



ADAPTATION FUND

AFB/PPRC.8/10  
23 February, 2012

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Adaptation Fund Board  
Project and Programme Review Committee  
Eighth Meeting  
Bonn, 14 March, 2012

## **PROPOSAL FOR COLOMBIA**

## I. Background

1. The Operational Policies and Guidelines for Parties to Access Resources from the Adaptation Fund, adopted by the Adaptation Fund Board, state in paragraph 41 that regular adaptation project and programme proposals, i.e. those that request funding exceeding US\$ 1 million, would undergo either a one-step, or a two-step approval process. In case of the one-step process, the proponent would directly submit a fully-developed project proposal. In the two-step process, the proponent would first submit a brief project concept, which would be reviewed by the Project and Programme Review Committee (PPRC) and would have to receive the approval by the Board. In the second step, the fully-developed project/programme document would be reviewed by the PPRC, and would finally require Board's approval.

2. The Templates Approved by the Adaptation Fund Board (Operational Policies and Guidelines for Parties to Access Resources from the Adaptation Fund, Annex 3) do not include a separate template for project and programme concepts but provide that these are to be submitted using the project and programme proposal template. The section on Adaptation Fund Project Review Criteria states:

*For regular projects using the two-step approval process, only the first four criteria will be applied when reviewing the 1st step for regular project concept. In addition, the information provided in the 1st step approval process with respect to the review criteria for the regular project concept could be less detailed than the information in the request for approval template submitted at the 2nd step approval process. Furthermore, a final project document is required for regular projects for the 2nd step approval, in addition to the approval template.*

3. The first four criteria mentioned above are:

1. Country Eligibility,
2. Project Eligibility,
3. Resource Availability, and
4. Eligibility of NIE/MIE.

4. The fifth criterion, applied when reviewing a fully-developed project document, is:  
5. Implementation Arrangements.

5. According to the Adaptation Fund Board Decision B.12/10, a project or programme proposal needs to be received by the secretariat no less than nine weeks before a Board meeting, in order to be considered by the Board in that meeting.

6. The following fully-developed project document titled "Reducing Risk and Vulnerability to Climate Change in the Region of La Depression Momposina in Colombia" was submitted for Colombia by the United Nations Development Programme (UNDP), which is a Multilateral Implementing Entity of the Adaptation Fund. This is the second submission of the project. It was first submitted as a fully-developed project document, using the one-step proposal process, for the 16th Adaptation Fund Board meeting, but was withdrawn.

7. The current submission was received by the secretariat in time to be considered at the 17<sup>th</sup> Adaptation Fund Board meeting. The secretariat carried out a technical review of the project proposal, assigned it the diary number COL/MIE/DRR/2011/1 and filled in a review sheet.

8. In accordance with a request to the secretariat made by the Adaptation Fund Board in its 10th meeting, the secretariat shared this review sheet with UNDP, and offered it the opportunity of providing responses before the review sheet was sent to the Project and Programme Committee of the Adaptation Fund.

9. The secretariat is submitting to the Project and Programme Review Committee the summary of the project, prepared by the secretariat, along with the final, revised submission of the proposal in the following section. The secretariat is also submitting to the Committee the technical review sheet in an addendum to this document.

## **Project Summary**

Colombia – Reducing Risk and Vulnerability to Climate Change in the Region of La Depression Momposina in Colombia

Implementing Entity: *UNDP*

Project/Programme Execution Cost: USD 861,000

Total Project/Programme Cost: 9,064,000

Implementing Fee: USD 770,440

Financing Requested: USD 9,834,440

### Project/Programme Background and Context:

The proposed project seeks to reduce vulnerability to climate change (particularly flooding and drought) in La Depression Momposina region of Colombia through a combination of hard, soft, ecosystem-based, and agricultural activities. The proposal represents an integrated approach that builds on the existing institutional framework in Colombia's government. While previous projects have already supported the development of climate change scenarios and advisory systems for hydrometeorological events, the project aims to apply these tools to the specific project target area. The project funds will be used to encourage small farmers and vulnerable families in the 11 identified communities to use production practices that are adapted to the changing climatic cycles and flood conditions. AF resources will also be used to build climate-resilient buildings for houses and schools.

Component 1: The existing HEIS is strengthened and used by local- and regional-level stakeholders, improving their resilience to the impacts of climate change (USD 1,564,000)

Component 1 focuses on strengthening the existing HEIS using local and regional data that will be used by local stakeholders from the municipalities of Ayapel, San Marcos, and San Benito Abad, as well as regional-level stakeholders to support planning and budgeting decisions at municipal and local level for mitigating the impacts of climate change. Component 1 will encompass the following: a) the development of hydrological and hydraulic models for the Depresión Momposina; b) the development of climate vulnerability scenarios (i.e., climate change profiles, flood-risk maps, and vulnerability assessments) for the project target area; c) updating the hydrometeorological network in the target area; and d) designing and operating an early warning system at the local level.

Component 2: Rehabilitation of wetlands and their hydrology in the target area as a means to reduce risk to flooding and drought associated with climate change and variability (USD 3,486,000)

Component 2 will encompass the development of hydraulic works for flood control and hydrological management. It will reestablish a traditional pre-Hispanic system of canals and terraces along the Carate stream. Component 2 also includes the rehabilitation of 700 hectares of critical upstream systems that contribute to the Ayapel wetlands, the San Marcos wetlands along the western bank of the San Jorge River, and the San Benito Abad wetlands, repairing altered ecological functions of close to 31,000 hectares of wetlands and enhancing their flood-buffering capacity. Lastly, the component will include the creation of a 2,000-hectare multiple-use PA that will allow the long-term supply of ecological services.

Component 3: Introduction of climate change-resilient agroecological practices and building designs

helps local communities to reduce their vulnerability to the impacts of climate change (USD 2,724,000)

To reduce the increasing vulnerability of the rural population, the project will seek to implement innovative agricultural and livestock as well as traditional production practices that are proven to be the most resilient to the effects of climate change. The project will support the development of a variety of adaptive production practices that will enable the diversification of food sources and income generation in 11 communities within the project target area. In addition, the project will develop a programme directed to women for making natural-fiber crafts using plant species that thrive in flood conditions. Also as part of the strategy to reduce vulnerability in the region, the project will implement an adaptive architecture programme that will include adapting existing houses and communal infrastructure that have been affected by flooding to make them more resilient to the effects of extreme climate-related events. The project will develop three models of houses on stilts and/or floating houses, as well as the design and construction of educational units built on stilts to prevent interruptions in the school calendar or losses of educational materials during extreme flooding events.

Component 4: Relevant institutional and social structures strengthened for mainstreaming climate risk management and adaptation measures into planning and decision-making processes (USD 429,000)

Component 4 of the project aims to foster climate-related information and practices relevant to the La Mojana subregion among the 11 targeted communities and local civil authorities in the municipalities of Ayapel, San Marcos, and San Benito Abad. AF financing will be used to promote lessons learned with relevant stakeholders to replicate successful experiences in ecosystem- and community-based adaptation measures developed through the project and to facilitate a process to integrate them into local and regional planning policies.



## PROJECT/PROGRAMME PROPOSAL

### ■ PART I: PROJECT/PROGRAMME INFORMATION

PROJECT/PROGRAMME CATEGORY:	Regular
COUNTRY/IES:	Colombia
TITLE OF PROJECT/PROGRAMME:	Reducing risk and vulnerability to climate change in the region of La Depresión Momposina in Colombia (UNDP PIMS 4805; Atlas IDs – Proposal 00062507, Project 00080029, COL10)
SECTOR/S	Disaster Risk Reduction
TYPE OF IMPLEMENTING ENTITY	Multilateral Implementing Entity
IMPLEMENTING ENTITY:	United Nations Development Programme
EXECUTING ENTITY/IES:	Ministry of Environment and Sustainable Development (MADS)
AMOUNT OF FINANCING REQUESTED:	\$9,834,440 USD
CO-FINANCING	\$1,220,000 USD Government of Colombia (In kind)

### ■ PROJECT / PROGRAMME BACKGROUND AND CONTEXT:

#### *Climatic, Geographic, and Socioeconomic Context*

1. The United Nations Office for the Coordination of Humanitarian Affairs (OCHA) estimates that the 2010-2011 rainy season in Colombia, which included an unusual increase in rainfall during the episode of La Niña<sup>1</sup>, impacted 4 million people, caused 491 deaths, left 43 people missing, and destroyed 16,269 homes and damaged 545,940 others throughout the country. Close to 1 million hectares of productive farmland were flooded, which included the loss of approximately 200,000 hectares of crops. In addition, 115,000 cattle perished, and 1,460,000 more were displaced from 60,500 farms. Ninety-eight major roadways, along which goods from the productive regions are transported to consumer centers, were damaged, causing delays in distribution and driving up food prices. Financial losses due to the adverse effects of this climatic phenomenon in Colombia reached \$4.66 billion (USD)<sup>2</sup>, which is equivalent to almost 2% of the Colombian Gross Domestic Product (GDP).

2. Colombia, with a total land area of 1,141,748 square kilometers (km<sup>2</sup>), is located within the equatorial belt and is influenced by the Intertropical Convergence Zone (ITCZ). This is a determining factor in the spatial-temporal distribution of precipitation, cloud cover, and other climatological variables in the country. In addition, because of its location in the northwestern part of South America, the country is influenced by climatic processes that occur in the Tropical Atlantic Ocean, the Caribbean Ocean, and the

<sup>1</sup> La Niña is a coupled ocean-atmosphere phenomenon that is the counterpart of El Niño as part of the broader El Niño-Southern Oscillation (ENSO) climate pattern. During a period of La Niña, sea surface temperatures across the equatorial Eastern Central Pacific Ocean are 3 to 5 degrees Celsius (°C) lower than normal.

<sup>2</sup> DNP, CEPAL, and BID. 2011. Valoración de daños y pérdidas por la ola invernal 2010-2011 (La Niña) en Colombia.

Pacific Ocean<sup>3</sup>. Colombia's continental zone is divided into five large natural regions: the Andean, Caribbean, Pacific, Orinoco, and Amazonian regions. It also has marine and insular areas in both the Caribbean and Pacific Oceans. Each of the five natural regions is divided into subregions with unique economic, social, cultural, environmental, and climatic characteristics<sup>4</sup>.

3. Colombia has one of the highest rates of disaster occurrences in Latin America. Between 1970 and 1999, Colombia experienced an average of 2.97 disasters per year, which is the third highest annual rate among all of the countries in the region<sup>5</sup>. Floods and landslides accounted for two-thirds of all disasters recorded in the country during this period<sup>6</sup>. The Intergovernmental Panel on Climate Change (IPCC) estimates that the occurrence of disasters related to climatic conditions in Colombia during 2000-2005 increased by 2.4 times when compared with the period from 1970 to 1999.

4. During the past 30 years, more than 15.5 million Colombians have been affected by disasters (primarily floods, landslides, and torrential rains). More than 38,000 people have died as a consequence of these events, and currently about 15 million people, or 35% of the population, are exposed to a high level of risk; another 20 million (47% of the population) are exposed to an intermediate level of risk. The National Planning Department (DNP) estimates that climate-related events during the time period of 1970 to 2000 reached USD2.2 billion in damages, which represents approximately 2.66% of the Colombian GDP for the year 2000. However, during the last decade (2000 to 2010), the country surpassed historical levels of flooding along the major rivers, and some regions of the country have suffered the driest periods in 30 years.

5. According to the Second National Communication to the United Nations Framework Convention on Climate Change (UNFCCC) (2010), Colombia will face increased climatic variations in the future. The results from modeling changes in temperature in Colombia for the remainder of the century by the Institute of Hydrology, Meteorology and Environmental Studies (IDEAM), which is based on an analysis of the historical series of daily temperature extremes (minimum and maximum) and daily accumulated precipitation, indicated that on average the median temperature would increase 1.4°C during the period from 2011 to 2040, 2.4°C from 2011 to 2070, and 3.2°C from 2011 to 2100. Modeling results indicate that during the period from 2011 to 2040, 78% of the country will experience a variation in precipitation of ±10%, which is considered to be within the normal range of variability. Nevertheless, there will be a major reduction in precipitation (-30 to -10%) in 20% of the country for the time period of 2011 to 2040. The rate of variation of the annual median precipitation that would possibly occur during the different periods (2011 to 2040, 2041 to 2070, and 2071 to 2100) will decrease in a greater portion of the country (74 to 56%) within the range of -3.1 to -4.0 millimeters per year (mm/yr). At the end of this century there may be greater reductions of more than -4.0 mm/yr in 20% of the country, thereby causing this trend to worsen. The modeling results also indicate that there will be increases in precipitation in some sectors of the Caribbean, Amazonian, and Andean regions (particularly in the western and northern areas), at the same time that decreases in the eastern and southern Andean region will occur. Future changes associated with climate will cause additional alterations to those already evident in coastal zones, glacial areas,

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<sup>3</sup> Instituto de Hidrología, Meteorología y Estudios Ambientales & Universidad Nacional de Colombia. 2005. Informe de evaluación del cambio climático en Colombia. Documento digital elaborado en el marco del contrato firmado entre Conservación Internacional Colombia y la Universidad Nacional de Colombia, sede Bogotá, Depto. de Geografía para el Ideam. Bogotá: Ideam. p. 62.

<sup>4</sup> Romero, M., Cabrera, E., & Ortiz, N. 2008. Informe sobre el estado de la biodiversidad en Colombia: 2006-2007. (IAvH, Ed.) Bogotá, Colombia: IAvH.

<sup>5</sup> Sanchez-Triana, E., Ahmed, K., and Awe, Y. 2007. Environmental Priorities and Poverty Reduction: A Country Environmental Analysis for Colombia. The World Bank, Washington D. C.

<sup>6</sup> Ibid.

climate-sensitive ecosystems, and hydrological systems<sup>7</sup>. These changes will increase the probability of the occurrence of threats such as floods, droughts, fires, and desertification, among others.

6. In Colombia, hydrometeorological-related disasters and emergencies are closely linked to the annual distribution of rains with specific precipitation trends in each region. Variations in the spatial-temporal distribution of rain are also related to the El Niño-Southern Oscillation (ENSO) climatic cycle. Historically, a high percentage of episodes related to low levels of precipitation, especially in the Andean, Caribbean, and Orinoco regions, has been associated with the warming effect of El Niño, impacting agriculture, cattle production, electrical energy generation, public health, and the supply of drinking water to cities and rural communities. On the other hand, during La Niña years, precipitation in these regions increases, bringing with it an increase in floods, torrential rains, and landslides<sup>8</sup>. El Niño and La Niña phenomena (2010-2011) yielded the most extreme values on the Multivariate ENSO Index (MEI)<sup>9</sup>, when compared with the prior events (Figure 1).

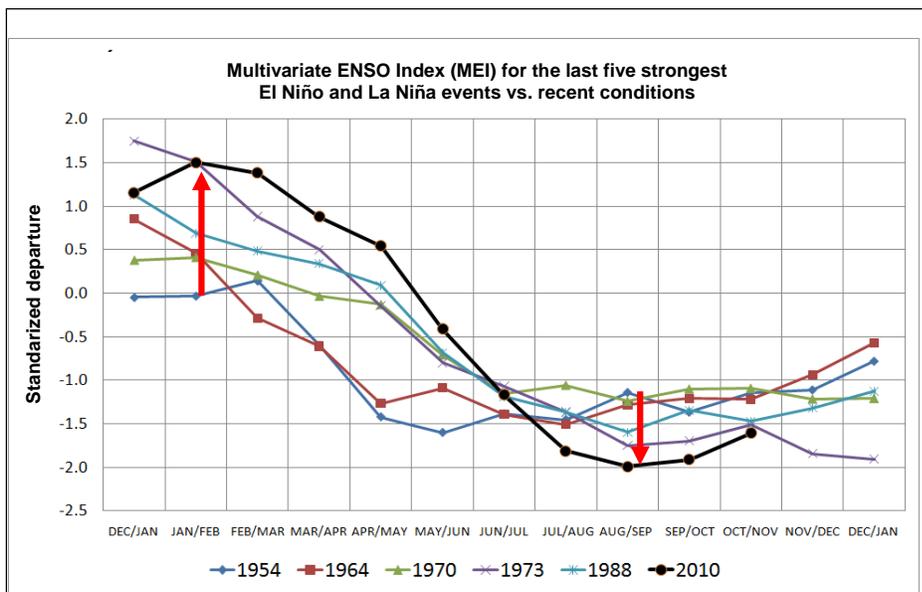


Figure 1 - Comparison between the strongest La Niña events (1954-1988) and the La Niña event which occurred in 2010 (black line). Positive values correspond to the presence of the El Niño phenomenon and negative values to the occurrence of the La Niña phenomenon. (Source: IDEAM, 2011)<sup>10</sup>.

