



REGIONAL PROJECT/PROGRAMME PROPOSAL

PART I: PROJECT/PROGRAMME INFORMATION

Project/Programme Category:	Regular Project
Title of Project/Programme:	Strengthening the adaptive capacity of coastal communities of Cuba and Panama to climate change through the binational exchange of best practices for climate management and local food security
Countries:	Republic of Cuba and Panama
Thematic Focal Area:	Food Security
Type of Implementing Entity:	Multilateral Implementing Entity (MIE)
Implementing Entity:	Food and Agricultural Organization of the United Nations (FAO)
Executing Entities:	Cuba: Environmental Agency of the Ministry of Science, Technology and Environment – CITMA (AMA), and the Ministry of Agriculture (MINAG) Panama: Ministry of Environment and Fundación Natura
Amount of Financing Requested:	USD 14 million (in U.S Dollars Equivalent)

A. Project / Programme Background and Context:

Cuba and Panama form part of the Wider Caribbean Region that is made up of 28 countries, both insular and coastal. These States and Territories have coastlines located on the Caribbean Sea and Gulf of Mexico (Figure 1). The wider Caribbean is particularly vulnerable to climate change (CC) due to increased ocean temperatures, sea level rise (SLR), shifting precipitation patterns that will concentrate most rainfall in short periods of time leaving open the possibility for both drought and flooding. The region is highly susceptible to extreme weather from both hurricanes and tropical cyclones that when compounded with rising sea levels provide a high risk of flooding to coastal communities. These threats are currently evidenced in both Cuba and the Caribbean coastline of Panama with effects on food security and rural livelihoods.



Figure 1: Map of the Greater Caribbean Region

The wider Caribbean is particularly vulnerable to climate change (CC) due to increased ocean temperatures, sea level rise (SLR), shifting precipitation patterns that will concentrate most rainfall in short periods of time leaving open the possibility for both drought and flooding. The region is highly susceptible to extreme weather from both hurricanes and tropical cyclones that when compounded with rising sea levels provide a high risk of flooding to coastal communities. These threats are currently evidenced in both Cuba and the Caribbean coastline of Panama with effects on food security and rural livelihoods.

Coastal communities of Cuba and Panama are currently facing diverse effects and impacts of global CC. For both countries, recent research and modelling indicate changing conditions such as higher temperatures, erratic seasonal rains, more intense precipitation in concentrated time spans and regions, an increased frequency and intensity of tropical storms and cyclonic activity and SLR. These projections will have impacts on coastal ecosystems, livelihoods and communities, particularly those mostly vulnerable such as women and indigenous groups.

According to national communications to the United Nations Framework Convention on Climate Change from both countries, the coastal areas of Cuba and Panama are likely to suffer significant modifications due to flooding caused by the SLR. It is foreseen that an increased ambient and ocean temperatures will affect biodiversity and its ecosystems

services, thus in turn impacting livelihoods such as tourism, agriculture and fishing. While both countries have developed national strategies to attempt to manage impacts from CC, capacities at community and municipal levels- where these impacts will be felt most acutely- are currently lacking partly due to a failure to translate climate impacts into tangible costs and losses to local economies and livelihoods. This is particularly a challenge when assessing the impact of slow onset hazards such as SLR that will result in the salinization of soils and water resources or in the case of increasing temperatures that will have cascading effects.

Loss and Damage: Methodologies for assessing loss and damage are critical inputs in calculating the economic impact of natural disasters and can be used to estimate the potential cost of CC to national economies when projecting more frequent extreme weather. Input from loss and damage calculations are powerful tools for internalizing the impacts of disasters and providing a key baseline to measure the effectivity of risk reduction actions and assess post disaster needs for recovery. These methodologies however, albeit useful, are often infrastructure-focused and respond to specific one-off disasters while failing to aggregate cascading impacts of CC and how they interact with a series of hazards.

International organizations have looked at improving traditional loss and damage methodologies to include impacts on livelihoods and development, such as the UNDP's Post Disaster Needs Assessment and FAO's Methodology for Damage and Loss Assessment in Agriculture. FAO's methodology, in particular, allows countries to better calculate loss and damage to agricultural related production even in the case of slow onset hazards. This is a key issue in generating resilience as recurrent and prolonged natural hazards and disasters can have a devastating impact not only on agricultural livelihoods but also in the long term can lead an entire economy into recession. Hence, the methodology developed by FAO is relevant as it addresses a common challenge in post disaster assessment that often results in an under-estimated evaluation of long-term disaster impact to populations, leading to the under-investment in resilient agriculture and adapted livelihoods¹.

The capacity to implement loss and damage methodologies in the face of slow onset impacts, will allow assessing the cost of CC to local economies and implementing adaptive measures that may be required for their reduction in order to ultimately have an impact on protecting local food security. This last point is particularly relevant to coastal communities, who depend on coastal ecosystems for primary production such as fishing, coconut and rice harvesting. Adaptive measures include the implementation of Nature-Based Solutions (NBSs) for the protection of critical ecosystems and the development of alternative and more resilient livelihoods.

This project will, hence, address common challenges to better assess climate impacts and how these will affect local economies and livelihoods through the use of FAO's loss and damage methodology as an active adaptive planning and evaluation tool for coastal communities, and will implement a series of adaptive measures to reduce projected loss in livelihoods that will result in resilient agriculture production while favoring local food security. A bilateral cooperation mechanism will be formalized by the project to allow for knowledge sharing and facilitate the upscaling of lessons learned in both countries, including incorporating baselines and analysis in national and regional databases through similar approaches to allow for upscale within the larger Wider Caribbean context. This will allow the project to bring innovations in accounting for concrete local resilience measures (such as the implementation of NBS and the use of technologies/techniques for resilient agriculture) to reduce loss and better evaluate resilient capacity that is both measurable and accountable.

The project will focus on coastal municipalities of both Cuba and Panama located along the Caribbean littoral, whose vulnerability to coastal flooding due to SLR and level of exposure to frequent storms, are aggravated by their limited adaptive capacity. In Cuba, the project will be implemented in the municipalities of Consolacion Sur, San Cristobal, Batabanó, La Sierpe and Baracoa, located along the southern and eastern coastlines of the country. In Panama, the project will be implemented within the municipalities of Santa Isabel, Portobelo, Chagres and Donoso (all belonging to the Colon province located along the Western Caribbean Region of Panama). The project will ensure an inclusive approach to vulnerable populations including women and minority groups who face differentiated needs and conditions to climate adaptation.

¹ Conforti, P., Markova, G., & Tochkov, D. (2020). "FAO's Methodology for Damage and Loss Assessment in Agriculture". *FAO Statistics Working Paper 19-17*. Rome. <https://doi.org/10.4060/ca6990en>

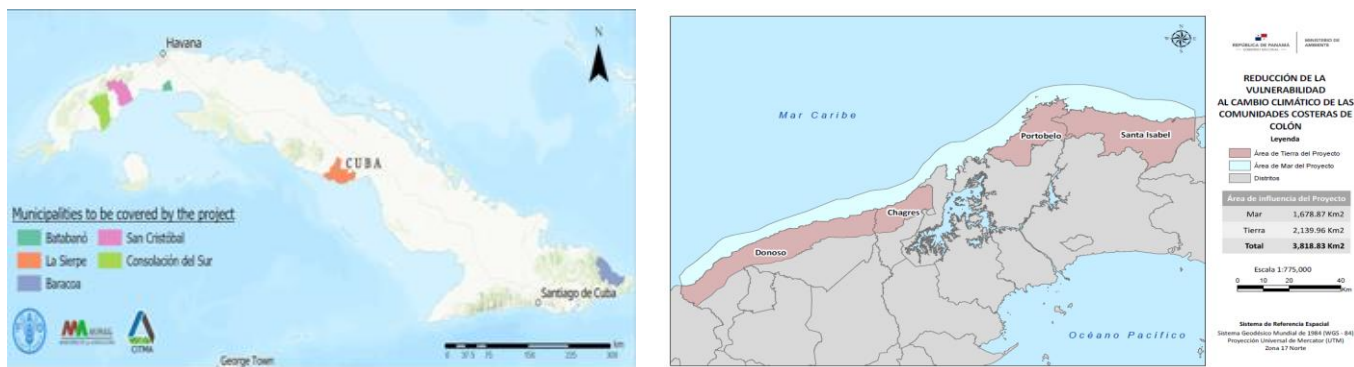


Figure 2: Target Areas in Cuba (left) and Panama (right)

Cuba

The Republic of Cuba is a small island developing state (SIDS) located in the Caribbean Sea, at the entry of the Gulf of Mexico, in one of the most active spots of the Atlantic/Caribbean hurricane region. Over the past ten years, Cuba has been hit by 11 hurricanes of large magnitude that have severely damaged infrastructure, housing and communications (PNUD, 2020).

Cuba's irregular coastline extends for 6,073 km with its Northern coastline being characterized by deep harbors, coral lowlands, and sandy beaches and its Southern coastline featuring coral islands, reefs and salt marshes. The island of Cuba is 1,250 km long with its widest part measuring 191 km and 31 km in its narrowest, hence it can be concluded that in Cuba one is never far off from the coast. The population of Cuba stands as 11.167 million people², of which approximately 42% live in coastal municipalities.

Socio-Economic Vulnerability: There are 7,014 human settlements (ONEI, 2012) in Cuba, of which 6,417 (91.4%) are rural and 597 (8.6%) urban. The geographical distribution of the population influences the levels of coverage of public services; therefore, access to services in urban areas that imply greater capacity and social resilience has increased compared to that of remote rural communities. The majority of the rural population relies on primary sectors for their livelihoods. This includes agriculture, livestock, forestry and fishing, which together represent 17.8% of the economically active population.

An important part of the Cuban population resides along coastal areas making them highly vulnerable to climate impacts in the form of extreme weather and SLR. Most of these coastal communities, particularly those rural in nature have a narrow economic base dependent largely on artisan fishing, basic services and tourism; in addition, many members of coastal communities are involved in agriculture and livestock raising in neighboring areas due to limited employment opportunities in their own areas. Coastal communities have been affected by decreasing employment opportunities due to the decline of the fisheries sector and the degradation of productive infrastructure by the weather and extreme climatic events.

Agriculture in Cuba occupies 6.1 million ha (out of a total area of 10.1 million ha), of which 1.2 million are devoted to seasonal crops, 1.5 million to permanent crops and 3.7 million to livestock. The government has placed a high emphasis on increasing agricultural production as part of its social and development planning, to reduce its high reliance on food imports. The main agricultural products produced by Cuba include sugar cane, citrus and other fruits, rice, beans, bananas, tobacco, coconut, coffee and cocoa (particularly in the Baracoa region).

Gender: Cuba's gender equality rates are amongst the best for the LAC region as made evident in the 2017 WEF Global Gender Gap Report that ranks it in the top 25th in the world. Women are represented equally amongst all sectors, occupying 53% of the seats held by in the National Assembly of People's Power (ANPP), the highest legislative body in the country, account for 60% of all higher degree graduates and 67.2% of technicians and professionals nationwide.³ However, despite these positive indicators, it should be noted that the primary sector provides an exception, indicating a high perception of masculinization within the rural sector and employment. Only 19% of forestry workers in Cuba are women (mainly in managerial positions) and only 18% of women participate in the agricultural

² ONEI (2012). Cuba National Census
³ Ibid

sector⁴. Further, while agrarian laws declare the equal right to land for both sexes, in practice many more men own land than women, as well as participate in cooperatives and hold managerial positions in local cooperatives.

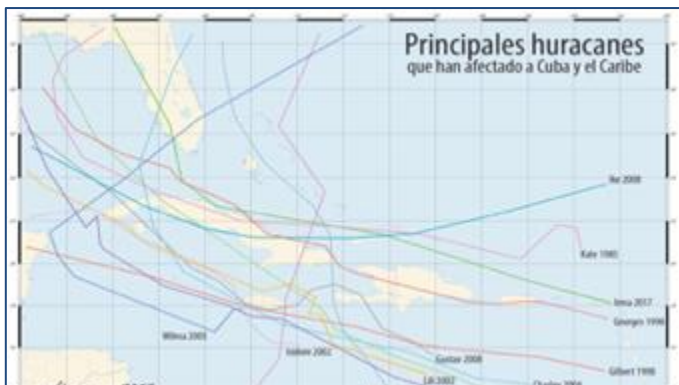


Figure 3: Map of paths of the major hurricanes that have hit the island of Cuba between 1985 and 2017

Climate: Cuba’s climate is tropical, seasonally humid, with maritime influence and semi-continental features. The mean annual air temperature varies from 26°C in the plains to 24°C in the mountainous areas. The average maximum temperature fluctuates between 27°C and 32°C, and the average minimum temperature between 17°C and 23°C (Insmet, 2018). The island’s tropical climate is moderated by trade winds and the surrounding waters; however, the warm temperatures of the Caribbean Sea and the fact that Cuba itself almost completely blocks access to the Gulf of Mexico, make Cuba prone to frequent hurricanes (See Figure 3).

Geography: The country has a distinct orography that includes extensive low land and coastal plains and mountainous inland territories. Mountains are concentrated

along a longitudinal axis of the country and play a fundamental role in its climatic characteristics. Plains represent 82% of the total area of the country, these include typical coastal and river plains; the lowest zones correspond to marshes, both coastal and inland. The geographical characteristics of the archipelago determine the direct relation between fresh and salty waters. Of particular significance for the management of water resources is the existence of a watershed boundary that runs through the main island’s longitudinal axis. This watershed fosters the formation of small basins with karst being predominant in deep aquifers; in many of them the karst develops from the surface of limestone massifs under which these aquifers lie. Karst processes are present in 67% of the national territory.

The **hydrological regime** of Cuba depends on the pattern of precipitation, combined with the geological characteristics of river basins, rivers and aquifers. The average annual rainfall for the period 1961-2000 stood around 1335 mm. Of the Cuban basins, 82% occupy areas less than 200 km² and the extension of the main river courses is less than 100 km. The exploitable hydrological resources are estimated at around 24 km³ per year, 75% of which correspond to surface water and 25% to groundwater.

Biodiversity: The coastal diversity in geomorphology and spatial distribution is responsible for the great biological diversity of the Cuban coastal fringe. The main coastal ecosystems on the Island of Cuba are cays (of sandy and reef origin), coral reefs, sandy or silt beaches in the cays or on the mainland, respectively, seagrass beds, mangroves and swamp forests and swamp grasslands. Mangrove forests are present in over 50% of the national coastline with an extension of 5.1% of the country’s surface area and account for 20% of the national forest surface area. Mangroves provide valuable services to the coastal areas in water management, including infiltration and purification, and provide buffering protection from storm surge in the form of wind and wave protection. A recent completed project funded by the Adaptation Fund in the areas of Artemisa and Mayabeque, demonstrated the role of mangroves in sediment retention and coastal stabilization as well as in reducing general salinity rates within target areas.⁵

Unfavorable conditions associated with human development such as poor physical planning and environmental management has contributed in the degradation of mangrove forests, particularly along mangrove coastal edges, that has resulted in marine penetration along the coastline and saline intrusion in groundwater. Mangrove loss due to coastal development continues to be a major threat in Cuba (Menendez Carrera, 2013), especially given the anticipated future increases in coastal tourism and tourism-related infrastructure that could further affect mangroves (Spalding et al., 2010; Suman, 2013; Lugo et al., 2014).

Cuba’s coral reefs are among the most diverse and best preserved in the Caribbean, growing along virtually the entire border of the Cuban shelf (>98%) and extending inshore across broad areas of the shelf. The continental shelf is 2,150 km long on the North coast and 1,816 km on the South. Inshore patch reefs are dispersed in the western Gulf of Guanahacabibes and the Gulf of Batabanó, as well as on the Eastern Gulf of Ana María-Guacanayabo. Reefs, however, have started showing signs of bleaching and degradation due to acidification that have been attributed to mangrove and sea grass degradation (including natural flows alteration, invasive species, water contamination).

⁴ Ministerio de Agricultura (2016). Estrategia de Genero del Sistema de Agricultura en Cuba. Gobierno de Cuba

⁵ CITMA (2020). Third National Communication of the Government of Cuba to the UNFCCC

Degradation of corals poses a threat to coastal resilience and protection. A recent study published by ECLAC with the support of the University of Cantabria estimated that coral reefs in Cuba provide annual protective services valued at USD 401million by reducing physical damage to some 76k m² that without the barrier effect of reefs would flood. Furthermore, if impacts from storm surge are included, reefs protect a coastal fringe of 1,398 km² from flooding, thus preventing an estimated 5 billion in physical damages.

Climate Change in Cuba: The climate in Cuba has experienced a rapid change, approaching projections made by the IPCC. Cuban research has estimated projections of warmer weather, with mean annual temperatures increasing by 1°C and annual mean minimum temperatures by 2°C within the next 20 years⁶. Meteorological observations have identified that the past three decades have been warmer than previous ones. In addition, while stable precipitation rates have been observed over the last decades, there has been an indication of increasing severe drought events over the last 20 years.⁷

CC will have a profound effect in Cuba, particularly in terms of water availability, increased vulnerability to extreme weather, coastal erosion and retreat, changes in agricultural and primary production patterns and crop viability and changes in critical ecosystems that currently provide valuable ecosystem services, such as water filtration and buffering capacity.

According to projections, flooding of coastal areas due to the impact of SLR will result into the flooding of 537,000 ha of forest land and 32,000 ha of active agricultural zones. Salinization will have significant impacts on soil agro-productivity, including estimated accumulated losses of 40,000 tonnes in harvests of fundamental crops (rice and sugar cane) and other various staple crops (tubers and roots), thus putting at risk the food security not only of the most vulnerable coastal communities,⁸ but also of the island as a whole. Shifts in temperature and precipitation patterns may also alter the total length of crop cycles affecting crop yields in basic staple crops such as rice and potatoes, while also having an impact in the reduction of agricultural areas lands due to water shortages for irrigation, increased salinization and soil degradation.

Coastal Flooding and Sea Level Rise: Cuba suffers from moderate to strong coastal flooding caused by SLR (meteorological tides) and periods of intense rainfall. Over the period of 1996- 2016, 12 flood events occurred affecting 134,957 people. Future climate projections indicate that mean SLR may reach up to 29.3 centimeters in 2050, and 95 in 2100; values that are in correspondence with the probable ranges estimated by the IPCC for the entire planet.⁹ This will result in a gradual but continuous reduction of large low land coastal plains; as well as the gradual salinization of inland aquifers due to the intrusion of the saline wedge of seawater.

The majority of Cuba's aquifers are open, with a free exchange of water with the sea thus making them highly susceptible to saline intrusion. In a scenario of drought, recharge of fresh water is limited which weakens the capacity to counteract saline water incoming from the sea. Also, during periods of sudden storm surges, the saline intrusion pushes its way further inward. During repeated and prolonged droughts without appropriate recovery, seawater enters the aquifer replacing fresh water, thus creating a layer of mixed (brackish) water and making it not apt for human or agriculture purposes.¹⁰

SLR is aggravated by the impact of extreme storms that result in

coastal flooding due to storm surges and peak astronomic tides. Between 2001-2017, the country has been affected by 12 hurricanes, 10 of which have been Categories 4 and 5. This trend is likely to intensify in the coming decades, as seen through the increase in intense storms observed across the Atlantic and related to the high temperatures observed in the Caribbean since 1998. Data from the National Office of Statistics and Information of Cuba¹¹ and quoted within Cuba's Nationally Determined Contributions, have shown that hurricanes and



Figure 4: Impact/ Danger of coastal flooding in coastal areas by combination of tropical cyclones and storm surge¹

⁶ Idem

⁷ Idem

⁸ Idem

⁹ CITMA (2020). Third National Communication of the Government of Cuba to the UNFCCC

¹⁰ Government of Cuba (2021). Green Climate Fund: Coastal Resilience to Climate Change in Cuba through Ecosystem Based Adaptation - "MI COSTA". May 2021.

Website: <https://www.greenclimate.fund/project/fp157>

¹¹ ONEI (2012). Cuba National Census

extreme weather events in Cuba have a great economic impact with losses from hurricanes in the period of 1998-2008 amounting to over USD 20.5 billion in damages.

The main areas with the greatest risk of flooding from hurricanes and associated storm surges are in the western regions of Cuba with large swathes of the southern coast at high risk (Figure 4).

If these projections are maintained, it is estimated that the land surface that would be permanently submerged by 2050

Table 1: Projected SLR in selected inland and coastal communities of Cuba (Source: Iturralde-Venet and Serrano, 2015)

Estaciones	Latitud N	Longitud W	Intervalo de tiempo registrado	Tasa de elevación del nmm (mm)
Siboney	23° 05.6'	82° 28.2'	1966-2005	2.14
Cabo Cruz	19° 50.4'	77° 43.7'	1993-2013	1.71
Guantánamo	19° 09.0'	75° 15.0'	1937-1971	1.64
Gibara	21° 06.5'	76° 07.5'	1976-2013	1.63
Puerto Padre	21° 12.1'	76° 36.0'	2002-2010	1.44
Bufadero	21° 33.6'	77° 14.2'	1992-2013	1.23
Punta de Prácticos	21° 36.2'	77° 05.9'	1992-2013	1.00
Los Morros	21° 54.0'	84° 54.4'	1973-2013	0.52
La Isabela	22° 56.4'	80° 00.8'	1973-2013	0.50
Casilda	21° 45.2'	79° 59.5'	1972-1995	0.05
Cayo Loco	22° 09.1'	80° 27.3'	1992-2013	- 0.21
La Coloma	22° 14.2'	83° 34.3'	1991-2001	- 1.21
Santiago de Cuba	19° 59.1'	75° 52.5'	1993-2013	- 1.95

would cover an estimated area of 2,691.47 km² equivalent to 2.4% of the national territory. With the same tendency, this could reach, by 2100, to 6,371.05 km² (5.8% of the territory).¹² These projections show that by 2050, some 14 human settlements would disappear and 41,310 people would be displaced. Table 1 presents the SLR projections for coastal communities throughout the Island of Cuba. Some sites, it can be noted, show a negative value due to continued geological processes near coastal communities.

Vulnerability maps that include water quality along the national hydrological network, estimate that there are currently 574 human settlements vulnerable to saline intrusion in the coastal aquifers of the archipelago.¹³

Sea level is rising and causing coastal erosion and saline intrusion with effects on livelihoods, ecosystems, infrastructure, coastal communities and the salinization of aquifers thus aggravating the problem of water availability. The area of Los Morros (target area

of the project) constitutes to one of the five points of the archipelago where SLR has been more evident in regular tidal measurements over the last five years, given its low elevation. As for the salinization of aquifers due to sea water intrusion, it is particularly evident in the South Zone of Pinar del Río-Artemisa -Mayabeque in Cuba, also located along the Southern Cuban Coastline.¹⁴

Precipitation Pattern Changes and Severe Drought: The average annual rainfall of Cuba for the period 1961-2000, was 1335 mm. This represents a reduction of over 38,100 million m³ with respect to the previously reported average annual rainfall of 1375 mm. However, a stable pattern of precipitation has been registered over the last decades with multi-year variation of precipitation anomalies over the period 1961-2017, reflecting a slight increasing trend in recent decades, although not statistically significant. In the dry season, despite the predominance of negative anomalies in recent years, the overall trend has also been observed, though not statistically significant.¹⁵ Projections, however, do indicate a general reduction in rainfall by 2070, with an average reduction in relative humidity between 2% and 6% by 2030 and 2070, respectively. Reduced rainfall is expected to occur during the rainy season in the summer. These changes coincide with an expected increase in wind velocity and a significant increase of potential evapotranspiration, suggesting a drier climate in the future.

The three most significant and severe drought events occurred during the periods of 2003-2005; 2009-2010 and 2014-2015. These events took place mainly in the Eastern Region and in some municipalities of the Central Region. The increased frequency of such events indicate that severe droughts periods may become more frequent thus having a significant impact on populations and ecosystems along Cuba's Eastern Region (where the project target area of Baracoa is located). The drought event of 2003-2005 has been the most critical meteorological event of Cuba in recent the last 100 years, since it threatened the livelihoods of more than two million people (17% of the entire population) by causing agricultural and livestock losses. It also facilitated the invasion and spread of alien species in ecosystems, such as the sickle bushes (*Dicostrachys cinerea*).

¹² CITMA (2020). Third National Communication of the Government of Cuba to the UNFCCC

¹³ Iturralde Serrano (2015). Peligros y vulnerabilidades de la zona marino-costera de Cuba: estado actual y perspectivas ante el cambio climático. CITMA. La Habana

¹⁴ Idem

¹⁵ CITMA (2020). Third National Communication of the Government of Cuba to the UNFCCC

Increased Temperature: An evaluation of climatic variation and change in Cuba carried out by the National Meteorological Institute of Cuba¹⁶, provides observation-based evidence that indicates that the climate in Cuba has become warmer, with all regions demonstrating rising trends. Mean annual temperature during the years of 1951-2017 has increased by 1.0°C (Figure 5).

