross-checking information with prioritization process conducted for the National Plan on Comprehensive Risk Management of Dominican Republic; and 4) the communities with largest population, proximity to river or other water stream and Quality of Life Index = 1, that is, living in extreme poverty.

30. Hydro-Meteorological Shock Vulnerability Index (IVACC)[14] - developed by the Unique Beneficiary System (SIUBEN) of the Dominican Government - measures the vulnerability of a household to the occurrence of natural phenomena. The Index was developed to complement the Quality of Life Index to better target social programmes aimed at the most vulnerable populations. The initial list of municipalities was selected from those whose IVACC was equal or above 0.634. The other criterion used for the selection was the prioritization of municipalities carried out for the National Plan on Comprehensive Disaster Risk

[13] Executive summary of project Restoration and Integrated Management of Upper Basins of Rivers Nizao, Nigua and Ocoa, Ministry of Environment, Quisqueya Verde. 2011
[14] SIUBEN catalogs households according to their socioeconomic situation, measured through proxy variables, characteristic of households.

Management, which weighted 165 municipalities of the country by the degree of vulnerability. Using the total of 16 indicators (6 for exposure, 9 for susceptibility, and 1 for resilience to disaster risks) three levels of risk levels were established: high, medium and low. Thus, the risk levels for the municipalities are identified:

Table 1 Risk level according to prioritization process for National Comprehensive Disaster Risk Plan crossed with the degree of vulnerability

PROVINCE	MUNICIPALITY	RISK
PERAVIA	BANÍ	HIGH
	NIZAO	LOW
SAN CRISTOBAL	CAMBITA GARABITO	MEDIUM
	LOS CACAOS	MEDIUM
	VILLA ALTAGRACIA	MEDIUM
SAN JOSE DE OCOA	SAN JOSE DE OCOA	MEDIUM
	SABANA LARGA	MEDIUM
	RANCHO ARRIBA	MEDIUM

31. These municipalities are characterized by their vulnerability to hydro-meteorological risk due to their location in the River Nizao basin and other socioeconomic and structural factors such as low education levels, precarious living conditions, and high number of dependents.

Jamaica

32. Jamaica is the third largest island in the Caribbean archipelago with a tropical climate, with predominantly hot and humid weather, and more temperate weather in higher inland regions. Some regions on the south coast, such as the Liguanea Plain and the Pedro Plains, are relatively dry rain-shadow areas. With increased frequency and severity in droughts, floods, storms and hurricanes, Jamaica is already experiencing the impacts of climate change.

33. Jamaica is highly prone to climatic hazards such as hurricanes, floods, droughts, storm surges, and landslides. High exposure to hazards can be attributed to the country's geographical location on the Atlantic Hurricane Belt, and geophysical orientation with low-lying coastal zones and mountainous topography. Hurricane risk is also appreciable as approximately 82% of Jamaica's population lives within five kilometers of the coast, which exacerbates the relative vulnerability of residents, major infrastructure and the housing stock. The coastal zone contains an estimated 75% of productive industries and service sectors and is responsible for contributing an estimated 90% to the country's GDP. Between 2001 and 2012 the country experienced 11 storm events (including five major hurricanes) resulting in loss and damage of approximately US$1.2 billion[15].

[15] UNDP Jamaica

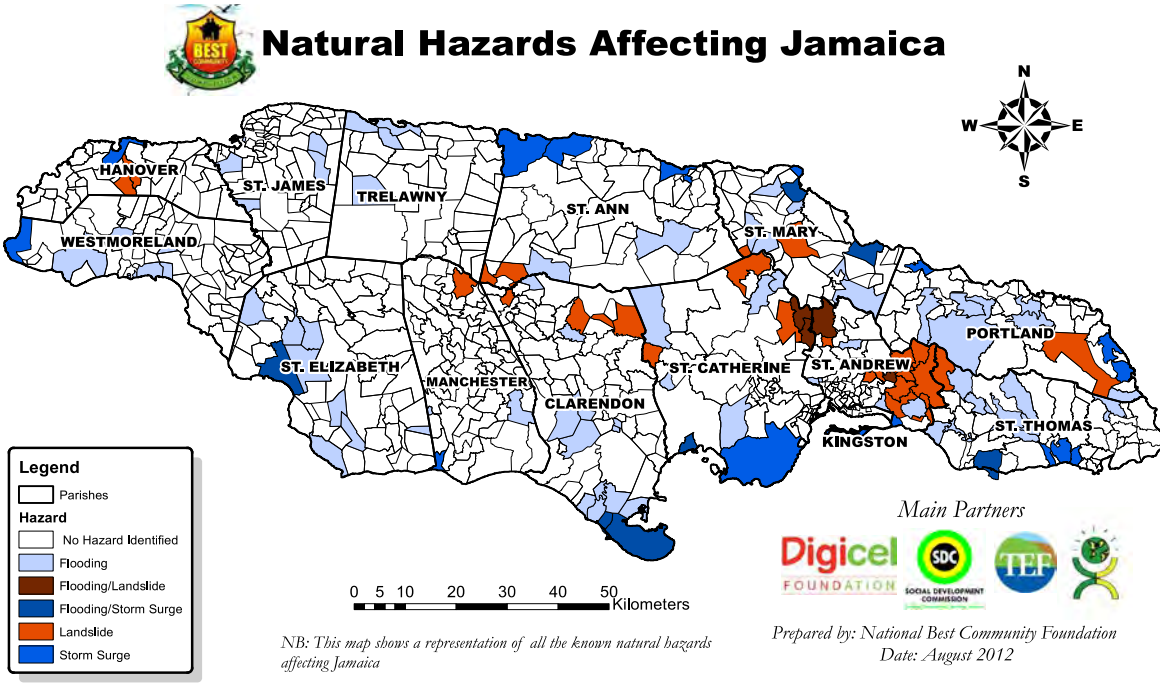

Figure 4: Jamaica Parishes and Natural Hazards

34. Climate change models[16] project that Jamaica could be impacted by an increased frequency of adverse natural events as a result of heightened surface temperatures and global sea level rise. The Intergovernmental Panel on Climate Change (IPCC) suggests that Jamaica will undergo a warming and drying trend and endure more frequent heat waves and droughts, rainfalls and hurricanes with increased intensity, and heightened storm surge.

35. Jamaica's mean annual surface air temperature was projected to increase across all models in a 15 Global Circulation Model (GCM) ensemble and across all scenarios by 1.1 to 3.2℃ by the 2090s. The range of increase was 0.7-1.8℃ by the 2050s and 1.0-3.0℃ by the 2080s. Projected mean surface air temperatures increase most rapidly over Jamaica in June, July and August.

36. The frequency of 'hot' Jamaican days and nights should continue to increase, reaching 30-98% of days annually by the 2090s. It is to be noted that the rate of increase varies substantially between models for each scenario. 'Hot' days/nights were projected to increase most rapidly in the period June, July and August (JJA) and September, October and November (SON), occurring on 60 to 100% of days/nights in JJA and SON by the 2080s. 'Cold' days/nights were projected to diminish in frequency, occurring on a maximum of 2% of days/nights by the 2080s. Cold days/nights decrease in frequency most rapidly in JJA. [17]

37. Global Circulation Model projections of future rainfall for Jamaica span both overall increases and decreases, but most models project decreases, especially by the end of the century. Projected rainfall changes range from -44% to +18% by the 2050s and -55% to +18% by the 2080s. The overall decrease in annual rainfall was strongly impacted by decreased JJA (early wet season) and SON (late wet season) rainfall. The drying will firmly establish itself somewhere in the middle of the current century. Until then, inter-annual variability will be a strong part of the rainfall pattern i.e. superimposed upon the drying trend. There was a tendency for decreases in rainfall extremes particularly in March, April and May (MAM). By the 2080s

[16] Hadley Center Coupled Model, Version 2 (HADCM2), as reported in Mulligan (2003). Same modeling data as used by the Intergovernmental Panel on Climate Change (IPCC).
[17] UNDP Jamaica own analysis

the range of changes is -19 to +9% for the proportion of rainfall during heavy events and -29 mm to +25 mm for 5-day maximum rainfall.[18]

38. All three Parishes (St Catherine, St. Thomas, St. Mary's) selected for project intervention demonstrate significant degree of vulnerability to climate hazards. According to the State of Readiness Report of the Ministry of Local Development, in St Catherine Parish all 49 communities are considered high-risk to flooding and landslides. Within St Catherine Parish, 12 communities of Portmore Municipality are at particularly high risk to storm surges and flooding, as well as other potential climate change effects, such as sea level rise, and the spread of diseases such as malaria, dengue, Zika and chikungunya viruses. St. Thomas is at high risk to flooding and landslides, whereas in St. Mary's Parish, 46 communities are at risk of coastal flooding and landslides.

1.2 Social, economic and environmental context

Cuba

39. Cuba is divided into 15 provinces and 168 municipalities, including the special municipality of the Isle of Youth. In 2013, the Cuban population reached 11,210,064 inhabitants of which 76.8% lived in urban areas. Demographic density of Cuba is 102.0 inhabitants/km. Due to the drop of total fertility rate below the replacement level, and an increase in life expectancy (78 years), the country has one of the most elderly population in LAC. Despite 4.6% GDP growth, the expenditure of the state budget decreased by 3% from 2012 – 2013. Total net revenues decreased by 4.8% to a negative fiscal balance of 4513.5 million Cuban pesos, accounting for 4.8% of GDP - at current prices – which forces both an intensified revenue collection and reduced spending to keep the deficit within acceptable limits[19]. Of the total expenditure of the state budget, 14.9% was allocated to health, 11.1% to social security and 17.4% to education.

40. The country ranks among those with high human development (HHD), holding the 44th place, according to the UNDP Human Development Report 2014.[20]

41. The Guidelines for Economic and Social Policy serve as the blueprint for the Cuban development model; the model pays special attention to fostering economic development based on scientific research and competitiveness, opening spaces for new forms of economic management and, at the same time, preserving social advances. Short-term priorities focus on actions to reduce balance of payments deficits, generate export revenues, and replace imports. In the medium term, Cuba aims at increasing self-sufficiency in food and energy science, and use of high human resource potential to achieve better economic performance.

42. Recent economic transformations have focused on improving planning, granting greater powers to public enterprises, promoting the efficient use of available resources, developing new forms of management in production and services, improving managerial capacities, and promoting the decentralized territorial development. Development of agro-food sector, and in particular, increase of food production, has become the central axis of the economic policy through the expansion of the cooperative sector, as a leader in food production; and, increased use of renewable energy sources among others. This process is accompanied by the gradual restructuring of employment and wages and extension of the Government's credit policy.

43. Cuba is implementing a process of institutional change and decentralization of government management, giving greater powers to territorial governments, through strengthening the local government structures and modifying current political and administrative division and territorial arrangements for increased government efficiency. [21]

44. The National Environmental Strategy for 2007-2010 identifies several environmental problems exacerbated by climate change effects, including soil degradation, deforestation and loss of biodiversity.[22]

[18] Biennial Update Report of Jamaica, Ministry of Economic Growth and Job Creation, 2016
[19] II National Communication of Cuba to the UN Framework Convention on Climate Change http://www.inaf.co.cu/cubnc2-1.pdf
[20] Ibid
[21] UNDP Country Programme (2014-2018) for Cuba
[22] II National Communication of Cuba to the UN Framework Convention on Climate Change

Dominican Republic

45. The Dominican Republic is a middle-income country[23], with an average growth rate of 4.8% over the last five years.[24] Its economy is small and open; the main drivers of the economy include tourism, free economic zones, transfers, foreign investment and commodity export, especially from agricultural and mining sectors. The economy has been going through a transformation process, moving from agricultural production based on sugar cane towards service oriented economy.

46. Dominican Republic is divided into three geographical regions, 31 provinces and the National District, which hosts the capital city of Santo Domingo. The provinces, in turn are divided into 155 municipalities and 228 municipal districts[25]. Approximately 60% of the population is concentrated in expanding urban areas located in coastal areas or the lower parts of river basins, exposing populations to the impact of extreme hydro-meteorological events and increasing the probability of flooding, displacement, and disruptions of water and food supply. The Dominican Republic is the eighth country most affected by the extreme meteorological phenomena in the period from 1993-2013[26].

47. In 2011 an estimated 10,056,000 persons lived in the country; rural-urban migration has resulted in rapid urban expansion of the two main cities, Santo Domingo and Santiago.[27] The proportion of urban population has increased from 56% in 1991 to 69.8 % in 2011[28]. Actual population growth was estimated at 1.33 % in 2011 and it is expected to reach between 11.0 and 15.1 million persons before 2050.[29]

48. The Dominican Republic has undergone accelerated economic growth in recent years, with a GDP growth rate expected to reach 5.4% in 2016. Despite the growth, the productive sectors on which the Dominican economy is based are highly vulnerable to climate change, as is a large part of the Dominican population. As of March of 2015, overall poverty rate was 32.1%, with 5.8% extreme poverty, mostly affecting the southern and border provinces. Likewise, despite the yearly increases of the Human Development Index (HDI) – Dominican Republic was ranked 101 out of 188 countries in 2014 – the country is still experiencing inequalities related to gender, health, education and income, transparency and governance, social spending, child and maternal mortality rates. The country faces challenges related to access to and reliability of electric power service; improving conditions for jobs creation; and strengthening access of the poor, women and the youth to labor markets. The Provincial Human Development Map (2010-2015), which calculated the HDI at the provincial level (HDIp), illustrates that human development opportunities are concentrated in the capital city and larger cities; the provinces located near the Haitian border and in the southern region register significantly lower HDIp, with important deficiencies in all indicators. This combination of rising poverty and inequality increases the causes of vulnerability of population to disasters and effects of climate change.[30]

49. Since 2012, the government initiated new strategies to help reduce poverty, allocating 4% of GDP for initial and primary education; providing small producers with access to credit; investing in health infrastructure; and expanding coverage of poor people. The national social security system signed up more than 650,000 new beneficiaries since August 2012.[31]

50. Environmental degradation across the island is increasingly more intense, partly due to deforestation, resulting in more frequent landslides and water runoff caused by strong annual rains. These factors, combined with the existing seismic hazard, call for special attention to the maintenance of dams and other similar infrastructure. Land-use planning remains weak, with human settlements in high risk zones such as

[23] World Bank Country Classification.
[24] Central Bank of Dominican Republic, average (2009-2014)/base year 2007.
[25] http://www.gob.do/index.php/e-municipios/e-localidades/2014-12-17-20-04-43
[26] https://germanwatch.org/en/download/10333.pdf
[27] World Bank, 2011a; Herrera Moreno and Orrego Ocampo, 2011
[28] World Bank, 2011b; PNUD, 2011a)
[29] UNDP Dominican Republic own analysis
[30] Information provided by UNDP Country Office in Dominican Republic
[31] Ibid

river banks or steep hillsides; widespread construction without observing building codes and technical norms increases the vulnerability of these populations. Occupation and use of the National System of Protected Areas for crops, touristic activities and/or human settlement puts future availability of water and other resources at risk. The country needs to address the issue of land use in an integrated manner, combining political, economic, territorial and environmental issues in viable and balanced long-term strategies.

Jamaica

51. Jamaica is the largest English-speaking island in the Caribbean, spanning approximately 10,000 km2 in size. Jamaica's population is approximately 2.7 million, with an average annual population growth rate of 0.2%32. The country is divided into 12 parish councils, one municipal corporation – the Kingston and St. Andrew Corporation (KSAC) – and a second- tier municipal council, Portmore Municipal Council (PMC), which falls within St Catherine Parish.

52. Jamaica is a highly indebted middle-income country, which has graduated to the status of upper middle-income country after several years of straddling the lower-upper middle-income threshold. Jamaica's Human Development Index (HDI) value for 2013 was 0.715—in the high human development category—positioning the country at 96 out of 187 countries and territories.[33]

53. In the recent years, the macro-economic outlook has improved and Jamaica's HDI increased 10.9% since 1980 to reach 0.719 in 2014, ranking 99th of 188 countries[34]; however, the country's social conditions remain challenged. According to the Jamaica Survey of Living Conditions (JSLC), the population living in poverty increased from 9.9% in 2007 to 19.9% in 2012. The JSLC records a deepening of poverty between 2009 and 2010, as measured by the Poverty Gap Index, showing an increase in "the severity of poverty, indicating a worsening in the circumstances of the poor and an increase in inequality"[35] and concluding that more resources are required to take the poor out of poverty. Jamaica's 2014 Social Protection (SP) Strategy expressed concerns over the deteriorating poverty trends since 2008.[36]

54. The country is challenged in protecting and ensuring sustainable use and management of its natural resources. The ecosystem includes dry and wet limestone forests, rainforest, riparian woodland, wetlands, caves, rivers, sea-grass beds and coral reefs. Coastal ecosystems such as mangroves and coral reefs provide protective barriers and habitat; there are considerable resources of fresh-and saltwater fish, which include kingfish, jack, mackerel, whiting, bonito, tuna, snapper and mullet.