<sup>7</sup> For example, according to the IPCC, during the 1990-2000 period there was an 82% reduction in Colombia’s glaciers, which showed a linear withdrawal of the ice of 10-15 meters per year (m/yr); under the current climate trends Colombia’s glaciers will disappear completely within the next 100 years. IDEAM estimates that the rising sea level along the Caribbean coast is at a rate of approximately 3.5 millimeters per year (mm/yr), affecting 15% of coastal areas, and 55% of the region’s population, most of who live in coastal cities. In addition, it is estimated that natural ecosystems will be displaced to the driest areas, and will include the reduction of the area of key ecosystems such as the páramos.

<sup>8</sup> IDEAM (ed). 2010. Second National Communication before the Framework Convention of the United Nations on Climate Change.

<sup>9</sup> The MEI, which is recognized internationally for its use of the greatest number of oceanic-atmospheric variables, was developed by the Earth Systems Research Laboratory, Division of Physical Sciences, of the National Oceanic Atmospheric Administration (NOAA, the Meteorological and Oceanographic Authority of the United States) at the University of Colorado. The MEI is used to determine the warm phases of the El Niño phenomenon and the cold phases of the La Niña phenomenon. It is calculated using the six main observed variables over the tropical Pacific Ocean: sea level pressure, zonal and meridional components of the surface wind, sea surface temperature, surface air temperature, and total cloudiness fraction of the sky. <http://www.esrl.noaa.gov/psd/enso/mei>.

<sup>10</sup> IDEAM document entitled “Desarrollo, evolución y efectos del incremento de las lluvias generadas por el fenómeno de “La Niña” 2010 – 2011.

7. Reports of disasters from the Seismic and Geophysical Observatory of Southwestern Colombia (OSSO) and the Office for Disaster Attention and Prevention (DGPAD) indicate that between 1950 and 2007 disasters associated with heavy rains showed a 16.1% increase in relation to normal conditions during the months in which a La Niña episode occurred, while during an El Niño episode, on average, a 33.5% decrease occurred. Similarly, reports of disasters associated with drought show an increase of 216% during a period of El Niño, and a reduction of 99.6% during periods associated with La Niña<sup>11</sup>.

8. The effects of the increasing intensity of weather events such as El Niño and La Niña have magnified the risk to disaster in Colombia, pushed back important advances in socioeconomic development, increased the vulnerability of populations to future extreme weather events, and diverted public resources from priorities related to development to climate-related emergencies. This makes the socioeconomic situation of the country that much more critical where, according to the most recent report on human development issued by the UNDP (2011), the country already shows 45.5% of the urban population and 64.3% of the rural population living in impoverished conditions and show a Gini coefficient of 0.85, which reflects a substantially unequal distribution of income.

*Project Target Area: Municipalities of Ayapel, San Marcos, and San Benito Abad*

9. The municipalities of Ayapel, San Marcos, and San Benito Abad are located in the La Mojana subregion within the Depresión Momposina (Figure 2). La Mojana was severely affected by the La Niña event of 2010-2011. Approximately 211,857 people (43.4% of the total population) were affected in 2010 by flooding in this area. La Mojana had already experienced severe flooding in 2005, 2007, and 2008, affecting the agricultural, cattle, and fishing sectors, which created a situation of food insecurity in the area and placed the population in a more vulnerable position during the La Niña event of 2010-2011<sup>12</sup>. La Mojana is a subregion characterized as a flat area that is part of the wetlands complex of the Depresión Momposina, a large sedimentary basin of 24,650 square kilometers (km<sup>2</sup>) that is among the largest river landscapes of the Neotropics. The Depresión Momposina is formed by the outfalls of the Cauca, San Jorge, and Cesar Rivers into the Magdalena River and is located between the Caribbean plains and the Andean foothills in the northern part of the country. The Depresión Momposina is divided into two great landscapes: the alluvial plan conformed by river flats, wetlands, lagoons, and streams (65% of the area); and highlands conformed by terraces of variable thickness, height, and drainage and hills and footlands of the San Lucas, Perijá, and Ayapel mountain ranges.

10. La Mojana comprises 11 municipalities of four different departments of Colombia and has an area of approximately 550,000 hectares. The La Mojana wetlands act as a buffer system for the Magdalena, Cauca, and San Jorge Rivers, which flow from the Andean region. La Mojana is subject to annual floods that vary in scale depending on the intensity of precipitation in the upriver mountainous region. Its system of interconnected swamps serves as a buffer to the impacts of flooding and as a deposit for river sediments; functions that are vital for the environmental regulation and ecological balance of Colombia's Caribbean coast.

11. La Mojana is characterized by a warm and humid tropical climate, with a median temperature of 28°C, a monomodal rainfall distribution with an annual dry period that lasts from December to April, and the rainiest months occurring from August to October. The annual precipitation varies between 1,000 and 4,500 mm. La Mojana is divided into a flooded area (swamps, lagoons, streams, and rivers) (32.9% of the total area) that remains flooded for more than 6 months each year, a transitional zone (17.7%) that

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<sup>11</sup> IDEAM (ed). 2010. Second National Communication before the Framework Convention of the United Nations on Climate Change.

<sup>12</sup> OCHA. Colombia. Temporada de lluvias 2010. Fenómeno de La Niña. Informe de Situación #6. 12/11/2010. Available at <http://ochaonline.un.org/colombia/Home/tabid/3911/language/en-US/Default.aspx>. Accessed on 07/2011.

remains flooded for 3 to 6 months per year, and emergent lands (49.4%), which may be flooded for 3 months or less during the year (only 10.3% of the area usually does not flood)<sup>13</sup>. The flooded area has associated vegetation that has adapted with the development of structures that allow it to grow in hydrological conditions or from anoxic soils for prolonged periods. The emergent areas have soils with water saturation and oxygen concentration that are not limiting and allow the development of emergent vegetation or vegetation on solid ground. Tropical forests used to cover the upland areas; however, the land cover has been extensively transformed for agricultural use and cattle grazing<sup>14</sup>. According to the IDEAM, 74.78% of La Mojana is susceptible to flooding and has a high percentage of areas with high (60.01%) and very high (3.20%) vulnerability.

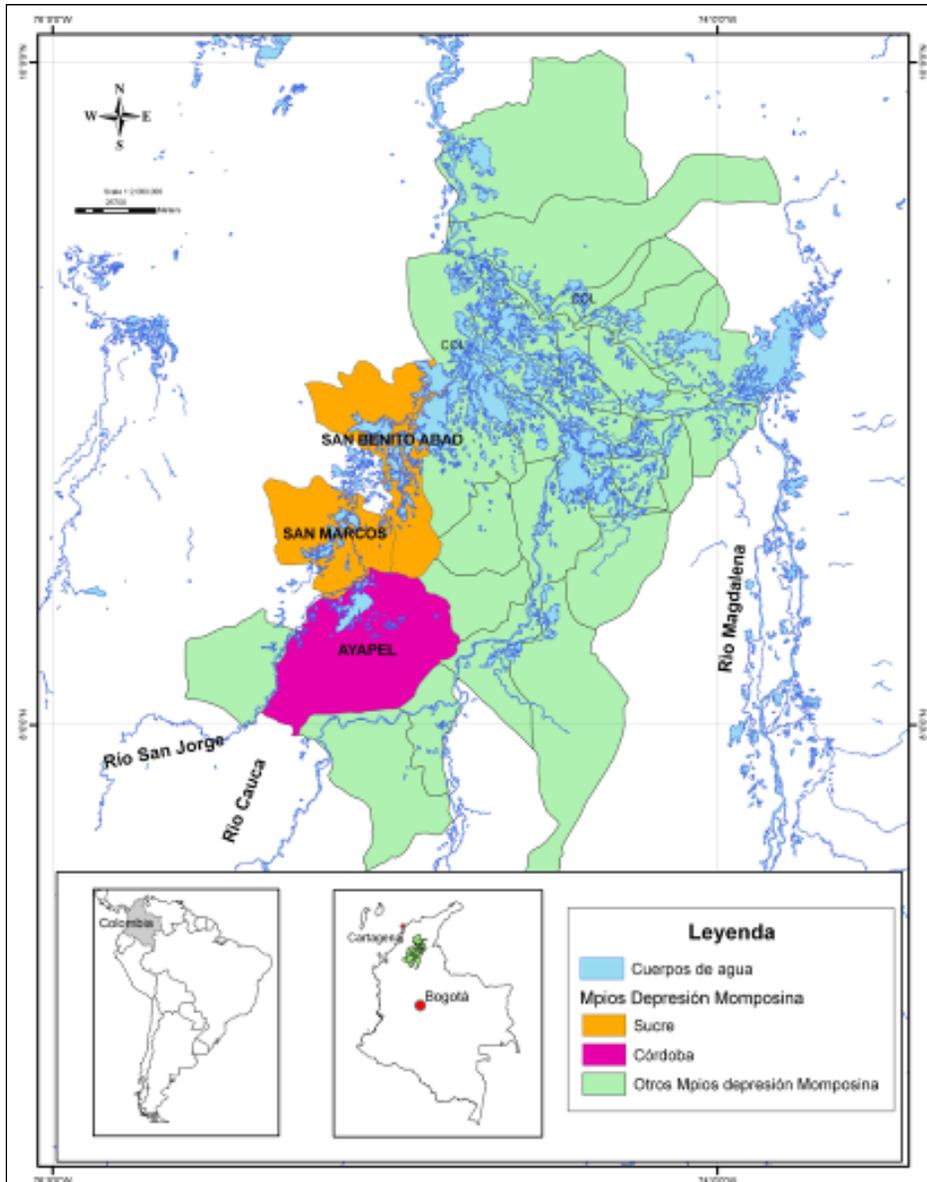


Figure 2 – Location of the project target area within the Depresión Momposina region in Northern Colombia.

<sup>13</sup> Aguilera, M. 2004. La Mojana: riqueza natural y potencial económico. Banco de la República, Cartagena de indias. 73 pgs.

<sup>14</sup> Departamento Nacional de Planeación - DNP, Organización de las Naciones Unidas para la Agricultura y la Alimentación – FAO, y Dirección de Desarrollo Territorial - DDT. 2003. Programa de Desarrollo Sostenible para La Mojana. 567 pgs.

12. Based on the results of the analysis of environmental vulnerability to climate change that was performed in 2010 by IDEAM (projected for the time period 2011-2040, see Figure 3), and also their high poverty levels and risk to flooding during the 2010-2011 rainy season, the municipalities of Ayapel (Department of Córdoba), and San Marcos and San Benito Abad (Department of Sucre) were selected as the areas for project implementation since they were found to be among the most vulnerable within the La Mojana subregion.

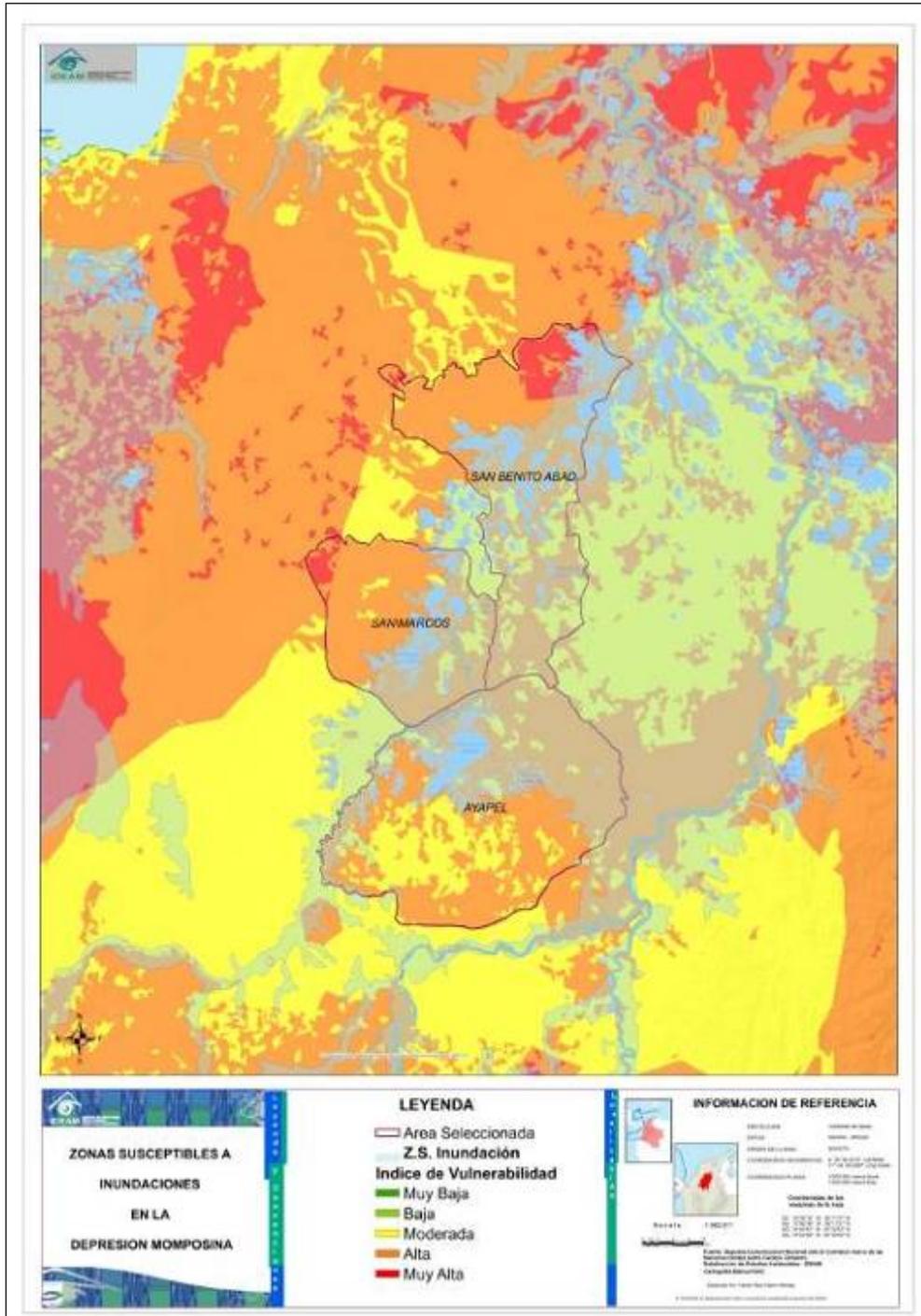


Figure – 3 Areas susceptible to flooding and vulnerability to climate change effects for the target municipalities in the La Mojana subregion. Source: IDEAM, 2010.

**13. The municipality of Ayapel** covers an area of 193,400 hectares. The number of inhabitants projected by the National Administrative Department of Statistics (DANE) for 2011 is 46,525. This area shows an Unsatisfied Basic Needs Index (NBI)<sup>15</sup> well above the national average of 27.27%, indicating high levels of poverty and low levels of access to education, housing, health, and basic sanitation and sewer services. The principal economic activities are agriculture, cattle ranching, and traditional fishing. The overflow of the Cauca River in 2011 flooded the Ayapel municipality, affecting more than 3,800 families, or around 15,000 people. Many towns within the municipality become isolated by the rising water levels of the wetlands and creeks of the Cauca River and the San Jorge River watersheds. During the last rainy season (2010-2011), 3,282 hectares of crops, 28,184 cattle, and 371 water buffalo were reported as lost to the flooding.