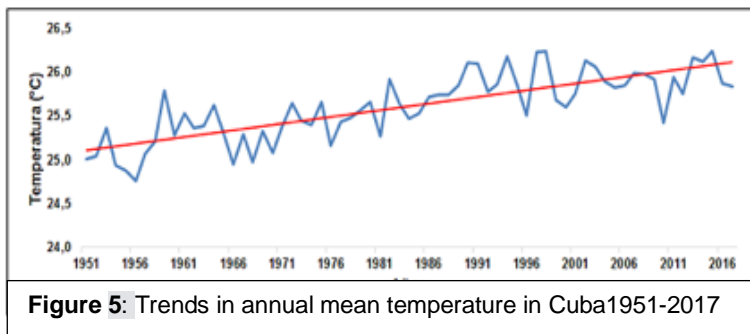


Figure 5: Trends in annual mean temperature in Cuba 1951-2017

Regional Climate Modeling, including the use of a large multi-parameter ensemble⁹, suggests that by the end of the 21st century, the climate in Cuba will be 1.0 °C and 3.5 °C warmer for the periods 2030 and 2070, respectively.

Target Areas in Cuba: The project has selected the coastal municipalities of Consolacion del Sur, San Cristobal, Batabanó, La Sierpe and Baracoa, as the target areas in Cuba. The criteria used for the selection of such sites include their vulnerability to SLR, their exposure to storms and hurricanes as well as the presence of valuable ecosystems that provide important ecosystem services and therefore can be linked to nature based adaptive solutions.

To assess risk and vulnerability to CC of the Cuban coastline, the GoC invested in a national coastline assessment of natural ecosystem protection from projected SLR and storm surge. The assessment identified coastal stretches with immediate risk and high potential for Ecosystem-Based Adaptation (EBA) actions related to coastal resilience. Target

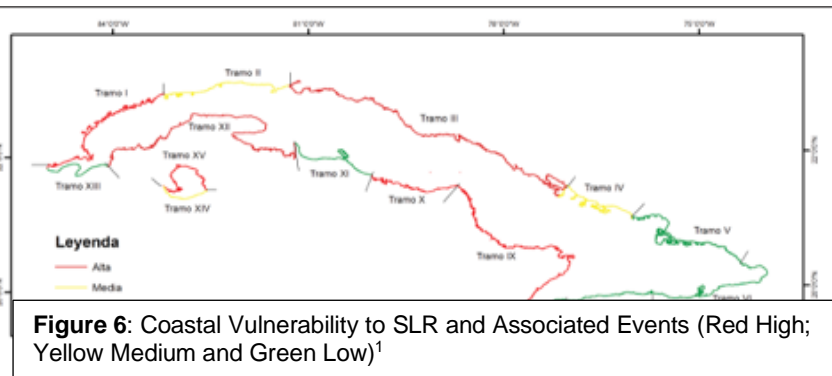


Figure 6: Coastal Vulnerability to SLR and Associated Events (Red High; Yellow Medium and Green Low)¹

municipalities prioritized through this project are located in coastal stretches V (Baracoa), X (La Sierpe) and XII (Consolacion del Sur, San Cristobal and Batabanó) (Figure 6).

High vulnerability coastlines have been identified as those located in low lying coasts where coastal flooding is common and where coastal ecosystems have been degraded thus providing reduced coastal protection. This is the case of the municipalities in Consolacion del Sur, San Cristobal, Batabanó and La Sierpe.

These southern coastlines are characterized by being low, subsident, swampy, cumulative and deltaic coasts hence highly prone to coastal flooding due to their low-lying nature. The municipalities have extensive areas of mangrove and flooded forest as well as a series of salt marshes (San Cristobal) and coastal lagoons of estuarine conditions (brackish) that are vital for a large number of species. The municipalities of Consolacion del Sur, San Cristobal and Batabanó hold important hydrological systems, which are important sources of water supply for human populations, such as the hydrographic basin of the Guama River.

The area also houses various coastal aquifers that have begun to be affected by saline intrusion. For example, in the areas around Consolacion del Sur and San Cristobal, a study developed on the hydrographic basin has indicated that the salinity line (1 gram/l of salts) has advanced in depth. Studies on coastal vulnerability rates indicate that marine intrusion along this coastline as a result of SLR and associated events could reach an average of 8.1 kms inland and a maximum of 47.2 kms in the case of a category 5 hurricane. Various communities have begun to feel the impacts of coastal erosion with some beaches along Batabanó having disappeared.¹⁷

These areas are also highly vulnerable to extreme storms. Hurricanes Lili (1996), Irene (1999) and Michelle (2001) produced extreme waves that hit the keys around Batabanó, and Hurricane Gustav (August 30, 2008) caused damage by high storm waves on the Southern coast of the municipality of San Cristóbal with penetrations of up to 5 km and wave heights in the Batabanó Gulf of 2.0 m to 2.5 m and sea water intrusion up to 2 km. Hurricane Charley (August 13, 2004) also produced damage by storm waves in the municipalities of Batabanó, temporarily flooding areas up to 2.0 km inland. Hurricane Irene (October 15, 1999) also affected the municipality of Batabanó with sea water flooding up to 1.5 km inland.

¹⁶ R. Pérez et al. (2009)

¹⁷ CITMA (2020). Third National Communication of the Government of Cuba to the UNFCCC

Mangroves in these areas have deteriorated due to anthropogenic impacts including extensive and unsustainable fishing practices as well as to agriculture pollution and direct uses of mangrove by the population. The impact on mangrove forests has in turn negatively impacted fishing-dependent livelihoods, as fish stocks have been reduced. Only some industrial and livelihood-based fishing remains in Batabanó. Artisanal oyster production has also been identified as a potential source of local livelihoods if mangroves can be properly restored.¹⁸ The elimination of mangrove has represented the loss of important natural barriers, thus further facilitating coastal erosion and marine intrusion into agricultural productive areas. Rice, root vegetables and banana production are significant in the target areas, with Pinar del Rio being amongst the most productive agricultural areas in the country¹⁹. A positive example, however, can be found in the outcomes of a prior Adaptation Fund project implemented near the area of Batabanó, that demonstrated the protective role of mangrove restoration in coastal stability and the recuperation of the coastline, thus evidencing the positive transformational role of nature-based solutions.

In the case of coastal stretch V, coastal vulnerability is categorized as low, yet it is still present. The municipality of Baracoa is located in an area highly exposed to progressive SLR and to wave impacts, hence it has been prioritized within the Government’s State Plan to Manage Climate Change “Tarea Vida”. As it can be seen in Figure 7, the coastline lies within a region vulnerable to coastal flooding by meteorological waves in the occurrence of tropical storms and hurricanes. Hurricane Ike (September 7, 2008) caused severe flooding in the municipality as a result of extreme meteorological waves of more than 6 m height that affected the city of Baracoa and surrounding areas.

About 95% of the total area of the municipality features small and low mountains. The remaining 5% is made up of a small coastal strip 2 km wide. The coast along Baracoa is bordered by a mountainous system, with a dense fluvial network that disseminate land-generated pollutants through runoff into the sea from agriculture (Coffee, Cocoa and Coconut) and livestock. Such sediments and organic pollutant not only affect mangroves but also reefs that lie close to the coastline.



Figure 7: Map of Coastal Stretch 5 (in red the Municipality of Baracoa, Black lines along the marine shore represent coral stretches, blue lines are rivers, grey shading depicts the marine platforms and the pink dots represents cities)

The municipality includes Alejandro de Humboldt National Park that has an extensive mangrove forest that constitutes an important natural barrier, as well as being the habitat of many estuarine, and the nursery area for many marine species. The insular platform along the coastline is narrow and fringed by coralline ridges, with a few keys and some bays that provide protection from intense wave activity (Figure 7). The stretch is particularly vulnerable, due to its exposure to trade winds and high impact waves.

SLR will have considerable effects as projected by 2100 in urbanized areas, loss of land, homes, networks, infrastructure and displaced people. Infrastructure and construction vulnerability is expected due to insufficient coastal protection against extreme hydrometeorological events. Greater effects on coastal vegetation and erosion of sandy beaches are also expected (most beaches have signs of moderate to intense erosion), affecting the availability and quality of water. Aquifers

located along Baracoa are open to sea and hence very vulnerable to saline intrusion. These currently present total suspended sediment rates of > 1 G/L²⁰.

Panama

Panama has an extension of 75,420 km² and a population of 4.2 million inhabitants. The country is divided into 10 provinces and 81 municipalities. It is bordered by coastlines along the Pacific to the West and the Caribbean Sea to the East. Its coastal littorals extend for 2,988.3 km, of which 1,287.7 km are on the Caribbean and 1,700.6 km on the Pacific. Hence, Panama has the highest coast/area ratio among the continental countries of Latin America. Based on

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¹⁹ Sanchez, Y (2020). Produccion de alimentos prioridad para Consolacion del Sur. Telepinar. <https://www.telepinar.icrt.cu/produccion-alimentos-prioridad-consolacion-del-sur/>

²⁰ Iturralde Serrano (2015). Peligros y vulnerabilidades de la zona marino-costera de Cuba: estado actual y perspectivas ante el cambio climático. CITMA. La Habana

its coastal exposure, it ranks 14th among the countries mostly exposed to multiple natural hazards, in relation to its land surface area. 15% of its total area and 12.5% of its total population are vulnerable to two or more hazards.

Geography: The country is predominantly mountainous with coastal plains chiefly on the Pacific side. The bulk of the territory is made up of lowlands that have resulted from the erosion of the mountain ranges. The Central Cordillera extends throughout the Isthmian territory, from the border with Costa Rica on the North, to the border with Colombia on the South, dividing the country into two physiographic regions: the Pacific (the most extensive one) and the Caribbean. 70% of the national territory is occupied by lowlands and hills located at less than 700 m above sea level, and is made up of the extensive plains of Chiriquí, Veraguas, the Azuero Peninsula, Coclé and the coastal plains of the Caribbean. The remaining 30% corresponds to lands above 700 m above sea level, which include the central mountain range.

Biodiversity: Panama boasts a high biodiversity (ranks 10th worldwide considering its size). Over 65% of its territory is occupied by primary forests, placing it amongst the countries with the highest percentage of forest coverage. Panamanian coasts are also among the most diverse in Central America, with a variety of marine ecosystems that includes mangroves, estuaries, sandy shores and 76 different types of coral species, 58 of which dwell on the Caribbean. These ecosystems provide an important protection from storms and coastal tides as well as other ecosystem services to coastal communities. Such ecosystems and their resources, however, have been seriously threatened by the pressure exerted by human activities including pollution (only 56% of households have access to a full drainage system with important regional disparities) and poor physical planning that has resulted in the construction of housing and public infrastructure along sensitive coastal areas.²¹

Climate: Panama's climate is tropical in nature with average annual temperatures ranging from 23-27°C in coastal and inland regions. However, temperatures can drop to 16°C at higher altitudes. Considering its geographical tropical position, historical temperature values reflect thermal uniformity among the different months of the year and locations within the country, with elevation being the principal factor for temperature differences.²² The country receives a large amount of rainfall with marked variations between its two physiographic regions (Pacific and Caribbean). Along the Caribbean, average rainfall is 3,000 mm per year, with no marked dry season, whereas on the Pacific, rainfall averages 1,500 mm per year, with a very marked dry season from December through March.²³

The country is particularly prone to climate variability with rainfall and temperature patterns being modified with sudden changes from year to year. The impact from El Niño-Southern Oscillation (ENSO) in both its warm and cold phase (La Niña) influences precipitation patterns according to its intensity. Impacts and modification of these climate patterns have an important effect on both the communities and economy of Panama. According to statistical and meteorological records, since 2004 an increase in the frequency of extreme events has been observed in the country, with hydro-meteorological events having affected mainly ecosystems and vulnerable populations.²⁴

Socio-Economic Vulnerability: In 2019 Panama ranked 67th (out of 189 countries) in the Human Development Index, placing it amongst the highest in the LAC region. While it has progressed in reducing poverty, the country remains highly unequal with marked differences between urban and rural populations, thus making rural areas highly vulnerable. The rural population accounts for 33% of the national population with poverty rates estimated at nearly 40% versus 9.3% of poverty rates in urban areas. The average national poverty rate in 2019 was 20.7%. Economic vulnerability in rural areas can be attributed to climate vulnerable livelihoods such as fishing and agriculture ones, with extreme natural phenomena such as el Niño, tropical storms, hurricanes and droughts.

Rural economies are mainly dependent on the primary sector as a main source of employment, accounting for 14.4% of the employment at national level, despite its limited contribution to the national economy (2.7% of GDP). It should be noted that the majority of primary producers in Panama are men, only 9% of women are employed by the primary sector²⁵. According to FAO, over 63% of producers in Panama are reliant on family agriculture, and this accounts for 70% of all the rural livelihoods of the country.²⁶ Fishing is also an important activity not only for community livelihoods but also in valuable exports that generated 128 million USD in 2019.²⁷ The majority of all fishing exports (commercial

²¹ International Organization Forest of the World (n/d). *Forest of the World in Panama*. May 2021. Website: <https://www.forestsoftheworld.org/programme/panama>

²² Global Water partnership (2011). *Actions 2011: GWP in Central America, Working together for a sustainable water management*. March, 2021. Website: https://www.gwp.org/globalassets/global/gwp-cam_files/acciones2011.pdf

²³ Global Water Partnership (2015)

²⁴ Government of Panama (2017). Adaptation Fund project: "Adapting to Climate Change through integrated water management in Panama. March 2021. Website: <https://pubdocs.worldbank.org/en/648441532335502221/3059-FN-REQUEST-FOR-PROJECT-January-2017-VF-VC-clean-6feb-17.pdf>

²⁵ *Ibid*

²⁶ FAO (2019). *Family Farm Review*. June 2021. Website: <http://www.fao.org/3/cb4184es/cb4184es.pdf>

²⁷ SICA, 2021

fishing) takes place in the Pacific area with the Caribbean area being mainly focused on artisanal fishing for the local market.

Gender and Vulnerable Populations: Panama’s population, as per its 2018 Census, stands at nearly 4.2 million, with women representing 49.8% of the population. The society in Panama is highly diverse and includes both a strong indigenous population that makes up 12.3% of the population.²⁸ Women and indigenous population, particularly those residing in rural areas, have been identified by the Government of Panama as especially vulnerable to CC due their reduced capacity for adaptation that can be attributed to high poverty levels, high underemployment, reduced income levels and reduced access to economic assets that are important for primary production such as land.²⁹ Only 28% of women primary workers have access to land and the majority of them do not have a deed or a proper title of ownership³⁰. These inequalities suggest a situation of feminization of poverty³¹. Panama’s Gender Inequality Index averages at 73 indicating a high level of gender inequality in the country, particularly as it relates to indigenous women whose gender inequality rate is 0.87 vs the country’s 0.58 for non- indigenous areas. This pronounced difference can also be attributed to extremely high levels of multidimensional poverty for indigenous women: 93.7% of the Gunas women, 89.8% of the Ngäbe Buglé women and 70.9% of the Embera women have been classified as poor.³²

Climate Change in Panama: According to the National Climate Change Strategy 2050, the main effects associated with CC include risks from SLR and extreme hydro-meteorological events. These impacts will result in flooding of coastal plains of both littorals as well as from extreme precipitation events particularly along the Caribbean Central and Eastern Regions (Figure 8). Coastal risk modeling tools suggest flood scenarios in 2050 for critical areas of the canal operation in Panama City as well as for other areas of the country.



Figure 8: Climatic Regions of Panama and National Expected Scenarios 2050 (Western Caribbean Areas facing reduced precipitation in green. Central Region facing increased precipitation in blue. Eastern Caribbean Region facing increased precipitation in red. The Pacific Western Region facing reduced precipitation in turquoise. The Dry Arch Region facing increased precipitation in orange and the Eastern Pacific Region facing increased rainfall in light green)

The recurrence of periods of drought in recent years and the significant losses that they have generated in the agricultural sector (USD100 million losses in the sector only in 2013) have made CC one of the main concerns of the Panamanian agricultural sector. Mapping agricultural vulnerability has indicated national scale vulnerability to CC with the coastline along the Caribbean identified as highly vulnerable.

Coastal Flooding and Sea Level Rise: Satellite data analysis for the period 1992-2012 indicate an average increase in sea level of 1.8 mm per year, which is equivalent to an increase of 3.65 cm over the 20-year period. Due to the level of exposure, SLR has become a particularly relevant threat to the Western Caribbean region of Panama, especially in Costa Abajo de Colón, located within the municipalities of Donoso and Chagres. According to regional models, the climatic scenarios for the Western Caribbean of Panama rise of the sea level, coastal erosion, marine intrusion and prolonged



Figure 9: Agricultural Vulnerability to CC (green lower vulnerability, yellow medium vulnerability, red high vulnerability)
Source: Bouroncle C., Imbach P., Laderach P., Rodriguez B. Medellín C., Fung E. (2014). *Panama Agriculture and climate change: Where are adaptation priorities?* June 2021, from CGIAR, International Tropical

²⁸ Ministry of Environment (2020) . Nationally Determined Contributions. Government of Panama. p21

²⁹ UN Women (2020). June 2021. Website: <https://data.unwomen.org/country/panama>

³⁰ NEC. *Censo Agropecuario 2010*. Volumen VII. Enfoque de Género. Panamá

³¹ Ministry of Environment (2020). Nationally Determined Contributions. Government of Panama. p23

³² Ibid p.23

flooding are expected along the coastal zone.³³ A similar situation occurs in the Central Climatic Region that includes the municipalities of Portobelo and Santa Isabel, whose expected climate impacts include the rise of sea level, an increased recurrence of strong inward winds and prolonged storm-derived flooding with impacts on the rainwater system and port facilities.

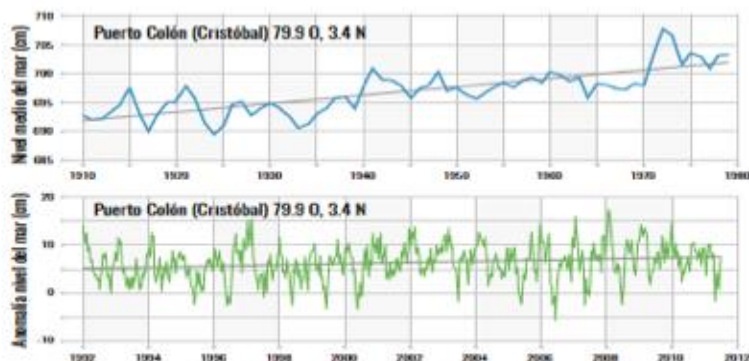


Figure 10: Relative Changes in SLR between 1909-1979 (blue line) through oceanographic data and absolute SLR between 1992-2012 (green line) estimated through satellite images in Puerto Colon

In Panama, floods are a consequence of high rainfall caused by extreme events and large amounts of sudden precipitation that surpass the natural draining capacity. Moreover, because of the widely scattered mountainous terrain, flash flooding and landslides are increasingly common. On December 8, 2010, the storm La Purisima brought a historic maximum recorded value of precipitation over a 24-hour period in the Panama Canal Watershed of 292 mm and the second record occurred during the passage of Hurricane Otto, in 2016, with 183 mm of accumulated precipitation over a 23-hour period.³⁴

Precipitation Changes: In the case of Panama, a relative reduction of accumulated precipitation is

expected, particularly during the influence of El Niño³⁵. CC scenarios, as demonstrated in the Third National Communication on Climate Change, have allowed to visualize and indicate a significant reduction in precipitation towards different time horizons.

While it is not yet possible to gain a clear picture of annual precipitation change due to large model uncertainties, GCM projects changes in national dry season rainfall from -7% to +7% by 2020, -12% to +5% by 2050 and -20% to +9% by 2080. What is clear, however, is that future climate will increase variability and intensity of extreme events. Under one particular downscaling study (PRECIS), extreme precipitation events (greater than 40 mm per day) are expected to increase by as much as half under the A2 emissions scenario³⁶.

The districts of Donoso and Chagres, located within the Western Caribbean Climatic Region, will face significant changes based on national climatic scenarios model that indicates negative changes in precipitation accompanied by an increased frequency of meteorological phenomena that will result in increased flooding and landslides. The municipalities of Portobelo and Santa Isabel, located within the dry Central Climatic region, will face increased extreme precipitation events, which will result in increased flooding and landslides similar to those experienced in 2010 during the “La Purisima”³⁷.

Increased Temperature: Climate change scenarios for Panama point to a potential increase in temperature with temperature changes in recent years already showing an increasing trend despite climate variability. In the case of the maximum values, in recent decades, the average value has increased by around 1°C and 2°C in the months of March and April, climatically considered the warmest ones.

Target Areas in Panama (District of Colon): Colón is one of the 10 provinces of the Republic of Panama. It lies along the Caribbean Coastline with the northern section of the Panama Canal located in its territory. Its territorial extension is 4,868.4 km² with a total population of 294,060 inhabitants (2019). The province is comprised of 5 municipalities (Colón, Chagres, Portobelo, Donoso and Santa Isabel) (Figure 11), with 4 of these (Portobelo, Chagres, Donoso and Santa Isabel) being highly rural with a low population density. Together, these 4 municipalities have a population of 32,891 inhabitants, representing 11% of the total provincial population.

The Human Development Index (HDI) of the Province of Colón was 0.770, below the country's average. Donoso and Chagres are the municipalities with the highest levels of extreme poverty. The main economy of the province is linked

³³ IPCC. (n/d). *Sea Level Rise and Implications for Low-Lying Islands, Coasts and Communities*. June 2021, de IPCC Sitio web:

<https://www.ipcc.ch/srocc/chapter/chapter-4-sea-level-rise-and-implications-for-low-lying-islands-coasts-and-communities/>

³⁴ Ministry of Environment (2019). *Third National Communication of Climate Change of Panamá*. Government of the Republic of Panama. 232 p

³⁵ Ministry of Environment (2019). *Third National Communication of Climate Change of Panamá*. Government of the Republic of Panama. 232 p

³⁶ Vulnerability, Risk Reduction, and Adaptation to Climate Change, Panama. Climate Risk and Adaptation Country Profile. World Bank. 15 p

³⁷ https://www.prensa.com/impresia/panorama/madre-lluvias_0_3538896143.html

to trade and commerce with 27,500 employments, followed by transportation, warehousing and logistics, which create more than 20,000 jobs associated to operations in the Panama Canal, mostly in the highly urban Colon municipality. There is a high concentration of employment in the service sector and in the more urban districts of Colon (83% of those occupied) and Portobelo (68% of those occupied).

An estimated 12,041 agro-producers have been identified in the province of Colon per Panama's 2011 Agricultural Census, mainly located in the municipalities of Chagres, Donoso and Santa Isabel where the agricultural sector is the main source of employment (46%, 54% and 31%, respectively). In these rural areas, productive activities are linked to agriculture, livestock, fishing and nature-based tourism (Portobelo and Santa Isabella), all of which are highly climate sensitive. The majority of agricultural producers are organized through family farms (nearly 50% less than 0.1 ha) that produce three-edged coconut, banana, cacao, lowland coffee and yucca, hence depend on their crops not only as a source of income but also as a pillar of their food security. Nearly a third of all agricultural producers depend on home gardens to complement food security and 63% of farms have stated they have not been beneficiaries of extension information support for their productive activities³⁸. Associative capacity in the region is low with only 13 cooperatives identified in the province³⁹. Artisanal fishing is also widely practiced, and the main target species include spiny lobster, snapper, grouper, and cherna, which are sold in local markets.⁴⁰

These activities depend entirely or partially on natural resources and ecosystems, and are the basis of the majority of livelihoods and food security of the population. Fish production depends on wild stocks and hence their abundance and distribution are a result of the natural productivity and the health of marine and estuarine ecosystems, including in mangrove forests located within the target areas. Most small-scale fishing is practiced in such ecosystems. These habitats are highly susceptible to the repercussions of the SLR, especially when unplanned development has affected coastal ecosystems and their function. Due to their low mobility, small-scale fishers are often not in a position to adapt and follow the species that have modified their zones of distribution in response to CC. Some adaptation actions and strategies for artisanal fishermen due to the SLR and to the damage caused by intensifying storms may include EBA measures, such as wetland rehabilitation and improving information systems that integrate and share knowledge from different coastal sectors whereby appropriate strategies are planned.⁴¹

As for the agricultural sector, coconut production is an important source of livelihoods for the coastal population of Donoso and its harvesting mainly relies on rudimentary methods practiced throughout generations. **Coconut productivity is sensitive to temperature and precipitation**, with extremely high temperatures resulting in reduced pollination/germination rates of the coconut fruit as well as creating favorable conditions for plagues and diseases⁴². In Donoso, the coconut industry has faced recent challenges from reduced coconut prices and productivity losses due to diseases to the coconut tree. To increase coconut production, the Ministry of Agriculture has begun to pilot some agroforestry production with coconut with efforts having to be put on pause as a result of COVID 19 mitigation measures. Consultations with coconut producers have emphasized the importance of the industry to local culture and cuisine as well as identifying a concrete need for greater technical assistance in coconut production.