55. Jamaica's economic and social sustainability is dependent on its natural resources and ecosystems, which support key productive sectors such as fishing, tourism, agriculture, mining and quarrying, and manufacturing, and provide a range of environmental services including fresh water supply. Some of the country's key economic sectors are particularly vulnerable to the impacts of climate change, such as water, tourism, agriculture, fisheries and forestry. The country's climate sensitivity is enhanced by the fact that its major infrastructure, population settlements, and economic zone are primarily located on its narrow coastal plains[37].

56. For the past 25 years in particular, the impact of hydro-meteorological disasters on Jamaica's GDP has greatly increased; the impact from2001 and 2010 tripled in comparison with previous decades. About 50% of the country's economic assets, including commercial and industrial facilities and tourism infrastructure are located on the coast contributing to 90% of the GDP; over two million people reside in coastal areas[38]. Between 1990 and 2000, there were 10 major climatic events affecting approximately two million people and causing nearly US$1.21 billion (2010) in damages. Hurricane Ivan in 2004 alone caused over US$351

[32] Planning Institute of Jamaica, 2015.
[33] Medium Term Socio Economic Policy Framework 2015-2018, Abstract, Government of Jamaica, 2015
[34] Human Development Report 2015, Work for Human Development. Briefing note for countries on the 2015 Human Development Report
[35] Executive Summary, Jamaica Survey of Living Conditions, 2010; http://www.pioj.gov.jm/Portals/0/Social_Sector/OVERVIEW%20JSLC%202010.pdf
[36] UNDP Country Programme for Jamaica, 2017-2021
[37] Jamaica: Future Climate Scenarios, Climate Studies Group, Mona, The University of West Indies, 2016
[38] Allison Richards, Development Trends in Jamaica's Coastal Areas and the Implications for Climate Change, Planning Institute of Jamaica, March 2008

million (2010) in damages, an amount equivalent to 8% of the GDP. From a sectorial perspective, infrastructure bore the highest economic impact at 45% of the overall costs, largely in the transportation sub-sector (roads and bridges). At a household level, the Livelihood Assessment[39] revealed that 90% of all farming households have been impacted at some time or another by a natural disaster; Hurricanes Gilbert (1988), Ivan (2004) and Sandy (2012) were among those that had the greatest impact on livelihoods.

57. Households involved in activities such as fishing, agriculture or husbandry are affected negatively by shocks, trends and seasonality related to hydro meteorological events and may not benefit from external risk management measures or have the resilience to sustain their livelihoods in the event of a natural disaster.

58. It is estimated that an extreme tropical storm event in Jamaica could produce losses estimated between US$7-10 billion[40].60% of Jamaica's population lives within the coastal areas of the island, underscoring of the vulnerability of these residents to flooding and storm surges. The fastest growing urban centers, Old Harbor and Portmore, would be severely impacted by sea level rise, risking the protection of its harbors and infrastructure such as the Norman Manley International Airport. The inundation risk in Jamaica from storm surges could affect 37% of the coastal wetlands. Environmental degradation is particularly notable in the three target parishes. In Portmore, fishing industry and livelihoods have been particularly eroded due to climate change. There is an overall degradation of coral reefs and coastal ecosystems and forests, and coastal erosion in St. Catherine and St Thomas Parishes.

1.3 Long term solutions to the problems:

59. Long term solutions lie in institutional set ups that enable proactive climate risk reduction planning and implementation at local, regional and national levels. This more specifically involves strengthening municipal capacities for risk management and reduction measures to climate and disaster risks through the enhancement and replication of the model of local Risk Reduction Management Centers (RRMCs), established in Cuba and piloted in Jamaica and Dominican Republic. RRMCs would function as a local clearing house mechanism embedded in municipal governments to receive, analyze and channel climate risk information from different sectors and ensure that decision-makers and planning process benefited from a comprehensive climate risk analysis. These local mechanisms further strengthen and enhance local and national capacities to generate and disseminate climate information and early warning system to communities in coordinated and harmonized way. Furthermore, the application of territorial level development plans as the integrated tool to implement risk reduction and adaptation measures in vulnerable areas and sectors (such as water resources management, agriculture, flood protection, coastal management, fisheries and tourism) would enhance and sustain local level resilience. To ensure effective replication of these mechanisms between and within the participating countries, and more broadly in the Caribbean region, knowledge management products (online knowledge hub, technical guides, information toolkits, multi-media material) would be developed and disseminated, and systematic exchange of experiences and lessons learnt organized through regional fora and exchanges between the countries.

1.4 Barriers for implementing climate change adaptation measures in the target countries

Lack of technical capacity at national and local level to produce and update risk, hazard, and vulnerability analysis and information

60. In Cuba, the Ministry of Science, Technology and Environment (CITMA) conducts risk, hazard, and vulnerability studies (RHVS) at national and local level, which incorporate parameters for defining vulnerabilities for climate change. However, these studies as well as the methodology are outdated and require updates in methods of risk and vulnerability assessments, scenario quantification and modeling. There is a need to expand the coverage of these assessments to the target area of this project (Ciego de Avila).

61. Likewise, studies in Jamaica and Dominican Republic are either outdated or nonexistent, or focus only on hazards, lacking an integrated risk analysis. In Cuba these assessments are standardized; in Dominican Republic and Jamaica they are not, impeding national level risk analysis and corresponding comprehensive

[39] Help Age, 2014.
[40] Caribbean Catastrophe Risk Insurance Facility, 2013

national planning. All three countries lack climate change scenarios downscaled to the provincial or parish levels.

Limited capacity of local governments to address multi-hazard risks and coordinate DRR and EWS functions across the institutions at local level.

62. In Cuba the RRMCs have function as a risk information clearing house mechanism which facilitates the participation and contribution of local level representatives of sectoral agencies (health, transport, agriculture, infrastructure etc) to contribute, analyze and assess multiple risk variables and channel this information upwards to local decision makers.. The model has been functioning successfully to date in Cuba with a focus on sudden onset events (such as hurricanes, storms, intense precipitation); there is a capacity gap to address slow onset climate hazards, such as drought and sea level rise, and their effects on aquifers (including capacities to monitor salinization levels, water quality and quantity). The RMMC model and drought early warning systems needs to be expanded to Ciego de Avila, where these currently does not exist and there is a lack of capacity to address the primary hazards (drought and sea level rise). In the Dominican Republic and in Jamaica municipalities lack the capacity and an effective coordination mechanism to gather, analysis and communicate localized risk related information from different sectors. There are identified technical and technological capacity gaps, such as equipment, protocols and guidelines, and training, for data management, integrated risk information platforms, GIS applications and tailoring and communicating risk analysis for effective use by local government officials and community members. Community members in the target municipalities lack the understanding and technical capacity to monitor hazards, transmit early warning information, and take adequate and appropriate response measures to reduce risk and protect lives and livelihoods.

Limited capacity of hydro-met services to generate and disseminate climate and early warning information

63. In all 3 countries there is a lack of territorial coverage of the observation network (weather stations, river gauges) in the project target areas impeding the generation of local datasets as basis for climate information services. This deficit is accompanied by technical and technological capacity gaps in data transmission and processing by national hydro-meteorological services. In addition, current hydro-met and sectoral databases and information systems in all three countries tend to be fragmented, lacking correlation between them. Meteorological services lack thorough understanding of sectoral climate and early warning information needs, resulting in a deficit of tailored information products and communication channels to sectoral and local government counterparts (including key vulnerable sectors, such as tourism, fisheries, agriculture, heath, water and coastal management). Part of the capacity gap in channeling climate and EWS information to local government is the lack of capacitated counterparts in municipal governments (like RRMCs) who support climate risk analysis and decision-making.

Lack of capacity of local governments to integrate disaster risk reduction and climate change adaptation considerations into territorial and local level development plans

64. In the participating countries there is a lack of technical and institutional capacity to integrate climate risk information into territorial policies and plans. In Dominican Republic, territorial planning remains a challenge for the National Prevention, Mitigation and Response (PMR) System limiting proper integration of environmental sustainability, climate change adaptation and disaster risk reduction in territorial policies and plans, especially in municipalities with deficient land use planning, (vulnerable settlements close to river and mountain slopes prone to landslides). While Jamaica has advanced significantly in terms of integrating climate change in national sectorial plans and climate scenarios, these are not properly communicated and coordinated with institutions at parish level. In Cuba, in municipalities where there is a RRMC, there are functional disaster risk reduction plans and territorial development plans informed by risk analysis, which is not the case in the province of Ciego de Avila.

Lack of harmonization and coordination of data and information management between different levels

65. In all three countries, significant barriers include gaps in climate information (e.g. baselines, downscaled climate scenarios), insufficient human resource capacities at local level, the financial means to cover all vulnerable areas, and prioritization of risk and measures to address it. Problems persist in terms of institutional coordination for effective and comprehensive data management and sharing, especially among institutions in charge of climate change adaptation and disaster risk data, at central and local levels. Data

generation, consolidation and analysis; historical record of climate and disaster events; hazard, vulnerability and risk studies (RHVS); and disaster impact studies are all inputs to inform territorial development planning. Barriers to data generation and management limit the effectives of long-term solutions.

Low awareness and risk perception of climate change and disaster risks combined with lack of capacity to implement adaptation measures at municipal and community levels

66. In all three countries the perception of the population and local government official regarding the relevance and risk associated with climate change and increased incidence and intensity of hydro-meteorological events constitutes a barrier to embracing risk reduction and adaptation measures. Risk perception, among other factors, affects preparedness and response to extreme climate events, and is critical to developing risk communication strategies. Part of preparing communities to respond effectively to climate threats is to ensure that early warning and risk communication is tailored to the end user and result in effective adaptation, risk reduction or protective measures

67. This is complimented by a lack of technical capacity at the local level to implement on- the ground adaptation measures. Local governments and communities do not have sufficient information and technical capacity to implement adaptation measures in the identified sectors, such as water resources management, agriculture, flood protection or coastal management.

68. The regional setting of the project will address underlying barriers to exchange experiences and information between the participating countries; language differences, and affiliation with different regional bodies significantly reduces the cooperation potential.

1.5 Project Objectives:

69. The main objective of the project is to upscale the function of local RRMC in Caribbean municipalities to facilitate the adoption of risk reduction, preparedness and adaptation measures, and deliver climate services to the most vulnerable, communities. The RRMC acts as a local clearing house to produce quality comprehensive risk analysis, supports the effective flow and use of early warning information and climate scenarios to communities and sectors, and enhances risk-informed planning processes. This mechanism aims at strengthening local governments and communities to better prepare and respond to climatic events through multi-hazard, multi-sector and integrated approaches to address climate and disaster risk.

70. In the three target countries, the project will address risks related to water resources management: in Cuba and Jamaica, the project will focus on a) sustainable water management to address drought related water shortages; and b) coastal erosion related to sea-level rise; in Jamaica and Dominican Republic, the project will address the risks related to river flooding and its effects on environment and livelihoods.

71. The project builds on the Caribbean Risk Management Initiative (CRMI), a platform launched in 2004 by UNDP, which supported the Cuban model of Risk Reduction Management Centers (RRMC) and its transfer.

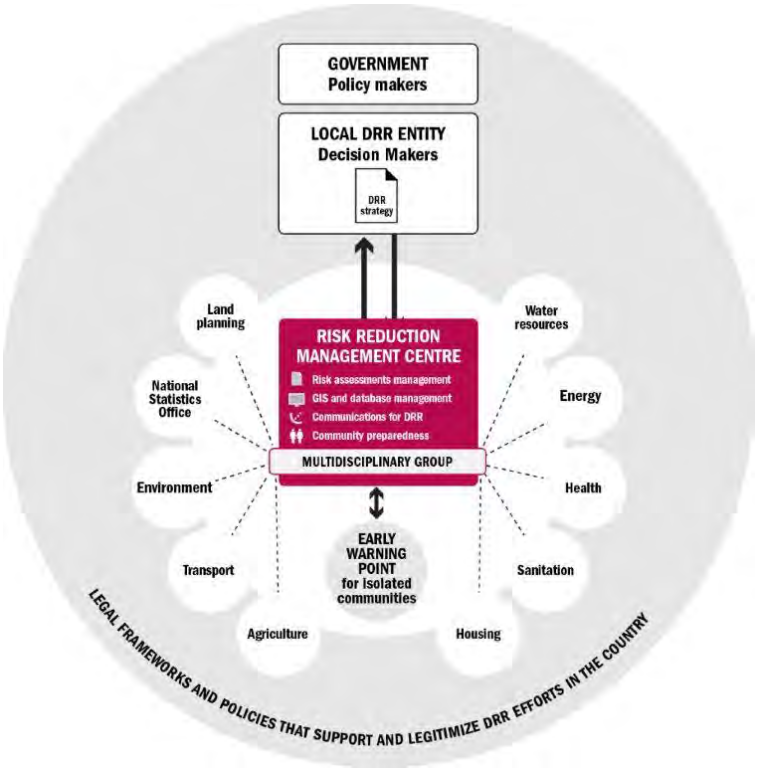

Figure 5: Risk Reduction Management Centre Model[41]

RRMC model was piloted in five Caribbean countries/territories: British Virgin Islands, Cuba, Dominican Republic, Guyana, Jamaica and Trinidad and Tobago

72. The RRMC is a tool for informed decision-making and early warning systems at the local and community levels; it aims to build the capacity and awareness of policy-makers, technical agencies and communities of climate risks and ability to take adaptation and protective measures. The RRMC model, supported by civil protection and hydro-meteorology institutions, intends to improve climate and disaster information generation, management and analysis; early warning information collection, transmission and measures; decision-making informed by risk analysis; and adaptive territorial planning. The RRMCs are integrated within the local governmental structures, and linked to the communities through early warning focal points, who acts as first responders, observers and monitors. The RRMCs help tailor information for the end user, increase public awareness about climate risk, stimulate interdisciplinary and inter-sectorial partnerships, and strengthen local decision making at a sector and territorial government level for the protection of human life and livelihoods[42].

73. Building on the accumulated experience and lessons learned, as well as the advances made by countries in terms of climate change adaptation prioritization and planning, the project intends to take the next steps required to integrate climate change parameters into the model and foster comprehensive, multi-sectorial approaches to climate change adaptation and disaster risk reduction in target municipalities.

74. The project will therefore carry out a series of interrelated interventions to achieve the above-mentioned objective:

- Establish new and strengthen the existing RRMCs in select municipalities of the three target countries;

[41] Risk Reduction Management Centers – the Cuban Model

[42] Caribbean Risk Management Initiative: Sharing What Works: South-South Cooperation for Disaster Risk Reduction in the Caribbean Risk Reduction Management Centers – the Cuban Model.

- Upscale their functions to act as local clearinghouses and coordination centers for the effective use of risk and early warning information by providing necessary information management equipment, protocols/guidelines and training;
- Improve hydro-meteorological data collection, processing and analysis capacities in territories vulnerable to multiple climate related hazards (including flooding and droughts) by strengthening hydro-meteorological monitoring capacities, upgrading equipment and providing technical support;
- Improve data sharing and coordination through enhanced ICT protocols, standard operating procedures, software and risk information platforms;
- Enhance inter-sectorial and national-local coordination and information sharing for improved climate services to key sectors at the national and local levels;
- Equip and prepare local communities to monitor, prepare for and respond effectively to climate threats through establishment of community responders, observers and monitors;
- Strengthen community participation and ownership by fostering volunteerism and involvement of community organizations;
- Foster gender equality by including gender variables in studies and assessments and local development planning and fostering engagement of women organizations and groups in data collection, monitoring and decision-making;
- Improve data quality for local level planning by carrying out risk, vulnerability and hazard assessments and mapping, climate scenario modeling and projections for decision making for their inclusion in risk reduction and adaptation, territorial and environmental development plans;
- Implement pilot adaptation measures to demonstrate possible solutions to disaster and climate change risks, with a focus on ecosystem-based measures and ridge-to-reef approaches, wherever possible;
- Increase awareness on climate change and linkages with disaster risks, and promote behavior change though sensitization and awareness raising;
- Disseminate the tools and the experience documented and systemized at the local, national and regional levels through effective South-South cooperation and knowledge management.