**14.** In Ayapel, the number of people living in rural areas is greater than the number living in the urban areas, although the current dynamic of the population shows a tendency to concentrate in the urban centers and migrate to cities such as Montería, Medellín, Barranquilla, and Bogotá. The population is concentrated in townships and villages since the majority of the rural areas are comprised of large farms. The agrarian structure and land tenure system in Ayapel is unequal and the majority of the land is owned by a small few; extensive cattle farming (beef cattle and water buffalo) is the principal production activity and requires an extensive area of land (10,000 hectares) and whose owners generally do not live in the area. On the other hand, in the small towns of the rural areas, access to land is linked to agriculture (corn and rice crops), with land parcels usually smaller than 20 hectares and combined with other activities such as raising domesticated animals and small commercial and traditional activities. Many of these are subsistence activities, and as a result the quality of life in these areas is low. Land leasing occurs most often in the larger sized haciendas, or estates; owners of property from 30 to 50 hectares in size – for example – subdivide their land into parcels up to 1 hectare and lease them to inhabitants of the towns of Cecilia and Sejeve for them to plant, mostly corn crops.

**15. The municipalities of San Marcos and San Benito Abad** cover an area of 53,454 hectares and 159,200 hectares, respectively. For 2011, the DANE projected a population of approximately 54,364 inhabitants for San Marcos and approximately 24,387 inhabitants for San Benito Abad. As is the case with the municipality of Ayapel, both municipalities show NBI indicators above the national average (27.27%). The principal production activities are related to agriculture, and the population affected by extreme climatic events in San Marcos and San Benito Abad reached significant numbers with important repercussions for the municipalities' economies. Land ownership presents a common pattern in which properties larger than 200 hectares (51.4%) belong to a small group of landowners and are principally dedicated to extensive cattle ranching, while the areas of land less than 20 hectares in size are distributed among a large number of owners who farm the land with subsistence crops and complement these activities with fishing or hunting. In 2000, land ownership was divided into 6,404 properties with 7,721 owners: a) 4,344 properties smaller than 20 hectares (18,672 hectares) used for the peasant economy and equal to 7.4% of the entire area; b) 1,855 properties between 20 and 200 hectares (119,905 hectares) equivalent to 47.5% of the total area of the region; and c) 205 properties greater than 200 hectares (113,731 hectares) used for extensive cattle ranching and which comprise 45.1% of the total area. According to the information gathered from surveys by the Corporation for the Sustainable Development of La Mojana and San Jorge (CORPOMOJANA), 45% of residents claim to be land owners, 32% claim to

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<sup>15</sup> The NBI is a method used to directly identify critical deficiencies within a population and characterize the level of poverty. It uses indicators that are directly related to four areas of basic human needs: housing, sanitation services, basic education, and minimum level of income. In Latin America it is widely used, due to the recommendations given by the Economic Commission for Latin America (ECLA), an agency of the United Nations.

be renters, 16% claim to hold no property, 3% are communal, 2% are sharecroppers, and 2% fall into the category of “others.” Summary statistics for the three municipalities are presented below. The project will work directly with the most vulnerable populations in 11 communities (13,600 people) in the three municipalities.

Municipality	Area (ha)	Population projected for 2011 (# of inhabitants)	NBI <sup>16</sup>	Area affected by the 2010-2011 rainy season (ha) <sup>17</sup>	Population affected by the 2010-2011 rainy season (# of inhabitants) <sup>18</sup>
Ayapel	193,400	47,408	61.55%	25,128 (13%)	15,140 (31.9%)
San Marcos	53,454	54,364	58.14%	8,100 (15%)	18,870 (34.7%)
San Benito Abad	159,200	24,387	67.06%	22,288 (14%)	20,049 (82.0%)

### *Environmental and Cultural Context*

16. The region of the Depresión Momposina, including the project target area within the La Mojana subregion, has undergone an accelerated process of environmental degradation that includes the desiccation of wetlands, alteration of the hydrological regime through the construction of canals or filling in natural channels, deforestation, habitat alteration, and loss of biodiversity. In addition, the lack of control over legal and illegal mining practices within and outside of the region has created sedimentation and contamination with mercury, methyl mercury, and other bio-accumulated and highly toxic heavy metals. This has negatively affected agricultural and fishing production and constitutes a public health problem in the region, as the entire food chain becomes contaminated. Different studies that have been performed in the region indicating that, according to international standards, the concentrations of mercury and methyl mercury in the water, sediment, vegetation, and fish exceed maximum exposure concentrations. These studies have recommended that the aquatic system not be used for drinking water, domestic livestock farming, or agricultural activity due to the high levels of mercury contamination<sup>19;20</sup>. The environmental degradation of the La Mojana subregion has resulted in food insecurity, negative impacts on the local and regional economies, loss of ecosystem goods and services, limited ecosystem resilience, and the loss of the traditional land use.

17. Despite the vast anthropogenic changes that occurred in the past, the current level of biological richness in the Depresión Momposina and the project area is still high. This is due to a large number of aquatic, terrestrial, and transitional habitat that are present in the area, which originated from fluvial dynamics, hydrological variability, the transition between humid and dry climate regimes, and contact with three biogeographic provinces: Chocó – Magdalena, Northern Andes, and the Caribbean. The Depresión Momposina has been classified as an area of regional importance in Latin American and the Caribbean due to its biological distinctiveness (species richness, endemism, and ecosystem diversity)<sup>21</sup>.

<sup>16</sup> DANE, 2005.

<sup>17</sup> Dirección de Gestión del Riesgo (DGR), Evaluación de Daños y Análisis de Necesidades (EDAN), PAE Nacional. Cut-off date, March 28, 2011.

<sup>18</sup> Dirección de Gestión del Riesgo (DGR). Consolidado de atención de emergencias, Temporada Invernal 2010-2010. Cut-off date, May 23, 2011.

<sup>19</sup> Mancera-Rodríguez, N. J., and Álvarez-León, R. 2006. Current state of knowledge of the concentration of mercury and other heavy metals in freshwater fish in Colombia. *Acta Biológica Colombiana*, Vol. 11 (1): 3 - 23

<sup>20</sup> C. Ramos, S. Estévez, and E. Giraldo. 2002. Methylmercury analysis in environmental samples from La Mojana region in Colombia. *Symposia Papers Presented Before the Division of Environmental Chemistry American Chemical Society Orlando, FL. Preprints of Extended Abstracts Vol. 42 No. 1.*

<sup>21</sup> Olson, D., Dinerstein, E., Canevari, P., Davidson, I., Castro, G., Morisset, V., Abell, R., and Toledo, E.; eds. 1998. *Freshwater biodiversity of Latin America and the Caribbean: A conservation assessment.* Biodiversity Support Program, Washington, D . C.

### *Traditional pre-Hispanic flood control and hydrological management*

18. Locally adapted traditional land use/water management in La Mojana was based on a complex hydraulic system conformed by canals and terraces that allowed flood control and reduction of the risk of river overflows. In turn, fertile river sediments were used for sustainable agricultural production and allowed a continuous supply of vegetables and fish, the main protein source for local communities. Unfortunately, these practices were later abandoned and replaced by non-sustainable land use/water management models and production systems that have resulted in the drainage of wetlands, water pollution, alterations of fluvial dynamics, deforestation, natural habitat degradation, and food insecurity, causing the people from La Mojana to become highly vulnerable to the effects of hydrometeorological events associated with climate change and variability.

19. Traditional land use models in La Mojana have their origins in a complex social and economic system directly articulated with water management developed by the Zenú culture during pre-Hispanic times. The high level of understanding by the Zenúes of the agroecological and biophysical characteristics of their land, including hydrological regimes, allowed them to consolidate an adaptive response to river fluctuations, and included the design of hydraulic systems for land use in an area of 500,000 hectares (almost all of La Mojana) of wetlands along the San Jorge River, and 150,000 hectares along the Sinú River, as well as the development of intensive and permanent agricultural and animal captive breeding systems. This hydraulic system included an intricate complex of drainage and water conveyance canals, and terraces along the margins of the rivers, which allowed them to control floods and water level increases, as well as to take advantage of the sedimentation generated by the rivers to maintain a sustainable production of food for their large population. The canal system comprised different types and structures, some fanning out following meanders, others in groups of short canals from 30 to 70 meters in length, and others in a checkered-pattern layout. The technology developed by the Zenúes was passed down through generations and adapted to the needs of diverse social groups in the area. Currently these hydrological management and production techniques are not used in the La Mojana subregion, and although some of these canals can still be seen they are in an accelerated process of deterioration; nevertheless, some rural communities, particularly indigenous groups, in the neighboring watershed of the Sinú River continue to use some forms of hydrological management and production systems<sup>22</sup>.

### ***The problem and the proposed solution***

20. An increasing number of people and ecosystems are at risk to the negative impacts of flooding in the Depresión Momposina region due to the effects of climate change. Although the region has experienced flooding in the past, the severity of the recent ENSO cycles, including a harsher La Niña event, as well as the forecasted increase in temperature and change in rain patterns for the remainder of the century, will have major negative impacts on the region. As a consequence, larger areas of productive lands, natural ecosystems, and human settlements will be affected, resulting in: a) increased loss of revenue and food insecurity due to the loss of crops, livestock, and fishing grounds; b) long-lasting disruption in the provision of public services due to the flooding of roads and water supply systems and the over-flooding of water ways; c) extended degradation of wetlands and upland ecosystems due to excessive sedimentation and prolonged flooding; and d) and the loss of human lives, displaced people, and the destruction of homes.

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<sup>22</sup> The Sinú River is located to the west of the La Mojana subregion. It is 380 kilometers (km) in length and its watershed covers an area of 13,700 km<sup>2</sup>. The river forms multiple meanders, has a large floodplain, and ends in a system of marshes and swamps. The Sinú River originates in the Paramillo Massif in the Central Andean mountain range of Colombia, and empties into the Caribbean Ocean in the Cispatá Bay (Source: Ruiz-Ochoa, M., Bernal, G., and Polanía, G. 2008. Influencia del río Sinú y el Mar Caribe en el sistema lagunar de Cispatá. Bol. Invest. Mar. Cost. 37(1): 31-51).

21. The Government of Colombia (GoC) recognizes the need to implement adaptation measures to reduce climate-related risks and vulnerability to climate change in the region of the Depresión Momposina. Therefore, it is proposing a comprehensive strategy to address climate change and vulnerability in this region that is considered environmentally critical for the country and where efforts by different sectors should converge and be articulated in terms of developing adaptation to climate change measures. This strategy will be implemented in a highly vulnerable area in the southeastern sector of the Depresión Momposina (Ayapel, San Marcos, and San Benito Abad municipalities), with the idea of replicating it in other sites within the region. The strategy includes: a) strengthening the existing hydroclimatological and environmental information system (HEIS) by expanding the network for capturing and analyzing information and making the information available in order to strengthen local capacity and facilitate local decision-making regarding adaptation to climate change; b) the rehabilitation of wetlands as functional systems<sup>23</sup> as a measure to reduce the risk of floods; c) development of sustainable economic options for local communities to help reduce their vulnerability to the impacts of climate change; and d) mainstreaming climate risk management in planning and development strategies at the regional and local levels.

22. The effective implementation of adaptation measures to respond to climate change in the municipalities of Ayapel, San Marcos, and San Benito Abad in the region of the Depresión Momposina is limited by the following barriers:

a) *Lack of information and awareness about the impact of climate change to make more informed decisions at the local level:*

23. Critical informational constraints include a lack of understanding and awareness on climate change related issues at the local level and lack of information on future threats related to climate change at local level. The GoC through IDEAM has access to and uses hydrometeorological information to support the decision-making processes regarding the reduction of vulnerability to the impacts of climate change and to develop adaptation strategies in the country. Available hydroclimatological information has allowed IDEAM to determine the effects of climate change already observed in the country, and the development of the climatic scenarios that will likely occur during the next decades, as well as to develop risk and vulnerability scenarios at the national and regional scales. IDEAM also has an environmental alert and advisory system for hydrometeorological events and issues multiple daily, weekly, and monthly warnings about climate-related events based on national and regional analyses. Despite this capacity, information for decision-making and planning regarding climate change and adaptation at the local level is not readily available. The network of hydroclimatological stations in the project target area is limited in terms of its ability to generate information and currently only provides partial data about the area's hydroclimatological conditions. IDEAM currently operates a limited number of hydrometeorological stations in the La Mojana subregion, including two river flow stations (Cauca River), five rainfall stations, two climatological stations, and two hydrological stations that measure water levels in two lagoon/wetland complexes (the San Marcos and Ayapel lagoon/wetland complexes). Of these, only the flow stations on the Cauca River are automated and linked to IDEAM's climate warning system. This is a significant limitation in the generation of hydrometeorological information since there are the only stations of this type in an area of 550,000 hectares (which includes the three project target area municipalities) with a complex hydrology and which is highly sensitive to climate variability and extreme

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<sup>23</sup> Rehabilitation is understood as actions to repair damaged or blocked ecosystem functions, with the primary goal of raising ecosystem productivity for the benefit of local people (Based on: J. Aronsod, C. Fled, E. Le Floc'h, C. Ode, and R Pontanier. Rehabilitation of degraded ecosystems in arid and semi-arid lands. I. A view from the South. Restoration Ecology, March, 1993.

weather. As such, it is imperative to obtain more spatially detailed, representative, and timely information to support local-level decision-making regarding climate change adaptation.

24. Informational barriers also include a limited technical capacity at the municipal level to incorporate hydroclimatological information (i.e., climate scenarios, results of hydroclimatological modeling, and assessments of vulnerability and risk) into local management and planning systems. Also, there is an overall low/limited awareness in most communities in the three municipalities on climate change impacts and on the increased frequency of extreme events, such as flooding and of mitigation measures. An early warning system at the local level to alert communities to move away from areas where the risk of flooding is imminent or to carry out any other timely measures and adaptation of infrastructures to prevent flooding is lacking. A local-level early warning system is needed to support the communities in implementing timely measures to address risks related to extreme climatic events. The local-level early warning system should be articulated to IDEAM's national early warning system to take advantage of their capacity to capture, store, and analyze hydroclimatological information. The system must also include dissemination mechanisms so that early warnings reach local authorities and local communities in remote locations fast enough to provide the full benefit and to strengthen existing local forms of information sharing so that warnings and other climate-related information is made available to all vulnerable community members.

*b) Current practices of unsustainable use of natural resources undermine the capacity of wetlands to mitigate the effects of climate change:*

25. The continued degradation of natural resources in the region of La Depresión Momposina adds uncertainty to the ability of ecosystems and local communities to face climate change and variability. As flooding becomes more prevalent due to extreme climate events including La Niña, the capacity of wetlands to serve as hydrology regulators and to mitigate floods becomes more important. A major challenge for the protection and sustainable use of wetlands is the lack of examples of ecosystem management within the region that will make local communities and landowners aware of the value of wetlands in mitigating flooding. Prevailing uses of natural resources in the region usually result in the loss and drainage of wetlands, and the alteration of their natural hydrodynamics through clogging of natural water courses and construction of artificial canals and dikes in the many water courses with which wetlands are interconnected. These practices reduce the wetlands' ability to buffer the effects of extreme weather events (storing excess water, slowing down floods, trapping sediments, and other services) and to help reduce vulnerability to climate change.

26. In the Depresión Momposina region, and particularly in the La Mojana subregion, efforts to enhance wetlands functions through their protection, rehabilitation, and reduction of stressors caused by human activities are practically non-existent. The relationship between increases in flooding and opportunities for having healthy wetlands as part of an adaptation and mitigation strategy has not yet been contemplated.