An additional threat to agriculture development occurred in recent years, is represented by the loss of cultivated areas due to changes in land use and land acquisition by large housing and tourism companies. In the Portobelo municipality, this has further impacted coastal ecosystems and various communities have witnessed the loss of beaches due to rising tides particularly along the areas of Puerto Lindo.⁴³

The Colon Regional Development plan includes a food security plan, as well as a number of supporting actions for small rural producers to help them improve their competitiveness and to foster innovation and integration of small-scale and industrial scale producers. A key consideration of the plan is the need to reduce environmental impacts by focusing on an adaptive and resilient agriculture. While a potential for alternative and adapted livelihoods has been identified through improved productive practices (e.g. the promotion of a circular economy for coconut, promotion of apiculture and agroecological systems) and the promotion of new touristic activities such as sports fishing, little investment and knowledge exists at the local producers' level to detonate the major change needed to increase sustainability. In addition, when consulted, communities have indicated the need for the construction of sea walls and

³⁸ Agricultural Census (2011). INEC. https://www.inec.gob.pa/publicaciones/Default3.aspx?ID_PUBLICACION=443&ID_CATEGORIA=15&ID_SUBCATEGORIA=60

³⁹ Séptimo Censo Agropecuario de Panamá (2011). <https://www.inec.gob.pa/archivos/P4431Cuadro%2001.pdf>

⁴⁰ Camargo I., Bieberach C., Villalobos A. & Alvarado P.. (2016). The State of biodiversity on food and agriculture in Panama. Panama: s/d

⁴¹ Daw T., Adger N. & Brown K. (s/d). Consequences of climate change for fisheries and aquaculture: an overview of the current state of scientific knowledge., from United Nation Food and Agriculture Organization website: <http://www.fao.org/3/i0994s/i0994s02.pdf>

⁴² Ranasinghe. Climate Change Impacts on Coconut Production and Potential Adaptation and Mitigation Measures: A Review of Current Status. Proceedings of the Workshop on Present Status of Research Activities on Climate Change Adaptations (Ed. B. Marambe), pp 71-82. Sri Lanka Council for Agricultural Research Policy, Colombo and Ewing Cho. "Climate Smart Coconut Agriculture could be the Caribbean's Tree of Life" *Forbes Magazine*. Nov 17, 2019

⁴³ Government of the Province of Colon. Management plan of Portobelo National Park 2013-2022

hard infrastructure for protection against extreme tides, without consideration of the resulting ecosystem fragmentation nor the alternative for ecosystems-based protection measures.

The potential of forest resources in CC adaptation is also a key feature of the target areas. Over half of the territory in the Colon Province is made up of forests, including protected areas such as Portobelo National Park. Protected areas play a key role in both climate effects mitigation and adaptation and in maintaining essential ecosystem services. Conservation of forests and other relevant ecosystems is one of the crucial adaptation measures that should be regarded as top priority to secure land and water within forested and protected ecosystems.⁴⁴

Mangrove forests are found along the coast of the Colon Province, covering an estimated surface of 466.55 ha and located within protected natural areas (Portobelo National Park), and extend to areas with greater saline influence at the mouths of some rivers (Rio Indio located in Chagres). While the area of Portobelo has maintained healthy mangrove forests, studies have indicated pressure to forest health as a result of anthropogenic pressure, particularly around Punta Farnesio, Playa Blanca and José Pobre. These mangrove areas have been altered mainly due to poor physical planning along the mangrove ecosystem (buildings located along the shoreline).

The marine area around Portobelo National Park contains coral reefs with elements of platform and the slope with an almost continuous distribution along the coast. The average depth reached by the reef slope to the sandy bottom is usually around 10 m, although there are small patches at a depth of 15 m. Coral reefs provide important buffering services particularly in areas subject to intense wave energy that is particularly acute during dry season (December-April) due to the influence of north and northeast winds and currents. Degradation and bleaching of corals, particularly around the Bay of Portobelo, have been evidenced and mainly attributed to the strong sedimentation⁴⁵ that may be aggravated as a result of intense rainfall as projected in climate scenarios. Coral reefs have also been affected by overfishing including underwater fishing and the use of chlorine for octopus fishing⁴⁶.

National Capacities to Manage CC in Panama and Cuba

As evidenced above, both Panama and Cuba are facing a wide range of CC impacts that will affect local livelihoods and agricultural productivity, including progressive SLR, increased temperature and altered precipitation patterns. While impacts will be felt nationally, rural coastal communities will be mostly at risk due to their higher vulnerability aggravated by high levels of poverty and the high dependency of primary sector livelihoods. For these communities correctly assessing these impacts will be paramount to allow for the implementation of adaptation strategies that will result in adapted livelihoods and the incorporation of climate smart productive practices to allow for resilient local development and food production.

Both countries have prioritized CC adaptation in their national development agendas and have introduced a series of government actions including the Política Nacional de Cambio Climático (National CC Policy) in Panama and the State Plan for the Management of Climate Change in Cuba (“Tarea Vida”). Both countries have also developed sectoral analysis at a national level of climate change impact on agriculture and water resources. Cuba, in particular, designated target sectors within their NDCs for the adaptation action. The NDCs for both countries have also identified ecosystems-based adaptation solutions as key in achieving mitigation targets.

Climate change impact and disaster risk management are core elements in national planning; however, capacities and social awareness at a local level are still weak. Upon consultation with municipal governments and local producers, there is evidence that very little specific information and knowledge exists at community level on the nature of CC impact and more importantly on the potential adaptation actions that need to be taken. This is a key gap when it comes to implementation action at a local level since municipal governments are the responsible institutions in charge of municipal planning and land use management, fundamental for the protection of valuable ecosystems and their protective services. Local producers whose livelihoods will be directly affected, on the contrary, lack the skills and knowledge required to manage climate impacts and too often recur to traditional and unsustainable agricultural practices to compensate for lost productivity thus paradoxically increasing their vulnerability to climate impacts.

For most local governments, the value of coastal ecosystems remains an intangible asset, dissociated from the climate impact that their communities are already experiencing through diminished livelihoods, reduced access to natural resources such as water, lower productivity and more frequent extreme weather events. In both Panama and Cuba, business as usual solutions to climate impact are preferred as witnessed by initial consultations, which favored the building of seawalls or protective grey structures as the only adaptation solutions.

⁴⁴ Ministry of Environment. Climate Vulnerability index of Panama. 2021

⁴⁵ Government of the Province of Colon. Management plan of Portobelo National Park 2013-2022

⁴⁶ Idem

Local governments are not yet fully aware of the long-term impacts that CC may have on local economies and agricultural productivity. While a sense is beginning to emerge as seen through the Colon Food Security Plan, the links at a practical level remain missing and made tangible. Information regarding sustainable agricultural and fishing production needs to be internalized and made available to vulnerable primary producers to ensure that plans are actionable. Barriers in this sense are not only in human capacity but also in technical knowledge that can motivate appropriate action and facilitate upscale.

Regional Approach: A regional approach including Cuba and Panama, differently from a country intervention, will allow for the implementation of innovative accounting measures to evaluate loss and damage to slow onset climate impacts across two similar settings while allowing room for experimentation of on-the-ground actions to reduce climate induced loss that will inform both counties while being applicable to wider regional context in the Caribbean region.

The bilateral mechanism that will be formalized through the project will mobilize bilateral support and knowledge transfer on these accounting measures as well as in the implementation of adaptive practices in similar environments while providing an opportunity for the systemization of best practices and lessons learned. Hence components 2 and 3 that favor local implementation of concrete adaptation options in the form of Nature-Based Solutions (NBS) and adapted livelihoods will inform and be evaluated for their capacity to increase local and sectoral resilience through the use of the loss and damage methodology while promoting cross learning in both countries that will also be favored by having access to regional level expertise that will be provided by the project. Cross cooperation across agricultural and fishing productive associations in both countries will also be favored through exchanges and South-South Cooperation mechanisms in keeping with the project's approach for Farmer Field Schools (FFS) that allows for learning by implementation that is made feasible in a bilateral context considering similar productive ecosystems. Inclusivity of local actors in bi national knowledge exchange and in implementation is a key aspect of the project as these actors are often unaware of international best practices and of relevant local knowledge that has been gained in a regional setting across similar contexts. A regional approach also ensures that knowledge that will be derived by the project (including local knowledge developed) will have the scale necessary to be relevant to the wider Caribbean region which houses similar ecosystems and also faces a high risk to slow onset climate impacts. FAO's Loss and Damage Methodology for Agriculture will be instrumental in systemizing this information and disseminating it within a larger setting while incorporating lessons learned from on the ground implementation and its use as a tool for local adaptive planning in the face of slow onset pressures.

This piloting approach has been prioritized first for Cuba and Panama considering a long tradition of cooperation on environmental and productive management as well as cultural and language similarities in addition to similar ecosystems and climate challenges that facilitate project implementation. Consideration of both projects also takes into account lessons learned on EBA such as mangrove restoration and on livelihood diversification and circular economy practices that have begun to be explored by both countries and have been included within NDCs. Lessons learned in the use of loss and damage methodology for adaptation and structures created through the project (including interlinked FFS) however will allow for simple replicability and relevance (by not being country and site specific) to the Wider Caribbean region. The project foresees the exchange of information through regional organizations to which both Cuba and Panama are party to including the Association of Caribbean States (AEC) and the Community of Latin American and Caribbean States (CELAC) that contain directorates and common positions for disaster risk reduction to address common climate challenges. Cuba also has a long trajectory of providing cooperation and technical assistance on disaster risk reduction and climate change management within the CARICOM community that will include results developed through the project. Panama through its participation within the Integration System for Central America (SICA) and its Environmental commission (CCAD) will be able to provide inputs from project results to be shared within the wider Latin American Region, particularly to those countries with a Caribbean coastline (Honduras, Guatemala, Nicaragua, El Salvador and Costa Rica).

B. Project / Programme Objectives:

Long term solution:

With current climate scenario, both Cuba and Panama need to implement adaptation measures to face CC challenges, reduce vulnerability, and strengthen the resilience of communities and their livelihoods while protecting sources of local food security and livelihoods that have already been affected as a result of CC. Solutions need to incorporate existing local strongholds across the wider Caribbean, such as coastal ecosystems, to enhance resilience while ensuring that local capacities are sufficient to understand climate change impacts as they will affect local economies and food productivity through consistent methodologies that can correctly estimate and project damages and losses in the face of slow onset hazards.

Current barriers to meet this objective and that will be addressed by the project include:

- **Lack of local awareness by communities and local government of tangible impacts from CC to economies, agricultural productivity and rural based livelihoods.** Although impacts have been largely experienced, they have not been associated necessarily to CC, particularly in the case of slow onset and progressive changes such as SLR and increased temperatures. This in turn has created a lack of local capacity in the creation of policy frameworks, regulations and plans that promote adaptation to CC in territorial planning including the favoring of NBSs for managing climate impacts and ensuring local food security.
- **Lack of understanding and knowledge of the environmental services generated by priority ecosystems for adaptation and resilience to CC and strengthening of food security.** Lack of awareness of the role of ecosystems in managing climate impacts has generated a negative reinforcement whereby producers feel the need to extend productive areas at the expense of ecosystems or continue implementing unsustainable practices that increase degradation and climate vulnerability without necessarily increasing agricultural production. This is often a result of a lack of national mobilization across sectors who fail to understand the tangible impacts of climate change to economies and agricultural productivity. At a government level this results in limited financing for potential local adaptation measures and investment for protection and restoration of key ecosystems. Hence investment in what seems like environmental issues is often considered as a nice to have rather than a critical investment for local economies and agricultural productivity.
- **Limited capacity in the development and implementation of tools and sustainable production practices to contribute to diversification and improvement of the resilience of production systems to CC effects.** Consultation across both countries demonstrated a need for improved technical assistance to manage climate change impacts to agricultural productivity in specific crops and environmental conditions. Innovations in agroforestry for coconut, including intercropping and tiering, have increased the resilience of trees to diseases, increased productivity and carbon sequestration as well as water capture. Regenerative aquaculture can provide diversified income opportunities to local communities when correctly managed while protecting mangroves. Such innovations are not generally applied in the target areas particularly by small scale producers as local actors are often unaware that these exist. Rice varieties that are more tolerant to saline conditions can also be implemented while identifying potential thresholds in line with projections. Methods to decrease water footprint in agricultural productivity, promote the use of elevated beds and reduce the reliance on biofertilizers can also provide support to shifting precipitation patterns while reducing the risk for ecosystem degradation in the case of flooding and drought.
- **Lack of access to knowledge of relevant regional best practices and lessons learned to allow for upscaling and local implementation of adaptation measure and to ensure food security.** Bilateral cooperation mechanisms to bring innovations on technical issues related to CC are limited and often only mentioned within broader cooperation arrangements that fail to materialize into localized actions.
- **Local governments and producers are often crowded out of knowledge exchange.** This creates a disconnect between national ambition and local actions that are required to tangibly increase resilience. In the case of coastal ecosystems innovations in mangrove restoration, oyster cultivation and the use of agroforestry have created some local capacity within the Caribbean that is often times not shared nor provided an opportunity for proper upscale across the Wider Caribbean and hence remain localized pilots only applicable to specific national settings.

Project Objective:

This project will implement strategic actions to strengthen the adaptive capacities of coastal communities in Cuba and Panama to perform ecosystem-based adaptation and risk reduction practices linked to local sustainable food production and the protection of agricultural and fishing based livelihoods for local food security in the face of slow onset climate hazards. The implementation of a loss and damage methodology to better assess impacts to slow onset hazards will be used and integrated to allow local governments to better judge the tangible impacts of climate change to local food security and develop concrete adaptive measures (across multiple levels) to reduce potential losses while creating an opportunity to use this methodology in real time and in two similar scenarios to allow for its evaluation as a tool for disaster risk management and adaptation in the Wider Caribbean region.

This will be achieved through the project's three components and outcomes.

- **The first component** will establish the enabling actions to effectively measure and project loss and damage from sea level rise and increasing temperatures in the face of coastal pressures. Establishing baselines will allow the project to monitor long-term impact while also project future losses as sea level rise and temperatures continue to increase per climate projections, calculating lost potential agricultural and fishing productivity and

its effects on livelihoods and local economies hence making climate change a tangible issue to governments, productive associations and communities including international and regional knowledge networks.

- **The project’s second component** will be focusing on assessing coastal ecosystems in target sites in both countries as measures for resilience for agricultural and fishing productivity and will implement, through the use of interlinked FFS, ecosystem recovery and rehabilitation as nature-based solutions for food security and resilience. Sharing similar ecosystems will favor experimentation in implementation across different settings and communities (local contexts) for upscale and systematization and will be favored through the interlinkages created among the 9 coastal municipalities.
- **The project’s third component** will adopt sustainable productive practices and develop diversified and resilient livelihoods for coastal communities in the 9 target sites. Actions will include the identification and implementation of adaptive agricultural productive measures and inputs for coconut and rice harvesting as well as to fishing activities. Focalization of specific activities will be done by providing investments (grants to small scale producer organizations and productive associations) and technical assistance through an FFS approach where local producers, have the opportunity to learn by in field implementation. Selection of beneficiaries will be done by focusing on those most vulnerable and ensuring inclusive approach for women and minority populations.

Implementation of actions across the project’s second and third component will be evaluated through the project’s first component to measure the impact of adaptive measures as factor for enhancing long-term resilience to slow onset hazards and will be incorporated within the loss and damage methodology. The bilateral cooperation mechanism will result in facilitating knowledge exchange at various levels (government, sectoral, community) as well as shared capacities for development of informational products. The interlinkages of farmer field schools among the target sites will also address a key barrier to local communities, particularly small-scale producers, that are often locked out of regional knowledge exchange mechanism and hence are not able to implement known innovative measures for enhancing resilience and protecting productive capacity, much less through the leadership of similar producers facing similar challenges.

The project’s outcomes and outputs will be aligned to those of the Adaptation Fund as exemplified below:

Table 2- Alignment of Project and Fund Outcomes

Project Objective(s)	Fund Outcome	
Implementing strategic actions to strengthen the adaptive capacities of coastal communities in Cuba and Panama to perform ecosystem-based adaptation and risk reduction practices linked to local sustainable food production and the protection of agricultural and fishing based livelihoods for local food security in the face of slow onset climate hazards.	Outcome 3: Strengthened awareness and ownership of adaptation and climate risk reduction processes at local level Outcome 5: Increased ecosystem resilience in response to climate change and variability-induced stress	
	Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	
Project Outcome(s)	Project Output	Fund Output
1.1. Loss and damage of agricultural and fishing productivity methodology implemented in 9 target coastal municipalities in the face of slow onset climate impacts	Policy frameworks that incorporate management plans of projected loss and damage to food productivity in target sites due to SLR <ul style="list-style-type: none"> • Development of 9 Participatory Adaptation Plans at the Municipal Level and 9 Participatory Risk Management Plans with Specific Adaptation Actions for Food Productivity (informed by the projected loss/damage analysis) that will be implemented through actions Components 2 and 3 	Output 1.1: Risk and vulnerability assessments conducted and updated

1.2. Damage and Loss Information Systems for slow onset climate hazards institutionalized at a sectoral and local level and shared binationally for monitoring and evaluation and adaptive planning	Development and operation of a Damage and Loss Information System for Agriculture and Fishing Production in Cuba and Panama to continually evaluate loss and damage and resilience (through adaptive actions) Capacities created in both countries for cooperation and use of the information system to develop regional, sectoral and local information to guide adaptation actions and evaluate resilience gained as a result of adaptive investments to manage impacts from slow onset hazards.	Output 3.2: Strengthened capacity of national and subnational stakeholders and entities to capture and disseminate knowledge and learning
1.3. Best practices and lessons learned in assessing loss and damage methodologies for slow onset hazards systematized as a tool for adaptation planning and risk management to food security and agriculture- and fish-based livelihoods	Tools and strategies developed for local adaptation action derived from the project including in field implementation	Output 8: Viable innovations are rolled out, scaled up, encouraged and/or accelerated
2.1. Nine Municipalities manage critical ecosystems, through EBA measures, increasing the resilience of their communities, livelihoods and local food security	Number of hectares of better protected priority ecosystems. Number of hectares of priority ecosystems recovered (reforested, restored, enriched).	Output 5: Vulnerable ecosystem services and natural resource assets strengthened in response to climate change impacts, including variability <ul style="list-style-type: none"> Through the implementation of nature-based solutions that will reduce pressure on ecosystems including conservation and restoration.
3.1. Climate-smart agricultural and fishing productive technologies and methods adopted by local producers to improve the long-term sustainability and productivity of traditional livelihoods in the face of climate impacts	Number of producers implementing adaptive productive practices (gender disaggregated)	Output 6: Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability <ul style="list-style-type: none"> Through the infield implementation of adapted techniques and methods for local fishing based and agro-productive livelihoods.
3.2. Diversified-EBA compatible livelihoods identified and supported for agricultural and fishing dependent households	Number of diversified productive practices introduced per target site and producers implementing these (gender disaggregated)	

Project / Programme Components and Financing:

Table 3: Project Components

Project Components	Expected Outcomes	Expected Outputs	Countries	Amount (US\$)
1. Local planning and cooperation in 9 coastal municipalities to reduce fishing and agricultural productive loss and damage from slow onset hazards in Cuba and Panama	1.1. Loss and damage of agricultural and fishing productivity methodology implemented in 9 target coastal municipalities in the face of slow onset climate impacts	1.1.1. Identified adaptation measures considering projected losses from sea level rise and temperature increases to food security and local livelihoods derived from implemented loss and damage methodology 1.1.2. Participatory plans formulated for adaptation to CC and natural risk management in the identified municipalities with a focus on reducing losses in agricultural and fishing productivity and livelihoods for resilient local food security.	Cuba and Panama	2,100,000
	1.2. Loss and Damage Information Systems for slow	1.2.1. Damage and Loss information system for agricultural and fishery products to manage impacts of slow onset climate	Cuba and Panama	

	<p>onset climate hazards institutionalized at a sectoral and local level and shared binationally for monitoring and evaluation and adaptive planning</p>	<p>projections in coastal communities and facilitate standardization and knowledge exchange at the different levels of governance designed</p> <p>1.2.2 Capacities developed for the operation of the binational information system and data processing of the damage and loss methodology for adaptive planning and future risk management in municipalities with similar characteristics created at the subregional level.</p>		
	<p>1.3. Best practices and lessons learned in assessing loss and damage methodologies for slow onset hazards systematized as a tool for adaptation planning and risk management to food security and agriculture- and fish-based livelihoods</p>	<p>1.3.1. Challenges, best practices and lessons learned from the implementation of the FAO loss and damage methodology for slow-onset hazards, for possible escalations and aftershocks in similar systematized contexts</p>	<p>Cuba and Panama</p>	
<p>2. Ecosystem based adaptation (EBA) measures implemented and shared in key ecosystems to protect local food production and promote resilience and food security in 9 targeted municipalities.</p>	<p>2.1.Nine Municipalities manage critical ecosystems, through EBA measures, increasing the resilience of their communities, livelihoods and local food security</p>	<p>2.1.1. Key areas of critical ecosystems protected as assessed to reduce projected loss and damage to food security from slow onset hazards</p> <p>2.1.2. Farmers Field Schools (FFS) for local training and the implementation of nature-based solutions including restoration and sustainable management of identified critical ecosystems</p>	<p>Cuba and Panama</p>	<p>4,400,000</p>
<p>3. Coastal communities of 9 municipalities in Cuba and Panama adopt and share sustainable practices and develop resilient value chains increasing their food security and livelihood resilience</p>	<p>3.1. Climate-smart agricultural and fishing productive technologies and methods adopted by local producers to improve the long-term sustainability and productivity of traditional livelihoods in the face of climate impacts</p>	<p>3.1.1 Agricultural and fishing cooperatives have been created and/or strengthened in their associative, and productive capacities for climate smart production.</p> <p>3.1.2 Field schools created for local training and use of sustainable and resilient productive practices including coconut, plantain and rice harvesting and fishing related practices.</p>	<p>Cuba and Panama</p>	<p>4,980,000</p>
	<p>3.2. Diversified and EBA-compatible livelihoods identified and supported for agriculture- and fishing-dependent households</p>	<p>3.2.1 Rural food productive small holder cooperatives (favoring women and vulnerable populations) in 9 target sites have been created and/or strengthened in their capacity to implement diversified and EBA compatible livelihoods (artisanal oyster and mollusk cultivation in mangroves, commercialization and processing of coconut and banana-based products, nature-based tourism).</p> <p>3.2.2 Implementation of diversified and EBA compatible livelihoods across 9 target sites.</p>	<p>Cuba and Panama</p>	

6. Project/Programme Execution cost	1,330,000
7. Total Project/Programme Cost	12,810,000
8. Project/Programme Cycle Management Fee charged by the Implementing Entity (if applicable)	1,190,000
Amount of Financing Requested	14,000,000

Projected Calendar:

Table 4: Project Milestones

Milestones	Expected Dates
Start of Project/Programme Implementation	Q1 2023
Mid-term Review (if planned)	Q1 2026
Project/Programme Closing	Q1 2028
Terminal Evaluation	Q2 2028

PART II: PROJECT / PROGRAMME JUSTIFICATION

- A.** Describe the project / programme 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. For the case of a programme, show how the combination of individual projects would contribute to the overall increase in resilience.

The project's main objective is strengthening the adaptive capacities of coastal municipalities and local agricultural and fishing production towards CC. Illustrated objectives will be achieved through the 3 project components that will address identified barriers by developing capacities of local governments and stakeholders, incorporating EBA measures to protect local livelihoods and food security as well as by establishing resilient and diversified livelihoods that will be supported by a regional approach in the exchange of best practices and innovation in implementation addressing a key information accessibility barrier identified during project consultations. All project components will take into account the differentiated impact that CC has on the different population groups, including women.

Component 1: Local planning and cooperation in 9 coastal municipalities to reduce fishing and agricultural productive loss and damage from to slow onset hazards in Cuba and Panama

1.1. Loss and damage of agricultural and fishing productivity methodology implemented in 9 target coastal municipalities in the face of slow onset climate impacts

Component one will focus on of the implementation of FAO's loss and damage methodology in target coastal municipalities in Cuba and Panama to assess local agricultural and fishing production loss as a result of slow onset hazards derived from CC. Coastal municipalities are already facing productivity losses and impacts as a result of slow onset hazards (SLR and increased temperatures) that have yet to be fully evaluated and made tangible to local stakeholders for risk management and to guide adaptive planning, also considering the aggravated impacts as climate projections begin to materialize.

Output 1.1 will focus on establishing baselines for loss and damage assessments, including the use of historical trend analysis. Actions will also include vulnerability assessment to slow onset impacts to better evaluate climate impact based on climate projections and analysis as they pertain to agricultural and food productivity. The calculation of tangible impacts to municipal socio-economic indicators such as income and productivity loss as well as effects on local livelihoods will also be developed (*Output 1.1.1*). Information derived from these analyses will be socialized and provided to local stakeholders to allow for the development of participatory CC adaptation and risk management plans at the municipal level) to include specific actions with a gender perspective across local sectors and will guide adaptive measures implemented through Components 2 and 3 (*Output 1.1.2*).