Project / Programme Components and Financing:

75. Project duration is 3 years (36 months) from 2019 – 2021.

76. The following table describes the proposed outputs and outcomes of the project, which are explained in more detail in Part II, Section A. During the project formulation phase, a more thorough baseline study such as an Integrated Participatory Rural Appraisal will be conducted and more precise activities within the outputs will be defined and specified to national and target areas context, along with more detailed costing of interventions.

Table 2 Preliminary Results and Resources Framework

Project/Programme Components	Expected Outcomes	Expected Outputs	Amount (US$)
1. Local Risk Reduction Management Centers (RRMCs)	Local government's capacity strengthened to undertake comprehensive risk analysis and successfully undertake measures in response to early warnings is enhanced and connected to national systems and services	1.1 RRMCs established, equipped, functional linked with national EWS. [43] 1.2 Risk, Hazards and Vulnerability studies (RHVS) and risk mapping available at the municipal/community level. 1.3 Local government and population able to take adaptive and preparedness measures, based on effective EWS	Output 1.1 900,000 Output 1.2 360,000 Output 1.3 200,000
2. National climate information and early warning services for disaster risk reduction	Enhanced capacities of national agencies to generate and disseminate climate information and early warning on hydro-meteorological hazards to sectorial and local entities	2.1 Observation network strengthened with automated weather and flow stations and related data transmission equipment refurbished and installed in disaster-prone areas[44] 2.2 Hydro-met and sectorial databases and information systems and platforms streamlined, software, methodologies and procedures developed for information analysis and prognosis. 2.3 Climate information and EWS products complemented and developed with ICT protocols and tailored to sectorial and local entities.	Output 2.1 500,000 Output 2.2 200,000 Output 2.3 200,000
3. Disaster Risk Reduction/Adaptation plans and measures	Local governments are able to integrate risk reduction and adaptation into territorial development planning	3.1 Climate resilient territorial development plans (municipal, parish, provincial) developed with risk reduction measures integrated 3.2 Selected adaptation measures prioritized in the development plans are implemented	Output 3.1 380,000 Output 3.2 600,000
4. Knowledge management and South-South cooperation	Good practices and lessons learnt are documented and disseminated among the participating countries and in the Caribbean region	4.1 Online knowledge hub that includes technical guides, toolkits, standardized methodologies, webinars, experience notes and multi-media experience materials are developed and disseminated 4.2 Exchange site visits organized between participating government and community reps	Output 4.1 417,000 Output 4.2 350,000

[43] This activity implies strengthening of the existing pilot RRMCs established through the CRMI initiative in St. Catherine Parish in Jamaica and establishment of 2-4 new RRMCs in each country

[44] While section J offers preliminary estimates, number, type and location of hydro-met stations will be defined in each country during the proposal development stage.

		4.3. Regional training and lessons learnt events held	
6. Project/Programme Execution cost			431,235
7. Total Project/Programme Cost			4,538,235
8. Project/Programme Cycle Management Fee charged by the Implementing Entity			431,132
Amount of Financing Requested			4,969,367

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Describe the project components, particularly focusing on the concrete adaptation activities, how these activities would contribute to climate resilience, and how they would build added value through the regional approach, compared to implementing similar activities in each country individually.

77. The project is proposing multi-sectoral and multi-hazard risk reduction approach to reduce the vulnerability of populations and increase their resilience to climate induced disasters. This approach builds on the successful regional experience implemented in the Caribbean, which aims at creation of comprehensive mechanisms for evidence-based decision-making and sustainable development planning at local and national levels.

78. The first three project components aim to address specific climate risks pertinent to the country, applying the Risk Reduction Management Centre model (RRMC) model adjusted to the country context. The fourth component intends to enhance regional engagement between the participating countries, and exchange of lessons and knowledge and harmonized technical assistance for further replication.

79. The activities are indicative at this concept stage describing the main focus of interventions in the countries and per each component. The full proposal development stage will contain more specific description of activities per country and per outputs.

80. The components will address the barriers to resilience to climate change and disaster risks, identified in the previous section, such as lack of technological and technical capacity to produce and update risk, hazard and vulnerability analysis and information; lack of institutional capacity for cross-sectoral coordination of information and provision of coverage; lack of technical capacity to generate and disseminate climate and early warning information; lack of capacity to integrate climate change information to produce climate resilient territorial policies and plans; lack of harmonization and coordination of data and info management; and, lack of awareness on challenges of climate change and disaster risks.

81. In Cuba, the project will increase the resilience of populations in the province of Ciego de Avila to climate-induced water shortages by reducing vulnerability associated with drought and sea-level rise. The project will address the following issues: sustainable management and control of water use for population, agriculture, tourism and industries; saltwater intrusion into subterranean aquifers caused by a combination of depleting water levels due to drought and pumping and sea level elevation; effects of sea level rise on aquifers and coastal ecosystems; perceptions of populations about climate change, relationship between rainfall and drought, and the importance of adaptation measures.

82. The project will strengthen capacities and mechanisms for real-time monitoring of drought and establish early warning systems for implementing adequate preparedness and adaptive measures. The project will also enhance the capacities for long-term planning by facilitating the preparation of climate scenarios

downscaled to the province/parish level. The project will implement pilot adaptation measures described in Section J, which will serve as demonstration models for potential replication in Cuba as well as other participating countries. The project will enhance the capacities of the provincial government of Ciego de Avila, municipal authorities of Chambas, Morón and Ciro Redondo and national, provincial and local technical agencies to collect, process and analyze risk information for planning sustainable and integrated development interventions at local, provincial and national levels.

83. In Dominican Republic, the project will focus on increasing the resilience of populations in four municipalities of the Nizao River Basin, which are highly vulnerable to flash floods and river overflow caused by intense rainfall. These four municipalities are Cambita Garabitos y Los Cacaos located in San Cristóbal province, and Sábana Larga and Rancho Arriba located in San Jose de Ocoa province. The project will adapt the RRMC model to strengthen the municipal Prevention, Mitigation and Response committees (PMR-C) and enhance their capacities for real-time monitoring of rainfall and rise of the Nizao River levels as well as transmitting early warning information and enacting preparedness and adaptive measures for floods. The project will also strengthen the long-term planning and decision–making capacities of municipal and provincial authorities by facilitating climate scenarios downscaled to the sub-national level.

84. The project will support the strengthening of National Meteorological Office (ONAMET) by enhancing meteorological networks in the territory and fostering community engagement in monitoring climate and disaster risks and EWS. The project will also pilot small-scale adaptation measures (in water resources management, agriculture, flood protection), for potential replication. The project will improve the effectiveness of early warning systems by engaging with the community to raise risk perception, to participate as climate observers and monitors, to tailor early warning information and to plan response and adaptation measures, thus ensuring the protection of lives and livelihoods.

85. In Jamaica, the project will aim at increasing the resilience of populations to floods, drought and coastal erosion affecting the 3 target parishes: St. Catherine's, St. Thomas and St. Mary's. The project will strengthen the existing RRMC in St. Catherine and replicate the model in St. Thomas and St. Mary. The project will strengthen hydro meteorological networks, update old and develop new disaster preparedness, risk reduction and adaptation plans, and strengthen end user/community participation in early warning systems. The project will help develop downscaled climate scenarios at the subnational level, to aid the three parishes in longer term local sustainable development plans; and include pilot adaptation measures for possible replication. As in Cuba and Dominican Republic, the project will seek to address perceptions of the population about climate risks such as intense rains, drought and sea-level rise by engaging the community as first responders and climate observers, and in the development of tailored climate information, and piloting risk reduction and adaptation measures.

86. Utilizing a common approach that strives to harmonize climate and disaster risk management, the country-level interventions will be enhanced by technical assistance, regional trainings and exchange. The regional approach will serve to implement South-South Cooperation solutions drawing particularly on Cuban expertise, support the production of knowledge products for the purpose of replication, and work with regional agencies such as CDEMA and CCCCC to provide articulated and coordinated support to climate and disaster risk

87. The regional approach will also allow the exchange of experience in application of different responses to similar climate and disaster risks (water-related hazards, such as floods, drought and rise of sea level). This will support regional replication and upscaling of locally and nationally tested good practices and lessons learnt. The regional setup of this project represents a cost-effective approach utilizing existing models and tools (e.g. RHVS, EWS protocols, community preparedness) and leveraging existing technical expertise (especially from Cuba where this model has been developed), based on a previous regional initiative, the Caribbean Risk Management Initiative (CRMI). This project will serve however to further enhance and replicate the model, tailoring to the needs of each country and specific municipalities, while providing an opportunity for further enhancement of disaster and climate risk integration for improved risk management. The countries involved are part of the Western Caribbean sub-region in close proximity, facing similar hydro meteorological hazards, and have engaged previously in cooperation activities related to climate risk. This

project will represent a key opportunity to upscale this risk-reduction approach in these countries. The regional approach also facilitates application of pooled expertise to provide more consistent and effective tech assistance, harmonization and coordination of hydro-met information management techniques, early warning technologies and protocols, as well as promoting an economy of scale for the application and replication of adaptation solutions responding to similar climate induced risks and hazards

Component 1: Local Risk Reduction Management Centers (RRMCs)

88. Component 1 will strengthen existing Risk Reduction Management Centers and establish new ones in key vulnerable and hazard-prone areas and communities. The primary function of RRMCs is to collect and collate risk information, involving multiple stakeholders, and create awareness with municipal authorities for risk-informed decision-making and planning; the RRMC serves as a climate risk-information clearing house. In order to perform this function, the RRMCs will be embedded in municipal and/or provincial governments; they ensure the regular implementation and updating of risk, hazard, and vulnerability studies; facilitate processing of data and create spatial risk information (through GIS maps); activate and coordinate the multi-sector groups at a local level; and advice on how to integrate risk considerations into disaster management as well as territorial planning.

89. The secondary function of the RRMC is to foster upward and downward linkages with national early warning systems. At the local and provincial level, the RRMC supports climate information analysis and tailored protocols to address the EWS needs of communities and sectors. On the community side, RRMCs help coordinate the work of volunteer climate monitors/early warning points in vulnerable communities, encourage greater risk-perception through dissemination of tailored information aimed at the sector actors and community members, and build preparedness capacity to take first responder and adaptive measures at a community level.

Table: Existing municipal capacities along RRMC key functions and indicative actions for RRMC model (integrated with municipal structures) to be replicated in new locations:

RRMC Functions	Cuba (Ciego de Avila)	Dominican Republic (Nizao River basin)	Jamaica (St. Thomas and St. Mary's Parishes)
Community preparedness and hazard monitoring warning (early warning focal points)	None existing at community level. Action: To be set up	None Action: To be set up	None Action: To be set up
Multi-disciplinary/sector actor coordination	There is a provincial multidisciplinary group as well as a Temporary Drought Group, but multi-sectoral/ disciplinary coordination does not exist at municipal level. Action: to be established at municipal level	There are Prevention, Mitigation and Response Committees (PMR-C), which tend to focus on disaster response, but lack capacity for risk analysis and and application of risk reduction measures. There is a need for greater vertical integration with National Prevention, Mitigation and Response structure as well as horizontal integration with sectoral actors. Action: strengthen coordination of multi-disciplinary municipal actors (horizontal and vertical), as well as capacity for risk	Parish Councils have Disaster Service Units, which tend to focus on preparedness and response only, but do not coordinate with sectoral agencies to address multi-hazards from risk reduction and adaptation point of view. Actions: strengthen coordination of multi-disciplinary/sectoral municipal actors (horizontal and vertical), as well as capacity for risk analysis.

		analysis. The RRMC model will provide the structure to connect and collaborate with municipal authorities, local development councils and technical agencies such as ONAMET.	
Prepare risk, hazard and vulnerability studies	The Environmental Agency has conducted risk, hazard and vulnerability studies (RHVS) studies, 5 years ago. Action: RHVS to be updated at municipal level with drought data integrated	A recent analysis of PMRCs has revealed weakness in capacity to conduct risk, hazard and vulnerability studies, provide analysis and spatial representation of risk, leading to limited integration of risk reduction in disaster management plans and territorial plans. Action: Tailor the RHVS tool to the Dominican Republic's target municipalities and build capacity to analyze risks at municipal level	There has been some risk assessment conducted at the Parish level. Nevertheless, these lack consistent application and coverage across the Parishes; there is no standardized and comprehensive methodology available. In addition, there is a need to include climate change parameters as a critical data field. Action: Tailor the RHVS tool to the Jamaica's target Parishes and build capacity to analyze risks at a Parish level.
GIS and mapping of risk	Limited mapping of data and capacity at municipal level Action: establish municipal level risk mapping and GIS capacities	There is no spatial representation of data Action: establish municipal level risk mapping and GIS capacities	There are no established risk indices for parishes nor spatially presented data. Action: action establish Parish and community level risk mapping and GIS capacities
Manage territorial level data bases	Not at municipal level Action: establish data collection and management capacity at RRMC	Not at municipal level Action: establish PMRC capacity to collect and manage data based on RRMC model	There is a Disaster Risk Information Platform (DRIP), but only limited to the St. Catharine's (output of CRMI pilot) Action: replicate the DRIP platform to the other Parishes, to feed into National Risk Information Platform
Communication of disaster and early warnings	Civil Defense issues early warnings, but its communication and uptake needs to be targeted	Early warning is emitted by Civil Defense, but there is a need for greater vertical integration between the municipal PMRCs and	Early warning is emitted by ODPEM, who works with the Parishes and exchange information with existing local EWS

	tomunicipal authorities and communities.	the national structure, as well as with ONAMET. Action: Improve communication protocols and flows to reach municipal and community levels.	such as with St Catherine´s and St Mary's river flood warning system. There is a lack of comprehensive EWS coverage in the 3 Parishes, including transmission of articulated EWS to the community level. Action: Improve communication protocols and flows to reach Parish and community level structures for multi-hazards.
Increase risk perception and community/sector awareness	Conducted by Civil Defense, but lack targeting for specific hazards and risks at sector and community level, esp. for drought. Action: target climate and early warning information based risk perception and analysis	Conducted by Civil Defense, but lack targeting for specific hazards and risks at sector or community level, such as flooding Action: target climate and early warning information based on based risk perception and analysis.	Conducted by ODPEM, but lack targeting for specific hazards and risks at sector or community level, such as flooding or sea level rise Action: target climate and early warning information based on based risk perception and analysis

Detailed capacity assessment on the existing municipal structures and how the RRMC model and related functions (as described in the other two components of the project) will be conducted in each target municipality during the proposal development phase.

Component 2: National climate information and early warning services for disaster risk reduction

90. Component 2 will seek to strengthen meteorological and hydrological early warning systems by updating software and methodologies for observation and monitoring of climate events, installing hydro and meteorological observation equipment and training of observers, production of geo-referenced maps of vulnerabilities and risks for target areas. The installed and upgraded stations and equipment will be complemented with ICT protocols and standard operating procedures for different types of hazards (drought, flood) and protocols for upstream and downstream integration with national platforms and systems. The component will enhance capacities for the short-range real-time monitoring and projections; produce medium and long-term scenarios for different climate events (rainfall, drought, extent and depth of flooding and sea level rise); and, analyze different time scales of risk for relevant decision-making.

91. Sector-tailored early warning systems will be strengthened through supporting the main components of hydro meteorological and sectorial information systems (observational networks, data-base management and GIS mapping, generation and dissemination of information services), the resulting information which is utilized by the RRMCs. The RRMCs work in collaboration with different sectoral actors at the local level to ensure that these information products and services such as alerts to extreme events, short term and seasonal forecasting, long-term scenario modeling for target provinces and parishes (esp. droughts and

intense rainfalls), tools for easy display of geo-referenced climate information, and risk maps overlaying hydro-meteorological and sectorial information (e.g. land use, soil and crop suitability maps, health surveillance) in key vulnerable and productive sectors are transmitted to both community members and local government officials. This risk information serves to inform decisions related to protection of lives and assets, agriculture, health, tourism, fisheries, water, and infrastructure development strategies at a municipal or provincial level.