*c) Inadequate on-the-ground experiences to promote resilience to climate change:*

27. The implication of changes in the periodicity and length of flooding as well as the changes in the intensity of extreme weather events such as la Niña will likely have long-term effects on food production and economic options for local populations, particularly rural communities, which are the poorest and most vulnerable. Currently, there is inadequate on-the-ground experience in climate change-resilient production practices that would help local communities to be better prepared to face changing climate conditions. Traditional agricultural practices employed by rural communities (small scale agriculture and cattle ranching) and that are finely tuned to seasonal climate variations have been placed under increasing pressure from prolonged and unpredictable flooding. Efforts from the government and development

agencies to help local communities sustain food production under climatic uncertainty have not successfully address the need for combining traditional knowledge with climate resilient soft and hard technologies and practices. This include the application and access to flood resilient seed varieties adapted to extended soil saturation conditions, short-cycle crops for shortened dry seasons, improved livestock management techniques, as well as alternative methods for food production for those communities that are experiencing flooding almost permanently.

d) *Limited organizational/institutional capacity and policy framework to promote adaptation approaches at the regional and local levels:*

28. Colombia has made progress in developing institutional capacity at the national level to address climate change issues, particularly for the development of related policies, programmes, and projects. However, there is limited technical capacity among regional and local institutions to lead the actions necessary to incorporate adaptation measures into regional and local territorial, environmental, or sectoral planning processes and for their implementation. In the project target area, municipal (Ayapel, San Marcos, and San Benito Abad municipalities) and departmental authorities (Cordoba and Sucre) play a central role in providing support during flooding and climate-related emergencies; however, they are not fully aware of the potential impact of climate change and variability and have limited knowledge about options (e.g., ecosystem-based management and traditional fluvial management) besides engineering solutions for flood control and hydrological management. Bridging this gap in knowledge is critical, as municipal and departmental authorities are ultimately responsible for the formulation and implementation of development and territorial management plans that guide government-based investments, including those potentially related to reducing risk and vulnerability to climate change at the local level.

29. At the community level, there is limited knowledge about climate change adaption and organizational capacity. Local communities have basic emergency management training for flood events and have ample knowledge about traditional production practices that are in tune with seasonal flooding. However, this knowledge is not sufficient under uncertain climate conditions, as was evidenced during the 2010-2011 rainy season when many of these communities suffered the worst flooding levels in recent history and which affected many aspects of their lives, including housing, food security, and income. Local communities should become more aware of options for adaptation to prolonged and recurring flooding. Additionally, avenues to promote a discussion at the local level about adaptation to climate change options and strategies are largely absent. This limits coordination and the establishment of necessary partnerships across local and regional institutions and with local communities that would create an enabling environment for effective planning and managing the uncertainties of climate change. This situation constrains the ability of local communities to participate in decision-making processes to ensure that local development and land use plans include their perspective and address their needs to reduce risk and vulnerability to climate change impacts.

## **PROJECT / PROGRAMME OBJECTIVES:**

30. The project objective is to reduce the vulnerability of communities and of wetlands in the region of La Depression Momposina to flooding and drought risks associated with climate change and variability. To achieve this objective the project will include the following four components:

1. The existing hydroclimatological and environmental information system (HEIS) is strengthened and used by local- and regional-level stakeholders, reducing their exposure to the impacts of climate change.
2. Wetlands and their hydrology in the target area are rehabilitated as a means of reducing risk to flooding and drought associated with climate change and variability.

3. Increased adaptive capacity of local communities in three targeted municipalities through the introduction of agroecological practices that help reduce their vulnerability to the impacts of climate change.
4. Institutional and policy capacity strengthened for mainstreaming climate risk management and adaptation measures into planning and decision-making processes.

## ■ PROJECT / PROGRAMME COMPONENTS AND FINANCING:

PROJECT COMPONENTS	EXPECTED CONCRETE OUTPUTS	EXPECTED OUTCOMES	AMOUNT (US\$)
1. The existing HEIS is strengthened and used by local- and regional-level stakeholders, improving their resilience to the impacts of climate change.	<p>1.1. Hydrologic and hydraulic models for the Depresión Momposina region and the project's target area support medium- and long-term decision-making. <b>(\$252,000)</b></p> <p>1.2. Climate scenarios, trends in climate variability, and vulnerability analysis for the target area supports decision-making for planning instruments and the implementation of adaptation measures. <b>(\$376,000)</b></p> <p>1.3. Mechanisms for gathering, processing, and managing hydroclimatological information at the regional and local levels are strengthened and articulated with the national hydroclimatological network. <b>(\$669,000)</b></p> <p>1.4. An early warning system developed at the local level to prepare local communities to reduce their vulnerability to extreme weather events. <b>(\$267,000)</b></p>	An enhanced HEIS strengthens local capacity and facilitates decision-making for adaptation to climate change.	1,564,000 <b>(17.3%)</b>
2. Rehabilitation of wetlands and their hydrology in the target area as a means to reduce risk to flooding and drought associated with climate change and variability.	<p>2.1. Hydraulic works (infrastructure development, dredging, and unclogging of water courses) for flood control and hydrological management are in place in the target area. <b>(\$1,224,000)</b></p> <p>2.2. Traditional pre-Hispanic systems of flood control,</p>	The buffering and water regulation capacity of wetlands has been rehabilitated in a multiple-use landscape, reducing the vulnerability of local communities to the impacts of climate change.	3,486,000 <b>(38.5%)</b>

	<p>agricultural production, management of fluvial systems, and responses to drought are reestablished in the target area. <b>(344,000)</b></p> <p>2.3. Ecosystems associated with the hydrodynamics of the target area are rehabilitated, enhancing their ability to mitigate the effects of flooding. <b>(\$1,492,000)</b></p> <p>2.4. A 2,000-hectare protected area (PA) is established providing long-term ecosystem goods and services improving the coping capacity and livelihoods of local communities in the face of climate change. <b>(\$426,000)</b></p>		
<p>3. Introduction of climate change-resilient agroecological practices and building designs helps local communities to reduce their vulnerability to the impacts of climate change.</p>	<p>3.1. Climate change-resilient agricultural and women-oriented production practices (vegetable and organic gardens on stilts and native rice adopted in the target area. <b>(\$1,047,000)</b></p> <p>3.2. Structural measures for housing and school to respond to climate related risks or threats designed and implemented benefitting approximately 650 people. <b>(\$1,032,000)</b></p> <p>3.3. At least 250 ha with climate resilient agro-silvopastoral measures established to help vulnerable small-scale farmers to mitigate the effects of flooding. <b>(645,000)</b></p>	<p>Strengthened local communities implementing adaptation measures to increase their resilience to the impacts of climate change and improve their quality of life.</p>	<p>2,724,000 <b>(30.1%)</b></p>
<p>4. Relevant institutional and social structures strengthened for mainstreaming climate risk management and adaptation measures into planning and decision-making processes.</p>	<p>4.1. Lessons learned from interventions codified by MADS and used raise awareness about managing climate change induced flood and drought risks. <b>(\$115,000)</b></p> <p>4.2. Communities and local</p>	<p>Strengthened national, regional, and local institutions and organizations for implementing planned adaptation measures to climate change and replicating activities and lessons learned.</p>	<p><b>429,000</b> <b>(4.7%)</b></p>

	<p>authorities in targeted municipalities trained in climate change threats related to flooding and adaptation measures which reduce vulnerability.  <b>(\$168,000)</b></p> <p>4.3. Climate risk management considerations built into regional and local territorial, environmental, and sectoral planning tools are articulated with national planning guidelines.  <b>(\$146,000)</b></p>		
5. Project/Programme Execution cost			<b>861,000</b>
6. Total Project/Programme Cost			<b>9,064,000</b>
7. Project/programme Cycle Management Fee charged by the Implementing			<b>770,440</b>
<b>Amount of Financing Requested</b>			<b>9,834,440</b>

## ■ PROJECTED CALENDAR:

MILESTONES	EXPECTED DATES
Start of Project/Programme Implementation	<b>March</b> 2012
Mid-term Review	<b>September</b> 2014
Project/Programme Closing	December 2016
Terminal Evaluation	July 2017

## ■ PART II: PROJECT / PROGRAMME JUSTIFICATION

31. To reduce the impact of the expected adverse effects of climate change in the region of La Mojana, the GoC is proposing a strategy that includes a set of complementary adaptation measures to be implemented over a period of 5 years. This strategy is described in the following sections.

A. Describe the project / programme components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience.

***COMPONENT 1 - The existing hydroclimatological and environmental information system (HEIS) is strengthened and used by local- and regional-level stakeholders, improving their resilience to the impacts of climate change.***

32. Component 1 focuses on strengthening the existing HEIS using local and regional data that will be used by local stakeholders (e.g., community members, community-based organizations - CBOs, and municipal authorities) from the municipalities of Ayapel, San Marcos, and San Benito Abad, as well as regional-level stakeholders (e.g., Regional Autonomous Corporation of the Sinú and San Jorge Valleys – CVS, and CORPOMOJANA), to support planning and budgeting decisions at municipal and local level for mitigating the impacts of climate change. Given the technical nature of the actions proposed under this

project component, IDEAM will lead their implementation. IDEAM is the national agency charged with establishing and operating national-level meteorological and hydrological infrastructure to provide information, predict weather patterns, issue advisories, and provide climate-related services in the country.

33. Component 1 will encompass the following: a) the development of hydrological and hydraulic models for the Depresión Momposina to support in the verification of hydraulic patterns in this region, which includes La Mojana, and whose behavior is determined by the confluence of waters of four major rivers in northern Colombia (Magdalena River, Cauca River, San Jorge River, and Cesar River). In addition, hydrological and hydraulic models will be developed for the project target area at a finer scale (1:25,000) so that hydraulic patterns and water balance may be determined for future scenarios of increase in precipitation and higher water flows that will result from climate changes; b) the development of climate vulnerability scenarios (i.e., climate change profiles, flood-risk maps, and vulnerability assessments) for the project target area in accordance with projected changes in precipitation and temperature as modeled by IDEAM for different time periods (i.e., 2011-2040, 2041-2070, and 2071-2100) and considering hydrological and hydraulic models for the larger region (i.e., Depresión Momposina) that take into account climate change in future hydrological scenarios for the principal rivers that have a large influence on the hydrodynamics of the target area; c) updating the hydrometeorological network (replacing nine conventional/mechanical stations with automatic stations) in the target area to obtain more precise (1:3,000 for urban areas and 1:25,000 for rural areas) and timely information (monthly reports of consolidated information) to strengthen local capacity for decision-making in the face of climatic variability and for adaptation to climate change; and d) designing and operating an early warning system at the local level to support the communities in implementing timely actions (i.e., assess potential impacts and develop strategies for the adaptation of production systems, natural resource use, housing, and population) to address risks related to extreme climatic events.

34. Under Component 1, IDEAM will generate hydrometeorological information and information about hydraulic patterns in the target area to effectively make decisions for directly improving the resilience of 2,640 families (approximately 13,200 persons) in 11 communities to climate change, and indirectly up to 54,000 people, in the Ayapel, San Marcos, and San Benito Abad municipalities, which are areas that are highly vulnerable to flooding.

35. During the project formulation phase, information needs (hydrometeorological information and information for hydraulic modeling) were determined by IDEAM through a consultative process with regional environmental authorities (CVS y CORPOMOJANA) and local stakeholders. The consultative process is described in Section H of this project document together with the list of those who were consulted. In addition, IDEAM defined the set of necessary actions, listed previously, that by project's end will result in a strengthened HEIS to provide the hydroclimatological and environmental information needed by local and regional stakeholders to improve their resilience to impacts from climate change.

36. During project implementation, IDEAM will conduct additional consultations with local stakeholders (e.g., community leaders and CBOs) to determine specific needs regarding hydroclimatological information to support in the design of a local-level early warning system to enable communities vulnerable to flooding and drought to monitor climatic variability in their region together with local, regional, and national authorities. Hydrological and hydraulic modeling (H-H models) results and consolidated hydroclimatological information will be made available through the Ministry of Environment and Sustainable Development (MADS) and IDEAM to stakeholders with presence in the Depresión Momposina region, including municipalities, departmental governments, regional environmental authorities, research centers, and universities, among other institutions. This information will contribute to other efforts made by the GoC for climate change adaptation, territorial planning, environmental protection, and the sustainable development of the region.

37. The improved hydrometeorological network will allow climatic estimates and scenarios to be made available by a variety of communications channels, tailoring information according to target audiences. The dissemination of relevant climate-related information will enable local governments, farmers, and communities in the project target area to include climate variability into their decision-making processes.

38. Component 1 will be disseminated through: a) IDEAM and MADS climate change web portals, (<http://www.cambioclimatico.gov.co>), which was developed within the context of the Second National Communication to the UNFCCC and the Strategy for Education, Training, and Public Awareness on Climate Change in Colombia as way to provide access to the public for climate change-related information and to build capacity in climate change issues. The web portal is widely used by national, regional, and local level government and civil institutions throughout the country; b) and through simplified printed bulletins and electronic files distributed by the local civil authorities and local NGOs directed to vulnerable communities in the target area, including women, and to other communities at risk in the municipalities of Ayapel, San Marcos, and San Benito Abad; and bc) the local-level early warning system (EWS) communication strategy that includes mobile phones and short wave radio-telephone transmission for timely dissemination of warning messages that are reliable, brief, and easily understandable, and which will directed to 54,000 vulnerable people in the target municipalities and municipal authorities (mayoral offices and CLOPADs). IDEAM has implemented a monitoring and feedback system to track how the EWS communication strategy has influenced population behavior based on bi-monthly surveys and mobile polls. Additionally, as part of project-related training events directed towards local communities, CBOs, and local authorities (Output 4.2) and the publication of project results and lessons learned in the national climate change portal (Output 4.3) and regional newsletters. The early warning system will also make use of existing media to which local communities in rural areas have access, such as community radio stations, as well as dissemination of information through trusted local organizations and their boards, such the Pastoral Social (a local non-profit organization that provides humanitarian assistance to communities affected by disasters), local churches, and local emergency committees.

39. To ensure cost-efficiency the project has been designed so that most of the outputs of Component 1 will be completed by the end of year 2 of the project, as it is understood that all the hydrological and climatic information generated by the AF project will be made available in support of the implementation of the other project components. Thus, all the information, data, and results related to Component 1 (which will be implemented by IDEAM), including the data and results of the hydraulic characterizations of the target area, will be available for use by other responsible parties (i.e., MADS, CVS, and CORPOMOJANA) for the implementation of Components 2, 3 and 4. For the implementation of Component 1, IDEAM will coordinate all technical actions to be developed in the project target area in coordination with the other responsible parties. The transfer of information, data, and results related to Component 1 will be done through the Project Coordinator and in coordination with the Project Director. Additionally, MADS, CVS and CORPOMOJANA may request any information they need directly from IDEAM for the implementation of Component 2, 3 and 4 through a written request, which is the standard mechanisms by which all regional environmental agencies in Colombia request information from IDEAM.

40. Component 1 consists of the following outputs and activities:

***Output 1.1 - Hydrologic and hydraulic models for the Depresión Momposina region and the project's target area support medium- and long-term decision-making.***

41. Hydrological and hydraulic modeling for the region of the Depresión Momposina and the target area, which will be performed by IDEAM using hydrological variables (e.g., precipitation, water level, water

flow, temperature, and relative humidity), will simulate four major rivers' (i.e., Magdalena, Cauca, San Jorge, and Cesar Rivers) hydrological interactions with the wetlands systems that serve as receptors and buffers for the excess water that flows into the region and areas of accumulation for sediment and suspended materials. The H-H models will use existing hydroclimatological information to establish the water balance of the Depresión Momposina region and the target area and to simulate hydrological changes and variability that will support local (mayoral offices, Local Committee for the Prevention and Aid of Emergencies and Disasters – CLOPADs, and CBOs), regional (CVS, CORPOMOJANA, government agencies, and Regional Committee for the Prevention and Aid of Emergencies and Disasters – CREPADs), and national (MADS and IDEAM) stakeholders, to make decisions regarding the implementation of adaptation measures.