Concrete actions include:

- Identification of projected food productive losses to local economies and livelihoods in 9 target coastal municipalities as a result of slow onset climate impacts
- Development of 9 Participatory Adaptation Plans at the Municipal Level with Specific Adaptation Actions for Food Productivity (informed by the projected loss/damage analysis) that will be implemented through actions Components 2 and 3

- 9 Participatory Risk Management Plans to be Incorporated into Municipal Management Plans with Specific Actions to Reduce Projected Risk to Food Productivity (informed by the projected loss/damage analysis) that will be implemented through actions Components 2 and 3

1.2. Damage and Loss Information Systems for slow onset climate hazards institutionalized at a sectoral and local level and shared binationally for monitoring and evaluation and adaptive planning

Actions under Outcome 1.2 includes the design of the Damage and Loss Information System for Agriculture and Fishing Production that will have relevant information products at a local, sectoral and regional level to guide adaptation planning. It will indicate project-avoided losses as a result of the implementation of adaptation and risk reduction actions (as foreseen in components 2 and 3) to slow onset climate hazards.

The Information System will be designed through a binational cooperation mechanism that will also allow both countries to standardize loss and damage methodologies for comparative analysis and binational sharing of relevant information and best practices in its implementation and in the development of information products. In the case of Panama, the information system will be integrated into the climate change transparency portal that is being created to enhance awareness of climate change impacts. Information products will allow governments to better assess the cost of climate change to agricultural productivity and impact to local livelihoods and therefore serve as inputs to nationally determined contribution targets and sectoral adaptation plans.

FAO will provide technical support to governments at a national, sectoral and municipal level to put in place and operationalize the Damage and Loss Information System for Agriculture and Fishing Production that is appropriate for both countries to house loss and damage data, the standardization of both systems will be key to facilitate cross regional knowledge exchange across similar productive systems.

Concrete actions include

- Establishment of a Binational Cooperation Mechanism to facilitate binational agreements and support in the use of loss and damage methodology and accounting as well as for cooperation around the development of regional information products and exchange of best practices among national and local governments as well as among productive associations and community groups.
- Design and operate a Damage and Loss Information System for Agriculture and Fishing Production for Cuba and Panama to Continually Evaluate loss and damage and resilience (through adaptive actions) in the target areas and sectors that will be maintained by countries during and post project implementation and will be enhanced through the Cooperation Mechanism.
- Develop regional, sectoral and local information products to be made available to decision makers, productive associations to guide adaptation actions and evaluate resilience gained as a result of adaptive investments to manage impacts from slow onset hazards.

1.3. Best practices and lessons learned in assessing loss and damage methodologies for slow onset hazards systematized as a tool for adaptation planning and risk management to food security and agriculture- and fishing-based livelihoods

Outcome 1.3 will focus on evaluating the on-ground implementation of the loss and damage methodology to slow onset hazards to systematize best practices and incorporate lessons learned for its enhancement, this will include facilitating exchanges across the 9 coastal municipalities in the implementation of actions foreseen in components 2 and 3 to favor cross pollination and experimentation through the interlinkages of farmer field schools across the target sites. Lessons derived from the project will be packaged to inform toolkits and methodological guidance notes for replication in similar coastal settings. This output will also evaluate the implementation of adaptation actions based on its potential for reducing local agriculture- and fishing-related losses and its impact on livelihoods. Information from 9 coastal municipalities across two countries with similar ecosystems and slow onset climate drivers will provide the scale required for informed analysis for replication across similar settings within the Wider Caribbean region.

Concrete actions include:

- Analysis and systematization of the implementation of the FAO loss and damage methodology for slow onset hazards including challenges for implementation, packaging of best practices on adaptation and evaluation of adaptive measures developed to inform the upscale in similar contexts.
- Establishment of a binational community at various levels (national, local, sectoral, productive and civil associations) through exchange missions, capacity building and FFS implementation in target sites to enhance

local knowledge and the sharing and systematization of traditional practices proven to be effective in protecting coastal food productive ecosystems to slow onset hazards.

- Development of technological and methodological guides training material on the use of nature-based solutions based on experimentation and their impact in reducing projected loss and creating alternative livelihoods for upscale in both Panama and Cuba as well as in the wider Caribbean.
- Development of methodological guidance training material on the implementation on the use of intercropping, mulching and soil and water conservation in coconut production based on lessons in the field.
- Development of methodological guidance training material on the implementation of the use of saline tolerant rice varieties in productive areas with saline intrusion based on lessons in the field.
- Development of methodological guidance and training material on sustainable fishing and regenerative aquaculture in mangroves as nature-based solutions for marine and coastal based livelihoods based on lessons in the field.

Component 2: Ecosystem based adaptation (EBA) measures implemented and shared in key ecosystems to protect local food production and promote resilience and food security in 9 targeted municipalities.

2.1. Nine Municipalities manage critical ecosystems, through EBA measures, increasing the resilience of their communities, livelihoods and local food security

Ecosystems in target areas along both countries can provide strategic ecosystem services to manage a variety of climate impacts and protect local security. Mangroves can provide buffering services from waves and storms while also favoring water infiltration and coastal stability that will provide support against the salinization of soils and aquifers as well avoid crop loss. Corals can provide wave buffering services while ensuring healthy marine systems required for fishing livelihoods.

To achieve *Output 2.1.1* the project will invest in local ecosystem valuation, using existing international methodologies (i.e. TEEB, TNC's Guide for Incorporating Ecosystem Valuation, Values Methods Database, ARIES, etc.) to translate these services into productive and livelihood indicators to be incorporated into government and productive analysis. The project will also invest in a loss a loss/gain analysis in target areas of the vegetation of these ecosystems with the support of geographic information tools to compare the historical evolution of vegetation cover and land use as an element for determining critical areas for conservation, rehabilitation and sustainable management based on their capacity to provide protective services to agriculture and fishing-based production areas and potential for reducing productivity losses.

Through *Output 2.1.2*, nature-based solutions (NBSs) and ecosystem-based adaptation actions identified through this analysis will be implemented along the 9 target municipalities using Farmer Field School (FFS) approach that promotes collective learning by doing based on the execution of on-the-ground best practices to ensure capacity building. This will provide increased awareness on the role of conservation as a cost-effective adaptive measure for local communities to reduce they vulnerability.

Through FFS for ecosystem protection and management communities will improve ecosystem management skills through observing, analyzing, identifying relations between ecosystems and vulnerability of their own productive systems while implementing specific actions (NBSs) for improved ecosystem management to reduce risk to agricultural and fishing productivity and will benefit from in field best practices developed through the project in both countries. These efforts will be reflected in the resilience of ecosystems to slow onset climatic events and a community that, knowing their value, protects them as part of a long-term solution.

NBSs and ecosystem-based adaptation actions implemented through the FFS approach include: improved ecosystem management for the recovery/rehabilitation of critical ecosystem such as mangroves protecting agricultural production spots (to reduce exposure to sea level rise and salinization), natural reforestation in specific basins to favor freshwater infiltration (enhance water capture and reduce salinization of coastal aquifers) or soil recovery. Actions may also include sustainable management of coral reefs to favor their rehabilitation to reduce exposure from sea level rise while promoting the recuperation of fish stocks as well as actions such as the recovery of coastal lagoons that are important for fishing-based livelihoods and ecosystem hydrology.

Concrete actions include:

- Identification of key ecosystems for protection, conservation and sustainable management to reduce projected damage and loss due to slow onset hazards.

- Implementation of FFS across 9 target sites including sharing best practice techniques across a bilateral setting through in field experimentation (mangrove restoration techniques, techniques for soil recovery, etc.)
- Implementation of NBS and EBA actions (as prioritized in community adaptation and risk management plans) in 9 target sties including improved ecosystem management and restoration of mangroves to act as a buffer to agricultural production spots, reforestation to favor freshwater infiltration, soil recovery practices in agro ecosystems, recovery of coastal lagoons, management of fishing practices to reduce impact on coral reefs.
- Assessment of NBS implemented across target sites and their incidence in reducing loss and damage projections from slow onset hazards.

Component 3: Coastal communities of 9 municipalities in Cuba and Panama adopt and share sustainable practices and develop resilient value chains increasing their food security and livelihood resilience

3.1. Climate-smart agricultural and fishing productive technologies and methods adopted by local producers to improve the long-term sustainability and productivity of traditional livelihoods in the face of climate impacts

The project will implement climate smart agricultural and fishing practices focusing on rice, coconut, banana/ plantain harvesting and fishing. Techniques introduced will include, but will not be limited to: 1) use of inter cropping for coconut harvesting, which has shown to increase carbon sequestration and improve microclimatic conditions as well as provide diversification of income sources; 2) introduction of saline tolerant rice varieties, including identifying those that will withstand current projections for salinization; 3) use of mulching, elevated and tiered crop beds as well as resilient technologies to protect agricultural productivity to the conditions created through slow onset climate hazards, including water efficient technologies and circular productive practices. Support will be provided to productive associations through extension services as important sources of information for local producers as well as by providing investments (grants) to support innovation and experimentation in field, women's and indigenous associations will be favored to ensure inclusivity of project benefits. Experimentation and best practices will be further disseminated across target sites through the use of FFSs for the implementation of locally appropriate actions based on projected climate conditions and thresholds.

Concrete actions include:

- Regional support (technical capacity and extension support) and investments (grants) provided to local productive associations (favoring women and indigenous groups) for the implementation of climate smart agricultural and fishing practices focusing on key food productive livelihoods as identified in participatory adaption and risk management plans (intercropping and the use of tier systems for coconut, the use of saline tolerant rice varieties, use of resilient technologies, etc.).
- Implementation of best practices through the use of farmer field schools across target sites and across a bilateral setting.
- Assessment of climate smart practices implemented across target sites and their incidence in reducing loss and damage projections from slow onset hazards.

3.2. Diversified and EBA compatible livelihoods identified and supported for agricultural and fishing dependent households

The project will make strategic investments to small scale producer associations for the diversification of climate sensitive traditional livelihoods through the identification and implementation of viable alternatives to local value chains. Alternative livelihoods will include the processing and transformation of key products such as coconut oil, plantain chips, coconut fibers; artisanal oyster and mollusk culture that has favorable incidence in mangrove health and regeneration; regenerative aquaculture for small scale producers and nature-based tourism such as sports fishing. Investments will be made to develop capacities and providing inputs for alternative livelihoods of local producers in target sites and their access to local value chains. Special attention will be provided to women and minority populations to ensure that value chains are inclusive and enhance household incomes that have been affected as a result of slow onset climate hazards.

Concrete actions include:

- Regional support provided to local communities across target sites for the assessment and identification of alternative livelihoods that are compatible with EBA and to climate projections.
- Regional support and grants provided to community associations (favoring women and indigenous groups) to invest in the implementation of alternative and EBA compatible livelihoods.
- South South-South Exchange across target sites for cross pollination of best practices in viable adapted livelihoods (interlinking of FFS).

- Assessment of alternative livelihoods across target sites and their incidence in increased benefits to livelihoods, incomes and general economic resilience in the face of slow onset hazards.

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

The project is innovative in its approach of using post risk disaster assessment tool (loss and damage assessment) in a manner that is applicable for the challenges facing coastal communities and their livelihoods. Particularly as a tool for adaptation planning to an ongoing hazard such as SLR so as to reduce the potential for loss and damage that is projected per climate scenarios but could through effective adaptation action be prevented and reduced. Hence developing the capacity to make concrete the impacts of climate change and the role that adaptation measures can have in mitigating these.

The project's approach of using loss and damage methodology to inform adaptation measures to productive capacity and then evaluate their impact is also highly innovative and will provide an important value add to countries in the formulation of NDCs and adaptive planning by ensuring that the value of local livelihoods and agricultural productivity is not undercounted nor underestimated (as often is as evidenced in post disaster assessments). This is particularly valuable to the Wider Caribbean region where food security is an important vulnerability with most countries relying on food exports to address production shortages.

The project also innovates by integrating local actions that will be guided and implemented as a result of the loss and damage assessment to reduce food projected loss and damages through nature-based solutions, climate smart productive practices and diversified livelihoods. The actions will be implemented through FFS that favor innovation, piloting and experimentation within local plots to address common challenges in a manner that prioritizes rural producers and observable results. This will provide the project room for innovation that through its interlinkages created through the bilateral coordination mechanism will provide an opportunity for a regional dissemination of local knowledge to other local actors by producers themselves through in the field support and implementation. The project hence will not only develop guidelines and toolkits but will also provide the exchange mechanisms among municipalities for on the ground learning by producers in other areas.

While Cuba and Panama will be using this piloting approach to the loss and damage methodology it will provide the lessons learned in its systematization and its use as an adaptive planning technique that translates into relevant on the ground action that will be upscaled to a wider regional setting through the creation of similar information systems and FFS structures that can incorporate lessons learned across the Wider Caribbean.

C. Describe how the project / programme 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 / programme would avoid or mitigate negative impacts, in compliance with the Environmental and Social Policy of the Adaptation Fund.

The project **will directly benefit approximately 32,948 people in Panama** (accounting for 12, 041 agricultural and fishing based households in the Colon Province) **and 101,250 people in Cuba** (rural population of target sites) by enhancing capacity for protecting local food security and livelihoods from slow onset climate hazards in target sites. **Support will be provided across 125 agricultural and fishing based cooperatives in Cuba and 13 cooperatives in Panama**, favoring those that encompass women and vulnerable populations that will be benefitted by enhanced capacities and inputs for resilient production to reduce projected damages from slow onset hazards. The project will also include among its beneficiaries indigenous populations. Initial consultations have identified 50 indigenous households within the Portbelo municipality dependent on fishing-based livelihoods including the use of shells and fish scales, for the development of handicrafts by indigenous women that are mainly sold to tourists.

The regional project will further generate economic and social benefits to coastal and adjacent populations vulnerable to the effects of CC, while also providing positive impacts on the environment.

Economic Impacts: The project will develop an entire component related to managing the livelihoods of vulnerable populations in the critical areas selected for their food security and generating economic benefits (component 3). In the case of Panama diseases in coconut plantations have affected local economies with producers report production losses of approximately 60% of their plots. Project consultations replicated this concern with producers stating production losses of up to two thirds of their previous productions. High temperatures as projected in Part I create favorable conditions for coconut plagues and diseases. The implementation of enhanced management techniques including tiered planting and the use of intercropping can regulate temperature, protect soil and enhance water capture

(reducing conditions for pests) while providing diversified incomes through the use of crops including papaya, cacao and banana. Recent experiences with intercropping in Sri Lanka have shown higher net returns of up to 117% to 180% than coconut monocropping under rainfed conditions⁴⁷.

The project will further invest in enhancing nature-based value chains for diversified products thus un-tapping economic opportunities within the targeted areas. While the project is still in its concept phase, the creation of income will be measured by the project to ensure impact on livelihoods. These include the processing of key products such as coconut into high value products such as coconut oil and coconut fibers that has shown to be promising in Chagres, Donoso and Baracoa. Additional opportunities will exploit the potential of new nature-based tourism activities, such as sports fishing that have high local return rates. A study developed by the IADB in Panama identified the potential for sport-fishing in contributing USD 170.4 million in total retail and business-to-business sales, 9,503 direct and indirect jobs, USD 3.1 million in new tax revenue, and an increase in national GDP of USD 48.4 millions⁴⁸. A mangrove restoration project in the Chiriqui Province of Panama identified an estimated increased annual income of USD 270,000 to the area due to nature-based tourism in mangrove protected areas with great growth potential as well as to increased value to fishing due to increased fish stock as a result of mangrove restoring of snapper, snook, turna, black shells calculated at USD 2million a year. Support to nature-based tourism will result in increased economic opportunities for indigenous women that are dependent on tourism for the marketing of locally made handicrafts.

Furthermore, the project will provide savings in avoided damages to infrastructure and productive areas in target municipalities faced by recurrent flooding and storm impact as demonstrated in Cuba during the 2021 hurricane season that has affected directly 5 of the project's targeted municipalities (Consolación -Pinar del Río-, Batabanó –Mayabeque-, San cristobal–Artemisa). The project by favoring nature-based solutions for mangrove restoration and protection will provide tangible benefits in risk reduction to these impacts that will be better assessed in project implementation through the use of loss and damage methodology. However, modelling by the University of Cantabria in Cuba was able to demonstrate the protective capacity of mangroves in buffering floods by up to 222kms inland and preventing damage valued at USD 226 million considering a 10 year return period, valuing protective annual benefits of USD 222 per km² of mangrove⁴⁹. It should be noted that this analysis did not include information regarding protective services provided by mangroves in preventing the salinization of crop land from sea water incursion thus one could argue that this number could be larger.

In coherence with the AF policies on gender equality and on indigenous and tribal peoples, specific actions will be developed to improve incomes and livelihood opportunities and development of these populations. The project in its Funding Proposal Stage will work with the Fund for the Development of Indigenous People (FILAC) to better identify potential entry points to these communities as well as appropriate management arrangements for benefit inclusion in a manner that is culturally appropriate and effective. Initial consultations have identified opportunities through the support to fishing based livelihoods. These will be explored and managed through existing indigenous organizations, cooperatives and learning institutions within the area that will have access to targeted grants and support for inputs for the development of nature-based solutions, climate smart and diversified livelihoods that prioritize ancestral knowledge. In the case of women, the project will similarly prioritize women productive associations in the provision of grants for nature-based solutions (Component 2) and adapted livelihoods (Component 3) thus ensuring that potential benefits address existing inequalities in target areas as seen in reduced income opportunities. Further the project's third component will favor small scale producers by working through communal associations in the provision of technical assistance and investment.

Social Impacts: The project focuses on protecting and enhancing food security among coastal communities. The project will directly benefit around 134,000 people across 9 coastal communities in both countries by providing access to diversified livelihoods (Output 3.2), resilient food production (Output 3.1), and ecosystems with the capacity to reduce loss and damage of local food production and livelihoods from slow onset climate impacts (Output 2). Direct beneficiaries account for the rural and agricultural dependent households in target municipalities that as described in Part I are primarily composed of small-scale producers hence looking to generate a vital social impact to vulnerable populations that have been identified by the project analysis as those with the least adaptive capacity. Project benefits will result in reduced risk to local food security from slow onset impacts that will additionally provide indirect benefits to urban populations and adjoining municipalities within the targeted provinces.

⁴⁷ Chandrakasan Sivaperuman et al (2008). *Biodiversity and Climate Change Adaptation in Tropical Islands*. Academic Press. Chapter 23.

⁴⁸ <https://publications.iadb.org/publications/spanish/document/Diagnostico-integral-del-sector-pesca-y-acuicultura-de-la-Republica-de-Panama.pdf>

⁴⁹ CEPAL (2018). Efectos del cambio climático en la costa de América Latina y el Caribe: Evaluación de los Sistemas de Protección de los Corales y Manglares en Cuba. Santiago Chile.

Coastal communities will improve their livelihood and make them more climate-resilient as a result of the inclusion of climate smart production and the economic benefits generated by livelihood diversification and reduced risk to projected losses from slow onset impacts. In Cuba, SLR will result in accumulated losses of around 40,000 tonnes in harvests of fundamental crops (rice and sugar cane). This will have a considerable impact to small scale rural producers and coastal communities who depend on these crops for livelihoods and food security and are ill prepared to manage slow onset impacts. Local farmers are small in both countries (nearly 50% of the agricultural dependent livelihoods in the Colon Province in Panama have under 0.1 ha of land) with little access to alternative productive options with monocrop farms being the most common. A mangrove restoration project in the Chiriqui province of Panama demonstrated increased income opportunities to local households as a result of benefits derived from mangrove restoration, including USD 270,000 derived from nature-based tourism.

Lack of access of extension support and technical knowledge was stated as a main concern during consultations in both countries and according to the 2011 Agricultural Census in Panama 63% of rural productive households have not received relevant information to productive management by any means of communication (in person, through written guides, radio, phone). The project will address this gap through FFS extension support, South-South Exchanges, access to regional experts, strengthening of productive associations, and dissemination of producer focused methodological guides for production and adapted livelihoods.

Access to productive technology and capacity adapted to a new climate scenario will make it possible to strengthen the resilience and sustainability of the livelihoods of small producer families while focusing on locally and culturally relevant crops such as coconut, rice, banana and plantain. Coconut production is important the Province of Colón (Costa Arriba, Costa Abajo) not only for its economy, but also for its culture associated to this crop for local population. In these regions, the coconut constitutes an essential element as a staple food. The entire region has among its main activities the collection and sale of coconut; which, its inhabitants carry out for decades and generation after generation and which will be affected as a result of SLR, temperature increases and their impact on water availability and has already been severely affected as a result of pest and diseases that favor high temperatures. The project will focus on providing extension support and in field implementation to manage these risks including the use of intercropping, mulching amongst others.

The project favors a participatory approach that ensures that consultation and governance mechanisms are included hence creating a local governance focused on managing climate impacts for local food security. The project will also work to include women and indigenous groups into rural value chains through climate-resilient and environmentally sustainable agricultural practices. This will aim to address their vulnerabilities through their active participation and inclusion while looking to generate income providing opportunities by favoring support to women's associations in enhancing associated capacities and providing investment for adapted and diversified livelihoods. The project will favor gender mainstreaming throughout the components, based on the Gender Analysis and Plan that will be developed during the project's Full Funding Proposal phase by a project technical specialist.

Indigenous groups have been identified within the project's target sites (Annex 3) in a community of an estimated 50 households. The project will look to engage with indigenous associations to ensure that benefits derived from the project in particular 2 and 3 are accessible and incorporate indigenous productive priorities within the target areas. Consultations have stated a primarily fishing based vocation that will be included within the project's target sectors in a manner that is culturally appropriate. Similarly indigenous women depend on textiles and inputs from fishing for handicraft development (shells, fish scales) as well as tourism. The project will work during full proposal stage and project implementation with FILAC for the identification of culturally appropriate EBA compatible livelihoods as potential additional income streams that prioritize ancestral knowledge. Initial consultations have identified oyster culture as a promising option that could be particularly relevant during low tourism season.

Environmental impacts: The project expects significantly positive environmental impacts by reducing biodiversity loss and promoting responsible use and protection of key ecosystems in identified vulnerable areas in both countries. As mentioned in Part I, target municipalities include coastal wetlands, mangrove forests, coral reefs and protected areas that have been threatened as a result of anthropogenic actions including unsustainable planning and productive management. The project in its approach of exemplifying the value of these systems to reduce loss and damage will allow communities to become aware of the importance of these ecosystems in the provision of environmental goods and services that are key to protecting the coastline from floods caused by the increase in mean sea level or generating fishing resources. It will also provide training to producers for the application of best production practices that contribute to the conservation of water, soil and biodiversity while improving productivity including adaptation and resilience actions to CC. Introduction of artisanal oyster and mollusk culture has been identified in Cuba to not only providing

increased opportunities for income and food security to fishing based populations but also in enhancing water quality, increasing fish stock and biodiversity that is beneficial to mangroves.

Through the implementation of sustainable ecosystem management, including the restoration of mangrove areas and riparian forests and the use of sustainable productive practices, the project will also contribute to GHG mitigation that will contribute to both country's NDC targets. Mangroves are unique carbon storehouse in their ability to lock carbon up in anaerobic soils with average carbon sequestration rates of 8.3 t CO₂ per hectare. Further coconut produced through intercropping has shown to sequester total of 138.91 tonnes of carbon (above ground plus below ground soil carbon stock per hectare) as compared to sequestration of 98.2 tonnes of carbon on a coconut monocrop plantation (usual practice in target sites) ⁵⁰.

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

The project favors a cost-efficient approach to implementation through its regional approach that will allow the project to build on binational best practices while leveraging existing capacities and promoting knowledge exchange. The project will provide regional technical assistance capacity to both countries that will result in less need for investment in individual country teams while allowing the project to better systematize, contextualize and cross pollination of lessons learned amongst areas. This approach creates an economy of scale in technical expertise that is both cost efficient and valuable for a principal project objective (promoting exchange for adaptation action, including gender mainstreaming, at a local level).

The project's approach in implementation through FFS that will be interlinked across the 9 target sites ensures cost efficiency in creating platform for and effective and scalable dissemination of best practices while addressing the limited availability of extension services in the target areas. The project will favor creating capacities among producers to provide in field instruction thus reducing the need of hiring national and internal experts rather counting on producers to instruct their community and similar coastal communities along the project sites. More importantly the approach of FFS in components 2 and 3 that will be supported through the bilateral cooperation mechanism created in component 1 allows for a binational platform that in fact favors local action through local actors (municipal governments and productive associations) hence creating efficiency in demonstrating on the ground results that are often left out of regional projects hence addressing a project identified barrier.

FFS have demonstrated to have a scalable effect that reduces costs as time progresses and farmers expand FFS programs by their own means. Most FFS remain in place after projects end with the majority of the cost being that of transportation rather than the hiring of international experts that is more accessible to local populations. The binational platform that will be created will allow for the continued exchange amongst FFS thus increasing the reach of extension support. This practice of South-South FFS exchange has demonstrated its success in past projects in increasing the impact and scope of technical expertise spreading key locally based knowledge beyond national borders as demonstrated through FAO's Global Integrated Pest Management Facility that provided support through the South-South Exchange of FFS facilitators (producers). Lessons learned from this South-South Exchange will be considered by the project to enhance its regional reach beyond Cuba and Panama.