Component 3: Disaster Risk Reduction/Adaptation plans and measures

92. Component 3 will strengthen local capacities for designing and planning climate change adaptation and disaster risk reduction measures by integrating them into territorial development planning processes. As a first step, assessments of municipal/provincial capacities, needs and assets will be conducted; capacity building will be directed at planning and decision-makers, such as multidisciplinary/sectoral groups and temporary drought groups in Cuba, local development councils in Dominican Republic, and Parish Councils in Jamaica. In addition, assessments of existing disaster, environmental and other development plans will be undertaken to identify gaps in integrating a disaster risk reduction and adaptation approach. The aim is to strengthen the risk-management focus of municipal and provincial land use plans, environmental plans, disaster management plans, sustainable economic development plans and policies of the participating countries to ensure that they properly capture climate change risks and propose effective adaptation measures. One desired outcome is that risk reduction and adaptation is adequately entrenched in planning processes through financial allocations and executive decisions. The project will also implement selected adaptation measures to demonstrate different approaches to reducing vulnerability and increasing local resilience to climate change risks. Broadly speaking, the adaptation measures will include: water adaptation solutions will potentially involve water source protection (surface water, recharge areas), rain-water capture storage, enhancing distribution efficiency and water use monitoring, water saving techniques, as well as more integrated watershed management solutions (reforestation, erosion protection, land use practices, etc.). Flood protection measures will focus on ecosystem based solutions (integrated watershed management as above) and some smaller protective structures, as suitable. Coastal protection will focus on mangrove rehabilitation and protection. Agriculture measures can potentially involve introduction of efficient irrigation systems, soil and water conservation measures (mulching, intercropping, hedge row planting), enhanced land use techniques (e.g. terracing in slopes for erosion control) and use of more resilient crop varieties. Country-specific indicative adaptation measures were identified through community consultations and are detailed in 181 under Component 3.

Component 4: Knowledge management and South-South cooperation

93. Component 4 will focus on learning and knowledge management and further strengthen ongoing South-South cooperation in the Caribbean region. The project will facilitate the exchange of technical capacities and knowledge among the participating countries to generate synergies and achieve efficiency in terms of resource use; carry out training courses and scientific encounters to consolidate and strengthen technical capacities of stakeholders; systematize and generate knowledge that can be shared through South-South Cooperation within the Caribbean region and beyond, especially between other SIDS affected by climate change. Methodologies, guidelines, scenario models and protocols generated, and adaptation pilots tested in the three target countries will be documented and published and made available for further dissemination and application, utilizing regional mechanisms available through Caribbean Disaster and Emergency Management Agency (CDEMA) or the Caribbean Community Climate Change Centre (5Cs). Specifically, this project proposes to create an online knowledge hub where project beneficiaries can forge linkages and sharing, using tools such as webinars and photo essays. Additionally, this web platform will provide a space to publish technical documents, multimedia materials, presentation materials, information on programme meetings and workshops, as well as news and updates. This platform will highlight the work happening in communities while fostering project linkages at the national and regional level. These project linkages will be further strengthened through trainings, regional exchanges and meetings.

B. Describe how the project would promote new and innovative solutions to climate change adaptation, such as new approaches, technologies and mechanisms.

94. The key innovative solution to climate change adaptation is the Risk Reduction Management Center Model,

which provides an integrated multi-sectorial approach to data collection and risk analysis for sustainable development planning at a municipal and provincial level. The RRMC model offers flexibility in that it can be adapted to different country contexts and institutional settings.

95. Another important innovative solution is the comprehensive and standardized Risk, Hazard, and Vulnerability studies (RHVS) methodology, tested and utilized in Cuba, to identify and map disaster and climate risk at provincial and local levels. The methodology, based on a watershed eco-system unit, incorporates social and economic vulnerabilities in addition to calculating for hazard and exposure, providing a standardized and comparable tool for provincial and national analysis. The tool can be adapted to different hazards; it will be updated to incorporate additional climate change parameters. The tool – and its aggregate data - is the basis of municipal and provincial planning. The methodology will be shared with the participating countries through the regional component and will be systematized for its future dissemination as a best practice.

96. The proposed approach also includes an analysis of end user risk perception in order to establish a baseline for public awareness and informs the development and tailoring of early warning messages, communication tools and products intent on shifting behavior related to climate risk.

97. The project will support climate scenario modeling downscaled to subnational levels and producing projections of climate change impacts and spatial and temporal scales for 20, 50 and 100 years. These scenarios will be used for analysis of forthcoming climate change risks and planning of adaptation measures. The scenarios will also be used as inputs for planning, awareness and sensitization activities at provincial and community levels.

98. In addition to strengthening early warning for sudden onset events, the project will develop early warning systems for drought and establish protocols and operating procedures to address long-term drought impacts. Given the typology of drought-induced risks, and increasing probability of drought occurrence in SIDS, the drought EWS and Standard Operating Procedures (SOP) will be particularly valuable for replication in other SIDS with drought risks. Likewise, the project will suggest innovative measures for monitoring and managing of subterranean aquifers, providing innovative adaptation measures against salinization of freshwater due to the project rise of sea levels. The project will also develop methodologies for planning adaptations measures for sustainable water use in drought-affected territories.

99. The project will promote the engagement of local communities in collecting and monitoring hydro meteorological data. The project will explore partnerships with UNV and Red Cross, to tap on their experience of community organization, especially in the area of community adoption of risk reduction measures. The project will support the model of volunteer climate monitors as key actors in the early warning system. Community monitors will keep authorities updated on climate and disaster risks, and ensure information flow, to and from the RRMC.

C. Describe how the project would provide economic, social and environmental benefits, with particular reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations. Describe how the project would avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy of the Adaptation Fund.

Economic Benefits

100. As included in the background section, all 3 countries have been incurring substantive economic losses due to extreme climatic events. Therefore, investments in risk reduction and preventive adaption measures should result in economic benefits given the potential avoided costs associated with damages.

101. The project will support the implementation of water adaptation measures that will address water stress in the agriculture sector. Water efficient farming methods and the adoption of local drought resistant staple crop varieties will be among the priority interventions. These measures will be geared towards reducing the losses of agricultural produce, which is one of the main economic activities in the targeted areas. In Cuba, sustainable and resilient water use practices will also benefit cattle ranching sector and shade-

houses/nurseries, which are among highest consumers of water resources. Information about water resource availability and location will allow proper planning for productive activities.

102. Addressing water supply issues will be beneficial for the tourism sector as well, which is particularly important in the north of the Ciego de Avila Province in Cuba and in coastal communities in Jamaica. Early warning for flooding in Dominican Republic will potentially benefit small enterprises which will be better prepared and be able to avoid major losses and damages to property and businesses, especially in the coffee growing regions.

103. Timely and continuous monitoring of water levels in subterranean aquifers, salinization of freshwater and sea-level rise, flooding and landslide risks and implementation of community monitor network will help minimize economic losses caused by climate change and hydro-meteorological events. Scenario modeling of climate change and variability will contribute to more efficient planning of local economies and settlements and development of short, medium and long – term adaptation measures to minimize economic losses.

Social Benefits

104. The project as a principle will apply participatory approach at the community and municipal level, engaging local community and developing municipal capacity to prepare for, adapt to, and respond to extreme climatic events, relying on the active engagement of multiple actors.

105. Taking measures to establish sustainable water management practices, improve early warning systems, and enhance territorial decision-making, based on risk-informed management of drought and floods will increase community resilience and improve the wellbeing of vulnerable populations over the longer term.

106. Monitoring water quality will help reduce the occurrence of water-borne diseases, infections and other health and sanitation hazards, which affect particularly strongly children, women, elderly, disabled and other vulnerable populations.

107. The project will work to ensure effective end-user climate services through improved communication and awareness, and thus shift perceptions of climate risks at a household, sector and municipal level; this in turn influences resource allocation and application of adaptation and risk reduction measures. By engaging municipal actors, local government authorities and community members in identifying climate information needs linked to monitoring, developing and transmitting early warning messages and applying response and risk reduction/adaptation measures, the project will lay foundation for eventual change in climate and environment-related behavioral patterns and attitudes of future generations.

108. Availability of quality information on risks on different timescales, will also have positive social effect; it will help improve decision-making and planning aimed at improving the wellbeing of populations and access to basic social services, such as health and sanitation.

Environmental benefits

109. Environmental benefits of the proposed adaptation measures will be the increased water resources for wetlands, mangroves and their ecosystems contributing to the conservation of biodiversity in the targeted areas, such as Grulla colony of migrant birds in Ciego de Avila. Availability of fresh water for mangroves will have positive effect on aquifers as the mangroves act as protective barriers for subterranean basins, which suffer from sea water intrusion, resulting in salinization of fresh water. Likewise, conservation and protection of mangroves will provide better protection for the wetlands from hurricanes. It is expected that the evidence and knowledge generated by the project will contribute to the ongoing discussion on the proposal of the Law on Subterranean Water management in Cuba.

110. Using the watershed unit for the basis of risk analysis intends to protect and preserve the integrity of the eco-system, including its forests, river and tributaries; thiseco-systems focus then becomes a pillar for municipal and provincial level planning and results in an overall benefit to the environmental health of the territory.

111. The exhaustive description of environmental benefits will be provided in the final proposal, after due assessments and consultations are carried with respective institutions.

112. The project will be compliant with the Environmental and Social Policy of the Adaptation Fund and will avoid negative impacts relating to the environmental and social principles identified by the Fund. More detailed information on social, economic and environmental benefits will become available during the proposal development stage.

D. *Describe or provide an analysis of the cost-effectiveness of the proposed project and explain how the regional approach would support cost-effectiveness*.

113. The project will build on the existing Cuban RRMC model, which has been successfully implemented in Cuba and has been replicated in Jamaica and Dominican Republic in a pilot fashion. This will allow for more precise costing of the intervention and avoids budgeting inefficiencies. The RRMCs will provide information management and advisory functions for local institutions and reduce transaction costs related to data collection, monitoring and analysis for enhanced risk reduction and adaptation measures, preparedness and planning.

114. The programme focuses on ex-ante risk reduction and adaptation measures (esp. early warning functions) to reduce damage and losses to infrastructure, assets and livelihoods, which are more cost-effective than reactive measures such as reconstruction or recovery processes.

115. At the local level the project will achieve cost-effectiveness, by convening diverse sector actors to realize multi-sectoral risk assessments, providing evidence-based analysis to local decision-makers and thus reducing losses caused by climate change and climate-related disasters.

116. By developing and testing a model for integrated disaster and climate risk management and planning, the project will offer the national and local institutions and communities effective management, planning and coordination tool that can be used in different settings and climate conditions. By supporting mainstreaming of risk reduction practices into territorial development and planning and management processes the project will enhance operational effectiveness of development interventions.

117. Adaptation measures piloted and tested in the framework of project will provide the basis for future territorial upscaling of successful measures to reduce economic and social costs associated with climate change. The preventive focus of disaster risk reduction/adaptation measures, such as early warnings, will contribute to cost-effectiveness of the project by preventing loss of lives and damage to assets and livelihoods, associated with traditional reactive measures.

118. At the regional level, the South-South cooperation aspect of the project will ensure harmonization and replication of cost-effective ICT tools and technologies, through pooling of technical expertise and advisory support, and facilitating the systematic exchange of risk information, lessons learnt and experience, in order to enable sufficient scale for cost-effectiveness. Existing experience, know-how and knowledge products (methodologies, guides, models, software) as well as those generated with the project support will be made available for participating stakeholders through face to face events and an online knowledge hub. This knowledge will be used to maximize economic, social and environmental benefits in other provinces of the participating countries and more broadly in the Caribbean region.

119. Finally, the project will rely on synergies with other ongoing and/or planned and completed projects/projects in the field of CCA and DRR. The project will tap on the models, methodologies, capacities, procedures developed and applied through the initiatives listed in Table 3 of this Section to avoid duplication of efforts and ensure maximum efficiency of interventions.

E. Describe how the project is consistent with national or sub-national sustainable development strategies, including, where appropriate, national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist. If applicable, please refer to relevant regional plans and strategies where they exist.

120. The project is fully consistent with the national development policies, strategies and plans, and specific national, provincial and municipal policy instruments and strategies pertinent to each target country. The project is also compliant with the relevant international agreements and protocols, in particular with the United Nations Framework Convention on Climate Change (UNFCCC), the Kyoto Protocol and Sendai Framework for Disaster Risk Reduction. The project will also seek synergies with the regional Comprehensive Disaster Management Strategy (CDEMA) and regional and global action plans for SIDS, the Barbados Plan of Action, Mauritius Strategy on Implementation, and the S.A.M.O.A Pathway.

121. In Cuba the project will be aligned with the Constitution; National Development Plan; National Economic Plan, National Climate Change Plan; Municipal and provincial Disaster Reduction Plans; Land Use Management Plans; Environmental Management Plans; National Drought Plan; National Water Policy; National Soil Improvement and Conservation Program; National Hydraulic Development Program 2015-2020; National Forest Program; National Biological Diversity Program 2016-2020; 2014 - 2020 Plan of the National System of Protected Areas; Program for the eradication of polluting sources that affect sources of water supply 2014 – 2020; Pollution control program for bays; Program of the Health Hygiene Commission and environmental quality; Program for phasing out of ozone-depleting substances (ODS); National Program for Energy Efficiency and Use of Renewable Energy Sources for Sustainable Development; Directives for Confronting Climate Change 2016-2020; National program to combat desertification and drought; Action Plans for chemicals and high-impact wastes; National Environmental Education Program; Law # 75 on National Defense; Directive # 1 of the Vice-president of National Defense Council on country planning, organization and preparedness for disaster situations; Law # 81 on Environment; Law Decree 138/93 on Subterranean basins; Law Decree 179 on Environment; Law on Subterranean Waters (pending public consultation and approval).

122. In Dominican Republic the project will be governed by the Constitution and its Article 194 (on territorial planning and sustainable use of natural resources adapting to climate change) and Article 260 (on prevention and mitigation of disasters), National Development Strategy 2010-2030 (Law 1-12) – and its 4th axis “Effective Management of Risks and Adaptation to Climate Change, Law on Environment and Natural Resources” (64-00); Proposed Territorial Planning and Land Use Law, National Action Plan on Climate Change Adaptation (PAN RD - 2008), National Climate Change Policy (in formulation process), National Action Plan against Desertification and Drought (2006-2016), National Plan of Integrated Disaster Risk Management (2011-16); National Strategy for Conservation and Sustainable Use of biodiversity and its respective Action Plan (2011); National Law on Biodiversity and Access to Genetic Resources (2015); Law on National District and Municipalities (176-07).

123. In Jamaica the project will be aligned with the Vision 2030 Jamaica - National Development Plan; the Government of Jamaica (GOJ) Medium Term Economic Programme for FY2015/16 – FY2017/18; Whole of Government Business Plan 2015- 2018; the Growth Agenda; Disaster Preparedness and Emergency Management Act (1993) repealed by the Disaster Risk Management Act (2014), the National Disaster Plan (1997), the Natural Hazard-Risk Reduction Policy (2005), Draft Building Code Bill (2013); Climate Change Policy Framework; and Parish Development Plans/Local Sustainable Development Plans; Environmental Permit & License System (P&L) (1997).

124. A more detailed inventory of applicable laws and policies will be compiled during the proposal development stage in consultation with the stakeholders.

F. Describe how the project meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc., and complies with the Environmental and Social Policy of the Adaptation Fund.

125. The project will be guided by the national technical codes and standards related to water balance and quality, building and construction, health and sanitation, and others. A detailed inventory of technical standards will be compiled during the proposal development stage during the elaboration of specific output activities.

126. During the preparation of the full proposal, information on national regulations related to social and environmental safeguards and their implication to the project will be assessed and complied to ensure full compliance with national standards and the Environmental and Social Policy of the Adaptation Fund as described in Section L. Prior to the project approval, the proposal will be also screened along the UNDP Social and Environmental Safeguards Procedure to ensure that necessary safeguards have been addressed and incorporated into the project design. The final proposal and the subsequent project document will include the completed quality assessment and social and environmental safeguards templates.

. ***G. Describe if there is duplication of the project with other funding sources, if any.***

127. There is no duplication or overlap of the proposed project with other initiatives or funding sources. Instead, the project will seek synergies with the on-going and planned initiatives and tap on the experiences and knowledge of completed projects and programmes, which will lead to greater efficiency of resource use and maximize the final benefits and impacts. There is no regional program that brings these countries together to address common climate related phenomenon, and apply similar approaches. The project will systematically draw lessons from other initiatives, through consulting available documentations and with project implementing agencies and partners. Specifically, the following lesson will be drawn from the following sample initiatives in each country (see Table 3):

Cuba: 1) From the *Sabana Camagüey Project* (GEF) (Table 3, row 6) this proposed project will make use of the environmental planning model developed to integrate DRR and CCA approaches as well as the updated EWS procedures modelled the new provincial environmental plan, 2) From the *Strengthening of Hydro-meteorological Early Warning System* (FORSAT) project (Table 3, Row 1) , the proposed project will use: a) the methodology for undertaking RHVS, b) the methodology for testing risk perception of the affected population, c) the satellite monitoring investment to better monitoring of meteorological drought, and d) systemization exercises and processes to strengthen the RMMCs and Early Warning, 3) From the *Strengthening National and Local Capacities for Integrated Drought Management to Reduce its Impacts on Food and Nutritional Security and Water Supply to Populations* (Table 3, row 2) Project, this proposed project will draw on the lessons from: a) systemization of related to the Hydrologic Monitoring System for drought monitoring with a particular emphasis on the experience of small groundwater basins b) the management and sustainability of specialized equipment for the Hydrologic Monitoring, c) the determination of drought and its monitoring, taking into consideration sources of storage and the water distribution system, and d) the Provincial platform for the early warning system management and exchange of information to adapt to cases of drought.