42. The H-H models developed with support from AF funds will both complement and benefit from an existing effort by the GoC, which is being carried out by the National University of Colombia (UNC), for the simulation of the hydrological and hydraulic conditions in the La Mojana region, and which includes a) assessing the hydrological benefits and impacts of a dike recently constructed at the Cauca River along the Nechí – Achí stretch to the east of the target area that is critical for regulating water flows and controlling floods in the target area; and b) hydrological and hydraulic modeling for bypass flows that relieve pressure from flooding along a canal parallel to the existing road between the towns of San Marcos, Majagual, and Achí (north of the project target area). In developing the H-H models, IDEAM will take into account the results of the work that is being developed by the UNC, which will only model specific areas within the La Mojana subregion; however, inputs from the UNC will be used in the H-H modeling thereby reducing the modeling effort to be developed by the proposed initiative.

43. The H-H models for the Depresión Momposina region is critical since they will help to determine how the system receives, distributes, and stores excess water during extreme climate events like La Niña and regionally localized severe rain storms. The modeling will also help to determine critical points along water courses that will be unable to hold excess water and to assess which areas would be subjected to severe flooding under extreme climate conditions.

Activities under Output 1.1 include:

- Bathymetric analysis of the Cauca River along the stretch between the towns of La Pintada (Department of Antioquia) and the confluence of the Cauca and Magdalena Rivers, (Department of Bolivar), and along the Magdalena River between the towns of El Banco (Department of Magdalena) and Calamar (Department of Bolivar) to assess water storage capacity. The bathymetric survey will include field measurements taken along identified river cross-sections, (the separation between cross-sections will be determined through a cost analysis), information processing and analysis, and the development of bathymetric maps and graphs. Bathymetric data will be used in assessing the possible impact of hydrodynamic changes (e.g., flooding) due to extreme weather.
- Bathymetric analysis of the Ayapel and San Marcos lagoon/wetland systems, other smaller wetlands, and minor canals (e.g., Rabón Stream and others) in the project target area. Bathymetric information is critical for assessing the water storage capacity of the wetlands and lagoons and determining the areas most vulnerable to extreme climatic events, mainly flooding associated with high levels of precipitation. The characterization of the wetlands will include determining the average depth and interconnection with streams and other water flows.
- Hydroclimatological characterization of the project target area. Includes: a) description of the variables that determine hydrological and climatological patterns, with emphasis on climatic variability, and their relation to oceanic-atmospheric indices such as the Oceanic Niño Index (ONI), which is used for identifying El Niño (warm) and La Niña (cool) events in the tropical Pacific; the

Southern Oscillation Index (SOI), which is a measurement of the monthly or seasonal fluctuations in the air pressure difference between Tahiti and Darwin in the Pacific Ocean; and the MEI; b) development of the meteorological database at a monthly scale; c) spatial-temporal characterization of climatic variables and climatological zoning; d) analysis of the intra-annual and inter-annual climatic and hydrological variability; and e) analysis of extreme events and their relation to oceanic-atmospheric indices for the Atlantic and Pacific oceans.

- H-H model design, calibration, and simulation to define flood conditions along the Magdalena River in a reach east of the project's target area and using data collected through IDEAM monitoring stations (hydrological and meteorological). The H-H model design will include two options: a) using the integrated model developed by the UNC; or b) construction of an alternative model, using different hydraulic/hydrologic software (e.g., Hec Ras, SOBEK, Mike She, or the Water Evaluation and Planning model –WEAP). In either case, a hydrological model of the San Jorge River watershed will be included to support the generation of early warnings and support decision-making during level rises of the San Jorge and/or Cauca Rivers (see Output 1.4). Fieldwork will be conducted to collect baseline information to calibrate the H-H models, which will be developed using MATLAB programming language<sup>24</sup>. The final selection depends on a conceptual analysis of the scope and purpose of modeling as a function of available information about wetlands (relation depth – area – volume, interconnection channel characteristics), water quality, and needs and perceptions of local stakeholders.

*Output 1.2 - Climate scenarios, trends in climate variability, and vulnerability analysis for the target area supports decision-making for planning instruments and the implementation of adaptation measures.*

44. Within the framework of the Second National Communication to the UNFCCC (2010), IDEAM developed a methodological structure or model to evaluate vulnerability in consultation with diverse sectors of the country (i.e., agriculture, cattle ranching, energy, social, ecological, and environmental) and with support from its technical support units. As a starting point, IDEAM used the Intergovernmental Panel on Climate Change (IPCC)'s definition of vulnerability (2007)<sup>25</sup>, which is “the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes.” This methodology serves to identify the most vulnerable regions, land cover types, and/or sectors and to identify critical zones; it aims to provide input for the design and evaluation of adaptation measures, with the possibility of including management criteria that help to reduce vulnerability. The methodological framework developed by IDEAM for assessing vulnerability is presented in Annex D.

45. This model has allowed IDEAM to develop vulnerability scenarios at the national scale and at the scale of the country's broad natural regions (for example, the natural region of the Caribbean – 1:1,500,000) that are instrumental for decision-making regarding adaptation measures at those scales. However, these vulnerability scenarios are not sufficient to support the implementation of concrete adaptation measures at the subregional level (for example, La Mojana) or local level (for example, the municipalities of Ayapel, San Marcos, and San Benito Abad), and specific areas within them. Currently, the development of vulnerability scenarios for the project target area rely on relatively low-resolution data that consist of estimates of changes in temperature, rainfall, and other climatic variables averaged over a large area, and may not be reliable to support decision-making at the scales of small towns and rural

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<sup>24</sup> MATLAB is a high-level technical computing language and interactive environment for algorithm development, data visualization, data analysis, and numeric computation. MATLAB can be used in a wide range of applications, including signal and image processing and modeling. <https://sitelicense.arizona.edu/matlab/>.

<sup>25</sup> IPCC, 2007: Summary for Policymakers. In: Climate Change 2007: Impacts, Adaptation and Vulnerability. Contribution of Working Group II to the Fourth Assessment Report of the Intergovernmental Panel on Climate Change, M.L. Parry, O.F. Canziani, J.P. Palutikof, P.J. van der Linden and C.E. Hanson, Eds., Cambridge University Press, Cambridge, UK, 7-22.

communities. As a result, through this project output, a climate change vulnerability analysis will be conducted at the subregional and local scales that will support decision-making and the implementation of adaptation measures for the La Mojana subregion and the target area municipalities. The methodological structure developed by IDEAM to assess vulnerability will be evaluated and required adjustments will be based on the information needs for the desired scales of analysis. Runoff variations during different climate change scenarios will also be analyzed for the principal inflows to the La Mojana subregion (San Jorge and Cauca Rivers) and flood-risk maps will be developed at the 1:25,000 scale for rural areas and 1:3,000 (or 1:2,000) for urban zones within the target area municipalities. IDEAM's assessments will be complemented with methodologies of participatory assessment of local vulnerability, which will allow combining science-based climate assessments with local knowledge of climate behavior.

Activities under Output 1.2 include:

- Develop or adjust the climate change vulnerability analysis methodology, within the framework of the National Adaptation Programme of Action, to specific conditions in the project target area. Vulnerability analysis will be developed on the basis of existing methodologies developed by the IDEAM within the framework of the Second National Communication to the UNFCCC, and adjusted to reflect ecosystemic, socioeconomic, and sectoral conditions specific to the target area; and methodologies for participatory assessment of local vulnerability.
- Analyze climate change scenarios (projected variation in rainfall and temperature) specific to La Mojana and the specified target area. For this the 2011-2040, 2040-2070, and 2070-2100 time periods will be used.
- Analyze runoff changes under climate change and climate variability scenarios for the Cauca River (town of Caucasia), Magdalena River (Loba branch), and for the San Jorge River watershed (town of Monte Líbano).
- Develop flood-risk maps, using high-resolution radar (LIDAR) or optical images (RapidEye, GeoEye, and/or Quick Bird), at the 1:25,000 scale for the rural area (towns of Cecilia, Sejeve, and Sincelejito in the Ayapel municipality; towns of El Pital, Cuenca, and Las Flores in the San Marcos municipality; and the towns of Las Chispas, Pasifiere, Tornobán, Chinchorro, and El Torno in San Benito Abad) and at the 1:3,000 and/or 1:2,000 scales for the urban areas of the Ayapel and San Marcos municipalities. IDEAM will develop the maps based on interpreted spatial data, hydrological characterization of the area, and H-H modeling in consultation process with authorities from the three municipalities (mayoral offices) and the three local and regional Committees for the Prevention and Aid of Emergencies and Disasters - CLOPADs, CORPOMOJANA, and the CVS.
- Analyze vulnerability and climatic trends for the target area using inputs from the risk scenarios identified above. These analyses will use environmental sensitivity indexes and vulnerability indexes developed by IDEAM and participatory assessment of local vulnerability.
- Information generated with AF support will be made available by IDEAM and the MADS through their climate change web portals to the municipal authorities (mayors, municipal advisory boards, and municipal planning offices) of Ayapel, San Marcos, and San Benito Abad; CLOPADs in the three municipalities and non-governmental organizations (NGOs) working locally; and to CBOs (agricultural producers, fishermen, and educator groups) and community members of Cecilia, Sejeve, and Sincelejito (Municipality of Ayapel), El Pital, Cuenca, and Las Flores (Municipality of San Marcos), and Las Chispas, Pasifiere, Tornobán, Chinchorro, and El Torno (Municipality of Benito Abad) through simplified printed bulletins and electronic files distributed by the local civil authorities (members of the CLOPADs) and local NGOs.

*Output 1.3 - Mechanisms for gathering, processing, and managing hydroclimatological information at the regional and local levels are strengthened and articulated with the national hydroclimatological network.*

46. The project will facilitate the updating of the hydrometeorological network to address the vulnerability of the identified target area and provide information for the development of climate variability scenarios. Updated stations (automated) will provide information for modeling (Output 1.1) and to develop climatic forecasts that will be part of a local-level early warning system (Output 1.4). In addition, the capacity for processing, validating, and interpreting hydrometeorological information will be strengthened at the national (IDEAM), regional (CVS and CORPOMOJANA), and local (municipalities) levels. The capacity to better analyze how climate changes causes temporal and spatial variations in the hydrological cycle will also be strengthened at the local and regional levels since it will facilitate more accurate predictions of the intensity and breadth of floods and droughts, and for defining and implementing adaptation measures. The updated hydroclimatological stations will be part of the national network; thus, the stations will generate information that will be also be useful also outside of the project target area in assessing climate change, particularly in other areas of the Depresión Momposina.

47. IDEAM currently operates a series of hydrometeorological stations in the project target area that includes six flow stations on the Cauca River, five rainfall stations, two climatological stations, one hydrological station that measures water levels in the San Marcos lagoon/wetland complex, and one hydrological station that measures water levels in the Ayapel lagoon/wetland complex. Of these, only two flow stations on the Cauca River are automated (to capture and transmit information in real time) and linked to IDEAM's early warning system. This is a significant limitation in the generation of hydrometeorological information in real time since they are the only stations of this type in an area of more than 400,000 hectares (the area of the three project target area municipalities) with a complex hydrology. As such, it is still not possible to make predictions on hydrological changes of wide coverage based on real time data, or which is duly incorporated into an early warning system. To overcome this barrier, the project through IDEAM's network operation group (Hydrology Division) will update two (2) automated hydrological stations, two (2) automated climatological stations, and five (5) automated precipitation stations with satellite transmission to transmit hydrological information in real time to develop fast, precise, and reliable climatic predictions.

48. An early warning system, with the capacity to make projections and provide warnings before an event, necessarily requires consistent and reliable environmental data in real time. Monitoring as accurately as possible critical variables such as water levels, soil conditions, weather, etc and then using that data to make projections and provide warnings to communities of impending climate induced hazards and risks will require the use of technologies that are currently available and used to good effect in many parts of the world. In this context, automated weather stations (AWS) and automated flow stations (AFS) are preferable to manual stations, largely because they:

- are more consistent in their measurements - reducing errors due to human interpretation;
- provide data at a significantly greater frequency - allowing monitoring of climate/hydrological extremes in real time rather than one measurement per day;
- provide data in all weather, day and night, 365 days per year at insignificant marginal cost;
- can be installed in sparsely populated areas and do not require maintenance support on a daily basis).

49. At the moment there are 11 functioning AWS in the project area (please refer to page 10 in project proposal; two flow stations, five rainfall stations, two climatological stations and two hydrological stations). These technologies are therefore nothing new to Colombia. They have been in use and have been effective to date. The problem is that the current number of AWS are too few to monitor the differences in climate, and other key variables across the region that is the focus of this project. Of the 11 functioning AWS, only the river flow stations on the Cauca River are automated and linked to IDEAM's

climate warning system. Hence the likelihood of monitoring and providing warnings on extreme climate induced events including being able to use this information to guide hydrology management under conditions of climate induced pressures(see below) is limited.

50. There are currently only two water flow stations on the Cauca River servicing the needs of an area of more than 400,000 hectares, the location of the three target municipalities in this AF-financed project. Not only are these too few for to accurately monitoring a complex hydrological catchment as found in the project area (and hence thereby providing warnings of dangerous water levels), the shortage of monitoring stations y provide leads to insufficient data for calibrating and developing the necessary high resolution hydrological models of the catchment (which simulate the flow of water between different sub-catchments) that are critical as an aid in informed decision-making to manage climate change risks. In order to obtain accurate measurements of flow in an area that is of the size of 400K HAs, at least 4 flow stations are required. With 2 flow stations, it is not possible to accurately calibrate and therefore make predictions about hydrological changes within the wider region based on real time data, or to timely incorporate these data and predictions into an Early Warning System (EWS). In order to obtain accurate measurements of flow in an area that is of the size of 400K HAs, at least 4 additional flow stations are required.

51. The new automated stations (AWS and AFS) will provide data at a significantly greater frequency, recording physical parameters (i.e. rainfall, wind, temperature, etc.) every minute, in all weather conditions, day and night all year around. . The technology will also provide accurate and useful data on extremes in climate (i.e., maximum rainfall intensity, maximum wind gusts, etc.) in the La Mojana region. It is critical to track these events as such events are the most damaging (in terms of human and financial costs), least well understood and potentially most important for the development of an effective early warning system that will help decisionmaking aimed at saving lives and avoiding high economic losses. When developing climate change induced risk scenarios from information on risks and vulnerabilities, this information on extreme climate hazards is crucial and hence will help local and regional governments and communities to plan for and manage climate-related risks. The data collected by the AWSs and AFSs will be stored as part of IDEAM's hydroclimatological and environmental information system (HEIS) and hence can be readily integrated into existing and readily used infrastructure and processes, including the early warning system.

52. In terms of generating long-term climate change scenarios for the region, the addition of these AWS and AFS stations will increase the ability to:

- Model future climate change induced hydrological changes at a higher spatial scale due to the development of more complex and regionally specific hydrological models;
- Understand the response of the local hydrology to extreme climate events;
- Provide information for testing and applying novel downscaling methods to future scenarios of climate, including information on climate extremes, which will greatly enhance decision-making.

53. Although final location for stations is still unknown an internal criteria will be developed by IDEAM in order to optimize the hydro meteorological station network in the Mojana region with no impact in the calculated budget for Component 1. [According to IDEAM, the cost of replacing existing conventional (mechanical) stations with automated stations will include purchasing and importing the equipment at a cost of \$21,176.47 USD per station, and the delivery and installation at a cost of \$7,973.86 per station].

#### Activities under Output 1.3:

- Replace existing conventional (mechanical) hydroclimatological stations with automated stations: two (2) automated hydrological stations, two (2) automated climatological stations, and five (5) automated precipitation stations with satellite transmission. The sites for installation of the stations will be selected by IDEAM with the participation of the regional (CVS and CORPOMOJANA) and local (municipalities) authorities. IDEAM will purchase all of the required equipment (hardware and

software) and will be responsible for all import procedures as the needed equipment must be purchased overseas. Upon arrival in the country, the equipment will be transported to each of the sites in the project target area and the conventional stations will be replaced with the automated equipment in coordination with the regional and local authorities, which will also provide logistical support. IDEAM's technicians will calibrate all of the equipment/sensors onsite and will run tests to ensure that all the equipment is working (capturing and transmitting data) properly. All data will be stored as part of IDEAM's hydroclimatological information system. Additionally, IDEAM will ensure that the stations are operational through the life of the project and beyond. The stations will provide information regarding river water levels and flows, water levels in lagoons and wetlands, atmospheric temperature, rainfall, and relative humidity, among other climatological and hydrological variables.