The project further favors cost efficiency through the implementation of NBSs and EBA as main solutions to manage slow onset climate impacts (dynamic in nature) while creating on-ground local capacities to develop them. NBS solutions have demonstrated through past projects such as the AF Funded Manglar Vivo Project in Cuba and in mangrove restoration in the region of Chiriqui in Panama to be effective in reducing soil erosion and onsite salinity levels and protecting coastlines from SRL pressures hence are considered appropriate responses, in addition NBS solutions can adapt more easily than other solutions and in fact become more effective with time progression which is required for slow onset impact. Further, NBS have been shown to provide multiple benefit in terms of building agricultural production and resilience, managing CC impacts, and enhancing nature and biodiversity.⁵¹ In the case of slow onset impacts such as sea level rise, nature based solutions such as mangrove restoration (costed at approximately at USD 23,000 per km) ⁵² have proven to be more cost efficient in the long run the alternative grey infrastructure strategies to manage saline intrusion and flooding with artificial structures for coastal protection such as seawalls and levees costing nearly USD19 million per linear kilometer as observed in the Caribbean⁵³. Positive impacts

⁵⁰ K. S. Naveen Kumar* and H. P. Maheswarappa (2019). « Carbon sequestration potential of coconut based cropping systems under integrated nutrient management practices » *Journal of Plantation Crops*, 2019, 47(2): 107-114

⁵¹ <http://www.fao.org/3/cb3141en/CB3141EN.pdf>

⁵² IFRC (2019). Coastal Protection: A Cost Comparison Between Natural And Artificial Structures.

⁵³ Ibid

to local livelihoods have been identified in past mangrove restoration projects in Panama resulting in increased incomes to local populations from tourist-based activities (USD 270,000 per year), increased fishing stock (valued at USD 2 million per year). In Cuba the recently closed AF project identified benefits in the amount above COP 7million in fishing-based livelihoods and COP 45,000 in apiculture in the two years after restoration actions took place, hence demonstrating the role that nature-based solutions have as a least cost most benefit option for adaptation and disaster risk management⁵⁴.

In consideration of projected climate impacts to coastal municipalities a do-nothing scenario will result in the invaluable loss of agricultural land as a result of coastal erosion and salinization in both countries. In Cuba, in particular, according to the Macro analysis report, accumulated losses are estimated at around 40,000 tonnes in harvests of fundamental crops (rice and sugar cane) and other various crops (tubers and roots) as a result of SLR. Hence, interventions in climate smart technologies including the introduction and experimentation with saline resistant rice varieties will result in a reduction of projected loss to this scenario. Quantification of avoided project loss will be a key indicator that will be a result of the project implementation and its use of the loss and damage methodology.

- E.** Describe how the project / programme 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.

The proposal is coherent and contributes to global goals such as the Sustainable Development Goals (SDGs), the Aichi biodiversity targets and the Paris agreement that establishes measures and encourages the 195 states that are party to the Framework Convention of the United Nations on Climate Change to establish commitments to reduce Greenhouse Gas (GHG) emissions through the mitigation, adaptation and resilience of ecosystems to the effects of Global Warming.

At a regional level it is consistent with commitments made within the Wider Caribbean Region for the protection of the Caribbean Sea through the Cartagena Convention for the Protection and Development of the Marine Environment to which both Cuba and Panama are parties to. This includes Protocols for the Protection from Land Based Sources and Activities as well as the Protocol Concerning Specially Protected Areas and Wildlife in the Wider Caribbean Region. The project will enhance the capacity of both Cuba and Panama to protect critical ecosystem and reduce unsustainable productive practices that result in pollution to the Caribbean Sea including those from sea bed activities and land-based source and activities such as agriculture.

Cuba: The project is aligned with the 2016/2020 National Environmental Strategy of the Republic of Cuba, which in its strategic line of confronting climate change establishes three key specific objectives:

- a) Increase the adaptation and mitigation capacity of the sectors of the economy and services, as well as of Cuban society in general; objective aligned with components 1 and 2 of the proposal.
- b) Reduce the vulnerability of the ecosystems and prioritized sectors to the effects of CC; objective aligned with components 2 and 3 of the proposal.
- c) Increase the perception of the impacts of CC at all levels of Cuban society, as well as participation in actions aimed at confronting CC; objective aligned with component 4 of the proposal.

It also supports the implementation of the Strategic Plan for the Agricultural and Forestry Sector of the Republic of Cuba, which includes among its strategic objectives to guarantee the conservation, protection and sustainable management of the environment considering the impacts of CC and disasters. Strategic priorities of this plan include increasing production and diversifying livelihoods, conserving and protecting resources and the environment, and tackling CC and disasters. This tool includes protection, conservation and rehabilitation of the environmental, agricultural and forestry activities, addressing CC, as well as conservation and rational use of natural resources such as soils, water and forests. The project also considers the implementation of Cuba's National Gender Strategy for the Agriculture Sector that looks to increase the role and participation of women in the primary sector.

Most critically, the project responds to and favors the implementation of the State Plan to Manage Climate Change "Tarea Vida", identifying prioritized areas and places, their effects and main actions to be undertaken so that these communities and their livelihoods can adapt and be more resilient to the effects and impacts of global climate change. It is also consistent with the National Plan for Economic and Social Development until 2030 (PNDES-2030) that

⁵⁴ Aguilar Gonzalez, Bernardo (2020). Valoración Económica de Bienes y Servicios Ecosistémicos para el Proyecto Manglar Vivo. Parte 2. Reporte de Consultoría para la Agencia del Medio Ambiente- CITMA, La Habana, Cuba. Fundación Neotrópica.

identifies food and energy production among the six strategic government sectors for which it is important to take into account environmental considerations, especially the effects and impacts of global CC. While Cuba is still in the process of developing its National Adaptation Plan, the project is fully aligned with Cuba's NDC that was recently submitted which highlights the country's vulnerability to climate change in the form of sea level rise and increased temperature, amongst other impacts, and prioritizes adaptation and the use of nature-based solutions to managing climate impact, targeting mangroves as a key ecosystem. Cuba's NDCs have also prioritized the adaptation and protection of food production systems (as part of community wellbeing) as well as the need for access to climate smart technologies for both adaptation and mitigation. The aims and objectives of the proposed Project are fully consistent with the Third National Communication to UNFCCC (2020), both on the priority actions related to food security and the promotion of Ecosystem-based adaptation approach.

The project is also aligned with the Country Priorities Framework developed by the GoC and FAO that identifies main national priorities for receiving FAO Assistance including adaptation to CC and the sustainable management of natural resources. As a result, selected institutions implement activities of adaptation to CC and promote the sustainable management and development of natural resources, in line with the National Environmental Strategy, the National Strategy for Biological Diversity and other programs, such as the National Action Program to Combat Desertification and Drought and the Sustainable Land Management Program.

Panama: The project is consistent with national strategies and sustainable development plans. Panama has formulated and recently submitted its National Determined Contributions, approved a National Policy on Climate Change (Executive Decree No. 35 of 2007) and has enhanced regulation of its climate change mitigation and adaptation policy, which has been incorporated within Panama's General Environmental Law (Executive Decree 100 of 2020 and Executive Decree 131 of 2021). The project is aligned with these policy instruments favoring EBA as well as in implementing solutions that are focused on climate vulnerable sectors, including rural communities and agriculture, as well as looking to solutions to favor the reduction of emissions in the AFOLU sector as well as its commitment to integrate emission reduction from blue carbon (including mangroves) by 2025. In particular, the project will address a key issue that has been identified in Panama's NDCs as well as in its Third National Communication submitted to the UNFCCC that stresses the lack of national and scientific capacity to fully assess vulnerability to impacts derived from sea level rise and other climate change related impacts to communities and national sectors of relevance.

The project is also consistent with the National Climate Change Strategy, which establishes a roadmap with the objective of direct the country towards a low-carbon economy with mitigation and adaptation actions with a sustainable economic, social and environmental growth (Component 1) as well as compliance with the SDG5 that favors the achievement of gender equality as a cross-cutting axis in development and the environmental management. Moreover, the achievement of the Strategic Government Plan 2019-2024 of Panama is framed within objectives and goals indicated through a large participatory process called "national consensus". The consensus includes environment and CC issues, the prevention and management of risks disasters, the promotion of actions to combat the effects of global CC as part of the climate action of the 2030 Agenda and the SDGs.

The project also relates to other national legal relevant instruments such as the National Forestry Strategy 2050, which targets to guarantee the conservation of this important resources, stimulate the sustainable forest industry, conserve the forest heritage as an important basis of ecosystems and mitigate the effects of CC. As part of the measures that promotes this strategy, it is the Alliance for a Million Hectares, which is a great public-private initiative that seeks the conservation, reforestation and recovery of 1 million hectares of forests and degraded lands in Panama. This initiative promotes a reduction in the deforestation of natural forests, carbon sequestration, generating multiple benefits such as economic, social and environmental to the country (Components 2 and 3).

The project is further aligned with the National Climate Change Plan for the Agricultural Sector of the Republic of Panama, which promotes sustainable production schemes and production diversification that incorporate variables for adaptation to global climate change (Component 2). It also favors the implementation of Panama's National Water Security Plan that establishes a roadmap that must be executed to improve Panama's quality of life, supports its inclusive economic growth, and ensures the integrity its environment (Component 3). Additionally, the project is in line with the National Biodiversity Strategy and its 2018-2050 Action Plan (Component 3) and its roadmap for the comprehensive management of biodiversity through the implementation of five strategic priorities: (1) conservation and restoration; (2) reduction of pressures on biodiversity; (3) environmental knowledge, awareness and education; (4) sustainable use and management; and (5) integration and governance. As well as with Panama's National Footprint

Reduction Program that aims at incorporating sustainable development indicators into existing productive practices, and at reducing impacts on national resources and GHG emissions.

At local level, the project results will provide support in delivering on the 2030 Food Security Action Plan included within the Colon Regional Development Plan. The Action Plan foresees activities targeted for small producers in rural districts to improve competitiveness and integrated innovation processes into artisanal production as well as traditional agroindustry. Actions under this target are to be focused with a sustainability focus that reduces environmental impact and enhances adaptive capacity for climate resilient agriculture and livestock in the district.

The results and lessons learned will be an important contribution to the fulfilment of the state's obligations in national communications on CC. Additionally, the project may also contribute to the process for the establishment of the REDD + strategy of Panama.

- F. Describe how the project/programme 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.

The project will work with relevant authorities in both countries to ensure that national and local regulations are met, including those on natural resource management in both countries for on-ground action as well as those protecting the rights of workers and vulnerable populations.

Table 5: Alignment with Regulations

National Regulations	Project Compliance
Panama	
Constitution of Panama (2004)	Establishes the normative, legal and political framework for Panama, including laws for the protection of human and political rights (Arts 131- 145) and establishes an ecological framework (Arts 118 -121)
General Environmental Law of Panamá (2009)	Adherence to the Law including its Article 16 that requires environmental impact assessment process for the implementation of large-scale actions in the establishment and expansion of agriculture, livestock, hunting and forestry as well as in fishing productive activities (fish hatcheries and farming of shrimp, crocodile, turtle and crabs)
Regulation of Water uses- Decree Law No. 35 of September 22, 1966,	Regulation for the exploitation of state waters ensuring their exploitation according to the social and ecological interest and establishes regulation for water uses. Project alignment: Project will consider uses and water regulation into field actions in components 2 and 3.
Integrated management of hydrographic basins (law 44 of 2001)	Include into the Adaptation plan, considerations about land use plan for the hydrographic basin state in art. 2, including carrying capacity of the natural environment. Project alignment: Project will take law into consideration into potential alternative value chain proposed related to water use including climate smart practices in agriculture, fishing and eco-tourism.
National Water policy- Executive Decree No. 84 of April 9, 2007	States, water management as part of the economic, social and environmental development, possible through a systematic and participatory approach. Establish principles for water use (equity, environmental sustainability, prioritization, value, governance, information among others) that will guide project implementation and associative capacities created for its management
National Plan on Water Security: 2015-2050- Water for all. Creation of National Water Council and Technical secretariat (Cabinet resolution N°114, August 23.2016)	Is an Instrument of national inter institutional coordination of involve sectors for water uses that allows to guarantee water supply for human uses, productive uses and reduce associated risk to climate extreme events such as drought or floods. Project alignment: Project will be in line with goal 3 that has Adaptation plans as main actions and goal 4, working on the identification of sea level rise affectation to coastal communities of municipalities of Colon. Art. 4 creates National Water Council and art. 5 creates its technical secretariat in Ministry of Environment. Project actions will be in line with goals 3 and 4 mentioned and will work in close collaboration with Miambiente to fulfill all the procedures, policies and strategies, local and national, related to water availability as a result of EBA project interventions.
Administrative Resolution No. 88 of August 23, 2011	Establishes technical guidelines for the preparation of Evaluation and Audits for Environmental Impact Studies for Coastal Marine Zones and Inland Waters, including the development of impact studies for projects in coastal marine areas. Project alignment: National environmental impact assessment will be conducted if required in project activities of component 2 or 3 according with this national legislation.
Administrative Resolution No. 103 of October 7, 2011	Establish guidelines for Environmental Audit and Inspection of Companies in Coastal Marine Areas and Inland Waters applicable to companies and activities that may affect coastal marine resources and continental waters in the jurisdiction of the Natural Protected Areas and Protection. Project alignment: if necessary, will conduct a National environmental impact assessment if required (triggered interventions along Portobelo National Park) in project activities of component 2 or 3 according with this national legislation as well as AF environmental and social standard.

Regulation of the process of elaboration and adoption of the guides of good environmental practices foreseen in article 23 A - chapter II title IV of the law I of the general env. law (Ex. Decree 111, Aug 25, 2016)	This decree defines and establishes the procedure for the creation of guides of best environmental practices. Project alignment: Project will be in line with the definition, scope and technical standards establish in this decree in the field EBA activities and it best practices, lesson learned and codification process.
Wetland National Policy (Executive Decree 127- December 21,2018)	Modify and standardize national regulations on wetlands in accordance with international conventions and the national context and ensure its compliance to guarantee its conservation, protection and sustainable use. Action 3 will create a wetland diagnosis including limits and demarcation according Miambiente criteria. Project alignment: Project will act in accordance to regulation in interventions in coastal wetlands (component 2) and ensure actions in component 3 (regenerative aquaculture) are aligned with regulations.
Forest legislation (Law 1 of 1994)	Protection conservation, enhancement, education, research, management and rational use of the forest resources of Panama. Art. 5 states type of forests, management plans, forest sustainable use, reforestation plans, managed regeneration and Environmental Impact Studies. Project alignment: Per legislation and if required for actions in components 2 and 3 the project will conduct a National environmental impact assessment in particular in actions in mangrove forests.
Law 127- Family Agriculture	Article 8 mentioned the objective of promote the access to services to improve life quality, production, and commercialization of the familiar agriculture. Include strategies of commercialization and marketing according to the type of family agriculture. National plan states the necessity of technical assistance and training Project alignment Art- 18 mentions different mechanism to be adopted to facilitate associativity of agricultural farmers and promote strengthening of the existent organization relevant to component 3. Project will be in line with this law and will consider national promotion mechanism to help and promote local farmer associativity, training and technical assistance needs.
National Forestry Strategy to 2050 (Executive decree 10, April 2nd, 2019)	Recognized mangroves as part of forests of Panama and recognized its carbon storage capacity This is how blue carbon is considered as an integral part of ecosystem services of the Forestry Sector and a green economy, with a view to integration to emerging markets. Project alignment: Project will consider mangroves as part of key ecosystems that generates barriers that benefits coastal community resilience. Potential action could be done in these ecosystems in targeted municipalities.
National Policy on Agricultural Transformation 2001 (Law 25 of June 2001)	States several elements to achieve agricultural transformation including technological alternative for national producers, increase livelihood of self – producers as well as new productive alternatives. Project alignment: project will be in line with this policy in the promotion of climate smart practices into the component 3.
Panama's Declaration of Indigenous Peoples Rights	Establishes the process for ensuring free informed prior consent of indigenous communities that the project will follow in consultation indigenous populations and project implementation in areas that have been identified by the project as having indigenous populations.
Work Code of Panama of 1995	Establishes applicable labor laws to be followed to ensure the safety, human and labor rights of all Panamanian workers, including establishing working hours and ensuring non-discrimination. Chapter 3 focuses on conditions for rural work that the project will comply in the implementation of components 2 and 3, amongst others.
Law 15 of 1977 by which the Inter American Convention on Human Rights is Approved	Approves the international framework for human rights as applicable and valid in Panama guaranteeing rights for all Panamanian people
Cuba	
Constitution for the Republic of Cuba (2019)	Establishes the normative and legal framework for the Republic of Cuba including the role of the central, provincial and municipal governments and representation. Establishes in its Chapter 5 Political Rights and Guarantees protecting human dignity in the form of education, jobs, health, social security and including equal access to women to all political and economic rights and protection against violence (Art 43) and establishing the right of children and adolescents to education and prohibiting child labor
General Environmental Law (Law 81 of March 11, 1997)	Principal environmental law in the Cuban legal system. Establishes the principles that govern environmental policy and the basic norms to regulate the environmental management to protect the environment and contribute to achieving the sustainable development objectives of the country. It establishes the general framework for the protection of coasts, waters, terrestrial and marine biodiversity, forest resources and the bases of the National System of Protected Areas, among others. The Law is also the basis of all the instruments that apply to the country's environmental management, which are listed in Article 18 and include, among others, environmental management; environmental licensing; environmental impact assessment; environmental information system; state environmental inspection system. Project alignment: Project will be

	made aware of specific regulations in terms of license end impact assessments when implementing actions along Components 2 and 3 to ensure actions comply with management criteria.
Law 129 of 2019 on Fishing Regulations	This regulation, without directly addressing CC, includes various measures that have been used to protect fisheries and marine resources, and which are also good adaptation practices. This includes the elimination of the most aggressive fishing practices for the species and the environment; the implementation of new minimum sizes for catches of different species; the control of fishing activity at times of reproduction of some critical species; the introduction of longer fishing bans in reproductive periods and the establishment of Areas under special use and protection regimes. These are defined as legally established protected areas in which fishing activities are governed by special provisions. Project alignment: Project will be in line with sustainable fishing practices and standards stated by this law.
Decree-Law 212 of 2000, Coastal Zone Management	Decree-Law No. 212 of August 8, 2000, on "Coastal Zone Management", aims to establish provisions for the delimitation, protection and sustainable use of the coastal zone and its protection area, in accordance with the principles of integrated management. The Decree-Law defines the coastal zone and its protection zone and establishes a classification that takes into account the structure and configuration of the different types of coastlines, criteria from which the extension of this zone is established. The execution of works or activities in the coastal zone, including those of protection, are conditional to acquiring the environmental license and compliance with the requirements of the same, in accordance with the provisions of "Article 28" of Law No. 81, Environmental Law, and the corresponding legislation. Project alignment: Project work into component 2 and 3 will adhere to policy requirements, in terms of environmental license and compliance, in accordance with the provisions of "Article 28" of Law No. 81, Environmental Law, and the corresponding legislation. If necessary, will conduct a National environmental impact assessment in project activities of component 2 or 3 according with this national legislation.
DL 136 Forest heritage and wildlife and their contravention	Establish the following subjects: (I); Forests (II); Protection and conservation of forest heritage and wildlife (III); Common provisions (1), Fire control (2), Clearing (3), Reforestation (4); Use (IV); Control of wild fauna (V); State service for the protection of forest resources and wildlife (VI). Project alignment: Project will fulfil requirement of title 4 if restoration actions take place in mangrove ecosystems. if necessary, will conduct a National environmental impact assessment if required in project activities of component 2 or 3 in accordance with national legislation.
Law No. 81 of July 11, 1997	Law No. 81 of July 11, 1997, "On the Environment", defines as one of its objectives (article 9, paragraph e) "to regulate the development of environmental assessment, control and monitoring activities" and by virtue of this, establishes, in its Chapter IV, the general provisions of the Environmental Impact Assessment process, the management of which corresponds to the Ministry of Science, Technology and the Environment. Project alignment: Project will consider environmental regulation and monitoring activities as well as national environmental impact assessment in field actions specially for components 2 and 3 if necessary, will conduct a National environmental impact assessment if required in project activities of component 2 or 3 according with this national legislation as well as AF environmental and social standard.
Law 124 of 2017 on Terrestrial Waters	Most recent law issued in the country on the protection and management of natural resources. Declare measures to reduce vulnerability to the current or expected effects of climate change, and is thus referred to within the objectives of the Law. Project alignment: productive climate smart practices promoted by the project in component 3 will be in line with the scope of this law about sustainable use of land and water. Also, EBA measures in component 2 will be in line with its principles.
D/ 179 Protection, use and soil conservation	Some of the main objectives are: a) to establish control over the protection, use, conservation, improvement and rehabilitation of soils; c) to conserve and protect soil fertility and productivity by controlling erosion, salinity, acidity which may damage it; e) to determine the personal contraventions. Project alignment: project will be in line with the contravention of this law at the time to promote climate smart agricultural practices in FFS component 3.
Decree-Law 200 System environmental violations	establish applicable violations in the field of the environment, without prejudice to the provisions in force or that are established from time to time in relation to certain sectors of environmental protection. Project alignment: project will be in line with the contravention of this law at the time to promote climate smart agricultural practices in FFS component 3.
Resolution 139 of 2010 of the Ministry of Science, Technology and Environment	Establishes the application of environmental impact studies to activities related to: <ul style="list-style-type: none"> • Tourist facilities, in particular those that are planned in coastal ecosystems; • Changes in land use that may cause significant deterioration in this or other natural resources or affect the ecological balance; • Beach improvement and rehabilitation projects. Project alignment: Project will consider environmental regulation and monitoring activities as well as national Environmental impact assessment in field actions especially for components 2 and 3, including potential eco touristic activities. If necessary, will conduct a National environmental impact assessment if required in project activities of component 2 or 3 according with this national legislation as well as AF environmental and social standard.

G. Describe if there is duplication of project/programme with other funding sources, if any.

The project will ensure coordination with related national projects in Cuba and Panama. Lessons will be shared through national coordination mechanisms, also considering that the Ministries of Environment and Agriculture are involved in all cases, hence creating an opportunity to enrich and mutual learning. Furthermore, best practices will serve to enrich the bi-national network that will be created for the project thus creating an ample opportunity for upscale at a regional setting.