Jamaica: 1) From the *Japan-Caribbean Climate Change Partnership* (Table 3, row 19), the proposed project draws on the following learned lessons a) how to implement adaptation measures through strengthening the governance, prevention, preparedness and response systems at the municipal (parish) and community levels. 3) From the *Pilot Programme for Climate Resilience* (Table 3, Row 22), the proposed project draws on the following a) lesson that efforts and actions to improve resilience at the parish and community levels should be focused and targeted to achieve maximum impact and engender sustainability, b) adaptation efforts at the national, local and community levels are bolstered by provision and access to reliable and up to date climate data and information. This proposal whenever possible, aim to locate adaptation measures at the parish and community level to build resilience, and will be realized with the objective to support and preserve sustainable livelihoods.

Dominican Republic: 1) From the *Climate Smart Agriculture project* (Table 3, row 12), the REDDOM foundation, which funded the initiative, will be invited to follow-up and monitoring meetings for this proposed project to guarantee feedback and synergy between the two projects and maximizing lessons learned in reducing flooding and runoff through the revegetation processes 2) From the *Planning for Climate Adaptation Project* (Table 3, row 13), ICMA, which funded this initiative, will be invited to follow-up and monitoring meetings for this proposed project to maximize the lessons learned in territorial planning and 3) From the *Climate Adaptation Measures Project* (Table 3, row 14), IDDI, which funded this initiative, will be invited to follow-up and monitoring meetings to share adaptation strategies for increasing resilience to flooding.

128. The following table summarizes the programmes and projects implemented in the three target countries. The table will be updated and completed with additional information during the proposal development stage:

Table 3 Synergies with other interventions

#	Project Title	Focus/ objective	Status and duration	Funding source (donor/state)	Funding amount	Executing/implementing agency	Proposed Synergies with the Project
CUBA							
1	Strengthening of Hydro meteorological Early Warning Systems FORSAT	Strengthening of Hydro meteorological EWS	Ongoing (2015-2016)	DIPECHO UNDP	US$ 1,069,518	UNDP	Synergies to access satellite information and use the existing meteorological platforms and equipment, communication platforms, EWS Servers; possibility to use the methodology for including gender focus in perception surveys of the surveys; use the experience of working with voluntary climate observers;
2	Strengthening national and local capacities for integrated drought management to reduce its impacts on food and nutritional security and water supply to populations	Preparedness, EW, response and adaptation to drought	Ongoing (2016-2017)	DIPECHO	€ 513, 394	WFP	Possibility to apply best practices and methods of strengthening local capacities for integrated drought management; Possible use of methodologies developed by this project, in other regions of Cuba, for water management and monitoring of subterranean basins, drought monitoring and prognostics; using drought EWS and Standard Operating Procedures as reference for establishing EWS and SOP in Ciego de Avila.
3	Project 2 Capacity building for information coordination and monitoring systems/SLM in Areas with Water	Information management systems, awareness and education activities	Ongoing (2016-2020)	GEF	US$ 2,375,000	UNEP/FAO with INRH, MINAGRI, MINAZ, MES	Information on methodologies and practices on sustainable use of ground water, resistance to drought and other climate events, conservation of rainwater; sustainable water use, drought

	Resource Management Problems.						prevention and sustainable water management to be applied
4	Environmental Base for Local Food Sustainability - BASAL	Food security	(2012-2017)	European Union/Swiss Development Agency	US$ 11,347,849	UNDP with CITMA (NEA) and Ministry of agriculture	Important information related to saline incursion risk, which will may be used for adaptation measures against salinization of subterranean aquifers in Ciego de Avila; measures for possible replication or reference to ensure guaranteed water supply for crops
5	Landscape Approach to the conservation of threatened mountain ecosystems	Connecting landscapes between endangered ecosystems	Ongoing (2014-2022)	GEF	US$ 7,481,944	CITMA/AMA	Useful information and practices on the use and management of superficial and subterranean water resources and water quality for adaptation measures in Ciego de Avila; possibility to use data from the implemented climate variability studies for coastal ecosystem measures coastal zones of Ciego de Avila
6	Strengthening and sustaining conservation of biodiversity in three productive sectors of Sabana Camaguey ecosystem	Ecosystem biodiversity protection	Finished (2008-2014)	GEF, UNDP, Cuban Government, WWF	US$ 4,119,498	UNDP, CITMA, NEA	Information and best practices for coastal and wetland management for replication in coastal areas of Ciego de Avila; Possible use of training centers and resources established by the project for strengthening local capacities in Ciego de Avila.
7	Centers for creating capacities of DRM and CCA	Capacity development	Finished (2013-2016)	Norway	N/A	Environmental Agency	Possibility for using the methodology and classrooms for DRM and CCA trainings for local authorities and volunteers in Ciego de Avila.

8	Live Mangrove	Coastal Management, mangrove protection through AbE and increased population resilience to CC	Ongoing (2014-2019)	Adaptation Fund	US$ 6,067,320	UNDP with CITMA-Ministry of Agriculture	Possibility for using data, methodologies and practices related to saline incursion, coastal protection, mangrove recovery and protection for designing adaptation measures related to salinization of subterranean aquifers due to coastal erosion and saline intrusion in Ciego de Avila.
9	Sustainable Land Management	Sustainable Land Management	Ongoing (2008-2018)	GEF	US$ 800,000	CITMA	Potential replication of practices and use of information on land use plans, monitoring and adaptation measures for improving territorial planning.
DOMINICAN REPUBLIC							
10	Life-Saving Actions: Disaster preparedness and seismic and tsunami risk reduction in the south coast	Disaster preparedness and seismic and tsunami risk reduction	Ending 30//11/2016	ECHO	€ 729,000	UNDP, UNESCO, ACPP	There is a complementary in increasing disaster and climate risk preparedness capacity of the PMR committees.
11	Strengthening urban resilience through humanitarian protection, shelter and communication in San Cristobal, Dominican Republic	Disaster preparedness and humanitarian protection	Ending 30//11/2016	ECHO	€ 850,000	Oxfam, Plan International, Habitat	The Project will build on project advances by introducing the climate change risk angle to humanitarian protection.

12	Climate Smart Agriculture Project	Surface and groundwater contamination in the upper Yaque del Norte river basin and improve small-scale farming within the basin's rural communities.	Ongoing (2015 -2018)	USAID	$1.4 million	REDDOM Foundation	The adaptation measures which focus on retaining vegetation for reducing rain runoff could be examined for applicability to the Nizao river basin.
13	Planning for Climate Adaptation Project	Resilience to impacts of climate change through improved municipal-level land use planning processes.	Ongoing (2015-2019)	USAID	US$6.6 million	International City/County Management Association (ICMA)	Lessons learned in forestation and land use planning to reduce floods will be applied.
14	Climate Adaptation Measures Project	Appropriate and affordable climate change adaptation strategies to mitigate specific problems related to flooding and unreliable water supply	Ongoing (2015-2019)	USAID	$3.9 million	Dominican Institute of Integrated Development (IDDl)	Possible identification of adaptation strategies to improve flood resilience.
15	Climate Resilience And Index Insurance Project	Access of small-scale farmers to climate risk management tools, including a	Ongoing (2012-2016)	USAID	$2.4 million	REDDOM Foundation	Risk reduction to protect vulnerable livelihoods and provide access to tools in order to manage climate risks.

		tailored insurance product for weather risks, complementary risk reduction activities, and improved quality and flow of usable climate information.					
16	Improved Climate Information Project	Increase and improve climate change information for municipal and individual-level decision-making.	Ongoing (2015-2018)	USAID	US$ I .3 million	Technological Institute of (INTEC)	Access to climate information and upcoming impacts forecast.
17	Dominican Republic. FCPF REDD+ Readiness Preparation Project (P151752)	Implementation of key readiness activities to develop a national REDD+ strategy. Reduction of green-house gas emissions from deforestation and forest degradation (REDD+)	On going 3 years	World Bank	US$ 3.80 million	Minister of the Ministry of Environment and Natural Resources	Protection of forests and lands to reduce the runoff and its velocity.
18	Mainstreaming Conservation of Biodiversity and Ecosystem	Mainstream the conservation of biodiversity and ecosystem	Initiating 5 years	GEF	US$ 8,176,165	Ministry of Environment/ UNDP	Conservation and restoration of forested areas, decreasing and slowing the runoff in mountainous slopes.

	Services in Productive Landscapes in Threatened Forested Mountainous Areas	services in public policies and practices to effectively buffer current and future threats across productive mountain landscapes					
JAMAICA							
19	Japan Caribbean Climate Change Partnership (J-CCCP) Project	Advancing inclusive low-emission risk-resilient development by improving energy security and integrating planning for adaptation to climate change within improved development planning and budgeting processes.	2015- 2017	Government of Jamaica	US$ 600,000.00	UNDP Jamaica Head Ministry: Climate Change Division within the Ministry of Economic Growth and Job Creation	National and local capacity to develop and implement adaptation plans. Support to the coordination and implementation of the Sector and National Adaptation Plans whilst the adaptation Fund will provide support to the inclusion of adaptation actions into territorial plans
20	Global Environment Facility (GEF) 6 – Sustainable and Low Carbon Development	Resilient and sustainable cities through the delivery of green initiatives and infrastructure	Concept Phase	Global Environment Facility	US$ 8.78 Million	Implementation Modality (To be finalized)	Opportunity through which RRMCs could be bolstered in select parishes; inclusion of adaptation actions in local development plans; opportunity for collaboration with the development of a Sustainable Urban plan for the city of Portmore.

	Pathways in Urban Centers						
21	Jamaica Disaster Vulnerability Reduction Project (JDVRP)	Enhancement of resilience to disaster and climate risk.	2016 -2022	World Bank	US$ 30 Million	Office of the Prime Minister with national ministries and agencies, University of the West Indies (Earthquake Unit) (UWI-EU)	Collection of hydro meteorological data. Possible synergies to address the existing gaps related to collection of targeted hazard and risk information and enhance RRMCs.
22	The Adaptation Programme and Financing Mechanism for the Pilot Programme for Climate Resilience (PPCR) Jamaica	Part of Jamaica's Strategic Programme for Climate Resilience (SPCR), with the overall goal to increase Jamaica's resilience to climate change.	Ongoing	Inter-American Development Bank (IDB) & World Bank`	TBD	Ministry of Economic Growth and Job Creation	Mainstreaming CCA and DRR into local level plans for selected communities. Preparation of Vulnerability assessments Strengthening the collection and processing of hydro-meteorological data. Support in updating climate change scenarios and the upgrades to the multi-agency climate and natural risk data and information sharing system.
24	National Biodiversity Planning to Support the implementation of	The project addresses the country's need to continue to fulfill its	2014 – 2016	Global Environment Facility	US$ 205,046.98	NEPA	Synergies for local level planning processes, taking into consideration adaptation planning.

	the CBD 2011-2020 Strategic Plan in Jamaica (NBSAP)	obligations under the CBD, with particular focus on the Convention's Article 6, the Aichi Targets and the CBD COP Decision X/2.					
25	GEF IWEco (Regional – 11 Countries)	Integrated approach to water, land and ecosystems services management	2016-2021	GEF	US$ 20,000,000	Multi-stakeholder at national and regional levels In Jamaica: NEPA	Support for CCA planning and biodiversity mainstreaming in coastal areas. Data sharing.
26	Portmore Climate Change Park	Mitigation, adaptation, community awareness and municipal resilience; Landscape planning	Ongoing	Government of Germany	€ 250,000	Portmore Municipality	Demonstration projects in St Catherine Parish, data sharing.
27	National Public Safety Communication System for Disaster – Emergency Major Incident Responders	Enhancement of Jamaica's Disaster/Emergency Communications System for improved preparedness, response and recovery from the impacts of disasters at the	Proposal Stage 2018 - 2020	Government of Japan	US$ 64,527.13 JMD 8,324,000.00	ODPEM	Synergies with the Early Warning Systems in St Mary's Parish.

		national, parish (local) and community levels.					
28	Climate Economic Analysis for Development, Investment and Resilience (CEADAIR)	Technical assistance to strengthen the capacity to analyze low greenhouse gas emissions scenarios; economic development strategic planning and implementation. economic analysis to promote investment in low emissions technologies and projects.	2015-2018	USAID	USD1.5 million	Crown Agents, USA in partnership with Ministry of Science, Energy and Technology (MSET) and Ministry of Economic Growth and Job Creation (MEGJC)	Social and economic information to inform local level planning across the various sectors.
29	Jamaica Rural Economy and Ecosystems Adapting to Climate Change (JA REACH II)	Protection of rural lives, livelihoods, and ecosystems through interventions that increased and strengthened climate change adaptation; Ecosystem based	Ongoing	USAID	US$ 12,000,000	ACDI/VOCA GOJ	Information related to climate risks and adaptation priorities for development planning for the communities

		adaptation strategies					
30	ENHANCING THE RESILIENCE OF THE AGRICULTURE SECTOR AND COASTAL AREAS TO PROTECT LIVELIHOODS AND IMPROVE FOOD SECURITY	The primary objective of the programme is to increase livelihoods security of the population in the targeted communities and to increase the climate resilience of sections of the Negril coastline, which will also contribute to increased security of livelihoods.	2011-2016	Adaptation Fund	US$ 9,995,000	PLANNING INSTITUTE OF JAMAICA	Information and experience related to its Component 2 Enhancing the climate resilience of the agricultural sector by improving water and land management in select communities, as well as from Component 4, esp. regarding training of local communities and entities in disaster risk reduction (DRR) and natural resources management, methods of development of a climate risk atlas, and capacity building of vulnerable farming communities. The Planning Institute of Jamaica and the knowledge products produced by the project will be consulted to ensure that lessons learnt are drawn upon.

H. If applicable, describe the learning and knowledge management component to capture and disseminate lessons learned.

129. Component 4 of this proposed project is particularly dedicated to fostering knowledge management and South-South cooperation actions, as described under section II.A. These learning and knowledge management activities include systematization of the existing methodologies related to risk, vulnerability and hazard studies; climate scenario modelling, and risk perception surveys; early warning systems and standard operating procedures. Models of integrated local and provincial development planning as well as case studies will be captured. The provision of technical assistance and training through South-South cooperation will be documented, leaving a tool package for further upscaling and replication. Lessons learned in adapting the RRMC model to each country and climate change parameters will be systematized; a knowledge hub will be constructed to share documents, webinars, and experiences.

130. More detailed description of learning and knowledge management activities is described in Section A as well as in section J below.

I. Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations, in compliance with the Environmental and Social Policy of the Adaptation Fund.

131. The project specifically includes vulnerability analysis in determining risk to climate change and disasters, and aims to strengthen both decision-making to reduce this vulnerability, as well as strengthening early warning processes and community involvement in them. For this purpose, the project involves RRMCs, which are designed to effectively reach out and coordinate with most vulnerable areas and community groups within municipalities through volunteer observers and monitors.

132. In order to harness existing national and local disaster reduction and climate change platforms and coordination mechanisms, a comprehensive consultative process was carried out, coordinated through the UNDP Regional Hub for Latin America and the Caribbean (RH LAC) and UNDP Country Offices in the three participating countries. Key representatives of national and local governmental institutions and technical agencies in charge of environment, disaster risk management and climate change adaptation as well as the representatives of key sectors (water resources, agriculture, meteorology) and academia were consulted during the elaboration of the concept note. Project objectives, intervention strategy, expected output-level results and implementation modalities were discussed with stakeholders.

133. The following institutions were involved in the consultative process:

- In Cuba: Provincial Government of Ciego de Avila; National Meteorological Institute (INSMET); Environmental Agency (AMA); Ministry of Science, Technology and Environment (CITMA); Physical Planning Institute (IPF); National Institute of Hydraulic Resources (INRH); National Civil Defense (EMNDC); National Group of Vulnerability and Risk Studies (AMA/CITMA); Provincial Meteorological Centers (INSMET); Provincial Offices of INRH; Provincial Offices of EMNDC; local mass media (TV, radio); A one-week consultation mission Ciego de Avila and the municipalities of Chambas, Moron and Ciro Redondo took place in mid-Sept 2016 to ascertain needs and barriers in the planning for and applying risk reduction measures.
- In Dominican Republic: National Emergency Commission (CNE); Ministry of Environment and Natural Resources (MARN); Dominican Federation of Municipalities (FEDOMU); Climate Change Directorate and its Inter-institutional Technical Group; General Directorate of Territorial Planning; National Meteorological Office (ONAMET); National Institute of Hydraulic Resources (INDRHI); National Council of Climate Change and Clean Development Mechanism; National System of Disaster Prevention, Mitigation and Response; Technological Institute of Santo Domingo (INTEC); Dominican Institute for Integral Development (IDDI). Community consultations were undertaken in the municipalities of Cambita Garbitos, Los Cacaos, Sabana Larga and Rancho Arriba in the two provinces adjacent to the Nizao river in December 2016.