The GoC will assume the responsibility over the maintenance of the stations after project completion.

- Strengthen the capacity of IDEAM's regional offices for validating and storing information in IDEAM's databases to make it readily available for users in the project target area.
- Provide daily and monthly reports through IDEAM's early warning system, and eventually through the local early warning system for the target area (see Output 1.4), using information from the stations in the area (from at least ten stations, including existing stations and stations to be updated by the project) and deliver information to users through IDEAM's Web page and other mechanisms so that the information will be made available at the local level. Once the information is validated, monthly histograms will be posted on the Web page.

**Output 1.4** - *An early warning system developed at the local level to prepare local communities to reduce their vulnerability to extreme weather events.*

54. Hydrometeorological and climatic monitoring and early warning systems in the country are performed by IDEAM's Office of Predictions and Alerts. The office's mission is to provide forecasts and alerts to all public and private entities in the country and the general public to reduce negative impacts from hydrometeorological and climatic threats. IDEAM has a technological platform that includes a central satellite receiving station for meteorological images, work stations for the development of meteorological models and climate forecast and prediction models, and related databases of information, among other components. In addition, in 2010 IDEAM employed a nation-wide network of stations that included 2,134 conventional stations (782 hydrological stations, 500 meteorological stations, and 1,298 rainfall-measuring stations) and 446 automated stations (216 automated stations without satellite transmission and 230 with satellite transmission) that are part of the national system of measurements and observations, and which provide vital information for IDEAM's early warning system<sup>26</sup>. This national level - early warning system is based on a set of environmental status reports (bulletins, warnings, alerts, and special communications) that are disseminated principally through electronic portals (forecasting and alert portals and the climate change portal) in the form of daily, weekly, biweekly, and monthly reports. The environmental status reports provide information about hydrometeorological and climatic status at the national and regional levels.

55. IDEAM's national early warning system uses a top-down approach for the distribution of information and relies solely on the data obtained through its network of hydroclimatological stations and coarse socioeconomic and environmental data. This represents a limitation for decision-making at the local level regarding adaption to climate change. The project will allow to overcome this limitation by enabling IDEAM, to work with key local and regional stakeholders, including the CLOPADs and CREPADs, and

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<sup>26</sup> Martínez, M. T. 2010. La vigilancia hidrometeorológica en el Ideam y los sistemas de alerta temprana. Available at [http://www.wmo.int/pages/prog/drr/eventsThematic\\_en.html](http://www.wmo.int/pages/prog/drr/eventsThematic_en.html). Accessed on 09/2011.

local communities in developing a local-level early warning system for the three municipalities of the project (Ayapel, San Marcos, and San Benito Abad) that meets local needs in terms of availability of climatic and hydrological information, and that will provide mechanisms of dissemination that effectively reach the most vulnerable communities, particularly those in rural areas with limited access to information outlets. Community participation is key for the long-term operation of the early warning system. To this end, through Component 4 at least 25 CBOs and community leaders will be trained in the use and operation of communication equipment, the development of community-based risk maps, and preventive actions with defined evacuation routes and proper signaling so as to gradually improve local resilience and decrease the communities' risk to climate change impacts. Additionally, the early warning system will include different perspectives on how men and women cope with climate change in the La Mojana subregion and use climate-related information.

56. The local-level early warning system will include: a) the timely assessment of risk for potential flooding in urban and rural areas; b) a system of communication that includes mobile phones and short wave radio-telephone transmission for timely dissemination of warning messages that are reliable, brief, and easily understandable, and which will be directed to 54,000 vulnerable people in the target municipalities and municipal authorities (mayoral offices and CLOPADs); c) community preparation and response plans developed and adapted with support from the municipal authorities (mayoral offices and CLOPADs) and regional environmental authorities (CVS and CORPOMOJANA; and d) development of a financial sustainability strategy that will allow IDEAM to maintain and manage data, and for the overall sustainability of the local-level early warning system after the project ends. At the local level, the early warning system will continue operating under the guidance of the three municipal governments and the regional environmental authorities (CVS and CORPOMOJANA) and will rely on community participation for its long-term operation. In addition, local groups of volunteers will be established to implement contingency measures in the case of climate change-related emergencies.

57. Regarding the financial sustainability strategy for the local-level early warning system the following options will be considered during the development of the: a) a review of IDEAM's general operations budget to incorporate all associated costs related to the involvement of IDEAM in the EWS after the project is completed; b) incorporation of the hydrometeorological stations and equipment that will provide information for the local EWS (Outputs 1.3 and 1.4) as part of IDEAM's monitoring network; as such, the gathering, analysis, and dissemination of all climate-related information to be generated through the project will be done as part of IDEAM's functions; c) the use of IDEAM's own financial resources to cover all future costs associated with the operation and maintenance of the stations, as well as for gathering and processing information; d) an analysis of the costs of operating the EWS at the local level, including recommendations so that these costs are incorporated into local and regional investment plans that are associated with local and regional planning tools. Under this scenario, the operational costs of the EWS will be assumed by local (Ayapel, San Marcos, and San Benito Abad) and regional governments (Córdoba and Sucre). Through the activities planned for Output 4.3, the project will facilitate the incorporation of the recommendations for the financial sustainability of the EWS into the local and regional territorial, environmental, and development planning instruments so that their funding is secured beyond the life of the project. To reduce the risk of not securing funding beyond the life of the project, a risk mitigation strategy has been developed and incorporated as part of the description of the measures for financial risk management (refer to the response to CR24 and Part III, Section B of the project proposal).

58. The design of the Early Warning System (EWS) includes lessons learned from Joint Programme "Integration of ecosystems and adaptation to climate change in the Colombian Massif", which developed a EWS for indigenous communities in remote rural areas and the CELUCAMPO project in the Cundiboyacense Plateau (Eastern mountain range of the Colombian Andes), implemented in 2009 by IDEAM.

59. Lessons learned from these projects included: a) in rural areas with dispersed population and widespread risk, and in small urban centers, the use of media such as radio and regional TV, with culturally sensitive information, facilitates the dissemination of climate-related information; and b) The use of communication technology with widespread usage in rural areas such as cell phones, allows the development of early warning systems (EWS) that are innovative, low cost, and that provide timely information to local authorities and the local population.

60. The communication strategy to be implemented by the project will be as follows:

61. AF funds will be used to put in place an EWS that is simple, field-tested and targets different segments of communities (women, children, farmers, school teachers, and community leaders) who are vulnerable to climate variability. Diverse channels of communication including short-wave radio, mobile transmission (through sms), printed and electronic bulletins disseminated through tv and other means will be used for this purpose.

62. The effectiveness of the system will be evaluated through surveys to assess user level of satisfaction. Local universities and/or private companies will have an opportunity to tender bids to perform these impact tasks. Evaluations can also be conducted by the Local Committee for the Prevention and Aid of Emergencies and Disasters (CLOPADs), through the use of participatory evaluation methods that include local authorities and community organizations opinions about simulations, and how the system performed during an emergency.

63. The EWS communication strategy will also consist of the following activities:

- Establishment of groups comprising of local communities (including women and elderly) and local and sub-national government officers, and non-governmental institutions who will be subsequently trained on climate risk management using information generated by the EWS. The establishment of the groups will be based on the teams already created by CORPOMOJANA for emergency relief during the rainy season of 2010-2011. In that instance, group members, who played a critical role in the delivery of disaster relief, were selected by communities based on their leadership and level of commitment. The groups were then trained by humanitarian aid organizations. In the context of the AF project, at least one group will be established in each of the targeted eleven rural communities. At the institutional level, the CLOPADs will provide support to community groups. The Ministry of Environment and Sustainable Development (MADS) and the Department of Risk Management (DGR) will monitor the process and will provide additional technical assistance, disseminate information, increase awareness, and provide guidance to the community on the use of the EWS.
- Define the content of communications and target audiences (public officials, teachers, sectors, and CBOs) and development of communication tools
- IDEAM will store and analyze the climate information for each station in the region, and will define the level of risk that should be communicated to the population (e.g., landslides, flooding), through daily and monthly reports to be posted in IDEAM's Web page and distributed by e-mail to local authorities, and by text messaging as describe below to people in rural areas.
- IDEAM will liaise and communicate with the CLOPAD (Local Committee for Prevention and Emergency Response) by short wave radio-telephone transmission (radios purchased by the project) through frequencies defined by the Colombian Red Cross and local mayors.
- Focal points for each community, local government and municipality officials and NGO will be trained to activate alerts and initiate action protocol when they receive IDEAM notification, either by radio-telephone transmission, mobile phone (text messages), or email.
- Awareness and partnership with the mass media in the project area (regional TV, community-based and commercial radio stations, newspapers, etc.) to disseminate regional climate information, hydroclimatic-related risks, EWS, and protocols for action, focusing on reduction of climate risk.
- Equip mayor offices, education centers, community-based organizations (CBOs) with emergency relief equipment according to contents of the training and the implementation of the action protocol.

- Adjustment of the strategy and dissemination of any changes in the protocol base on stakeholders' feedback and updates in national emergency response guidelines.

64. For text messaging using mobile phones, IDEAM in partnership with private companies has tested procedures that are outlined below:

- Text messaging will allow timely dissemination of relevant climate information generated by IDEAM to rural communities using SMS (short message service) which have no access to the internet but have mobile phones and use them regularly. This technology has been used as part of the CELUCAMPO project in the Cundiboyacense Plateau, implemented in 2009 by IDEAM, jointly with Inalambria (software company that provides technical support and assistance in the use of SMS), and the Universidad de los Andes (monitoring and evaluation of the project's impact) benefiting around 600 community members.

65. The steps for using text messaging as part of the AF project will consist of the following:

- IDEAM currently develops national and regional climate and weather forecasts
- IDEAM will issue climate risk bulletins for the target municipalities in the La Mojana sub-region and other areas of the Depression Momposina
- Protocol for information traceability is established by creating a database with mobile contact information of relevant stakeholders in the target communities in order to receive SMS containing EWS information.
- IDEAM defines schedules with relevant and reliable climatic information) needed by users (i.e., local communities in the target area), and determine the frequency of submission.
- A text message of 160 characters is emitted based on EWS information to users (i.e., local communities, government officials in the target area)
- Evaluation and feedback from users (i.e., local communities, government officials in the target area) through surveys.

66. All applied technologies required for the EWS communication strategy are of current practice by IDEAM:

- Software as a service (SAS) technology and use of natural language
- Programming and information parameterization
- Application programming interface (APIs)for different operation systems
- Web portal for information availability and e-mail
- Short wave radio-telephone an mobile phones

67. The following activities will be performed to achieve this:

Activities under Output 1.4:

- Design of the early warning system with participation from the national (IDEAM), regional (CVS and CORPOMOJANA), departmental (CREPADs), and local environmental authorities (mayoral offices, CLOPADs), and leaders and women from 11 communities participating in the project. The implementation of the early warning system will follow the procedures and steps defined by Colombia's Red Cross, which consist of the following: a) community organization: assigning roles among community leaders and members for the operation of the early warning system; b) recognition of risks: assessment and mapping of risk and vulnerability and developing local capacities to identify and respond to climate-related events and threats; c) development of early warning tools: identify climate-related threats and associated risks, and identify, develop, deploy, measure, and interpret early warning tools; d) operation of the early warning system: information and communication processes in which national, regional, and local authorities must inform the community about changes in the behavior of climate-related threats, or in which local communities inform local authorities about any changes in their locations; and e) assessment of the situation, dissemination of alert (notice, warning, alarm), and emergency plan.

- Operate a hydrological and meteorological forecasting system that includes a) a geographic information system (GIS) and hydrological models as tools for developing risk warning messages to be operated by IDEAM; and b) community-based risk maps that combine local knowledge on climate behavior with information collected through the climate stations network and locally by members of the CLOPADS (CVS, CORPOMOJANA, the Red Cross, and mayoral offices) using limnimeters and pluviometers.
- Distribute timely, reliable, and understandable warning messages to local authorities (mayoral offices and CLOPADs) and to 11 at-risk communities through local and community radio stations and daily, monthly, and quarterly newsletters.
- Assess the effectiveness of the early warning system for reducing risk and vulnerability.
- Define, jointly between IDEAM regional and local authorities and local communities, a financial sustainability strategy for the early warning system.

***COMPONENT 2 - Rehabilitation of wetlands and their hydrology in the target area as a means to reduce risk to flooding and drought associated with climate change and variability.***

68. The GoC believes that working to adapt to climate change in the region of the Depresión Momposina should not be limited to implementing engineered solutions. It also requires rehabilitating and protecting the natural functions of the region's wetlands, and where possible, recovering ancestral techniques for flood control, water management, and food production that were once employed by the people who inhabited the region's floodplains. These inhabitants had a broad understanding and knowledge of the region's fluvial behavior and the importance of conserving and managing its wetlands and forests. Therefore, project Component 2 is focused on making localized and strategic investments for developing conventional works (dikes and unclogging of streams) and traditional hydrological management techniques (pre-Hispanic canal and terraces) for flood control under the leadership of CVS and CORPOMOJANA, who will be responsible for their maintenance as part of their annual programming actions. It also includes investing in the rehabilitation, conservation, and sustainable management of wetlands to repair ecosystems functions so that these systems can mitigate the effect of prolonged flooding, and guarantee a lasting supply of ecosystem goods and services. This approach builds on traditional pre-Hispanic knowledge for flood control and principles of ecosystem and community-based adaptation, and will generate a range of social and cultural adaptive benefits that at the same time contribute to the conservation of biodiversity.

69. Component 2 will encompass the development of hydraulic works for flood control and hydrological management that will directly benefit at least 50% of the families (6,600 people) in 11 communities in the project area (Sincelejito, Cecilia, and Sejeve in the Ayapel municipality; El Pital, Cuenca, and Las Flores in the San Marcos municipality; and Las Chispas, Pasifiere, Tornobán, Chinchorro, and El Torno in San Benito Abad municipality). Additionally, it will reestablish a traditional pre-Hispanic system of canals and terraces along the Carate stream (San Marcos municipality).

70. Improving the adaptation capacity of communities in the target area requires measures to rehabilitate the ecological functions of wetlands where these have been altered and to decrease environmental degradation. Thus Component 2 also includes the rehabilitation of 700 hectares of critical upstream systems that contribute to the Ayapel wetlands (Barro, Muñoz, Viloría, La Quebradona, and La Escobilla streams), the San Marcos wetlands along the western bank of the San Jorge River (Santiago and Canoas creeks), and the San Benito Abad wetlands (Grande and Corozal creeks), repairing altered ecological functions of to close to 31,000 hectares of wetlands and enhancing their flood-buffering capacity; and d)

the creation of a 2,000-hectare multiple-use PA that will allow the long-term supply of ecological services in the face of climate and improving the coping capacity and options of local communities and their livelihoods.