Table 6: Complementary Projects in Cuba and Panama

Cuba		
Project and dates of implementation	Characteristics	Entry Points for Coordination and Project Additionality
Coastal Resilience to Climate Change in Cuba through Ecosystem Based Adaptation - "MI COSTA" (GCF/UNDP/AMA) (2021-2029)	The project is focused on implementing an integral coastal ecosystem-based approach for coastal resilience including SLR and storm intensity. It will invest in the restoration of coastal ecosystems as well as in enhancing an enabling legal framework for EBA and on informed communities. The project will be implemented along two large coastal stretches that include interventions in Batabanó and San Cristobal.	The Mi Costa project, although focused on EBA for general coastal resilience and protection, is not related to food security on productive systems and it will not provide support to productive associations nor measure the projected loss and damage due to SLR. Synergies and no duplication actions: - Opportunities for coordination learning with CITMA (main actor for both projects) enhance it adaptation to CC information and actions to achieve a sustainable production level linked with EBA. - Sustainable production work of this project will complement adaptation efforts to producer level with high possibility of dissemination and inclusion of sustainable practice. - Proposed project actions can be articulated with monitoring protocols and management plans being created through the GCF project.
Coastal recovery in communities in Cuba y Dominican Republic (Caribbean Biodiversity Fund)	The project is focused on marine ecosystem recovery in the Fauna Refuge of the Batabanó Golf located in the Batabanó municipality. Among the project's main expected results is the creation of the Caribbean School for the restoration of coastal wetlands.	The project is not overlapping with the proposed project since it focuses primarily on marine ecosystems and the role of coastal wetlands on their protection and conservation, while it has does not address the sea level rise issue. To maximize the efficiency of project implementation in the target area, lessons learned could be in-built. Synergies and no duplication actions: - The project results will serve to inform the proposed project and will provide a greater opportunity for knowledge sharing. Information developed can support the implementation of restoration actions of the proposed project.
Increased climate resilience of rural households and communities through the rehabilitation of productive agroforestry landscapes in selected localities of the Republic of Cuba (IRES-Cuba)" (GCF/FAO/MINAG) (2020- 2027)	The project will restore productive landscapes to preserve ecosystem services through the use of innovative methods and financial incentives. Amongst these, will be the use agroforestry and silvopastoral systems that will be introduced in 35,000 ha to improve water infiltration. The project will be implemented in the provinces of Matanzas, Villa Clara, and Las Tunas that do not coincide with the proposed project.	The project focuses on 3 provinces of Cuba, and there is no geographical overlap with the proposed project. Since some thematic areas are close to the proposed project one, potential synergies may be explored in terms of approaches and methodologies and providing support through agricultural cooperatives. Synergies and no duplication actions: - Best practices and lessons learned on productive practices as NBSs for adaptation will be considered by the proposed project as applicable considering different ecosystems into comp. 2 and 3. - Systematization of these experiences will be also shared with Panama through the binational platform.
Mainstreaming biodiversity into mountain agricultural and pastoral landscapes of relevant ecosystems in Eastern Cuba (Global Environmental Facility FAO/MINAG) (2022-2026)	The project will reduce pressures on key fragile mountain and pre-mountain ecosystems of Eastern Cuba, by mainstreaming biodiversity in agriculture/livestock production, and implementing integrated landscape management (ILM) and planning. To this end, the project will contribute to the strengthening of governance, legal framework, policies and programs and will introduce new and innovative sustainable production practices,	One of the municipalities targeted is the mountain and agricultural and pastoral landscapes of Baracoa. Part of the experience to be develop in this zone promotes the sustainable production practices of products such as coconut, to promote environmentally friendly food products and value chains. The project however does not address the role of SLR and its impact on potential food productive losses nor adaptive actions to reduce this loss. Synergies and no duplication actions: - The proposed project will promote complementary actions for protecting key ecosystems relevant to productions that are menaced by SLR and floods. It should be noted that the current proposal will be focused on coastal and not mountain ecosystems.

	including the promotion of locally-produced, high-quality and environmentally-friendly food products. The project will also address potential environmentally-friendly value chains.	- Relevant results on coconut value chain will be shared with Panama specially into component 3 framework promoting link between producers through binational cooperation mechanism.
Environmental Foundations for Local Food Sustainability (BASAL) (EU/COSUDE/ CITMA/MINAG) (2013-2021)	The project is focused on generating climate resilience to the agricultural sector in Cuba through improved technologies and productive practices as well as capacity building to the productive sector. The project was implemented in 3 municipalities in the Pinar del Rio (Los Palacios focused on rice), Artemisa (Guira de Melena focused on diverse crops) and Camaguey (Jimaguayu focused on livestock).	Project implemented in specific municipalities identified through key crops. The focus, while inter-sectoral (both CITMA and MINAG implemented), was limited to these municipalities with a strong capacity building element focused on the productive sector. The project did not consider the interplay between NBS and productivity. Synergies and no duplication actions: - Productive practices as well as working through local groups and organizations will be replicated by the proposed project, such as organic fertilizers, seedling production, agricultural production processing among others. - Current project will have a wider approach for food security that includes enhancing local government structures as well as linking productive practices to coastal ecosystems that is not foreseen in the BASAL project.
Reduction of Vulnerability to Coastal Flooding through Ecosystem-based Adaptation in the South of Artemisa and Mayabeque Provinces (Adaptation Fund/ UNDP/AMA) (2014-2021)	The project is focused on the restoration of 84km of mangrove lined coastline implementing an EBA approach for coastal resilience. It also implemented a community-based approach of ecosystem awareness.	The project has recently closed being implemented in nearby provinces to the Batabanó municipality. The project focused on coastal resilience through EBA with promising results. However, a productive approach was missing from the project design and was incorporated during the project's last year at a limited level. Synergies and no duplication actions: - Lessons learned on the implementation of an EBA approach for coastal ecosystems will be considered. - Community awareness techniques.
Panama		
Project	Characteristics	Entry Points for Coordination
Adapting to climate change through integrated water management in Panama (Adaptation Fund / Fundacion Natura) (2018-2021)	The project aimed at enhancing water management capacity for food and energy security through watershed management in the river watersheds of Chiriquí Viejo and the Santa María River. The project also piloted climate smart agricultural and sustainable livestock practices to manage both flood and drought conditions from precipitation-related weather events.	Fundación Natura will be a key partner in project implementation and will be one of the executing partners. The project did not take into account SLR scenarios that had not that had not been foreseen while focusing on coastal ecosystems and their preservation as NBS for food security Synergies and no duplication actions: - Lessons learned and best production practices will be incorporated into the proposed project, such as sustainable production of black shell in mangroves could be one of relevant production activities compatible with EBA. - Lesson learned to improve associativity between producers and producers net will be and useful input for component 3. - There is not duplication due its different scope and location.
Improved technical production of coconut and other harvests in the Low Coasts of the Colon Province (Ministerio de Desarrollo Agropecuario / Instituto de Inovación Agropecuaria de Panamá (IDIAP)	The project aimed at promoting sustainable production of coconut as well as to diseases related to coconut. The project is looking into research into coconut processing as well as into identifying a circular economy approach.	Synergies and no duplication actions Research developed by the IDIAP will be integrated into the proposed project, particularly in its 3 rd component. The proposed project in turn will provide a valuable climate lens that is currently absent from the project.
Diagnosis and management of terminal diseases that affect the coconut tree in the Costa Abajo de Colón.	This Tech. Assistance project, has as main objective, to diagnose different diseases that seriously affect the yields of coconut crops, established in the Districts of Chagres and Donoso in the province	This T.A project will work not only in the diagnoses of the deceases but also in crop management alternatives that minimize the damaging effects of pathological agents and best cultivation practices at a greater scale through FFS while incorporating climate change projections and impacts to coconut production and ensuring EBA sustainability. Synergies and no duplication actions:

(2020-2023)	of Colón, located on the Costa Abajo. In addition, an appropriate management to minimize or eliminate the effect produced by the causal agents of the diseases. It is expected to contribute to the support of the economy of the producers of Costa Abajo de Colón; considering that for them, this crop represents an important contribution to the sustenance of their families.	<ul style="list-style-type: none"> - Proposed project could include best practices that consider CC effects in the zone. - Knowledge sharing between producers of Cuba and Panama to share practices and identify sub products under sustainable standards. - Dissemination of the results of the project linked to CC adaptation practices.
Protection of carbon reserves and sinks in the mangroves and protected areas of Panama(IKI, Ministry of Environment, Wetlands international, International Conservation, UNDP) (2014-2017- 3.2M USD)	Demonstrates the contribution that mangrove ecosystems make to the management of risk and climate change both from the adaptation and mitigation perspective. His research improves understanding of the dynamics of the carbon in mangroves and associated ecosystems in Panama. This knowledge is incorporated into strategies nationals and reports to international conventions.	<p>Project ended in May 2018. Main results include: a) 13,000 hectares of delimited and demarcated mangroves; b) a protocol for measuring carbon in mangroves; c) a guide of best practices for restoration of mangroves; c) Managed to initiate a process of restoration of mangroves in Las Lajas lagoon, and d) a pilot program in three districts of the province of Chiriquí that managed to strengthen the capacities of various community leaders and the regional office of the Environment Ministry in Chiriquí.</p> <p>Synergies and no duplication actions:</p> <ul style="list-style-type: none"> - Consider its results as inputs to EBA related to mangrove restoration, including guide for Adaptation to Climate Change in Marine-Coastal Zones of the Panamanian Pacific to formulated adaptation measures. - Consider educational actions as way to local dissemination of knowledge. - Incorporate technical results about mangrove values contribution to promote it sustainable management not only as a natural value but also as a natural barrier against CC effects and the potential sustainable use of this ecosystem linked with communities' economic activities.
Increase forest cover to capture carbon and reduce vulnerability in priority watersheds in Panama (CABEI/ GCF) (CN formulation stage- propose implementation: 5 years and 92M USD)	Restoration, reforestation and sustainable management of productive ecosystems for clean and resilient development, by promoting approaches, knowledge, technologies and investments for climate action in vulnerable communities in priority watersheds.	<p>Even though the project has not yet started, potential synergies may be explored in terms of climate smart practices proposed, establishing a dialogue channel at full proposal level.</p> <p>Synergies and no duplication actions -Investment to dynamize green and blue economy</p> <p>Productive and conservation practices associated to mangroves such as communities eco-tourism, restoration and revegetation of mangrove areas and other associated wetlands to strengthen the resilience, cultivation of oysters as a carbon sink, reduction of eutrophication and economic development in fishing communities that in turn contributes to the restoration of mangrove forest and marine-coastal zones, management and co-management of filtering marine species (black shell) to reduce eutrophication of the marine-coastal zone due to runoff from the basin and increase the resilience of the productive ecosystem, restoration of marine biodiversity and its role in the carbon cycle through ghost net extraction and sustainable management.</p>
Ecosystem-based adaptation to increase resilience to climate change in the Central American dry corridor and arid zones of the Dominican Rep. (UNEP/CABEI) (CN approval stage- 263M USD -7 countries – 7 years of expected implementation Investment for Panama: 750k per year)	Targeted into Centro American dry corridor, include 2 basins of Panama located in the pacific coast (rather than the Caribbean). Include Ecosystem based adaptation in rural communities and technologies of efficient use of water in rural communities of targeted municipalities.	<p>No duplication has been identified from the project, since the project areas are in opposite coastlines. However, potential synergies may be explored in terms of climate smart practices proposed once the project will begin.</p> <p>Synergies and no duplication actions</p> <ul style="list-style-type: none"> - Climate smart practices, such as agroforestry systems to relevant crops in targeted municipalities form Cuba and Panama for crops such as coconut housing production. - Promote damage and losses methodologies from AF project into relevant crops of GCF project to enhance their results. -Project will be focused on the Central American Dry Corridor and not the Caribbean coastline.
Regional Initiatives		

Caribbean Biodiversity Fund	An umbrella fund created with permanent and non-permanent funding to targeted Caribbean countries (including access to sink funds) for conservation and sustainable development in the Caribbean region.	The fund provides support through funding and grants incentivize Caribbean nations to meet the goals of the Caribbean Challenge Initiative for marine and coastal environments including for local action. no duplication actions The initiative does not include Cuba nor Panama within its scope of action.
CIDC: Alliances for Coconut Industry Development for the Caribbean (EU/International Trade Center/Caribbean Agricultural Research and Development Institute (CARDI))	Initiative to increase the food availability and reinforce incomes of small-scale farmers through improved competitiveness of the coconut sector through better regional integration and improved production performance targeting 11 mainly English Speaking Caribbean countries.	The project has provided support in facilitating technical expertise on production processing and commercialization of coconuts and coconut products. It has developed research on integrated pest management for coconut and developed methodological guides. Synergies and no duplication actions: The initiative has not considered climate change within its scope it also does not include Cuba nor Panama nor most Spanish Speaking Caribbean countries (Dominican Republic being the exception) hence guidelines are not accessible to local producers. The project will build upon lessons learned for coconut production and guidelines while looking to expand on these.

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

Component 1 favors the creation of knowledge management through Output 1.3 that will allow to systematize best practices in the implementation and use of loss and damage methodologies. Through the implementation of such methodologies, impacts on productivity in the face of slow onset will be estimated, hence providing the opportunity for the project to inform international standardized methodologies to be enhanced through on-ground real-time action. These experiences will be systematized in the forms of toolkits, guidance notes and similar publications to allow for the replication and upscale in similar contexts (coastal ecosystems facing slow onset climate hazards). These knowledge products will provide an increased understanding on the applicability and use of loss and damage methodologies not only as reactive measures to assess impacts from specific disasters but also as tools to guide adaptation actions and evaluate resilience capacity. This is particularly relevant in the face of slow onset impacts where total losses are already felt but not yet calculated, and where an opportunity for the implementation of risk mitigating and adaptive measures exists to reduce loss and damage to local agricultural productivity and its effects on food security and local livelihoods. The evaluation of the impact of adaptive actions implemented through the project will provide important inputs to coastal communities facing similar pressures.

The project will also make use of an FFS approach that favors on-the-ground experimentation through a learning-by-doing approach that will incorporate lessons learned within municipalities for replication in neighboring areas through concrete results that favor local solutions. This is a key aspect to ensure the long-term change and appropriation that the project is looking for and has proven to be effective in upscaling agriculture best practices in a concrete manner.

The bilateral cooperation mechanism between Cuba and Panama will also create the opportunity for both countries to innovate and expand on the loss and damage methodologies to other sectors while enhancing bilateral cooperation in climate action.

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

Due to COVID restrictions the project has resorted to a mainly virtual consultation processes including surveys and the delivery of virtual meetings. These have taken place with key national and local governments in both countries to identify perceptions around CC and CC risks as well as to validate project measures. These consultative exercises have allowed to identify capacity gaps and concerns to be incorporated by the project, including concerns for community nature-based livelihoods and risk management and accounting through the use of loss and damage methodologies to better assess climate impact.

Consultation have included meetings (virtual and small in person settings) and communications with the Ministries of Environment, Agriculture, Fishing and municipal governments in Panama (Chagres, Santa Isabel and Portobelo) that have been recorded through project minutes and through online surveys (Annex 3, including full participant lists). In the case of consultations with Cuban municipalities these have taken place through surveys considering the challenges of accessing virtual platforms in local communities (Annex 3, including full participant lists).

Consultations with local producers in both Cuba and Panama took place through the use of online and telephone interviews and surveys with the support of the Ministries of Environment in both countries. These consultations allowed the project to better identify challenges to agricultural production and perceptions of climate impact as well as perceived needs, including the lack of technical guidance and inputs to enhance productivity in both rice and coconut harvesting. Consultations have also included indigenous people through interviews with the Heads of Indigenous People and also the Indigenous Representative at the Ministry of Environment. These consultations enabled the assessment of indigenous communities (Annex 3) and the identification of their main needs that will be integrated into components 2 and 3.

During full proposal phase, the project will conduct consultations with productive associations, women’s organization and women focal points, water boards and community representatives while ensuring a gender focus to identify concerns and vulnerabilities that are specific for women and vulnerable groups. These consultations will result in a Stakeholder and Gender Action Plan that will allow to further evaluate and identify the needs, and relevant actions, for vulnerable populations including indigenous groups. The analysis derived from these products will further inform project design.

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

Table 7: Justification for project funding requested

Components/Outputs	Baseline (without AF resources)	Alternative (with AF resources)
1. Local planning and cooperation in 9 coastal municipalities to reduce fishing and agricultural productive loss and damage from slow onset hazards in Cuba and Panama		
1.1 Loss and damage of agricultural and fishing productivity methodology implemented in 9 target coastal municipalities in the face of slow onset climate impacts	<p>Municipal governments with an abstract idea of CC based on national plans and observed changes. In the case of Cuba, while there is a general greater awareness, it is limited to general impacts that are not necessarily locally specific and hence do not translate into on the ground actions nor investments by local governments.</p> <p>Little capacity from municipal governments to manage vulnerability to climate impacts, particularly slow onset event.</p>	<p>Identification of projected food productive losses to local economies and livelihoods by municipal governments as a result of slow onset climate impacts.</p> <p>Local government capacity to begin identifying potential adaptation measures to reduce climate vulnerability to slow onset impacts. Development of Participatory Adaptation and Risk Management Plans to guide adaptive action.</p> <p>Municipalities will be able to project the concrete cost of CC and the value of adaptation and equipped with greater capacity to adjust budgets to finance adaptation planning.</p>
1.2 Loss and Damage Information Systems for slow onset climate hazards institutionalized at a sectoral and local level and shared binationally for monitoring and evaluation and adaptive planning	<p>No capacity to host information on damage and losses to slow onset impacts hazards and much less analytical capacity for the development of information products useful for adaptive action and planning.</p> <p>Decisions over loss and damage to agricultural production to specific disasters (storms) made without a capacity to analyze long term trends to slow onset impact hence undercounting and underestimating the impact of climate change to local agricultural production, livelihoods and food security. Little capacity to evaluate the true cost of adaptation inaction nor to prevent projected damages.</p> <p>Capacity to implement adaptation action is limited by lack of measures or methodologies to evaluate their impact in reduced losses and increased resiliency. Local investments are hence not necessarily linked to increased resilience.</p> <p>Existing loss and damage methodologies remain theoretical exercises with limited recorded experience (or retrofitted analysis) on how to adjust to local capacities and</p>	<p>Damage and loss information systems designed in a manner that is appropriate and methodologically consistent to both Cuba and Panama favoring the housing and processing of loss and damage data to slow onset impacts.</p> <p>National and local capacities created for data processing allowing for the analysis of long-term trends to slow onset impacts and calculating full (and ongoing) impact of CC to local agricultural productivity.</p> <p>Information products are developed to provide valuable inputs to inform NDCs and adaptation action to reduce projected losses. These measures can be evaluated through reduced loss impact to projected CC (SLR and temperature projections and their materialization).</p> <p>Standardization of loss and damage methodologies across two countries and 9 coastal municipalities provides the scale necessary to better inform loss and damage methodologies and their implementation as well as their transformation in tools for adaptive planning and risk management across the wider Caribbean. Lessons learned provide valuable insights to enhance methodologies.</p> <p>Bilateral cooperation amongst Panama and Cuba is enhanced at various levels including at a producer level through interlinked FFS across target sites that favor the infield implementation of lessons</p>

	challenges. When these are implemented following disasters, they are not necessarily incorporated into national and sectoral datasets or are done inconsistently thus not favoring comparability nor knowledge sharing across countries.	learned within a regional network with potential to be mobilized across the Wider Caribbean.
1.3 Best practices and lessons learned in assessing loss and damage methodologies for slow onset hazards systematized as a tool for adaptation planning and risk management to food security and agriculture- and fish-based livelihoods	<p>Innovative loss and damage methodologies remain theoretical exercises with little information regarding the calculation of on-ground implementation in the face of slow onset impacts (vs one off disasters). Loss and damage methodologies remain reactive tools for DRR to specific disasters.</p> <p>Adaptive action to reduce losses cannot be evaluated in a methodological manner and hence their impact in reducing climate risk is limited and cannot be measured. Lessons learned from regional best practices are not communicated to vulnerable coastal communities and remain within a practionar community and not necessarily implemented nor upscaled across a wider setting. Coastal communities remain with little capacity to implement best practices.</p>	<p>Innovative loss and damage methodologies are tested on the ground with lessons learned systematized and incorporated to enhance the methodology and better incorporate its use to slow onset hazards. Replication is favored through the development of tool kits and guidance notes for upscale and use in similar contexts in the region.</p> <p>Loss and damage methodologies allow for the incorporation of resilience measures and capacities to manage slow onset impacts and hence become tools to guide adaption planning.</p> <p>Bilateral cooperation amongst Panama and Cuba is enhanced at a producer level through interlinked FFS across target sites that favor the infield implementation of lessons learned within a regional network with potential to be mobilized across the Wider Caribbean.</p> <p>Coastal communities are made aware of existing best practices and have access to extension support through interlinked FFS and South-South cooperation.</p>
2. Ecosystem based adaptation (EBA) measures implemented in key ecosystems to protect local food production and promote resilience and food security		
2.1 Nine Municipalities manage critical ecosystems, through EBA measures, increasing the resilience of their communities, livelihoods and local food security	<p>Little knowledge to identify ecosystem services as related to food security and resilience. Agricultural-, and in some cases, tourist-based expansion further degrading valuable ecosystems. Short-term economic gains favored over long-term resiliency by productive sectors and government authorities.</p> <p>Ecosystem degradation is continued at existing rates due to unstainable productive management, exposing local livelihoods to recurrent and exponential climate impacts.</p>	<p>Increasing awareness on ecosystem-food-coastal resilience nexus. Valued ecosystems make ecosystem services easier to be identified and incorporated into local development metrics. Identification of coastal vulnerability based on climate impacts and ecosystem health that result in ecosystem protection.</p> <p>Awareness on EBA as a potential adaptation alternative is incorporated, socialized and implemented through a hands-on learning process (FFS). Impact can be analyzed on the basis of reduced exposure to agricultural losses through its incorporation as a measure of resilience in loss and damage methodology.</p> <p>Critical ecosystems are protected through EBA measures. NBS solutions are implemented and maintained by local communities with an increased awareness to their value in reducing projected loss and livelihood protection. 200km mangroves can save USD 200 million in coastal protection over 10 years. Communities can also significantly increase income from nature-based tourism and restored fish stocks (see section II – C for economic benefits).</p>
3. Improved resilience of nature-based livelihoods and local food security		
3.1 Climate-smart agricultural and fishing productive technologies and methods adopted by local producers to improve the long-term sustainability and productivity of traditional livelihoods in the face of climate impacts	<p>Unsustainable productive practices result inviable to climate impacts as SLR, coastal erosion and marine intrusion into aquifers and agricultural lands make these practices unsustainable. Increased degradation of protective ecosystems to make up for productive losses hence increasing vulnerability to climate impacts. Food insecurity increases in the region as nature-based livelihoods are lost due to low adaptive capacity.</p>	<p>Adaptive capacity of small producers is increased through extension services, access to technology and inputs for climate smart food production across traditional agricultural and fishing based livelihoods.</p> <p>Food security is enhanced by the implementation of climate smart practices that will result in reduced exposure to slow onset impacts (reduce losses and damages) and incomes are increased by an estimated 117% to 180% over traditional monocropping.</p> <p>Extension support is created for ongoing learning, innovation and experimentation with climate smart practices through FFS that are created and interlinked allowing for regional knowledge sharing at a producer level.</p>

		Cooperative associations among producers are created to maintain investments and enhanced for increased inclusivity and participation of women and vulnerable communities.
3.2. Diversified and EBA-compatible livelihoods identified and supported for agricultural and fishing-dependent households	<p>Traditional livelihoods remain insufficient to make up for economic losses due to climate impact and ecosystem degradation.</p> <p>Traditional livelihoods fail to fully incorporate women and indigenous populations that per national assessments continue to be those most exposed and vulnerable to climate change.</p> <p>Information on potential livelihoods for coastal communities does not flow down for territorial action hence communities remain vulnerable.</p>	<p>Alternative livelihoods are created across target sites ensuring their compatibility with EBA and made inclusive to women and indigenous populations.</p> <p>Food security and livelihoods are further protected by the introduction of alternative revenue streams from artisanal oyster culture and other alternative livelihoods that are resilient to slow onset impacts and compatible with EBA measures.</p> <p>Knowledge exchange between target sites on alternative livelihoods exist in a manner that favors not only local actions (FFS) but also can be evaluated for its role in providing increased incomes and resilience to slow onset impacts.</p>

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

Project sustainability will be guaranteed by the building of capacities at the institutional, multisector and local levels, by the commitment of the competent institutions in the monitoring and technical assistance of the actions implemented by the project, and by greater awareness and equal participation of the key actors identified by the project. The project will build capacities in multiple levels through its various components including enhancing productive and community associations in their ability to implement climate smart technologies and nature-based solutions. By relying on FFS approach the project ensures that expertise is maintained and replicated within local actors that are able to experiment in their own plots but also become facilitators to other producers. This allows the project to address the lack of extension support that has been cited during project consultations in a way that is scalable and has demonstrated to be sustainable in past projects beyond project duration.

By prioritizing in field work at a municipal setting, the project also allows for key actors to gain knowledge on the development and maintenance of nature-based solutions while the information gained by the loss and damage methodology generates a concrete value to local ecosystems in the potential reduction of livelihoods and food productivity. Hence creating a community interest in their upkeep. Communities will therefore be able to not only develop these solutions, but also have the capacity and interest to maintain them. Nature based solutions, and EBA in particular, have demonstrated to have the added benefit of reduced maintenance cost as time progresses in comparison to grey infrastructure.

By working through community productive associations the project has also looked to the sustainability of inputs provided for climate smart and diversified productive practices as these associations will have the organizational structure required to continue providing extension support (through FFS) but also in ensuring that members to these associations maintain the inputs provided. Revenue generated by additional productive incomes through alternative livelihoods and reduced losses will provide the income required to maintain inputs beyond the project's lifetime. To address existing capacity gaps within these organizations the project has considered the need for strengthening these organizations in their productive and managerial capacity through project initial actions.

The sustainability of the binational coordination platform is being favored through its framework within existing binational agreements and priorities developed by Cuba and Panama. These agreements for the most part have remained general and have lacked an actionable agenda as it relates to climate change that will be added through this project and the coordination of developing similar information systems on loss and damage as well as through the in-field support that will be promoted by the interlinking of FFS across the target sites. Ministries in both Cuba and Panama have committed to ensuring its sustainability and funding of bilateral cooperation actions beyond the project duration.

More importantly the regional character that is being sought through the project will allow project results to be sustainable as made applicable in a wider setting by incorporating lessons learned that are not just nationally nor site specific (a common challenge of national projects). These lessons will be systematized and packaged for wider dissemination within the Wider Caribbean to develop guidelines that are accessible to other regional producers facing similar challenges. The systematization of the use of loss and damage methodology also provides an opportunity to be further replicated within the Caribbean region by FAO and made applicable to SLR challenges facing the region

that will be benefitted by the piloting experiences and structures developed in Panama and Cuba. The project will further engage with regional initiatives that have looked to address common productive and climate challenges in the region such as AEC, CELAC and will favor participation in regional fora such as the Regional Platform for Disaster Risk Reduction in the Americas and the Caribbean and Regional Climate Weeks to enhance the dissemination of project results and their replication. Participation of Cuba within the CARICOM community (particularly in providing technical assistance in disaster risk management) as well as Panama’s role within SICA and its Environmental commission (CCAD) will provide a platform for regional knowledge management across a wider audience to include Central American countries with a Caribbean coastline. Technical support offered by both countries could include the use of the interlinked FFS developed through the project.

Finally the project by favoring the use of a loss and damage methodology and system that will be better adapted through in the field

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

Considering the project objective focused on sustainable development whereby economic and social advances will consider environmental conservation, the project does not foresee negative impacts derived from project implementation. The project will ensure equitable participation and benefit sharing while seeking to incorporate a gender focus to project activities. The project may have some minor risks associated with it, however, these can be easily mitigated. The project is therefore categorized as a category B project.