In Jamaica: Ministry of Local Government & Community Development (MLGCD); Office of Disaster Preparedness and Emergency Management (ODPEM); Planning Institute of Jamaica (PIOJ); Met Service of Jamaica (MET); Ministry of Water, Land, Environment & Climate Change – Climate Change Division (CCD); Water Resources Authority (WRA); National Environment & Planning Agency (NEPA); National Spatial Data Management Division (NSDMD); Pilot Programme for Climate Resilience of CCD; Third National Communication and Biannual Update Report Project of CCD; University of West Indies (UWI) Climate Studies Group; St Catherine Parish Council. In Jamaica, the consultations included national agencies who identified target communities and provided information on baseline and needs information. In June 2017, this was followed up with a workshop - held in St. Catherine's Parish - to identify climate risks, vulnerabilities and risk perception, involving the Planning Institute of Jamaica, Ministry of Communities and Local Government, National Spatial Data Organization, municipal council and the Parish disaster centre. Further community consultations were conducted in the parishes of St. Mary and St. Thomas in July, 2017. These consultations targeted the municipal councils, Parish disaster centres, volunteers and residents to identify key challenges and recommendations for implementing risk reduction strategies.

134. The beneficiary communities were selected using the existing vulnerability and hazard assessments, such as the Risk and Vulnerability Study, implemented by the National Group of Vulnerability and Risk Studies of AMA/CITMA of Cuba; Hydro-Meteorological Climate Vulnerability Index (IVACC) developed by the Unique Beneficiary System (SIUBEN) of the Vice-Presidency of the Dominican Republic with UNDP support; and multi-hazard and damage assessment reports and vulnerability assessment reports conducted in target parishes in Jamaica. These tools vary in the level of disaggregation of data by vulnerability criteria and will need to be analyzed to understand complementarity with proposed comprehensive and standardized RHVS undertaken by the project.

135. To comply with the Adaptation Fund's Gender Policy, the project proposes conducting an initial gender assessment during the proposal development stage. This assessment will help determine different needs, capabilities, roles and knowledge resources of women and men, target the interventions and estimate funds required for developing gender responsive activities and approaches. The project will also use the gender component of the risk perception survey of the Risk, Hazard and Vulnerability methodology, to measure differences in perceptions on climate and disaster risks among genders. In consultation with the stakeholders, project will seek to develop instruments and activities to assess impact of climate change and disaster risks on different genders and include gender parameters in scenario modelling, EWS and development planning.

136. The project will work closely with the gender and DRR specialist of the UNDP Regional Hub in Panama and gender focal points in Country Offices, national ministries and agencies working on gender issues, such as the Women's Affairs Ministry of Cuba, Women's Affairs Secretariat of Dominican Republic, Ministry of Gender and Bureau of Gender Affairs, and women's organizations (e.g. Federation of Cuban Women) where appropriate The project will be guided by key corporate documents and guidelines on integrating gender in adaptation and disaster risk reduction, such as UNDP Gender Strategy for 2014-2017; Sendai Framework for Disaster Risk Reduction 2015-2030; Comprehensive Disaster Management Strategy & Framework for 2014-2024; Regional Gender Equality and Equity Policy of SICA[45], UNDP Guidelines for Integrating Gender in Disaster Management in Small Island Developing Countries, and other relevant documents.

J. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

137. This section summarizes the baseline and additionality reasoning for the project. This will be further expanded and articulated for each project component in the full project proposal. The full proposal will further outline the baseline situation and related capacities (development activities that are currently financed out of government funds, international organizations and the private sector) and will further explain the additionality of outcomes financed with resources from the Adaptation Fund.

[45] Relevant for Dominican Republic

Component 1. Local Risk Reduction Management Centers

Baseline (Without AF Resources)

Risk Reduction Management Centres

138. Assets: Of the proposed areas of intervention, only one – St. Catherine's Parish in Jamaica has a Risk Reduction Management Center, which was established as a pilot in the CRMI project. The Center is embedded in the St. Catherine's Parish Council in Portmore; the council is responsible for developing and implementing Local Sustainable Development Plans for the Parish. The RRMC has an operational Disaster Risk Information Platform, providing Parish coverage; and is the only unified platform for spatial data on risk in the country. The target municipalities in the Nizao river basin contend with the PMRCs entities, with functionality limited to response.

139. Gaps: There are no RRMCs in Ciego de Avila of Cuba; the PMRCs in Nizao Province of Dominican Republic lack any preparedness or risk reduction function; there are no RRMCS in the two target parishes of Jamaica – St. Thomas and St. Mary's.

Risk, hazard and vulnerability information

140. To a certain degree all target areas have implemented hazard and vulnerability assessments and studies and mapped risks; however, many of these studies are non-standardized, obsolete or need updating to include comprehensive RHVS analysis and/or climate change and variability parameters in view of current climate patterns and projections and integrate climate adaptation measures.

141. Assets: In Cuba, national institutions realize Risk, Hazard and Vulnerability studies (RHVS) identifying the risk of disasters and climate change and including criteria related to water, forests, agriculture, coastal zones, biodiversity, human settlements and land use and healthcare. These studies have focused on the a) determination of physical, social and economic vulnerability; b) demonstration of occurred climate variability and changes; c) estimation and description of possible variations and changes; and d) elaboration of proposals on adaptation measures in ecosystems and socioeconomic sectors identified for responding to impact of climate change. There is national level capacity to conduct the studies, and expand the coverage and scope to cover different hazards. The study methodology offers an integrated vision for DRR and CCA. The RHVS are conducted every five years or earlier, based on the need.

142. Gap to be addressed: The RHVS methodology requires the incorporation of new data and methods, as well as addressing slow onset hazard, such as drought. The last RHVS in the province of Ciego de Avila was conducted five years ago, and thus there is a need to update and apply additional climate parameters to the data set and analysis

143. Assets: In Dominican Republic, numerous climate change and disaster risk studies have been carried out by the Ministry of Environment and Natural Resources, National Meteorological Institute, Climate Change Directorate, academia and international donor-supported projects. The Hydro-Meteorological Shock Vulnerability Index (IVACC), developed by the SIUBEN measures vulnerability of households to shocks produced by hydro-meteorological events calculating the probability of household vulnerability to hurricanes, storms and floods, based on a set of socioeconomic variables, such as housing, income and proximity to risk source. The Government has demonstrated political commitment to conduct a national-level vulnerability study and update the index to incorporate a wider spectrum of disaster risk variables.

144. Gap to be addressed: To date, there is no standardized or comprehensive risk and vulnerability methodology developed, applied and supported across the municipalities/provinces; no risk, hazard or vulnerability study has been conducted in the Nizao River Basis. There is no spatially presented data in the four target municipalities. In addition, there is a need to include climate change parameters as a critical data field.

145. Assets: In Jamaica, work has been done at the community level through the Township Risk

Assessments. In the community of Annotto Bay in St Mary, the Mitigation, Planning and Research Division of the Office of Disaster Preparedness and Emergency Management conducted a Multi Hazard risk assessment as well as a drainage study and plan, in 2013. In St Thomas, a coastal multi-hazard mapping and vulnerability assessment was done in Morant Bay in 2010. The Environmental Health Foundation (EHF) also facilitated a Multi-hazard mapping and vulnerability assessment in Cedar Valley. The most recent State of Readiness Report, conducted in June 2016 by the Ministry of Local Government and Community Development assessed the readiness of the parishes to for 2016 North Atlantic Hurricane Season.

146. Gap to be addressed: To date, there is no standardized or comprehensive risk and vulnerability methodology developed, applied and supported across diverse parishes; efforts have been fragmented and coverage is incomplete. There are no established risk indices for parishes nor spatially presented data. In addition, there is a need to include climate change parameters as a critical data field.

Local government and community capacities

147. Assets: The Province of Ciego de Avila ranks high among the Cuban provinces in terms of technical capacities and organization, especially in regard to Early Warning Systems for sudden onset events.

148. Gaps to be addressed: Early warning capacities in Ciego de Avila will need to be strengthened for slow onset event, such as drought.

149. Assets: In Jamaica, individual capacities of Parish Councils as well as specific high-risk communities have been strengthened in the area of hydro-meteorological risk and EWS. The Ministry of Local Government and Community Development of Jamaica has ranked the three parishes in terms of preparedness for hurricanes as follows:

Table 4 State of Readiness to Hurricanes[46]

Parish	Rank	Definition
St Catherine	Low level 3, Very Capable	Low level 3 = 67-100% (Above average or is prepared) Very Capable (67%-83%) –a high level of capability has been attained, and only a limited effort is required to reach full capability
St Thomas	Low level 3, very capable	Low level 3 = 67-100% (Above average or is prepared) Very Capable (67%-83%) –a high level of capability has been attained, and only a limited effort is required to reach full capability
St Mary	High level 2, Generally Capable	High level 2 =34-66% (Average or getting prepared). Generally capable (a baseline capability has been developed but a significant effort is required to reach full capability)

150. Gaps to be addressed: the above ranking is related to hurricane preparedness only and does not take into account capacities for risk analysis and application of risk reduction or adaptation measures to address climate risks. There is a need for improving of coordination among different actors and strengthening capacities for evidence based decision-making.

151. Assets: The Dominican Republic contends with local structures, known as the Prevention, Mitigation and Response Committees (PMR-C), which promote risk reduction and preparedness at the provincial and municipal level.

152. Gaps to be addressed: A recent analysis of this body has revealed weakness in capacity to conduct risk, hazard and vulnerability studies, engage in risk analysis, and represent risk spatially, leading to limited integration of risk into territorial planning processes. Likewise, there is a need for greater vertical integration with National Prevention, Mitigation and Response structure as well as horizontal integration with sectoral actors.

[46] Ministry of Local Government and Community Development

Component 1 - Additionality (With AF Resources)

153. Risk Reduction Management Centres

- In Cuba, the project will establish four (4) RRMCs: 1 provincial RRMC in the provincial capital Ciego de Avila and 3 municipal RRMCs in Chambas, Morón and Ciro Redondo. The RRMCs will work closely with the provincial multidisciplinary group as well as the Temporary Drought Group to collect and coordinate data as and address the identified risks associated with drought and sea level rise/salinization. The RRMC is situated within the headquarters of the municipal government body (People's Popular Council), responsible to the municipal assembly, providing a tool for bringing together municipal sector actors and branches – such as public works, transport, energy, agriculture, sanitation and water resources – to undertake a consolidated analysis of risk and support decision-making processes at the local level. In addition, this analysis is extended and utilized by municipal and national Civil Defense Directorates as well as local and national hydrological and meteorological actors responsible for supporting early warning.

- In Cuba, the model was initiated in 2005, and has been scaled up to 87 municipalities and 9 provincial levels. In the three proposed municipalities and one provincial government, the RRMC model has not yet been established to support risk analysis and risk informed decision-making.

- In Dominican Republic, the project will strengthen the existing structures of four (4) Preparedness, Mitigation and Response Committees (PMRC) to incorporate the risk management functions associated with the RRMC model. While these Committees exist, and are incorporated in the municipal structure, they are weak and require instruments and capacity building to fulfill their mandate to manage the climate risk information at a local level, activate early warning systems, and contribute to territorial disaster and adaptation planning, in addition to preparedness. The RRMC model would strengthen the PMRCs role to. connect and collaborate with municipal authorities, local development councils and technical agencies such as ONAMET, for improved risk reduction. The Committees respond to the municipal administration (mayor's office), and fall under the coordination of the Governor's office at the provincial level; they are backbone of the National System of Prevention, Mitigation and Response to Disasters (Law 147/02).

- In Jamaica, the project will upgrade the existing RRMC in St. Catherine and establish two (2) new RRMCs in St. Thomas and St. Mary's Parishes. The RMMC would be best placed and institutionalized in the Municipal Corporations (parish councils). They would enhance and link risk management and Sustainable Development Planning, and be situated to bridge the Planning Units and Disaster Management Units at the parish level, providing risk analysis and information to the various planning committees. This role is consistent with the Government of Jamaica's Reform Programme that gives the Municipal Corporations responsibility for leading parish level development planning taking into account climate change adaptation and DRR.

154. Risk, hazard and vulnerability information

- In Cuba, the project will conduct a RHVS in Ciego de Avila and update the methodology to include climate parameters and map the latest information in accordance with the standardized and comprehensive methodology. It is the establishment of the RRMC which play the central convening and analytical function to ensure a multi-sector comprehensive risk analysis.

- In Jamaica, the project will adapt the Cuban RHVS methodology to the Jamaican context, conduct multi-hazard risk and vulnerability assessments in the three target parishes and develop risk maps, providing data for the existing DRIP Platform and extending its reach to the other parishes. It is the establishment of the RRMC which play the central convening and analytical function to ensure a multi-sector comprehensive risk analysis

- In Dominican Republic context, the project conduct risk, hazard and vulnerability studies (RHVS) for

the Nizao River basin and develop risk maps. These studies will augment the IVACC methodology (which focuses on social protection). It is the establishment of the RRMC which play the central convening and analytical function to ensure a multi-sector comprehensive risk analysis.

155. Local government and community capacities

- The project will strengthen the capacities of the multi-sectoral groups for risk analysis and information transmission/communication to decision-makers, making use of RHVS, early warning data collection, climate scenarios and improved management of data. Complementing this, the project aims to increase the risk awareness and perception of development councils/parish councils for improved risk informed decision making. The project will strengthen capacities for short-term real-time monitoring of climate events and model scenarios for target provinces on 20, 50 and 100-year timescale. The Project will train and install community climate monitors in target communities and establish early warning protocols and guidelines for alerts and information exchange.

- A detailed assessment of physical and human resource assets and requirements will be conducted during the proposal stage to more precisely identify capacity gaps that the project will address. Baseline assessment, using assessment tools such as an Integrated Participatory Rural Assessment will identify key gaps in the proposal development stage, and will feed into the more intensive RHV studies that will be coordinated by RRMC in the project implementation phase. Likewise, a risk perception survey conducted in the initial phase of the project will establish baselines for awareness and advocacy actions. Training courses, community outreach activities and communication strategies will be designed and implemented on the basis of baselines collected during the proposal development phase and the initial assessments.

- An initial capacity assessment in the proposal development stage will identify the capacity building actions required to strengthen hazard, vulnerability and risk identification, analysis and interpretation of results for decision-making purposes, climate scenario modeling and their use for development planning.

Component 2. National climate information and early warning services for disaster risk reduction.

Baseline (Without AF Resources)

Observation networks and early warning systems

156. All target countries have hydro meteorological observation systems, albeit with the varied degree of technological sophistication. Many of the stations are obsolete, are not in use due to complexities of the geographical terrain (Dominican Republic), or the responsible entity lacks financial resources for upgrading the equipment and hiring personnel.

157. Assets: In Cuba, Ciego de Avila has four (4) automated meteorological stations in Jucaro, Venezuela, Camilo Cienfuegos and Cayo Coco. The province has a database with more than 60 years' worth of rainfall observation data. The collected data is processed statistically, digitalized and inputted into the database. The existing meteorological database collects data on a three-hourly basis since 1970.

158. The provincial hydro and meteorological services have basic equipment including pluviometers and sensors for measuring water levels in aquifers.

159. Gaps to be addressed: The current hydro-meteorological network capacity in Ciego de Avila is insufficient to properly monitor climate events. The four automated stations are equipped with obsolete computers (2007), of which three are not functioning. There is a need to upgrade the equipment for improved processing and data management, as well as a need to amplify timeframe and coverage through Automated Meteorological stations. The province also needs tide gauge equipment for sea level monitoring. The province also needs high-resolution satellite imaging for proper projections and modeling rain patterns, and strengthening the networks with modern ICT and communication systems.

160. There are no drought early warning systems in the province.

161. Assets: In Dominican Republic, ONAMET has more than 70 meteorological stations of different categories, including automated and manual observation stations. ONAMET operates thermo-pluviometers in San Jose de Ocoa, which have measured rainfall from 1931-1986 and temperature from 1931-2003; in Bani, rainfall measurements from 1936 to 2008 and temperature 1938-1993; in San Cristóbal, rainfall measurements from 1934-2005; and in Loyola, rainfall, temperature and relative humidity measurements since 1981-2016. To monitor multiple risks ONAMET uses, among other tools, global and regional digital models, satellite images and software such as MCH, Smartmet, QGIS, Rclimdex, WindGridd, CPT, and SPI.