71. Component 2 consists of the following outputs and activities:

***Output 2.1 - Hydraulic works (infrastructure development, dredging, and unclogging of water courses) for flood control and hydrological management are in place in the target area.***

72. Building on the results of an Institutional Agreement between the DNP and the UNC to conduct studies, analyses, and make recommendations about necessary and prioritized infrastructure projects for climate change adaptation in the La Mojana subregion, specific sites within the project target area will be identified, jointly with the municipal authorities and community leaders and members, where there is a critical need for hydraulic works for flood control and hydrological management to reduce impacts from flooding. Site selection will also consider the assessments conducted by CORPOMOJANA and CVS regarding flood control and hydrological management works needed in some of the major streams in the La Mojana subregion (e.g., Rabón, La Mojana, Viloría, San Matías, and Sejebe streams) and along the confluence of the Cauca and Magdalena rivers in the Loba Branch. Such works will be developed under the leadership of CORPOMOJANA and CVS, which have proven experience in contracting and supervising similar efforts within their jurisdictional areas, including works in the Ayapel, San Marcos, and San Benito Abad municipalities. CORPOMOJANA and CVS will ensure that all works developed using project funds meet the national licensing environmental requirements and legal standards. More specifically, Participatory Environmental Impact Assessments (EIAs) will be conducted in compliance with UNDP and MADS requirements and to national and local standards on environmental and social impacts and have been factored into the expected timeframe for this initiative. Financial support for the Participatory EIAs will be provided by the MADS and co-financed by the GoC. Additionally, all works will be developed so that they also contribute to reducing the vulnerability of wetlands to extreme climate events. More specifically, hydraulic works (dike and unclogging of water courses) will contribute to minimizing the impacts that excess water and prolonged flooding are currently having on wetlands.

Activities under Output 2.1 include:

- Hydraulic characterization of the flood-prone areas and critical points that will support in controlling the impacts of excess water and prolonged flooding resulting from extreme weather. This will include: a) inventory, description, geo-referencing, and systematization of available environmental and hydrologic information for each critical point; b) analysis of aerial photographs and satellite images from prior and current years to establish changes and hydraulic modifications; and c) complementary bathymetric studies for sites located outside of the lagoon/wetland complexes identified in Component 1 and for which bathymetric studies will be developed, which will ensure cost-efficiency and feedback between project components 1 and 2. The bathymetric analyses to be developed through Component 1 will be completed during year 1 and will be available for the hydraulic works that will be initiated during year 2.
- Application of measures to control flooding and hydrological management: a) participatory EIAs and construction of a dike in the confluence of the Sejeve stream and the San Jorge River in the municipality of Ayapel; and b) rehabilitation of water flows of 11 streams within the jurisdiction of CORPOMOJANA through the removal of invasive macrophytes along 128 kilometers.

The flood and erosion control works in the in the Sejeve area will include: under the supervision of the CVS, temporary support structures (piles and sand bags) and levees will be initially constructed to minimize the extent and impact of flooding. These structures will create more suitable conditions for

the construction of permanent structures to ameliorate the effects of flooding to several communities (e.g., Sejeve, Cecilia, and Sincelejito) in the target area (refer to Annex E for the technical specifications of these provisional structures). The permanent works will be carried out under the supervision of the CVS and will consist of outlining and rock-filling the bank of the San Jorge River along a 2-kilometer length and creating new dykes to mitigate erosion and stabilize the affected riverbank. Additionally, an 8-meter-wide terrace will be constructed, which will be superficially protected by a 30-centimeter-wide retaining wall and a 50-centimeter protective coating of rockfill to control erosion.

The rehabilitation of water flows in 11 streams will be carried out under the supervision of CORPOMOJANA and will include the construction of bridges and box culverts to allow the re-establishment of water flows; adaptation/remodeling of existing box culverts that do not meet the technical requirements for normal water flows; plugging of artificial openings and water jets; and manual removal of vegetation (living or dead) and sediments where required (refer to Annex E for the technical specifications regarding the rehabilitation of water flows).

- Design of a participatory **technical review system** to determine the efficiency and effectiveness of the proposed measures (the Sejeve dike and the rehabilitation of water flows), including the definition of relevant hydrological and ecological variables and protocols for gathering information.

***Output 2.2** - Traditional pre-Hispanic systems of flood control, agricultural production, management of fluvial systems, and responses to drought are reestablished in the target area.*

73. The recent history of the Depresión Momposina indicates that its natural flooding conditions and complex fluvial dynamics have not been fully understood. This has led to the unsustainable use of its wetlands and fluvial systems, the overuse of some wildlife and plant species, and the settlement of populations in risk-prone areas. The last is particularly critical given the intensification of extreme precipitation events. In the past, the environmental and climatic complexity of the region was managed by indigenous groups living in the area beginning around 900 B.C. until 1000 A.D. These groups employed traditional measures that were highly adaptable to changing conditions, and that included hydraulic systems consisting of a wide network of canals and terraces distributed along the principal rivers and lesser streams as well as in the interior wetlands of the Depresión Momposina. These canals and terraces varied in their configurations, depending on their function and location. Palynological studies of an approximate 800-year period (from 1000 A.D. to the present), which were conducted along the length of the Carate stream in the San Marcos municipality, found a relationship between the predominance of open vegetation or savannah and episodes of drought, suggesting that the management of the system of canals and terraces was successful<sup>27</sup>.

74. Climate change and variability in the Depresión Momposina have been well documented along with the current adaptation needs of its population. Therefore, as part of the proposed actions for Component 2, the project seeks to highlight and recover the adaptive value of the traditional pre-Hispanic practices for flood control, agricultural production, and fluvial management so that it will be an adaptation alternative for rural communities in the region. With AF support a traditional pre-Hispanic system of canals and terraces along the Carate stream (municipality of San Marcos) will be reestablished working closely with the land owners where remnants still exist and demonstrate the adaptive value of such a model. This effort will serve as a valuable experience in recovering adaptive traditional knowledge and practices that have great value for a region where existing production practices promote environmental degradation, and

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<sup>27</sup> Herrera, L. F., and Berrío, J.C. 1998. Vegetación natural y acción antrópica de los últimos 1000 años en el sistema prehispánico de canales artificiales del Caño Carate en San Marcos (Sucre, Colombia). Revista CORPOICA 12(2): 35-43.

which together with the intensification of extreme climatic events like La Niña, have resulted in maladapted communities being increasingly vulnerable to the effects of climate change.

75. During the project formulation, the Colombian Institute for Rural Development (INCODER) was consulted regarding the assessment of traditional pre-Hispanic practices in La Mojana sub-region. The INCODER has established national standards of land required for a rural community to satisfy food and shelter necessities by Department. In the specific case of Sucre Department, where the re-establishment of pre-Hispanic flood management practices will occur, the INCODER has established a 45-ha/community ratio, considering Zenú pre-Hispanic flood systems. Given that the communities of San Marcos and San Benito Abad will participate in the recovery of pre-Hispanic flood management such as digging and unclogging canals and reconstructing terraces as well as the re-establishment of agricultural production, a 90-ha of pre-Hispanic flood systems will be expected to be recovered with AF funds.

76. The proposed project will implement mechanisms of verification such as review of the rehabilitation plans by CORPOMOJANA and the Colombian Institute of Anthropology and History (ICANH). In addition, the project will rely on geo-referenced field and topographic maps to show where the pre-Hispanic structures recovered, and the establishment of memorandum of understanding (MOUs) with local stakeholders (landowners, farmers, and members of local communities) for the recovery/restoration/maintenance of the pre-Hispanic structures.

#### Activities under Output 2.2:

- CORPOMOJANA and the project team will identify the areas and properties along the Carate stream where the traditional pre-Hispanic system of canals and terraces and production practices will be reestablished. To this end, CORPOMOJANA and the project team will a) gather information about the traditional practices to be reestablished based on published and unpublished research on the subject; b) assess the current conditions of the physical remnants of the traditional hydrological management system; and c) develop rehabilitation proposals jointly with property owners where remnants of the traditional pre-Hispanic hydraulic system are located.

The traditional pre-Hispanic practices will be assessed through a combination of archaeological surveys and a review of existing studies for the area where remains of pre-Hispanic canals and terraces can still be observed (Carate Creek in San Marcos municipality or Rabón Creek in San Benito Abad municipality). The steps in the assessment process include a detailed archaeological survey, a baseline ethnohistorical investigation, the recovery/restoration of canals and terraces for flood control and reduction of risk to river overflow, and the implementation/replication of existing traditional/sustainable agricultural production practices. The specific steps to follow are:

- a) During the project formulation, the ICANH was consulted regarding the assessment of the traditional pre-Hispanic practices. The ICANH will continue collaborating with the project during its implementation and the project coordinator will work with ICANH staff to determine the specific assessment activities and to identify the appropriate assessment methodologies, as well as to coordinate and complement project actions with research efforts from ICANH in the target area.
- b) Secondary information (publications and unpublished reports) related to the archaeological studies or works developed in the area will be reviewed and updated.
- c) Field surveys will be conducted for identification to provide a detailed description of the existing archaeological sites in the Carate Creek and Rabón Creek areas, which have been preliminarily identified based on existing publications (e.g., Plazas and Falchetti, 1981; Plazas et al., 1988; and

Herrera and Berrío, 1998)<sup>28</sup> and local knowledge about their existence. The locations of the remnants of the Carate and Rabón creeks will be mapped.

d) Re-establishment/restoration of pre-Hispanic structures for flood management jointly with landowners will include: a) developing field maps with geo-referenced points of the pre-Hispanic structures to be recovered and topographic mapping of the site; b) establishment of memorandums of understanding (MOUs) with local stakeholders (landowners, farmers, and members of local communities) for the recovery/restoration of the pre-Hispanic structures; c) description of the recovery technique and adaptation to climate change benefits, and development of a recovery/adaptation plan; and d) conducting recovery activities. The method for recovery of the pre-Hispanic structures will be established following the recommendations of ICANH and with consideration given to the expectations of local stakeholders and the written permission of land owners in areas where the pre-Hispanic structures are selected for re-establishment/restoration.

e) Flood control techniques (i.e., re-establish canals and dykes along the Carate stream) and agricultural practices to address climate change effects will be implemented.

f) **Technical reviews** of the adaptation benefits associated with the recovery of the traditional pre-Hispanic practices for flood control and food production will be performed. In assessing the adaptation benefits, consideration will be given to how local populations are presently settled in the target area and how they make use of some of the areas that are frequently subject to flooding, as well as to existing forms of social organization since these differ from the pre-Hispanic period when structures for flood management were originally established.

- Upon establishing of MOUs between CORPOMOJANA, the Project Director (or his/her delegate), and property owners and farmers, recover and reestablish **90 hectares** of traditional pre-Hispanic systems for flood control and agricultural production along the Carate stream. The effectiveness of these systems for flood control and their adaptive value will be assessed as part of the **technical review** system developed under Output 2.1.

***Output 2.3** - Ecosystems associated with the hydrodynamics of the target area are rehabilitated, enhancing their ability to mitigate the effects of flooding.*

77. AF resources will be used to rehabilitate 550 hectares in critical upstream contributing system to the Ayapel lagoon/wetland complex (Barro, Muñoz, Viloría, La Quebradona, and La Escobilla streams), 75 hectares in critical upstream contributing systems to the San Marcos lagoon/wetland complex (western bank of the San Jorge River along the Santiago and Canoas creeks), and 75 hectares in critical upstream contributing systems to the wetlands of San Benito Abad (Grande and Corozal creeks). The rehabilitation of these areas will help the wetlands and lagoons recover their ability to serve as buffers to hydrological extremes (hydraulic excesses during atypical periods of heavy rainfall or extreme events), reduce the speed of flooding, and reducing the vulnerability of these wetlands and lagoons to these events. By rehabilitating riverbanks and increasing forest cover, wetlands and lagoons will be less impacted from excess runoff and sedimentation that will occur during episodes of torrential rains, water quality and

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<sup>28</sup> Plazas, C. & Falchetti, A.M. 1981. Asentamientos prehispánicos en el bajo Río San Jorge. Fundación de investigaciones Arqueológicas Nacionales, Banco de la República. Bogotá.

Plazas, C., Falchetti, A.M, Van der Hammen, T., & Botero, P.J. 1988. Cambios ambientales y desarrollo cultural en el Bajo Río San Jorge. Boletín Museo del Oro, Banco de la República. V. 20.p 58-59. Bogotá

Herrera, L. F., and Berrío, J.C. 1998. Vegetación natural y acción antrópica de los últimos 1000 años en el sistema prehispánico de canales artificiales del Caño Carate en San Marcos (Sucre, Colombia). Revista CORPOICA 12(2): 35-43.

water retention will be improved contributing to reduce the vulnerability of these systems to climate change. The definition of the rehabilitation needs and the selection of upstream contributing systems to be rehabilitated was based on the spatial-temporal analysis of vegetation cover for the Ayapel lagoon/wetland complex (1987 – 2000) developed by CVS in 2007, and in the absence of detailed information for the project target area, its recommendations for rehabilitation in CORPOMOJANA's jurisdiction, which were discussed with CORPOMOJANA staff during the consultative process of project preparation. These rehabilitation efforts will be carried out jointly with participation from local environmental authorities and landowners of the areas selected for rehabilitation. The efforts will be in compliance with the rehabilitation guidelines that will be developed as part of the planned activities under this output and the rehabilitation agreements that will be established in each case. Rehabilitation efforts will include the establishment of permanent conservation areas, protection of stream banks and buffer areas, reforestation of the riparian forest, and improve connectivity among forest and other ecosystem remnants. The development of the rehabilitation protocols will make use of the hydrologic and hydraulic models developed through Component 1 for the project's target area, which will be complemented with project surface water GIS-based modeling used to delineate individual contributing watersheds and to predict the effects of climate change on the wetland systems.

Activities under Output 2.3 include:

- Identify and delineate nine (9) contributing watersheds of the Ayapel lagoon/wetland complex (Córdoba), San Marcos lagoon/wetland complex, (Sucre), and wetlands in San Benito Abad (Sucre). This will be done jointly by the project team and regional (CVC and CORPOMOJANA) and local (mayoral offices) environmental authorities. This activity will include reviewing historical and current map information about the areas of interest as well as the delineation of the contributing watersheds using GIS.
- Perform an assessment of the environmental conditions of the selected contributing watersheds. CVS and CORPOMOJANA, jointly with the project team, will perform a socioeconomic and biophysical characterization of the areas selected for rehabilitation and will identify the small landowners interested in participating in the project and whose properties represent the most cost-effective options for rehabilitation, including location, level of connectivity, and extent of forest cover. This will be done in coordination with the environmental and planning offices of the Ayapel, San Marcos, and San Benito Abad municipalities. In addition, the team will develop a summary of the assessment by zone and will verify the information in the field.
- Develop guidelines for ecological rehabilitation that are adapted to the particular conditions of each area, including the identification of mechanisms to encourage and increase the participation of land owners or landholders in this initiative and the conservation of biodiversity. This will be done by the project team in concert with the landowners and local environmental authorities.
- Implement ecological rehabilitation measures (e.g., protection of stream banks and buffer areas, reforestation of the riparian forest, and enhance connectivity among forest and other ecosystem remnants) in the selected contributing watersheds to the Ayapel lagoon/wetland complex (Córdoba), San Marcos lagoon/wetland complex, (Sucre), and wetlands in San Benito Abad (Sucre) to improve the ability of landowners to respond to risks associated with climate change and variability (floods and droughts). To achieve this, a site analysis will be performed for each property in which ecological rehabilitation is implemented and agreements and compromises will be signed by participating landowners and/or landholders, local environmental authorities, and project staff (e.g., Project Director and/or his/her delegate). To reduce associated risks related to ecological rehabilitation measures will be selected through highly participatory consultative processes, and adaptive

management will be carried out to ensure appropriate and timely development and implementation of project activities and achievement of expected results.

- Develop a **technical review** and reporting programme operated by the project team that will evaluate the effectiveness of the rehabilitation activities. Monitoring will include the use of relevant variables such as changes in plant structure and composition, presence of wildlife, and changes in water levels and extent of flooding. Monitoring of total suspended solids, which will allow assessing changes in sedimentation, will be done by CVS and CORPOMOJANA as part of their annual programmatic activities.