An initial review of environmental and social impacts has been made below, which will be further analyzed during the Full Project formulation phase also to include the development a Stakeholder Engagement and Gender Plan. An Environmental Management Framework will also be prepared, in line with FAO and Adaptation Fund’s Policies.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
<i>Compliance with the Law</i>	Further assessment will be conducted for full proposal	The project will ensure alignment to existing national laws and regulations in both countries as detailed in section II – F above, as well as supporting governments in complying with global agreements and/or conventions. All project actions and activities will be coordinated with the responsible stakeholder institutions, who will provide guidance and support on technical and financial execution of the project in accordance with national regulations. It should be noted that both countries will include the active participation of environmental national authorities in charge of environmental regulation and compliance therewith.
<i>Access and Equity</i>		The project design aims at providing free access, information and participation to the different stakeholders and actors, guaranteeing equity as one of the main principles for the implementation of the project. During full proposal formulation and implementation there will be neither discrimination nor favoritism in accessing project / programme benefits. The project does not foresee reducing access to natural resources for local populations, although community action plans for ecosystem management may require restricting access during works on ecosystems during their implementation. Hence project will develop a stakeholder engagement plan during the Funding Proposal stage to better evaluate this risk and ensure appropriate mitigation measures.
<i>Marginalized and Vulnerable Groups</i>		Considering the risk of perpetuating lack of access to marginalized and vulnerable groups with a focus on women, youth and indigenous people, a stakeholder engagement plan will de be developed and benefits derived through Components 2 and 3 will favor support to women and vulnerable populations associations.
<i>Human Rights</i>		Cuba and Panama have ratified the following Conventions and Covenants: Against torture; on Civil and Political Rights; Protection of all persons from forced disappearances; Convention on the Elimination of All Forms of Discrimination against Women (CEDAW); Elimination of racial discrimination; Economic, social and cultural rights; The protection of migrant workers and their families; The right of the child; and the rights of persons with disabilities. Currently there are pending Special Procedures (SP) for Cuba for human trafficking and international solidarity while for Panama there are pending SPs on Indigenous Peoples with the recommendations inter alia on reducing the poverty rates between indigenous people and ordinary Panamanians in access to economic development; and to strengthen the coordination and implementation of economic development programmes in collaboration with indigenous authorities; and discrimination against women. The project will aim to redress the disparities in standards.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
<i>Gender Equity and Women's Empowerment</i>		Considering that in both countries, primary production is heavily inclined towards men with low female participation, the fully-fledged project proposal will develop a Gender Plan and Analysis to ensure that women's participation, specific concerns and vulnerabilities are reflected.
<i>Core Labor Rights</i>		Both Cuba and Panama have been members of the ILO since 1919 and have both ratified 8 of 8 fundamental Conventions. FAO will however will respect, promote, and realize in good faith the ILO principles and ensure that they are respected and realized in good faith by the EEs and other contractors.
<i>Indigenous Peoples</i>		A small group of indigenous populations have been identified within the target sites of Panama. The project has developed an initial analysis that has been enhanced through consultations with indigenous representatives. A further analysis will be made as part of the participatory consultations during the Funding Proposal stage to ensure the project incorporates the concerns and needs of indigenous populations.
<i>Involuntary Resettlement</i>		The project will not engage in involuntary resettlement. All consultations will be based on the Free, Prior and Informed Consent (FPIC) Principle. Should a situation of resettlement or economic displacement arise during the implementation of the project that was not anticipated during design, the implementers and FAO will ensure that a consultation and negotiation process is undertaken with the potentially affected people, according to the FPIC and do-no-harm principles. In case no agreement is reached, the project implementers will modify the specific interventions associated with the affected people, or halt them if changes are not possible. In the case where project implementers fail to undertake a consultation and negotiation process with the affected people, according to the FPIC and do-no-harm principles, the conditions and terms of the agreement could be considered to be breached and suspended, following FAO normal procedures for suspension.
<i>Protection of Natural Habitats</i>		The project considers the conservation, recovery and restoration of key ecosystems and their associated biodiversity as one of the key elements to reduce vulnerability due to the effects and impacts of CC. Nonetheless, NBSs for productive management (including agroforestry and silvopastoral systems) may entail restoration actions that will require careful analysis considering close proximity to naturally protected areas. Accordingly, the development of a management framework will be better evaluated during the preparation of the Funding Proposal for the project and as activities are better defined.
<i>Conservation of Biological Diversity</i>		The project considers the conservation, recovery and restoration of key ecosystems and their associated biodiversity as one of the key elements to reduce vulnerability due to the effects and impacts of CC. Nonetheless, NBSs for productive management (including agroforestry and silvopastoral systems) may entail restoration actions that will require careful analysis considering close proximity to naturally protected areas. Accordingly, the development of a management framework will be better evaluated during the preparation of the Funding Proposal for the project and as activities are better defined.
<i>Climate Change</i>		The project will not have any negative impact on climate change as it does not promote any drivers of climate change (energy, transport, heavy industry, building materials, large-scale agriculture, large-scale forest products, and waste management), it will therefore not contribute to climate change as all project components and activities contribute to increasing local capacities to better adapt to climate change. Nonetheless, the project could be affected by climate hazards considering their coastline location and general vulnerability to storms. Project investments including those foreseen in components 2 and 3 will consider climate impact in their development.
<i>Pollution Prevention and Resource Efficiency</i>		The focus of the project actions is based on NBSs that are expected to reduce pollution and improve efficiency in the use of resources. Special attention in the design of NBS will be made to ensuring the correct use of any potential pollutants as well as to their proper disposal per national regulations and international best practices.
<i>Public Health</i>		The project hopes to contribute to reducing the risks to public health in the project intervention area through a better understanding of the effects of CC and the execution of actions to reduce vulnerability and risks resulting from the effects and impacts of CC, and through improved economic opportunities. Special attention will be made in the implementation to NBS to reduce exposure of vector borne diseases in mangrove and coastal wetland areas.
<i>Physical and Cultural Heritage</i>		Within the study area is the Castillo del Real de San Lorenzo and Portobelo Cultural Heritage Site in Panama, declared by UNESCO in 1980. Both sites constitute officially declared and protected areas under the management category of Protected Landscape and National Park, respectively. No impacts or risks is expected from project implementation to these sites, however the need for a management framework will be better evaluated during the Funding Proposal stage.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
Lands and Soil Conservation		The project will promote the conservation and sustainable use of soils and land by incorporating tools and best productive practices that improve their management and promote the protection, recovery and restoration of priority ecosystems and with it the protection of the soil and retention of organic matter and sediments.

PART III: IMPLEMENTATION ARRANGEMENTS

Part III of the Adaptation Fund Template will be provided upon the submission of the Full Funding Proposal

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


A. Record of endorsement on behalf of the government⁵⁵

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 an annex to the project/programme proposal. Please attach the endorsement letters with this template; add as many participating governments if a regional project/programme:

Milciades Concepción, Minister of Environment, Ministry of Environment (Republic of Panama)	Date: July, 19, 2021
Ulises Fernández Gómez, Director of International Relationship, Ministry of Science Technology and Environment (Republic of Cuba)	Date: June 25, 2021

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, <u>commit to implementing the project/programme in compliance with the Environmental and Social Policy of the Adaptation Fund</u> and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.	
<p>Maher Salman Implementing Entity Coordinator</p> 	
Date: August 6, 2021	Tel. and email: 0039 0657054718 Maher.Salman@fao.org
Project Contact Person: Maher Salman	
Tel. And Email: 0039 0657054718, Maher.Salman@fao.org	

Annex 1: NDA Endorsement Letters

⁶. Each Party shall designate and communicate to the secretariat the authority that will endorse on behalf of the national government the projects and programmes proposed by the implementing entities.

Panamá, 19 de julio de 2021
DM-1361-2021

The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement for “Strengthening the adaptive capacity of coastal communities of Cuba and Panama to climate change through the binational exchange of best practices for climate management and local food security”

In my capacity as designated Authority for the Adaptation Fund in Panama, I confirm that the above regional project/programme proposal is in accordance with the government’s national priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the region.

Accordingly, I am pleased to endorse the above project/programme proposal with support from the Adaptation Fund. If approved, the project/programme will be implemented by Food and Agriculture Organization of UN and executed by NIE Fundación Natura and the Ministry of Environment.

Sincerely,


MILCIADES CONCEPCIÓN
Minister of Environment, Ministry of Environment



MC/AGALC/21


Albrook, Calle Broberg, Edificio 804
República de Panamá
Tel.: (507) 500-0855

www.miambiente.gob.pa



ADAPTATION FUND

**Letter of Endorsement by Government
Ministry of Science, Technology and Environment (CITMA) of Cuba**

June 25, 2021

To: The Adaptation Fund Board
c/o Adaptation Fund Board Secretariat
Email: Secretariat@Adaptation-Fund.org
Fax: 202 522 3240/5

Subject: Endorsement of Project "Strengthening the adaptive capacity of coastal communities of Cuba and Panama to climate change through the binational exchange of best practices for climate management and local food security".

In my capacity as designated authority for the Adaptation Fund in Cuba, I confirm that the above regional project proposal is in accordance with the government's regional priorities in implementing adaptation activities to reduce adverse impacts of, and risks, posed by climate change in the Panamá and Cuba.

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by Food and Agricultural Organization of the United Nations (FAO) and executed by Environmental Agency of the Ministry of Science, Technology and Environment - CITMA (AMA) with the support of the Ministry of Agriculture (MINAG)

Sincerely,


Ulises Fernández Gómez


MINISTERIO DE CIENCIA
TECNOLOGIA Y
MEDIO AMBIENTE
DIRECCION DE RELACIONES
INTERNACIONALES

Director of International Relationship
Ministry of Science, Technology and Environment
Republic of Cuba



Project Formulation Grant (PFG)

Submission Date: August 6th, 2021

Adaptation Fund Project ID:

Country/ies: Republic of Cuba and Panama

Title of Project/Programme: Strengthening the adaptive capacity of coastal communities of Cuba and Panama to climate change through the binational exchange of best practices for climate management and local food security

Type of IE (NIE/MIE): Multilateral Implementing Entity (MIE)

Implementing Entity: Food and Agriculture Organization of the United Nations (FAO)

Executing Entity/ies:
Cuba: Environmental Agency of the Ministry of Science, Technology and Environment - CITMA (AMA), the Ministry of Agriculture (MINAG)

Panama: Ministry of Environment, Fundación Natura

A. Project Preparation Timeframe

Start date of PFG	15 January 2022
Completion date of PFG	15 September 2022

B. Proposed Project Preparation Activities (\$)

Describe the PFG activities and justifications:

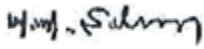
List of Proposed Project Preparation Activities	Output of the PFG Activities	USD Amount
Consultation with national and local stakeholders. In order to ensure project activities will effectively address challenges faced by local communities, local-level gender-responsive consultations will be held in project target countries throughout the full project proposal design phase to enhance ownership and strengthen sustainability	Consultation and assessment tools and processes	4 000.00 (Consultancy) 3 000.00 (Workshop)
	Stakeholders' consultation reports	Sub-total: 7 000.00
	Stakeholders mapping.	
Institutional capacity assessment. In order to identify institutional capacity gaps to be addressed and improved by the project, consultations will be held with national and local institutions in project target countries to strengthen collaboration, enhance	Consultation and assessment tools and processes	8 000.00 (Consultancy) 3 000.00 (Workshop)
	Institutional capacity reports	Sub-total: 11 000.00
	Identify main element and gaps for damage and losses baseline (information,	

<p>sustainability, and promote scalability</p>	<p>institutional, national and local level, targeted crops to be selected) for both countries in selected municipalities</p> <p>Proposal of indicators for damage and losses methodology</p> <p>Identify requirement for binational damage and losses information platform for both countries</p>	
<p>Sub-national and national consultations. In order to raise awareness and report on progress toward project development, an inception meeting at regional level will be held, followed by a detailed mapping of project area to identify potential locations, and relevant baseline assessments, surveys and targeting exercises. Finally, a regional validation meeting will be conducted to finalize the full project proposal and strengthen the buying-in by authorities and implementing partners at all levels</p>	<p>Regional inception meeting</p> <p>Detailed mapping of project area to identify potential ecosystems and potential agricultural and fisheries location in targeted municipalities to be part of the assessment of EBA according to component 2 and productive mapping of agricultural, tourism and fisheries activities according with component 3 and associated relevant indicators</p> <p>Regional validation meeting</p>	<p>7 000.00 (Meetings) 14 000 (Project area mapping EBA and NBS)</p> <p>Sub-total: 21 000.00</p>
<p>Environmental and social risk assessment and management plan. In order to ensure full alignment with the AF Environmental and Social Policy, and environmental and social assessment will be carried out in project countries to develop the overall Environmental and Social risk management plan, to be included in the final project proposal</p>	<p>Social vulnerability survey (women, youth, vulnerable refugees) for both countries</p> <p>Environmental and climate-risk baseline assessment (including, social, indigenous people, cultural minorities and gender analysis) of the project target areas in Cuba and Panama</p> <p>Environmental and Social risk management plan</p>	<p>25 000 (Consultancy)</p> <p>Sub-total: 25 000.00</p>
<p>Project document development. Collection and coordination of inputs from technical teams. Based on consultation meetings, refinement of project design, including final formulation of project</p>	<p>Full-project proposal document in (English)</p>	<p>25 000.00 (Consultancy)</p> <p>Sub-total: 25 000.00</p>

outcomes and outputs and project activities. Design of project logframe with relevant indicators, and implementation arrangements. Definition of project detailed budget		
Project document translation to spanish		11,000
Total Project Formulation Grant		100 000.00

C. Implementing Entity

This request has been prepared in accordance with the Adaptation Fund Board's procedures and meets the Adaptation Fund's criteria for project identification and formulation

Implementing Entity Coordinator, IE Name	Signature	Date (Month, day, year)	Project Contact Person	Telephone	Email Address
Maher Salman, FAO		6 August 2021	Maher Salman	+39 06 570 54718	maher.salman@fao.org

Annex 2: Initial Stakeholder Consultation and Analysis (Including Gender and Indigenous Populations)

• Initial Gender Analysis

Panamá

The 2012 "Public Policy of Equal Opportunities for Women (PPIOM)"⁵⁶, jointly with the National Institute for Women (INAMU), has per objective to end inequality and promote equal opportunities between men and women. Environment is defined as a strategic guideline to "promote the participation of women in the culture of conservation, environmental protection, use and access to natural resources, and the benefits generated for sustainable development, in order to improve the quality of life of the population from a gender equality and equity perspective". This policy also promotes institutional mechanisms and human resources to guarantee gender equality and equity in policies, plans, programs and projects for the sustainability, management and conservation of natural resources.

At the sectoral level, the Ministry of Environment (MiAmbiente), according to the information provided by the Direction of Climate Change,⁵⁷ does not have a defined legal framework for gender. However, since 2019, it began a process to prepare a Gender and Biodiversity Plan led by indigenous women and with broad participation of civil society, with the support of UNDP, and is working on the development of a mainstream gender perspective. In the case of the Ministry of Agricultural Development (MIDA), it has developed the Rural Women Program attached to the Rural Development Direction, which concentrates its efforts on serving women's organizations in rural areas who do not necessarily have agriculture as their main activity. This program does not have trained human resources or financial resources to address gender equality and its activities are financed by associations with other public entities or donations from cooperation organizations. By 2020, this program had 240 associations across the country with about 3,000 members.⁵⁸

Women in rural zones: In agricultural production, 3 out of 10 producers in the area are women. According to data from 2010 reports, about 29,000 women have a direct relationship with the land through different types of tenure. On the other hand, about 25% of those who carry out work within the exploitation are women. In general, it has been reported that men are in charge of the toughest tasks during sowing time (e.g. cleaning the land, making hulls), while women are in charge of crops care, including irrigation in the summer and at harvesting. In the case of livestock, men and women are involved in feeding and maintaining small livestock, although in most cases it is in charge of women while with larger livestock the greater responsibility falls on men.⁵⁹ The analysis of the specific gender roles in the productive activities and its related project activities to mainstream gender perspective will be developed during funding proposal stage in a deeper gender analysis.

Part of the survival strategies of rural families lies in the diversification of activities among their members. 54% of producers and 81% of agricultural producers have a non-agricultural occupation as their main occupation⁶⁰. According to the census, 36% of men work in agriculture as their main occupation and only 14.4% of women do so.⁶¹ Domestic activities, as described below, occupy most of the time of women, who also work into services and other areas of the economy that offer better conditions for them. The little support and the almost zero incentives that women receive to stay in agricultural or livestock activities work against their performance in the sector. Despite being linked to the land through various forms of tenure, their access to production services such as technical assistance and credit is almost nil.⁶²

Time use: At a general level, women's work in paid productive activities is affected by the burden of other tasks assigned stereotypically and almost exclusively to women, such as domestic work and care for other family members. According to data from 2011 at the national level, although the difference in time dedicated to total work (paid and unpaid) is small (M = 64.9 h / week, H = 64.2 h / week), the distribution between paid and unpaid work is great. Indeed, while women have 29 hours of paid work, men have 50 and while women dedicate 36 hours to unpaid work, men only dedicate 14⁶³. In the case of women in rural areas, the deficits of support from the State in the care area, the market and the little or no participation of other adult family members in care tasks, lengthen the unpaid working hours of women. For example, having children under 5 years of age reduces the paid working day of women by approximately 6 hours.⁶⁴

Scholarship: Women producers have higher levels of schooling than men do. The percentage of male and female producers with no level of education is very similar, 12% and 10.5% respectively, while 58% of male and female producers and 47% of women have completed primary school at most. In contrast, 30% of men and 42% of women have secondary or higher education⁶⁵. This comparative advantage of women producers could include digitalization and modernization processes of the sector and capacity building on sustainable productive practices including climate perspective in these activities to generate resilience. In the case of young population, there are advantages since 60% of those between the ages of 25 and 29 have finished secondary school. Additionally, technical and vocational education among

⁵⁶ INAMU. 2012. *Política Pública de Igualdad de Oportunidades para las Mujeres*. Panamá

⁵⁷ Entrevista realizada a Ruben Abrego, Veronica González y Edna Flores de la Dirección de Cambio Climático de MiAmbiente

⁵⁸ Entrevista realizada a Anayansi Pérez, Encargada del Programa de la Mujer Rural. DDR. MIDA. 07/12/2020

⁵⁹ Martínez, A (2020). Social and Environmental Analysis. GEF Project "Sustainable land management and restoration of productive landscapes in hydrographic basins for the implementation of the national goals of Land Neutrality (LDN)"

⁶⁰ Ibidem

⁶¹ Ibidem

⁶² Ibidem

⁶³ CEPAL. Los cuidados en América Latina. Textos seleccionados 2007-2018. Páginas selectas de la CEPAL. 2018

⁶⁴ CEPAL (2020) Decimocuarta Conferencia Regional sobre la Mujer de América Latina y el Caribe, Santiago, 27-31 de enero de 2020

⁶⁵ Calculado con base en información proveniente de INE. *Censo Agropecuario 2010*. Volumen VII. Enfoque de Género. Cuadro 22. Panamá

young people has gained importance in the country: 14% of secondary education students are enrolled in technical or vocational schools,⁶⁶ including the Professional and Agricultural Technical Institutes.

Land tenure and farm size: 28% of the agricultural producers with direct access to the land are women and distributed in the different types of tenure, mainly with property title (34%) and without ownership title (52%)⁶⁷. Strengthening land tenure as owners with property title will result in better household income, better family nutrition, greater investment in the agricultural farm and in the education of children, among other aspects that improve living conditions of families. On the contrary, if they do not have a title, they are limited in their access to credit, technological innovations for the production and sustainable use of natural resources.

Cuba

Cuban women are protected within the framework of laws and public policies, in which their rights are recognized. Some of them have specific articles in favor of women's rights, such as the National Constitution (2019, art. 49,205 and 207), the Family code (1975, art. 24 and 65), the Civil Status Registration Act and the Civil Code Act (Art. 517, 518) and general law of Housing, Labor code, and Worker's Maternity Law Decree, Paternity Law, Social Security Law. These legal frameworks recognize women rights and equality into the society.

Women in agriculture and rural areas: At sectoral level, the Ministry of Agriculture has a gender strategy, which is merely a management tool with a prioritization in forestry and tobacco sectors. According to the 2016 Statistical Yearbook of Cuba, of the total number of people employed in agricultural cooperatives, women represent 15.7%. They also account for 15.9 per cent of the total number of persons engaged in agricultural, livestock and forestry activities. In rural areas, women are the majority in services such as education and public health, which together account for more than half of the State's public employment. Between 2010 and 2013, more than 50,000 women lost their formal link with the state agricultural system in Cuba. In addition, in 30 years, more than 400,000 people are expected to emigrate from rural areas to the cities⁶⁸.

The largest percentage of emigration from the countryside is concentrated amongst men; and those who remain still concentrate representation in paid agricultural jobs. By 2030, more than half of all households in Cuba are projected to be headed by women, including households in rural areas. The Cuban context from a gender perspective, while showing some achievements, is confronted with countless gaps and inequities.

Employment rate (disaggregated by sex): At country level, the total number of women employed in the economy remains around 37%, with differences between the State Sector (45.3%) and the Non-State Sector (17.4%). In both cases, these percentages are with respect to the total persons employed in each sector (state 3262.1 thousand workers and non-state 1329). According to different types of economic activities, there is a high female presence in sectors such as health and social assistance (68.5%) and education (66.3%). There is a lower presence in mining and quarrying (17.7%), agriculture, livestock, forestry (15.9% of the total persons employed, 820.9 thousand), fishing (14.4% of the total in this sector, 27.0 thousand) and construction (11.3%). A gender gap may be considered the smaller number of women employed in the above-mentioned sectors, since it may generally refer to the persistence of gender stereotypes and traditionally masculinized jobs⁶⁹.

	total	Women	Men	% Women	% Men
Total employed	4 591.1	1 709.6	2881.5	37.2	62.8
State	3 262.0	1 478.8	1783.2	45.3	54.7
Non State	1329.1	230.7	1098.4	17.4	82.6
Cooperatives	189.9	29.8	160.1	15.7	84.3
• Agricultural	178.5	27.6	150.9	15.4	84.6
• Non-Agricultural	11.3	2.2	9.1	19.4	80.6
Private	1 139.2	200.9	938.3	17.6	83.4
• Of it: on its own	540.8	174.8	366.0	32.3	67.7

Unemployment. According to data indicated in the 2016 Statistical Yearbook reported in the table to the left, there are more men employed than women; which may be the reason for several direct or indirect causes.

Land tenure: Although progress in the process of handing over land in usufruct and the Cuban rural organization (ANAP) include a Gender Strategy in 2005, women's land tenure in the sector has not exceeded 17.4 per cent. In addition, women represent 10.9% of the total number of applications granted to obtain land in usufruct. In the national statistics consulted, there is no breakdown by sex of this indicator.

Educational level: By 2015, female enrollment on primary education was 48.7 %, secondary education 50.0% and university education 59.6%.

Women graduating from technical and vocational education is up to 33.5 % and women graduating from higher education 55.4 % of the total of people graduated in that category. According to previous data, more women graduate at the higher level than technical education. At technical level, men are the majority and in consequence have an immediate insertion into the labor market and income access. This could highlight a gap in terms of incorporation into employment, since men generally prefer to start working earlier, in order to obtain more income, and women prefer to dedicate themselves to greater educational improvement before starting their employment (as paid work). However, although women achieve higher levels of education, they are not necessarily inserted in better-paid jobs, or linked to decision making.⁷⁰

⁶⁶ OCDE/CEPAL/CAF (2016), *Perspectivas económicas de América Latina 2017: Juventud, competencias y emprendimiento*, OECD Publishing, Paris. <http://dx.doi.org/10.1787/leo-2017-es>

⁶⁷ INEC. *Censo Agropecuario 2010*. Volumen VII. Enfoque de Género. Panamá

⁶⁸ FAO (2020) Gender Analysis GCF -FP126: "Increased climate resilience of rural households and communities through the rehabilitation of production landscapes in selected localities of the Republic of Cuba (IRES)"

⁶⁹ Data taken from the results of the 2016 National Survey on Gender Equality and Statistical Yearbook 2017

⁷⁰ FAO (2020) Gender Analysis GCF -FP126: "Increased climate resilience of rural households and communities through the rehabilitation of production landscapes in selected localities of the Republic of Cuba (IRES)"

Division of labor between men and women: Overload of domestic roles limits the adequate insertion of women into the labor market, and their access to more recognized or better-paid positions. The predominance of “macho” attitudes at the labor, community, and family levels hinder women’s insertion, participation, and permanence in the labor market in the agricultural sector. Most of the women do not receive remuneration for their work in support of food production and their participation in agricultural work is undervalued, as it is related to a part of the productive process determined in accordance with the sexual division of labor and qualified as less effort. As a consequence, their work is perceived as a “help”, thus determining limits on their participation, decision-making and income generation. Women are recognized as those who control inputs, buy food and collaborate in productive activities (raising backyard animals, cleaning milking utensils, making food for workers, in addition to domestic work). Sometimes they are in a subordinate relationship, which implies the situation referred to above as a gender gap.⁷¹

The division of labor is considered a gender gap. The highest levels of participation in the unpaid activities of men and women are concentrated in the activities that integrate domestic work, which represents 63.21%⁷². In second place, care for dependent persons with 19.02 % for the total number of persons interviewed. Women employed dedicate almost 10 hours to unpaid work, which means that even with an employment, they maintain a domestic burden, showing the double workload they face. Within unpaid work, the gap between men and women, is also wide, as expressed in hours. In caring activities of children, adults and sick people, women dedicate 8:29 h/week vs. their male peers, which dedicates 3:38 h/week to the same activity.⁷³

- **Initial Analysis of Indigenous Populations:**

According to Panama 2010 national Census, out of 3.4 million inhabitants, 438,559 (12.8%) declared to be indigenous. Guna, Emberá, Wounaan, Ngäbe, Buglé, Naso Tjer Di and Bri Bri indigenous peoples have gained recognition and delimited their territories according to the fluctuation of the administrative political division of the State and are currently represented by 12 congresses and councils. Although the Kuna de Wargandi and Kuna de Madungandi peoples are recognized by law, they have the category of “corregimiento” according to the regulations that created it, and government aid is almost nil. For their part, the communities that remained outside the “comarcas” organized themselves on collective lands. In 2019, the government accepted and recognized the existence of 25 indigenous territories per holder.