162. According to ONAMET, there are two early warning systems in Sabana Larga of San J. Ocoa (community level), and in San Cristóbal.

163. Gaps to be addressed: Many hydro-meteorological stations are no longer operational. Some stations have transmission problems due to complex geographical terrain and are in need of additional signal amplifiers and transmitters. ONAMET lacks observers in the territory, due to limited funding and lack of trained personnel. The existing early warning systems need equipment, additional stations and human resource capacities.

164. Assets: In Jamaica, St. Catherine's has an operational climate monitoring system, with the inputs of five (5) Automatic Weather Stations and two (2) Rainfall logger stations. In St. Mary, there are three (3) Automatic Weather Stations and one (1) Rainfall logger station; eight (8) Automatic Weather Stations and one (1) Rainfall logger station provide data from St. Thomas.

165. In terms of early warning systems, St Catherine has a river flood warning system in Bog Walk Gorge and the Rivoli. The Bog Walk system was supported by the Water Resource Authority, while the Rivoli system was primarily a community based project. There is a flood warning system in Annotto Bay, in St. Mary Parish.

166. Gaps to be addressed: there is a need to establish fully operational early warning systems in the three parishes, including provision of equipment, training of community observers, and connection to the local municipal disaster and planning units. Despite observation stations, there is a lack of technical capacity for systematic data transmission and processing, particularly in St. Mary and St. Thomas. Gaps in coordination between Meteorology services, Water Resources, Parish Councils and ODPEM (Office for Disaster Preparedness and Emergency Management) result in disarticulated early warning functions and adaptive planning.

Hydromet and sectorial databases, information systems and platforms, ICT protocols

167. Assets: In Cuba, INSMET and INRH manage the national hydro and meteorological databases at the central level, which are connected with the local databases managed by provincial dependencies of said national agencies. The Climate Change Technical Unit (CCTU), recently created within the INSMET, is the focal point for all technical issues and requests regarding climate variability and change.

168. In Dominican Republic, the Observatory on Climate Change and Resilience has been established. The web-platform INFOCLIMA RD collects and disseminates information about relative humidity, temperature, precipitation, heat waves, droughts, floods, risk maps and other climate-related data.

169. Jamaica is developing a Climate Data Platform, which aims at improving the quality of data collected and used by public and private sector stakeholders at the local and national levels. The National Risk Information Platform (NRIP) mentioned above, aims to consolidate spatial and physical data at a parish and national level, and make it available for government institutions and other stakeholders.

170. Gaps to be addressed: Once established, RRMCs will be connected to central and provincial databases to ensure upward and downward flow of data to improve risk analysis, scenario modeling and decision-

making at local and national levels, and support the articulation of hydro-met and sectoral data bases for comprehensive data analysis. ICT protocols and standard operating procedures will need to be established and streamlined to strengthen the capacities of RRMCs, local governments and multidisciplinary groups for data collection, analysis and sharing, both upstream and downstream. Poor information transmission and communication to community users and decision-makers limits preparedness, risk and adaptation measures.

Component 2 - *Additionality (With AF Resources)*

Observation networks and early warning systems

171. The project will establish new and/or retrofit the existing observation networks in the target territories. While the exact numbers of networks to be upgraded/installed will be defined during the proposal development phase, the preliminary assessment is as follows:

- In Cuba, the project will strengthen hydrological and meteorological Early Warning Systems in the target province, by retrofitting and upgrading the existing 4 Automated Meteorological stations and installing additional five (5) ones in the municipalities of Morón, Florencia, Venezuela, Bolivia and Baragua. The project will strengthen technical capacities and access to satellite imaging for better data observation and projection. In addition to hydro meteorological stations the project will establish and strengthen EWS for drought and enhance capacities for monitoring water level in subterranean aquifers.

- In Dominican Republic, the project will install new meteorological stations in selected territories to complete the network, ensure that data processing software is optimized, and that information is adequately rendered through GIS mapping. The exact number, type (automated/manual) and location of stations will be defined during the proposal development stage.

- In Jamaica, the project will seek to retrofit one (1) AWS in St. Catherine and five (5) AWS in St. Thomas and will replace 2 obsolete and non-functional stations in St Catherine Parish and 1 in St. Thomas. As for St. Mary, the exact number and type of stations will be defined during the proposal development stage.

- The project will optimize national and regional community organizations, Red Cross chapters, women's organizations and other community-based organizations to ensure strong community participation, engage volunteers in climate monitoring and train populations on early warning systems and processes.

Hydromet and sectorial databases, information systems and platforms, ICP protocols

172. The project will assess the existing ICT protocols and data sharing capacities to connect the RRMCs with the national and local climate databases and platforms and improve inter-institutional coordination data collection, analysis and sharing, both upstream and downstream. The project will seek synergies with national institutions and platforms to connect local level data collection mechanisms and EWS with national and regional climate data platforms to strengthen prognostic capacities and support the transfer of technologies, software and methodologies.

- In Jamaica, the project will support the ongoing efforts to establish parish-level Disaster Risk Platforms (DRIP) managed by the RRMCs in St. Thomas and St. Mary and to connect them with the National Disaster Risk Platform (NRIP).
- In Dominican Republic, the project will explore the possibilities to establish data exchange protocols to connect the RRMCs with the Climate Observatory and INFO CLIMA RD and climate database managed by the ONAMET.

Component 3. Local governments are able to integrate DRR/CCA into territorial development planning

Baseline (Without AF Resources)

Local development planning

173. Assets: In Cuba, General Plan on Land Use Planning and Environmental Management Plans integrates information obtained through the RHVS. These studies inform the provincial and municipal Disaster Reduction Plans, provincial environmental strategies and plans, sectorial plans and projects. All these planning instruments contribute to the National Economic Plan of Cuba.

174. In Dominican Republic, national and local development planning is governed by the National Development Strategy, which is the instrument of the National System of Planning and Public Investment (SNIPP). In addition, there are Institutional Strategic Plans, which provide sectorial and territorial level inputs for the Multiannual Plan for Public Sector. At the local level, there are 97 Municipal Development Plans and 32 Provincial Socio-economic Development Plans, implemented by the Local Development Councils. Of the proposed municipalities, Bani, Nizao, Sabana Larga, Rancho Arriba, and San Jose de Ocoa have both Local Development Councils and Municipal Development Plans.[47] However, none of these plans address disaster risk, climate change or climate variability.

175. In Jamaica, Local Sustainable Development Plan (LSDP) of St Catherine is close to completion, whereas in St Thomas and St. Mary the work is incipient.

176. Gaps to be addressed: While a more precise analysis would be required in the proposal development stage, consultations in the three countries indicate that both national and municipal level plans are obsolete or require revision and updating to properly incorporate climate change parameters and both disaster risk reduction and adaptation measures.

177. In Cuba, General Plan on Land Use Planning (PGOT) and Environmental plan, as well as sectorial plans, require revision and updating with new information on climate change, climate risk analysis and adaptation measures.

178. In Dominican Republic, there are no Local Development Councils and Municipal Development Plans in Cambita and Los Cacaos municipalities. Where there are existing plans in target municipalities, they need to be revised and updated with climate change, climate and disaster risk information, and risk reduction/adaptation measures.

179. In Jamaica, there is no Local Sustainable Development Plan (LSDP) in St. Mary or St. Thomas. The existing plan in St. Catherine needs revision to determine if adaptation and disaster risk reduction analysis and measures are properly integrated.

Adaptation measures

180. Detailed assessment of the existing practices and adaptive measures in the target areas and vulnerable communities will be conducted in the proposal development stage.

Component 3 - *Additionality (With AF Resources)*

Local development planning

181. In the three countries, the project will provide technical assistance to local development councils, parish councils and municipal/provincial governments to upgrade existing development and territorial land use plans and develop new plans with the integrated risk reduction focus, using risk analysis and climate scenario models developed with the project support and incorporating innovative adaptation measures.

- In Cuba, the project will support specific analysis of the management of subterranean basins, especially from the public health and pollution perspective, to plan the locations of contaminating industries. The project will provide technical assistance to update the RVS methodology and carry out

[47] Other local level planning instruments include five (5) Municipal Risk Management Plans in San José de Ocoa, Sabana Grande de Boyá, Bajos de Haina, Padre Las Casas and San Felipe Puerto Plata; 7 Municipal Land Use Plans, of which 5 are completed (Hondo Valle, Jarabacoa, Guayabal, Santiago and Sabana Yegua) and 2 being developed (Juan Santiago and Miches); 3 Touristic Land Use Plans in Miches, Barahona and Pedernales; and one Land Use Plan with Climate Change focus in Samana.

new RVHS in the province. The project will review and update the existing disaster reduction plans, plans of the Temporary Drought Group, sectorial risk reduction plans, related to hydrological resource management, agriculture, etc. As noted, the project will use the environmental planning model developed by the GEF-funded Sabana Camaguey Project to integrate DRR and CCA approaches and updated EWS procedures and functions in the new provincial environmental plan.

- In Dominican Republic, the project will support local development councils develop local development plans, based on risk analysis and climate scenarios for the Nizao River Basin. There is a need to strengthen planning capacities, and implement standardized land use planning guidelines which include climate change and vulnerability reduction measures.

- In Jamaica, the project will support the development of LSDPs in St. Thomas and St. Mary Parishes and improve the existing LSDP in St. Catherine with the risk analysis and climate scenario information, leading to a more adequate integration of climate and disaster risk reduction measures.

Adaptation measures

182. The project will implement pilot initiatives in selected target sites to demonstrate adaptation solutions for eventual integration in local development planning. The adaptation measures will principally deal with issues of water supply, agricultural production, riverine flood protection and coastal management. In Cuba, the Dominican Republic, and Jamaica, community consultations highlighted key climate vulnerabilities for each of the proposed project communities. Based on these climate vulnerabilities, the following indicative adaptation measures have been identified by each country.

- In Cuba, community consultations in the municipalities of Chambas, Moron, and Ciro Redondo in the Ciego de Avila Province highlighted the need for the following indicative adaptation measures 1) the implementation of a local monitoring system for water distribution and construction of infiltration wells for replenishing subterranean aquifers to combat salinization due to salt water intrusion, 2) pilot strategies for the provision of year-round and safe water for vulnerable populations to mitigate water scarcity and water contamination issues, and 3) implementation of climate smart agricultural practices such as the sowing of drought resistant seeds to mitigate the impact of drought on farmers.

- In Jamaica, consultations in the three parishes highlighted the need for the following indicative adaption measures: 1) Rehabilitation of existing drains and revegetation of denuded riparian buffers to reduce the impact of flooding, 2) revegetation and promotion of sustainable agricultural practices on slopes to prevent land slippages, 3) collaboration with relevant agencies to restore and conserve coastal vegetation, such as mangrove forests, and marine vegetation, such as sea bed grass and coral reefs, to protect communities from the impacts of storm surges and coastal erosion, 4) capacity building with local fire squads and strategic equipment improvement to increase the efficacy of forest fire response, 5) promotion of climate smart agricultural practices and rainwater harvesting to adapt to the impacts of drought on farmers, 6) integration of climate change and disaster risk reduction considerations into the local sustainable development plans, and 7) support to national spatial planning process that will help local communities limit construction in flood prone areas.

- In the Dominican Republic, consultations in Cambita Garbitos, Los Cacaos, Sabana Larga, and Ranch Arriba highlighted the need for the following adaptation measures 1) strengthening the Prevention, Mitigation, and Response committees at the municipal, district and community level to respond to increasing frequency and intensity of storms and associated flooding, 2) drafting of climate change adaptation plans and elaboration of risk maps that incorporate climate scenarios, 3) restoring land cover and channel flood plain features within catchments to promote infiltration and groundwater storage, 4) improvement of drainage infrastructure to facilitate water discharge and reduce flooding, 5) promote climate smart practices through workshops conducted by Prevention Committees, and 6) improvement of local irrigation to enhance infiltration and groundwater storage.
  The RRMCs under Component 1 are to be considered as concrete adaptation measures, representing a key part of early warning and response systems at the local community level, providing necessary information, analysis, and guidance so that community end users can apply adaptive measures.

Component 4. Knowledge Management and South-South Cooperation

Baseline (Without AF Resources)

183. Assets: UNDP has been promoting the South-South Cooperation mechanism to foster the exchange of knowledge and experiences among the developing countries and help the advancement of sustainable development agenda and attainment of SDGs. UNDP has been supporting the exchange of methodologies, policy support tools, mechanisms and approaches through strategic partnerships, engagement of regional and national partners in policy dialogues and supporting development of regional capacities and innovation. One of such examples has been the CRMI project, which was first to advance the notion of integrated approach to CCA and DRR risk management in the Caribbean and has laid basis for future advancement in this area.

184. Gaps to be addressed: Given that the project will be implemented in countries with similar climate risks, it is important that country-specific knowledge and experiences be shared to maximize upscaling potential. There is a need to conduct a comparative analysis and systematization of RRMC models in different political and institutional settings, especially given that the Cuban model started 10 years ago and has evolved significantly; develop case studies on adaptation and risk-informed planning in countries with similar hazards and risks; establish historical disaster loss inventories in the target areas; share and compare climate models; catalogue climate services available to support planning; share risk and vulnerability assessment methodologies and models and adaptation measures to similar hazards. This experience sharing will be facilitated through an online knowledge hub that will include capacity-building webinars, technical documents, multi-media knowledge products such as photo essays, and information about events or milestones across the three countries.

185. In addition, there is a need to promote the cross-fertilization among Caribbean countries that normally do not share information and experiences, due to different in language, regional groupings and political affiliations.

Component 4 - Additionality (With AF Resources)

186. The project will seek synergies with the on-going projects and programmes identified in Table 3, Section G to identify relevant practices, methodologies and tools and apply them in Cuba, Dominican Republic and Jamaica. The project will provide technical assistance to national and local institutions to consolidate the existing know-how and enhance national capacities for DRR and CCA.

187. The project will collect information from RHVS, risk mapping, climate scenario modelling, perception surveys and other pertinent studies to analyse and systematize trends and behaviours in the three Caribbean SIDS. The project will organize exchange visits, study tours and workshops to bring together decision-makers and technical experts from the participating countries and strengthen their capacities.

188. Preliminary list of knowledge products to be produced with the Fund financing include, but are not limited to the following:

- Guidelines for establishing integrated multi-hazard risk management tools and capacities through RRMCs;
- Guidelines and models for community engagement as volunteer climate monitors;
- Updated methodology for hazard, risk and vulnerability studies (Cuba);
- Updated General Land Use Plans (Cuba);
- EWS and Standard Operating Procedures for drought (Cuba, Jamaica);
- Software and procedures for monitoring subterranean basins (Cuba);
- Downscale climate models and scenarios for 20, 50 and 100 years;
- Systematization documents, analytical papers, SOPs, manuals;
- Vulnerability studies, including gender vulnerability to CCA and DRR and georeferenced vulnerability and hazard maps;
- Environmental assessments;

- Updated disaster management, contingency, local development, land use plans and other development planning tools;
- Case studies, lessons note, and multi-media communication materials

189. The project will establish partnerships with national and regional academia and media, to develop educative and advocacy material for different segments of population, to work with community organizations and schools on raising awareness and changing perceptions on CCA and DRR.

K. Describe how the sustainability of the project outcomes has been taken into account when designing the project.

190. In the recent years, the three target countries have been advancing work towards greater sustainability and adaptation to climate change, testing new approaches and developing new technologies, methodologies and tools. The project will consolidate the existing knowledge and advances and establish information exchange, coordination and communication channels to help disseminate knowledge and strengthen institutional capacities in the participating countries. With the support of the project, the countries will have at their disposal vetted and validated innovative models for integrating risk reduction and adaptation into development planning, solid scientific data and mechanisms for its collection and analysis, and institutional capacities for evidence-based decision-making. The project will also help the countries achieve economies of scale, by strengthening synergies between ongoing initiatives within and between the countries.

191. A more detailed analysis of sustainability factors and arrangements will be detailed in the full proposal, specifying to aspects of institutional, social, economic, environmental, financial and technical sustainability.

192. The project takes the following sustainability approaches and factors into consideration:

- Operation and Maintenance Plans for the techniques and technologies introduced (e.g. EWS and communications equipment, water supply adaptation measures) will be identified in proposal development stage, and specified for each site during initial stages of implementation, attached to site specific plans.
- Support to territorial and municipal level planning processes will ensure that the longer-term operations and maintenance of the adaptation measures is incorporated in the budgetary planning processes of these plans, with the involvement of the suitable institutional frames and mechanisms. For the community level adaptation measures, associative structures (e.g. village councils, community water associations, etc.) will be harnessed to ensure community contributions for the longer-term sustainability of the installations. The RRMC is an integral part of the local governance structures. Therefore, the RRMC model to be applied in municipalities lacking this function, will be located in and support existing municipal entities, and thus will ensure cost-effectiveness and longer term sustainability.
- There is a strong interest and commitment of national stakeholders manifested through the endorsement of the project pre-concept and concept notes. Key stakeholders in the three countries participated actively in the consultative process, agreeing on the project objectives and intervention strategies and contributed to the development of each project component. In addition to national level consultations, community consultations in the target municipalities concluded that there is a high level of interest and identified benefit related to the project.
- The project proposes a multi-sectorial multi-hazard risk management model, with enhanced climate parameters. The model can be replicated to other municipalities and provinces and adapted in different territorial unites with different climate and disaster profiles.
- The project will build on the existing processes and projects and will complement ongoing work of the participating countries by building on synergies and strengthening capacities for integrated risk management. These capacities will be embedded in local, municipal, provincial and national institutions through decrees, executive orders, agreements and development plans and related budgetary processes.

- Knowledge generated by the project in the form of methodologies, guidelines, protocols and SOPs, platforms, software packages and the like will be shared with different stakeholders within and between the countries and appropriated by relevant institutions. The updated RHVS methodology will be used by the Government of Cuba and shared with other governments for future assessments and planning. Drought EWS and water management methods developed by the project can be used in all provinces and parishes affected by drought and depletion of water resources in Cuba, Dominican Republic and Jamaica. The sustainability of knowledge management actions also lies in the replicability of the municipal RRMC model, which will be supported through the generation of knowledge products (guides, technical reports, tools), training of national and local institutes, organizing exchange visits, involving national and regional events, virtual platforms and regional organizations to support further dissemination and uptake of experiences and lessons learnt. All of these materials will be made available through the online knowledge hub.
- In compliance with its mandate, the project will promote the integration of resilient development issues into the wider development objectives of poverty reduction and inclusive economic growth, and support national sustainable development processes in the region for the achievement of the key global commitments and strategies, such as SDG, Kyoto Protocol, Sendai Plan of Action, and the S.A.M.O.A Pathway.

L. Provide an overview of the environmental and social impacts and risks identified as being relevant to the project.

193. The following table offers the checklist of environmental and social principles indicating compliance and potential impacts and risks. The thorough Social and Environmental Safeguards screening procedure will be conducted during the proposal development stage to update and complete the risks and safeguards information:

Table 5 Environmental and social principles checklist

Environmental and social principles	No further Assessment required for compliance	Potential Impacts and risks – further assessment and management required for compliance
Compliance with the Law	Project will be undertaken in compliance with the domestic laws of Cuba, Dominican Republic and Jamaica and with the international laws and conventions that the respective countries are party of.	
Access and Equity	Project will not generate nor exacerbate inequities, particularly among vulnerable groups. It will ensure fair, inclusive and equitable access to benefits, unimpeded access to basic services and rights, and safe and decent working conditions.	In the communities identified by government for the project (based on nationally established criteria), a review of existing socio-economic and census data will be undertaken, as well as analysis of vulnerable groups, at least in a sample of key areas during the proposal development stage (complemented with gender analysis as mentioned below). Given that a key function of the RRMC model is to conduct

		comprehensive and standardized risk studies (to inform the other components of the project), these will be carried out during the inception stage of the project
Marginalized and vulnerable Groups	Project will avoid imposing any adverse impacts on vulnerable groups, including women and children, the elderly, people living with disabilities and/or HIV/AIDS and refugees/internally displaced persons.	The project will ensure that the adaptation measures are gender sensitive and that at the local level that they do not limit the participation of women and the disabled as beneficiaries. A gender analysis will be undertaken during proposal development stage
Human Rights	Project will respect international human rights.	
Gender Equity and Women's empowerment	Project will ensure full and equitable participation of all genders in activities and distribution of benefits and will ensure protection from disproportionate adverse effects.	The project will conduct gender assessment to determine gender differentiated needs, capabilities, roles and knowledge resources The project will also conduct perception survey to measure differences in perceptions on climate and disaster risks among genders
Core Labor Rights	Project will ensure observance of core labor standards as identified by national standards and the International Labor Organization.	
Indigenous Peoples	Not applicable	
Involuntary Resettlement	Project will not cause involuntary resettlement.	
Protection of Natural Habitats	Project will not imply unjustified conversion or degradation of critical natural habitats, including those that are legally protected or proposed for protection and recognized for their high conservation value, including as critical habitat.	The project will support interventions aimed at protection of mangroves and reduction of coastal erosion due to rising sea-level, based on site assessment and Environmental Impact studies
Conservation of Biological Diversity	Project will avoid any significant and/or unjustified reduction or loss of	The project will support conservation of biodiversity by implementing adaptation

	biodiversity or introduction of known invasive species.	measures aimed at protection of mangroves in coastal areas, based on site assessment and Environmental Impact studies.
Climate Change	Project will not result in any significant or unjustified increase in greenhouse gas emissions or other drivers of climate change.	
Pollution Prevention and Resource Efficiency	Project will meet applicable international standards for maximizing energy efficiency and minimizing use of material resources, waste production and release of pollutants.	
Public Health	Project will not cause negative impacts on public health.	The Project will propose measures related to sustainable water management aimed at reduction of public health hazards, related to plagues and vectors.
Physical and Cultural Heritage	Project will not interfere with the existing use and access of physical and cultural resources and will avoid alteration, damage or removal of any historic/cultural sites and artifacts, including those with unique natural value at community, national and/or international level.	
Lands and Soil Conservation	Project is not expected to cause significant land soil damage, and in fact it is expected that the introduction of adaptive agriculture practices supported through agro-meteorological information will enhance soil and water conservation.	

PART III: IMPLEMENTATION ARRANGEMENTS

A. *Describe the arrangements for project management at the regional and national level, including coordination arrangements within countries and among them. Describe how the potential to partner with national institutions, and when possible, national implementing entities (NIEs), has been considered, and included in the management arrangements*.

194. The project will be implemented through the engagement of National Executing Agencies, designated by participating Governments from the ministries of disaster risk reduction, environment, and/or local governance, involving central agencies of planning and line ministries dealing with key vulnerable

sectors, national hydro-met agencies, as well as territorial level governments. Existing national and local DRR and CCA platforms and coordination mechanisms will be harnessed. The National Implementing Entities in Jamaica and Dominican Republic will also be consulted during the detailed project development stage to identify a suitable role for it in project execution. Regional support institutions will involve CDEMA and Caribbean Community Climate Change Centre (5Cs). The project will be supported through UNDP Regional Hub for Latin America and the Caribbean and UNDP Country Offices.

195. In Cuba the project will be executed by the Ministry of Science, Technology and Environment (CITMA), in collaboration with the National Civil Defense (EMNDC), the National Meteorological Institute (INSMET) and the Environment Agency (AMA). In Dominican Republic, the project will be executed by the Ministry of Environment and Natural Resources (MENR) in collaboration with the National Commission of Emergencies (CNE), Dominican Federation of Municipalities (FEDOMU) and the National Meteorological Office (ONAMET). In Jamaica the executing agency functions will be undertaken by the Ministry of Local Government & Community Development (MLGCD), in collaboration with the Office of Disaster Preparedness and Emergency Management (ODPEM) and Meteorological Services of Jamaica (MET).

196. Regional Steering Committee (RSC) will be established composed of high-level representatives of the institutions from each target country, UNDP Country Offices and key regional institutions. The RSC will meet on a regular basis (frequency to be determined) during implementation to consolidate national components and ensure coherence of regional approach, to achieve consensus, and provide overall coordination. It is expected that the RSC will function as the key strategic and coordination body of the project with the detailed Terms of Reference to be defined during the proposal stage. The project also contemplates the establishment of National Technical Committees (NTC), composed of technical experts from key national and provincial/municipal institutions and agencies, representatives of local governments, academia, NGOs and community organizations, and UNDP Country Office technical officers. The technical experts will provide expertise in the area of environment and climate change, disaster risk reduction and EWS, local development, territorial planning, hydrometeorology, GIS/ICT and the like.

197. The Project Implementation Team will be composed of a Regional Coordination Unit (RCU) and National Implementation Units (NIU).

198. In each country the project will establish National Implementation Units (NIU) comprised of National Coordinators, administrative/financial officers, ICT/GIS Specialists, and other profiles as necessary. A more detailed description of RCU and NIU functions and structure will be provided after the completion of the proposal development stage.

B. Describe the measures for financial and project risk management.

199. The following table summarizes the preliminary risks identified through the initial consultative process. During the development of the project proposal and subsequent project document, the risks will be further analyzed and included in a Project Risk Log.

Table 6 Potential Risks

#	Type	Country	Description	Risk mitigation measures	Risk level
1	Economic and financial	Cuba	Challenges related to the US embargo to Cuba, such as procurement of goods and services manufactured entirely or partially in the US	The project will apply diligent screening mechanisms to ensure that the requirements are considered during preparation of tenders and procurement	Medium

				processes.	
2	Financial	Cuba	Exchange rate	UN Exchange rate will be applied during costing and procurement.	Medium/high
3	Social	Cuba DR Jamaica	Low awareness and perceptions on CCA and DRR in population	The project will carry out perception surveys to design specific awareness interventions.	Medium
4	Environmental	Cuba DR Jamaica	Occurrence of natural disasters	The project will activate and support national disaster risk preparedness and response mechanisms, as well as preventive measures through adaptation planning and pilot measures at target communities.	Medium/High
5	Political	DR Jamaica	Changes in the government leading to departure of key stakeholders	The project will maintain close coordination and consultations with national stakeholders through the Regional Steering Committee, RCU, NIU and UNDP Country Offices to mitigate the possible impacts.	Medium/High
6	Political	DR Jamaica	Lack of political will and engagement	The project will engage the stakeholders in the consultative process and implementation through RSC and NTC, advocacy and capacity development activities.	Medium
9	Social	DR Jamaica	Deficient human resources	The project aims at strengthening capacities at provincial, municipal and community levels through trainings, provision of equipment and technical assistance.	Medium/Low

10	Financial	Cuba DR Jamaica	Insufficient resources	The project will carry out rigorous budgeting and planning process during the proposal phase and will monitor project implementation to timely identify funding gaps. As part of the planning processes, operations and maintenance plans will be established. The project will also rely on synergies with the existing projects to maximize the efficiency and achieve the economies of scale	Low

C. *Describe the measures for environmental and social risk management, in line with the Environmental and Social Policy of the Adaptation Fund*.

200. During the preparation of the Full Project Proposal, all relevant issues related to environmental and social risks will be identified. The UNDP Social and Environmental Safeguards Procedure (SESP) will be completed along with all related requirements under the Adaptation Fund and recommendations made for appropriate action for the project implementation stage.

D. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan.

201. Monitoring and evaluation (M&E) will be applied in accordance with the established UNDP procedures throughout the project lifetime, and will be developed in detail during the proposal development phase. The executing partners, together with the UNDP Country Offices, will ensure the timeliness and quality of the project implementation. Technical guidance and oversight will be also provided from the UNDP Regional Hub in Latin America and the Caribbean as well as the RSC. Audits on the project will follow UNDP finance regulations and rules and applicable audit policies.

202. **Project start**: A Project Inception Workshop (IW) will be held within the first 3 months of project start with those with assigned roles in the project management, AF, UNDP CO and where appropriate/feasible, regional technical advisors as well as other stakeholders. The IW is crucial to building ownership for the project results and to plan the first-year annual work plan.

203. **Annual Project Progress Report**. An annual Project Progress Report (PPR) shall be prepared by the Regional Coordination Unit, shared with the RSC and submitted to the Donor. The APR will be prepared with progresses against set goals, objectives and targets, lessons learned, risk management and detailed financial disbursements.

204. **Mid-term of the project cycle**: The project will undergo an independent Mid-Term Review (MTE) at the mid-point of project implementation. The MTR will determine progress being made toward the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. The findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term.

205. Periodic Monitoring through site visits: UNDP Country Offices will conduct visits to project sites based on the agreed schedule in the project's Annual Work Plan to assess, at first hand, project progress. Other members of the RSC may also join these visits.

206. Project Closure: An independent Final Evaluation will be undertaken 3 months prior to the final RSC meeting. The final evaluation will focus on the delivery of the project's results as initially planned and as corrected after the mid-term evaluation, if any such correction takes place. The final evaluation will look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals.

E. Include a results framework for the project proposal, including milestones, targets and indicators.

207. The results framework, with SMART indicators, baselines and targets, will be elaborated during the proposal preparation phase and will be submitted to the Adaption Fund for approval.

F. Demonstrate how the project aligns with the Results Framework of the Adaptation Fund

Table 7 Alignment with the Adaptation Fund Results Framework

Project Objective	**Project Objective Indicator**	**Fund Outcome**	**Fund Outcome Indicator**	**Grant Amount (US$)**
Upscale the function of local RRMC in Caribbean municipalities acting as local clearing houses and coordination center for effective use of early warning information	To be developed	Reduced exposure at national level to climate-related hazards and threats	Relevant threat and hazard information generated and disseminated to stakeholders on a timely basis	
Strengthen local governments and communities to better prepare and respond to climate-induced disasters through multi-hazard and integrated approaches involving national agencies with complementary mandates to address climate and disaster risk.	To be developed	Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased	
Project Outcome	**Project Outcome Indicator**	**Fund Output**	**Fund Output Indicator**	**Grant Amount**

Local Governments' capacities strengthened to coordinate disaster preparedness and response through community-managed RRMCs connected to national early warning and climate information services	To be developed	Output 1: Risk and vulnerability assessments conducted and updated Output 1.2 Targeted population groups covered by adequate risk reduction systems	1.1. No. of projects/programmes that conduct and update risk and vulnerability assessments 1.2 No. of early warning systems	US$ 1,460,000
Enhanced capacities of national agencies to generate and disseminate climate information and early warning on hydro-meteorological hazards to sectorial and local entities	To be developed	Output 2.1 strengthened capacity of national and regional centers and networks to respond rapidly to extreme weather events	2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events 2.1.2. No. of targeted institutions with increased capacity to minimize exposure to climate variability risks	US$ 900,000
Local governments are able to integrate DRR/CCA into territorial development planning	To be developed	Output 4: Vulnerable development sector services and infrastructure assets strengthened in response to climate change impacts, including variability	Indicator 4.1.1: No. and type of development sector services to respond to new conditions resulting from climate variability and change	US$ 980,000
Good practices and lessons learnt are documented and disseminated among the participating countries and in the Caribbean region	To be developed	Indicator 3.1.1: Percentage in targeted population awareness of predicted adverse impacts of climate change, and of appropriate responses	Indicator 3.1.1: Percentage in targeted population awareness of predicted adverse impacts of climate change to their livelihoods, and of appropriate responses	US$ 767,000

G. Include a detailed budget with budget notes, broken down by country as applicable, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs.

208. A broad outline of the proposed financing for the project is given in Part I. A detailed budget will be developed during the preparation of the full proposal.

H. Include a disbursement schedule with time-bound milestones.

209. The disbursement schedule will be developed in the course of preparation of the full proposal for submission to the Adaptation Fund.

PART IV: ENDORSEMENT BY GOVERNMENTS AND CERTIFICATION BY THE IMPLEMENTING ENTITY

A. Record of endorsement on behalf of the government - ***Provide the name and position of the government official and indicate date of endorsement for each country participating in the proposed project/programme. Add more lines as necessary. The endorsement letters should be attached as annexes to the project/programme proposal.***

CUBA Sr. Enrique Moret Hernández Director Dirección de Relaciones Internacionales Ministerio de Ciencia Tecnología y Medio Ambiente	Date*: 28 December 2016*
DOMINICAN REPUBLIC Ing. Pedro García Brito M.Sc Director de Cambio Climático y MDL de este Ministerio Ministerio de Medio Ambiente y Recursos Naturales	Date*: 21 December 2016*
JAMAICA Una May Gordon Principal Director Climate Change Division	Date*: 5 January 2017*

B. Implementing Entity certification - ***Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address***

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.	
Date: (dd/mm/year)	Tel. and email:
Project Contact Person: Gabor Vereczi UNDP GEF, Regional Specialist, Climate Change Adaptation, UNDP Regional Hub for LAC	
Tel. and Email: +507 65502157; gabor.vereczi@undp.org	

List of Annexes:

1. Letters of Endorsement from Governments of Cuba, Jamaica and Dominican Republic