Panama has not ratified ILO Convention 169 on Indigenous and Tribal Peoples, but has voted in favor of the United Nations Declaration on the Rights of Indigenous Peoples. Current government administration appointed Ausencio Palacios of the Ngäbe indigenous people, as Vice Ministry of Indigenous Affairs, and Alexis Oriel Alvarado Ávila of the Gunadule indigenous people at the National Direction of Indigenous Lands and Municipal Assets of the National Land Administration Authority (ANATI).

Indigenous capacity building. In addition, the Government of Panama created regional trainings in the Guna yala and in the Ngäbe-Buglé and Emberá-Wounaan regions. As a consequence, new trainings in indigenous regions were completed by the Institute for Training and Use Human Resources (IFARHU), Ministry of Agricultural Development (MIDA), Ministry of Environment (MiAmbiente), Health, Education, National Institute of Professional Training and Training for Human Development (INADEH), Ministry of Social Development (MIDES).

Land tenure. Ministry of Environment Resolution No. DM-0612-2019 of November 29, 2019, establishes the legal criteria to be applied to determine the viability of granting approval to requests for the award of collective lands, to be submitted by indigenous communities through their authorities. The polygons of recognized traditional areas partially or totally overlap with protected areas or lands of the State Forest Heritage”, thanks to the influence of the National Coordinator of the Indigenous Peoples of Panama (COONAPIP) that seeks legal recognitions for indigenous territories.

Challenges. Despite the achievements obtained from indigenous organizations, and the efforts made by the government in favor of reducing inequalities, the situation of the indigenous peoples of Panama continues to show the need to strengthen their access to development, a comprehensive reduction of socioeconomic gaps, and strengthening of the design and implementation of public policies and differentiated programs that meet their specific needs. People who live in indigenous communities and regions have less access to basic services, fixed income, formal employment, health, food and nutritional security, among others, because of their rural location and difficult access, weather conditions, difficulties in accessing markets.

In 2019, a loan for US \$ 80 million from the World Bank was approved to supports the implementation of the Development Plan for the Indigenous Peoples of Panama, focused on improving access to quality of services in health, education, and water and sanitation in the 12 indigenous territories of Panama.

⁷¹ FAO (2020) Gender Analysis GCF -FP126: “Increased climate resilience of rural households and communities through the rehabilitation of production landscapes in selected localities of the Republic of Cuba (IRES)”

⁷² 52.37% declared by men and 74.07% declared by women according to data in the 2016 National Survey on Gender Equality.

⁷³ FAO (2020) Gender Analysis GCF -FP126: “Increased climate resilience of rural households and communities through the rehabilitation of production landscapes in selected localities of the Republic of Cuba (IRES)”

According to the analysis developed by FAO, UNDP, UN Women and UNICEF on the gender profile of Panama 2020, this country is in the group of countries with high human development. In 2018, it ranked 67th out of 189 countries, with a value of 0.795. Inequality is a basic element in the characterization of Panamanian society, which is reflected in a 21.2% reduction in the Human Development Index (HDI). Considering that the index is adjusted for inequality, it results in 0.626. On the other hand, the multidimensional poverty index between 2017 and 2018 did not show substantial changes (MEF, 2018). For women in 2017 and 2018 it was 18.5% and 18.6% respectively. For men, it was reduced by two tenths of a percentage, from 19.7% in 2017 to 19.5% in 2018. For both sexes the changes are minimal.

The multidimensional poverty rates produced in the past due to access to income have identified the Indigenous Comarcas and the provinces of Bocas del Toro and Darién as the territories where poverty conditions have the greatest impact. In 2018, multidimensional poverty is higher in Kuna Yala for both sexes. In the provinces of Panama, Los Santos and Herrera, women show the least impoverishment (see table).

The multidimensional poverty of children and adolescents in Panama reaches 48% (MIDES, 2018). This population between 0 and 17 years old represents half of the Panamanians in this condition.

The deficiencies caused by the existing structural poverty process have a greater impact on the lives of the children and adolescents. This population in the Comarca Ngäbe-Buglé represents one in four and in the province of Panama, children and adolescents are one in five.

The trend of life expectancy also shows significant inequalities in the country. In 2019, life expectancy in indigenous regions substantially reduced, (ref. table below). For indigenous men it is up to 69 years, and for women of the Emberá and Ngäbe Buglé regions it is around 73.9 years; in Guna Yala around 76 years. Clearly, poverty in indigenous areas takes many years from life. Men are in a more vulnerable situation, similarly to other districts such as Santa Isabel in Colón, where men have a life expectancy of 68.85 years. Within the Comarca Ngäbe Buglé, women with the lowest life expectancy (71.38%) are found in Jirondai and Santa Catalina with 71.76 and men are 66.94 and 67.51 respectively for those districts.

Regarding the Birth Rate at national level, in 2010 it was 18.62 of live births per thousand inhabitants, and in 2018, it decreased slightly to 18.5 births⁷⁴. However, they present great variations between provinces and regions. For example, 11.4 and 13.7 were reported in Los Santos and Herrera regions, 16.8 in the Guna Yala region, respectively, which it is much higher (37.2) in the Ngäbe Buglé region and 27.0 in the province of Bocas del Toro.

Finally, the project will be developed in the coastal communities of the Costa Arriba and Abajo de Colón in which, according to the head of indigenous people at the Ministry of Environment and Indigenous Representative, there are some indigenous peoples' families specifically in the province of Colón. Costa Arriba de Colón, Guna families live in the districts of Santa Isabel, Portobelo. In Costa Abajo de Colón (targeted zone for this project), in the District of Donoso, Buglé and Ngäbe families have been identified. In Portobelo, there are approximately 50 Emberá houses located in La Estacada neighborhood, the majority dedicated to fishing and tourism through the sale of handicrafts. They are about to constitute a cooperative of boats and agriculture. Also, there are some Kunas families are also residing within the municipality whose main productive activity is also handicraft mainly for tourists⁷⁵

Unfortunately, there is no updated census, so the number of families that make up this indigenous settlement cannot be said with accuracy at this stage. However, consultation allowed the project to gauge that in the area of Omar Torrijos Herrera (not among the project target sites, but in close proximity) there are communities of the Ngäbe and Buglé peoples.⁷⁶ Most of these are dedicated to fishing.

Annex 3: Initial Stakeholder Consultations

Several presentation, interviews and survey were included into the consultation process feeding into the present Concept Note proposal for both countries. The scope of the consultation was to identify project objectives, possible components, effects of CC facing in Cuba and Panama in targeted zones, possible adaptation solutions, including solutions based on nature, data collection for risk management against climatic threats in the area, implementation of economic diversification measures for the region through sustainable and resilient activities. It was also explained that a binational proposal scope will allow a teamwork and share experiences between both countries.

Panamá

Incidencia de Pobreza Multidimensional (IPM), por provincia, según sexo. Años 2017 y 2018

Provincias y comarcas indígenas	IPM 2017		IPM 2018	
	Hombre	Mujer	Hombre	Mujer
Bocas del Toro	44.8	44.4	40.3	41.9
Coclé	25.5	19.6	21.4	17.2
Colón	17.6	15.4	17.2	15.5
Chiriquí	13.4	11.5	12.7	11.1
Darién	42.0	37.9	35.8	36.1
Herrera	7.5	6.9	5.2	5.0
Los Santos	5.1	3.3	4.6	3.3
Panamá	8.9	8.2	10.6	9.9
Veraguas	20.1	18.2	18.2	16.1
Kuna Yala	91.0	91.7	93.9	93.7
Emberá	70.3	71.5	70.7	70.9
Ngäbe Buglé	93.7	93.0	92.4	89.8
Panamá Oeste	15.8	15.5	16.0	15.0
Total	19.7	18.5	19.5	18.6

Fuente: Encuesta de hogares INEC.

⁷⁴ INEC, 2010-2018

⁷⁵ Interview with Manager of Protected Area of Portobelo

⁷⁶ Official communication and interview with Mr. Iniquilipi Chiari Lombardo, Head of Indigenous people (Ministry of Environment), and also indigenous Representative and Maribel Pinto (Climate change direction- Ministry of Environment)

General source: Panama country profile according to gender equality. Available in: <https://panama.un.org/es/114729-perfil-de-pais-segun-la-igualdad-de-genero-panama>

• **Aquatic Resources Authority:** Provided information about the projects they are carrying out in the Province of Colón, for the aquaculture of the Tilapias and Colosomas breedings. They provided us with contact information and shared information about the Fishing cooperative of Donoso and Chagres.

They do not have information of CC projects in the area nor that they have used nature as a means of defense barrier.

• **Authority of tourism:** Because of their contact with organized groups from the coastal sector, they consider that CC is affecting fishing, agriculture, livestock and tourism, and mentioned some local communities that face floods and landslides, such as Palmas bellas in Portobelo, Chagres, Govea, Miramar and Coclé del norte. These last three suffer from erosion of the coastline and damages to coastal roads. According to them, important actions should include climate resilient infrastructure and a water harvesting plan, increase of agroforestry systems, use of resilient seeds, minimize the use of pesticides, awareness actions with local population on CC, and dissemination through radio, television and other media.

• **Ministry of Agriculture:** Reported the relevance of the coconut production in the zone. Since 2016, they are involved into a project that includes agroforestry systems into this production to stimulate the production of the coconut tree to increase the income of the families that are dedicated to the activity. It will be interesting to include climate resilient practices into this project to ensure adaptation to extreme events and temperatures are included into these crops to guarantee a long-term production.

• **Municipalities:** Mentioned that they have built a retaining wall on the coastal edge of Piña and that they are interested in building a wall to Aníbal Beach.

In **Chagres** municipality, consider that CC is affecting tourism, fishing, agriculture and livestock in the area. In addition, they mentioned that the actions to face CC effects must include the implementation of sustainable agriculture, management of sand extraction, such as in the Aníbal beach of the Nuevo Chagres district and the management mishandling of waste. In **Portobelo**, consider that CC is affecting fishing, agriculture and tourism. Relevant actions to mitigate effects of CC were related to the construction of retaining walls to face the force of the waves and fillings for the protection of the town of Puerto Lindo. Some of the main communities mentioned as most affected were Isla Grande, Puerto Lindo, Ballestilla and San Antonio (already lost part of their beaches due to the rising tides). Relevant floods were mentioned in Nuevo Tonosí, Portobelo downtown, Buenaventura and the community of María Chiquita. In **Santa Isabel** Municipality do not have knowledge about CC projects and they mentioned that do not have any department to take care of environmental issues. They considered that CC is affecting tourism, fishing, agriculture, tourism and livestock. Several actions mentioned to face CC were reforestation actions in the areas of the basins and the affected areas. Relevant floods and sea-level rise areas inside the municipalities were Palenque, Palmira, Cuango and Santa Isabel.

According to surveys from Ministry of Environment, Tourism Authority, Ministry of Agriculture, and Representatives from municipality council from Chagres, Portobelo and Santa Isabel, at least 14 from 18 of the people said that within these municipalities projects are carried out that are using nature as a barrier to reduce environmental shocks and impacts, such as SLR among others.

When demanded about a department inside the municipalities which includes protective activities to coastline, the majority of participants answered negatively.

Question about existing CC plans into municipalities, the majority of the answers was other, which includes no relevant mention about what were those plans except a mention about a dump. This reflects a lack of knowledge about CC and the relations with the effects of them into their lives and productive activities.

According to the same survey, participants mentioned as main productive activities sensitives to extreme weather events and SLR are fishing (13 mentions), agriculture (8 mentions) and tourism (8 mentions).

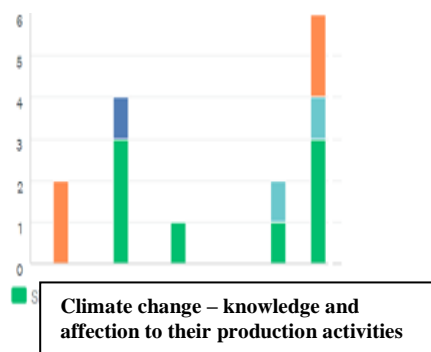
• **Indigenous people.** As mentioned earlier the consultations have been severely limited by the travel restrictions imposed due to the COVID-19 pandemic. The consultations with the indigenous communities in Panama have also been adversely affected as a result and also further compounded by their geographical remoteness. To ensure the inclusion of the indigenous people, the design of the concept note has been conducted in consultation with Mr. Iniquilipi Chiari Lombardo, the Head of Indigenous People, Representative at the Ministry of Environment. These consultations have enabled their initial assessment (see annex 2 above) and the identification of the key economic sectors that they operate in. These have been identified as mainly fishing, tourism through the making of handicrafts and agriculture. Due to the pandemic, tourism has been severely affected, therefore the project will focus on integrating the indigenous people into the components 2 and 3, including in tourism when it picks up again.

Cuba:

The Ministry of Environment (CITMA) and the Ministry of Agriculture, and their different directions, are the two ministries involve into this formulation process. Furthermore, during the formulation process some Cuban specialized institution, such as Agricultural Engineering Institute, Soil institute, Agroforestry research institute, Tropical Fruit Institute dependent of both ministries participated in consultative meetings and concept note design, in compliance with the specific functions assigned within the framework of its competences. As part of the integrated and articulated work system, alternative options to consultancy process were employed due to current context of Covid-19 to establish interaction with the territories. In Cuba, as part of the restrictive measures implemented to reduce the spread of the disease, the mobility of people between the different provinces of the country was regulated, representing a limitation to specify the planned routes to the selected municipalities in the framework of the elaboration of the Concept Note.

Virtual meetings between Technical Personnel in La Habana with FAO and Panama, held along one year, as well as survey with producers of targeted municipalities were include into this consultation process. Municipality selection process went through three important stages. 1) Conciliations with the municipalities considering the same selection criteria. 2) Definition of the initial proposal and the intervention in the provinces of Cienfuegos (coastal municipality) and Ciego de Ávila (non-coastal municipality to work the coconut chain). 3) At third stage, the final identification was made of the areas to be intervened in the municipalities selected for the implementation of the project, according to similar climate threats in coastal municipality with similar livelihoods (fishing and agriculture).

Surveys and interviews: Producers- Cuba and Panama:



A similar survey was taken among Panama and Cuba producers, and some Protected Area managers were interview, in order to focalized actions mainly into field components.

Most of the producers in Panama reported that they do know what CC is, but they did not associate the effects of floods or storms with CC. Some recognized problems with water, floods or change in rain patterns and temperatures, but did not identify cause-effect relations with CC. In addition, they did not foresee any long-term changes in terms of climate or extreme events that affect their productive activities. They did not report adaptive measures taken by them into their productive activities yet.

In the case of Cuba, direct links between floods, droughts and intensive storms and climate change are clearer for the producers, but only few of them mentioned the possible effects over their productive activities.

Protected Area Managers:



From **San Lorenzo protected area in Panama** indicated a strong impact on the coastal and beach areas, through the intrusion of the sea towards the coast along the coast of Colon, due to CC. They mentioned that almost all the communities had to develop containment areas (hills and levees) to avoid flooding.



About ecosystems they mentioned the existence in 12,000 hectares of the protected area, 90% of the ecosystem is rainforest, 40% beaches and 5% mangroves (mainly zones next to Chagres River, that is part of the Panama Canal). They mentioned the importance of the rainforest and the main effects from CC over it derived from the SLR and storms and their effect over the soil, which increase the tree fall in the area (because the soil is not enough to generate enough support for trees of a certain size). He also mentioned that the wetlands in this park is in good conditions and it is a zone of difficult access and because of that is less intervened. Also, is part of the Chagres River in the Canal Zone. The main threat to the protected area is related to neighbor communities (Gatun lake sector, North West margin, Escobado community, Achiote). The need for housing for the communities, the illegal hunting and agriculture of subsistence are some activities that generate pressures over this protected area.

From **Portobelo protected area in Panama** participants indicated the importance of the mangrove ecosystem along the coast of that municipality and that ecosystem is in good conditions, excepts in the area of Portobelo, where it is affected by waste. She recognized the importance of the mangrove could protect the population of the zone. Despite the fact that they did not have any recent study about the state of the mangrove, they had a recent episode of floods in the municipality on 2018, indicating how the SLR is affecting them.

From the **protected area in Batabanó in Cuba**, ecosystem conservation and restoration are the most challenges for her. She mentioned some extreme episodes of floods, hurricanes and droughts during the last 3 years. She mentioned that CC will affect all coastal forests and fauna provided services, and the productive activity that are carried out and directed. She also mentioned the possible effects of the SLRs in the coastal zones and villages, that could represent threats, such flooding, corals deaths, disappear of fish species, rains shift, heat increases and the risks of new diseases.

Annex 3- Consultation participants:

Panamá		
Municipal council- Donoso: meeting –survey) Hector Pino Mata-Ileana Sanchez-Thais Kenya Gutierrez-Benjamin Reys-Hadiel Melo-Juliana Rodriguez -José Ramirez-Felicito Terán-Armando Johnson 	Municipal council- Chagres (meeting- survey) Maria Esther Estil-Leopoldo Babará-Osvaldo Marinez-Sebero Castañeda-Tomas Mejía-Horacio Jimenez-Adrian Guerra -Graciela Vasquez-Katherine Martinez 	Municipal Council – Portobelo (meeting – survey) Alejandro Vargas -Angel Cat- Nidia Esther Cano - Marlene Zúñiga-Jonels Jimenez-Fernando Kelly-Dalys Chifundio-Zumakira Oliveros -Vides Ronco-Lauris Rodriguez -Meybis Delend-Wilam Mendoza - Sonia Molinar -Dimas Melachor-- Ana Barrera- Mario Ortiz-Anabel Chifundio-Arlen Bonilla -Yosimar Peña
Municipal Council Santa Isabel: (meeting-surveys) Tomás Salazar-Siria Melisa de Cordoba-Luis Barrera-José Anibal Valencia-Pablo Salazar-Bredio Barrios-Brenda Mencha-Tilsio Nuñez Sanchez	Institutional consultations (meeting-surveys) Abel diaz (Tourism Authority) -Rogelio Caballero (Tourism Authority)-Yaribel Perez (Tourism Authority)-Maryuri Estrada (Acuatic Resource Authority)-Katherin Aimeed Aguirre (Acuatic Resource Authority)-Ivan Elias Mendoza (National Council for Sustainable Development	Producers- Surveys/ phone interview Paulina Govea Hector Platanal Vielka tenis Lucio Medina Vicente Rivas Elvia Vega

	<p>-CONADES)-Olga Carrasquilla de Yopez CONADES -Carlos Abrego (Min of Agriculture-MIDA) Armando Solís (Min of Agriculture)-Sr. Lucas-Tecnico MIDA, Colón.-Iliana Martinez (Miambiente)-Edna Deliz Florez (Miambiente)-Mabel Zúñiga (Miambiente)-Belen Guevara (Miambiente)-Luis Acosta (Miambiente)-Maribel Pinto (Miambiente)-Carlos Alberto Ortega (Ministry of Public Works)-Randino (In charge of National Protected Area of San Lorenzo)-Daylene (in charge of Protected Area of Portobelo)</p> 	<p>Oscar Río Diego</p>
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Indigenous people: (meeting-interview-surveys)

Iniquilipi Chiari- Indigenous Representative at Ministry of Environment- Arcadio Castillo- Coordinator of the Association of Central American fishermen.

Surveys: Carolina Paredes Rodríguez- Craftwoman - Yiri Milushka Rodriguez- Craftwoman



Interviews with protected areas managers and Head of Indigenous People Representative from Ministry of Environment (and from Kuna etnia) allows FAO to identify disseminated indigenous people along the intervention area. Buglé and Ngábe families have been identified in Donoso District. In Portobelo, there are approximately 50 Emberá houses located in La Estacada neighborhood, the majority dedicated to fishing and tourism through the sale of handicrafts. They are about to constitute a cooperative of boats and agriculture. Several attempts to contact them was done but it is not possible yet. Also, there are some Kunas families are also lived within the municipality whose main productive activity is also handicraft mainly for tourists.

In addition, **Mr. Arcadio Castillo**, from the Association of Artisanal fishermen of central America based in Panama, confirmed via phone, that on these 4 municipalities there are several indigenous families that get married with local people and migrates to there. Despite that fact, they mention that they are not part of any governance systems such as is present in the “comarcas” (indigenous territories). In Colón there are only 2 or 3 families that dedicates to artisanal fisheries. Men between 20 and 35 years. They are not associated. They catch lobsters and arrecifal fish. About climate impact he mentioned that the type of fish that they catch today are different than before, they find horse mackerel (jurel) instead of snappers and the have to navigate approx. 8 hours to get lobsters. Before they find another species and near shores. About black shell harvest as an alternative he mention there are not so much artisanal fishermen in Colón municipalities but this is an alternative that is being promoted in Guna yala indigenous territory (comarca), a province next to Colón.



Ministry of Environment and FAO try to contact them by phone or personally through other local professionals of the Ministry of Environment, but it has been difficult to reach so much people. Due to the fact that contact is with someone external to their community they do not feel confident to share information. Also due to the fact that they are spread along the targeted communities, COVID measures and the fact that they do not belong to a governance system, such as existent in indigenous territories contact was limited. Sometimes they fear about losing other possible government incentives due to receive capacity building for example. Due to that situation, FAO is already generating an agreement with the Fund for the Development of Indigenous People (FILAC), an NGO with indigenous scope in the region, to continue direct consultation and FPIC process and the inclusion of their necessities and concerns into project formulation.

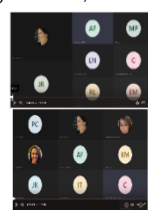
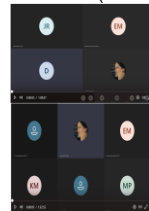


Cuba: Producers- surveys*

Batabanó: Maria Teresa Aguiar P.A Gulf of Batabano, Maura Lopez tree Nursery UEB Melena del Sur. **Consolación:** Roberto Rodríguez (CITMA regional)-Rodolfo Esteves(producer- Credit and service Cooperative- CCS) **San Cristobal:** Milagros bien Flores (municipality directive)-Ricardo Gonzalez Bofil (Basic Unit of cooperative production UPBC)-Felix Tamayo Arrenciba (Producer- Credit and service Cooperative- CCS) **La Sierpe:** Rafael Antonio Obregón Obregon (National Association of small agriculture- ANAP)-Andreis Oreste García -producer (Basic Unit of cooperative production UPBC)
*Consultation via mail (survey with questions) due to COVID national confinement and mobility is difficult between la Habana and local regions.

Cuba- Virtual Meetings

1. Meeting Cuba/ Panama: information and projects developed in Cuba. October 28, 2020.
2. Logic frame and theory of change proposal and consultation process between both countries (Cuba and Panama). November 18, 2020.
3. Cuba feedback about logicframe and theory of change proposal. November 11, 2020
4. Concept note advances with attendance of both countries (Cuba and Panama) May 3, 2021
5. Concept note Validation with attendance of both countries (Cuba and Panama) June 16, 2021



Cuba- Institutional sectors (meetings)

Orlando Rey, Jamileth Lamonche, José Quintana, Bernardo Calero, Ileana Santos (Ministry of Agriculture), Lázaro Aldama (MINAG artemisa) Ulises Fernandez, Pedro Ruiz, Jessica Fernandez, Yamiléth Crespo, (Ministry of Environment-CITMA), Yoandra Gomez (CITMA Sancti Spiritu) Carmen Duarte, Enrique Cisneros, Sarilena Ramos Agricultural Eingeniering Institute (IAgric). Ordenis Gonzalez (Dir. Dpt Sience and innovation Sacti Spiritu), J. Carlos Perez (Dir. Dpt Siience and innovation Pinar del Río), Malbis Betancourt (Dir. Dpt Siience and innovation Guantnamo).