**Output 2.4** – *A 2,000-hectare protected area (PA) is established providing long-term ecosystem goods and services improving the coping capacity and livelihoods of local communities in the face of climate change.*

78. The project will facilitate the declaration of a 2,000-hectare multiple-use PA, in a critical lagoon/wetland complex being particularly threatened by climate change effects. The creation of the PA is an adaptive measure to improve the resilience capability of the wetlands of the Caimanera and other associated wetlands in the San Marcos municipality, as well as to protect their ability to regulate flows and store water. These ecological functions are particularly important to control flooding and reduce risk during extreme rainfall events. The declaration of the PA and the integration of climate change consideration in its management plan, will contribute to rehabilitating key functions of the targeted wetlands/lagoons in the face of climate change, thereby augmenting their resilience. Climate change adaptation is also improved as the protected areas will secure important ecosystem good and services, enhancing the capacity of local communities to adapt to the adverse effects of climate change. In addition, it will allow the conservation of local and regional biodiversity and set limitations on land uses and production practices that may affect the wetlands and lead to the loss of their ecological functions. Through the protection and sustainable management of wetlands, the PA will also enhance the sequestration and storage of carbon, contributing to the mitigation of climate change effects.

79. The proposed site for the PA is located in the floodplain of the lower San Jorge River which is vulnerable to extreme rainfall and flooding as registered by IDEAM daily bulletins to National System for Disaster Prevention (SNPAD). The region has been impacted by extreme rainfall in the past years, which directly influence river level rise flooding affecting local communities. As a consequence, in this area critical roles of the ecosystems such as hydric regulation and prevention of landslides and erosion are expected to drastically diminish. The resultant implications on livelihoods are expected to be the reduction of means of productions, shelter and food security by the local community.

80. For this reason, the Government of Colombia has offered to provide financial and in-kind contributions to create a 2,000 hectare protected area (PA) aiming to absorb and reduce water flow during rainy season, strengthening flood attenuation helping local communities to better cope with climate change impacts. (See Annex I Co-financing letters: CORPOMOJANA). The PA will be managed by CORPOMOJANA (see below) and it will be registered within the National System of Protected Areas (SINAP), assuring finance sustainability after project completion.

81. The PA to be established as part of the proposed ecosystem-based adaptation measures by the project will be located in the floodplain of the lower San Jorge River (downstream). The proposed PA is part of a system of wetlands that serve as receptors and buffers of water flows, and are essential in the accumulation of sediment and suspended materials in the convergence area of the Magdalena, Cauca, and San Jorge Rivers. The PA will help to buffer the effects of extreme weather events through storing excess water, slowing down floods, trapping sediments, and other ecosystem services.

82. The proposed PA will be a multi-use PA, or IUCN Category VI, that aims to “conserve ecosystems and habitats, together with associated cultural values and traditional natural resource management systems. They are generally large, with most of the area in a natural condition, where a proportion is under sustainable natural resource management, and where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area.”

83. Accordingly, the area is expected to have minimal impact on the population living within it or around it, as well as on their income-generating activities. The PA will be created following the legal requirements for establishing new PAs, which include, among other aspects a) the development of a work proposal with the participation of key stakeholders, including local communities, that details the activities and budget plan for the declaration process; b) a consultation process with local communities and institutions for the creation of the MPA; c) the preparation of the management plan for each PA, including the definition of its adaptation objectives, with the participation of local communities; and d) informing all stakeholders about the final approval of the PA.

84. Under the 2,000 ha multiple-use PA (IUCN Category VI), the proposed project will introduce 250 ha of Silvopastoral systems (SPS) and sustainable agriculture practices. According to the CIPAV (Colombia’s Center for Research in Sustainable Agricultural Production) conversion of conventional pasture practices to silvopastoral systems (SPS), lead to an increase of carbons sinks given avoided deforestation due to an increase in on-farm cattle carrying capacity of animals per ha. The project will promote the use of adaptive silvopastoral practices that combine native tree species (forestry, fodder and/or fruit; 120 to 150 plants/ha) that are resistant to water with cattle ranching and crops. The establishment of at least 250 hectares of silvopastoral systems that are planted with native trees resistant to flood conditions in combination with crops and livestock will benefit up to 100 small and medium-size farmers.

85. AF funds will support the development and implementation of the PA management plan, to ensure that climate resilience activities are planned and delivered. The PA management plan will integrate climate change considerations to rehabilitate key functions of the targeted area while ensuring that these ecosystem services are recognized, benefiting local communities and not degraded. By restoring and securing ecosystems goods and services, the PA will increase its ability to regulate flows and store water to control flooding and reduce risk during extreme rainfall events. The effects of flooding will be buffered (the protected vegetation, trees, and root mats, will help reduce the speed of flood waters) and the water storage/absorption capacity will be improved. The PA will be established in an area where its buffer benefits are maximized to protect local community households and means of productions.

86. The risk for the PA to become a “paper park” is very low, since as mentioned previously, local stakeholders will be active participants in defining the PA’s Management Plan, where all restrictions and permitted uses will be defined. The PA will be administered by CORPOMOJANA. This agency will be responsible for implementing the PA’s management plan, including the enforcement of its adaptation, conservation, and sustainable resource use objectives. Furthermore, the PA will be a key component of the land use plan and zoning of the municipality of San Marcos. The inclusion of the PA as part of the land use plan and zoning of the municipality of San Marcos will be accomplished by Component 4, through which climate risk management and adaptation measures will be mainstreamed into planning and decision-making. Finally, the PA will be registered with the National System of Protected Areas (SINAP) and will be part of the Caribbean region subsystem of PAs in Colombia, which will improve its management and facilitate the achievement of its ecosystem-based adaptation goals. The functional role of the PA will be independently verified on an annual basis by CORPOMOJANA and the results of the findings will be fed back into the decision-making processes. During the course of project implementation, where the PA will be established, UNDP will be conducting at least two monitoring

visits a year to the site to establish progress and to resolve possible bottlenecks. Every three months, responsible parties and local representatives will meet to monitor the project's progress.

87. In line with the legal requirements for establishing new protected areas that will be included in the National System of Protected Areas (SINAP)<sup>29</sup> the project team will undertake the following activities:

Activities under Output 2.4:

- Develop a work proposal with the participation of key stakeholders that details the activities and budgetary plan for the PA declaration process and establish agreements with institutional and local stakeholders for the creation of the PA. The inclusion of women will be promoted to ensure effective participation in PA planning and management.
- Establish a PA declaration work team, including technical personnel and local experts and complete the biophysical, socioeconomic, and cultural characterization of the PA.
- Identify the institutions responsible for the declaration process, taking into account whether the area will be of a national or regional classification.
- Prepare the basic management plan for the PA integrating climate change considerations into the management plan. The basic management plan will include conservation and adaptation objectives, identification of biodiversity of concern, threats (including climate change relates threats), strategic plans, boundaries, and management category.
- Present and discuss the PA declaration proposal with the local stakeholders (local communities [including women], productive sectors [cattle and agriculture], and municipal authorities) and develop a technical proposal for declaration to national (UAESPNN) and/or regional authorities (CORPOMOJANA).
- Inform stakeholders (local communities [including women], productive sectors [cattle and agriculture], and municipal authorities) about the final approval of the PA and its importance as part of a strategy for ecosystem-based adaptation. By highlighting the relationship between climate change adaptation and PAs through communication efforts, awareness will be raised at the local level about the value of the PA as an adaptation response, leading to greater support and acceptance of it.

***COMPONENT 3 - Introduction of climate change-resilient agroecological practices and building designs helps local communities to reduce their vulnerability to the impacts of climate change.***

88. Climate change and variability is a serious threat to the food security, production processes, and quality of life of the inhabitants of the Depresión Momposina region. The intensification of rainfall in recent years, which includes an unusually intense La Niña event, in the Caribbean and central regions of Colombia, through which two of the most important rivers in the country flow and converge in the Depresión Momposina in northern Colombia, has resulted in flooding that is above the usual averages and extensive losses of crops and cattle. Flooding has limited the availability of land for agricultural and livestock production and has damaged the structure and productivity of soils suitable for agriculture, as they have remained under water for prolonged periods of time. In addition, housing for hundreds of families in the region has been affected. Those most affected by climate change and variability are rural

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<sup>29</sup> SINAP is coordinated by the Administrative Unit of the Protected Areas System of Colombia (UAESPNN), which is part of MADS.

families who practice subsistence farming. The difficult situation for these families, with some living in houses that had been under water for almost a year, was verified through interviews and field observations as part of the consultation process conducted during the project formulation phase.

89. To reduce the increasing vulnerability of the rural population, innovative agricultural and livestock production practices must be implemented to contribute to food security and income generation, considering women's needs and promoting gender equality. By the same token, traditional production practices that are proven to be the most resilient to the effects of climate change must be encouraged. To achieve this, the project will support the development of a variety of adaptive production practices that will enable the diversification of food sources and income generation in 11 communities within the project target area, benefiting 2,640 families. In addition, the project will develop a programme **directed to women** for making natural-fiber crafts using plant species that thrive in flood conditions and adapted vegetable and organic gardens. Activities supported by AF under this component, will benefit approximately 6,440 women generating additional income for women and their families.

90. Also as part of the strategy to reduce vulnerability in the region, the project will implement an adaptive architecture programme that will include adapting existing houses and communal infrastructure that have been affected by flooding to make them more resilient to the effects of extreme climate-related events. In addition, the project will develop three models of houses on stilts and/or floating houses (one in each municipality), which will serve as alternative housing models to cope with flooding. This type of housing is atypical in the project area and not currently used by local communities. During the life of the project the adaptive benefits of this housing will be used to encourage their adoption by the communities in flood-prone areas. Finally, the project will support the design and construction of educational units built on stilts to prevent interruptions in the school calendar or losses of educational materials during extreme flooding events. This will serve to benefit the school-age population in the communities, who are mostly children.

91. Climate change and variability also constitute a threat to the owners of agricultural farms and cattle ranches. One of the main consequences of the recent events of extreme flooding in the project area was the extensive loss of crops, livestock (cattle and water buffalo), and the forced displacement of cattle to drier areas, which resulted in economic losses for the farm owners. Prolonged flooding may also contribute to the degradation of soils and increased erosion, which limits future production. The project will promote the use of adaptive agro-silvopastoral practices to help owners cope with these climatic threats that directly affect agricultural and cattle production in the project area. Adaptive agro-silvopastoral systems will use a combination or association of native tree species that are resistant to water with cattle ranching and/or crops. An additional benefit of the adaptive agro-silvopastoral practices is that these would contribute to improving the production capacity of the region using a more sustainable mode of production.

92. The project has been structured to promote a community-based adaptation approach that will make highly vulnerable communities active participants in establishing their priorities and needs, as well as incorporating their knowledge and perceptions regarding climate variability into planning and the implementation of project adaptation measures. To ensure equitable distribution of benefits among the 11 communities (13,600 people) within Ayapel, San Marcos, and San Benito Abad municipalities, the project will use a specific criteria based on:

- NBI which indicates low levels of access to education, housing, health, and basic sanitation and sewer services
- Populations in extreme poverty according to national standards

- Vulnerability level of local communities to climate change variability (number of people exposed to flooding risk given disaster history)
- Potential to benefit most vulnerable households and equitable number of women and men for participation in project activities
- Foster control and access of means of production to women (the project will ensure that the adaptation measures are gender sensitive, ensuring the participation of women and disabled as beneficiaries)

93. The design of the project took account of national-level information on vulnerable areas (based on existing Government endorsed vulnerability analysis, as reflected in Figure 3 in the project document), including information on the population affected by the La Niña event of 2010 (Ayapel: 15,140 people affected [31.9% of the municipality population]; San Marcos: 18,870 [34.7%]; San Benito Abad: 20,049 [82.0%]). As well as information on other key determinants of vulnerability such as access to education, housing, basic sanitation, etc. as reflected in the Unsatisfied Basic Needs Index (NBI). According to this index, municipalities such as Ayapel, 61.55% of population is below the national average, while San Marcos's population is 58.14% and San Benito Abad 67.06%, being the national average of 27.27%

94. Implementation of this project component will be the responsibility of the CVS (Ayapel municipality) and CORPOMOJANA (San Marcos and San Benito Abad municipalities) and IDEAM will provide technical support. These regional agencies have extensive experience in providing technical assistance and implementing sustainable environmental-production projects. In addition, they will be supported by institutions that have local presence, technical capability, and are well known by the communities in the project area. Mayoral offices in the municipalities will also provide support through their Agricultural Technical Assistance Municipal Units (UMATAS) as well as national institutions such as the Colombian Corporation of Agricultural Research (CORPOICA), which has extensive experience in the region conducting research, gathering information, and in the transfer of technology to the agricultural sector.

95. Component 3 consists of the following outputs and activities:

**Output 3.1** – *Climate change-resilient agricultural and women-oriented production practices (vegetable and organic gardens on stilts and native rice) adopted in the target area.*

96. Production practices that are resilient to climate change and variability and contribute to food security will include a diversity of family- and/or community-based crops that employ both alternative and traditional forms of production. These activities will be directed towards small producers, including women, and will consist of the following: a) 20 vegetable gardens on stilts for growing vegetables and tubers (e.g., onion, lettuce, yam, pumpkin, squash, and tomato) for household consumption/food security that will be maintained in conditions of extended periods of flooding due to climate change and that will cover 2 hectares in the Ayapel municipality and benefit 415 families (996 women and 1,079 men); b) 60 family-based organic food gardens (2-hectare individual plots) that will be located in two community parcels (one in San Marcos and the other in San Benito Abad) on river flats during the dry season, which will make use of fast growing varieties of vegetables, tubers, and fruits (e.g., beans, cassava, corn, yam, pumpkin, squash, watermelon, and cantaloupe) for shortened dry seasons; and c) increased production of native rice that is more resistant to wet conditions, is less expensive to produce than foreign varieties, and does not require the use of agrochemicals; to this end the project will establish 440 hectares of native rice crops in 11 towns in the project target area. These activities will help to ensure food security and generate a surplus benefiting 2,640 families (6,340 women and 6,860 men), enhancing the ability of these families to accumulate assets, and therefore reducing their exposure to the risks and impacts of long-term climate

change as well as variability. The selection of the beneficiaries of the production practices will be made respecting local processes of social organization and relying on the experience of recognized institutions such as the Pastoral Social, who has experience working in the target area and are trusted by the local communities. These institutions were part of the consultative process during project preparation (see Section H of this project document).

97. The use of plant species that are adapted to local flood conditions will serve as a production opportunity for up to 120 women. A programme to create natural-fiber crafts from local aquatic plant species (“pajón de aguja,” “enea,” “bijao,” among others) will be implemented, and will rely upon the experience of CVS in supporting similar initiatives in its jurisdictional area (Department of Córdoba) including environmental certification (Colombian Environmental Seal), as part of the National Sustainable Biotrade Programme. The natural-fiber crafts programme will provide an adaptation benefit in that it will involve manually cleaning excess vegetation from some bodies of water contributing to regulate water flows under extreme weather.

Activities under Output 3.1 include:

- Construct and install vegetable gardens on stilts in flooded areas. This activity will include the selection of sites to plant the gardens, identifying interested families who will be responsible for their maintenance and will derive benefits from their use, the selection of species of vegetables with short growing cycles, and the technical support necessary for their implementation and cultivation.
- Establish family-based, organic food gardens on river flats with crops that have short growth cycles during the dry season. This activity will include the selection of sites to plant in the gardens, identifying interested families who will be responsible for their maintenance and will derive benefits from their use, the selection of species of vegetables and fruits with short growth cycles, and the technical support necessary for their implementation and cultivation.
- Establish native rice crops for food security and generation of surplus. This activity will include the selection of sites to plant the rice parcels; identifying interested families who will be responsible for their cultivation and will benefit from production; and the technical support necessary for implementation, cultivation, and commercialization of the crops.
- Develop a programme for the sustainable use of natural fibers, which will involve the weaving of natural fiber crafts by local women. The programme will be promoted in the three municipalities and will identify jointly with the women participating in the programme the areas with the most natural plant fiber resources. In addition, the necessary technical support will be provided for the production and commercialization of the crafts.
- Participatory technical review strategy to assess the effectiveness of agroecological practices as an adaptation strategy and in providing socioeconomic benefits to local farmers and women (i.e., increase in production, food security, and income generation).

98. The activities listed above will be complemented with the necessary training for all participants to develop production practices that are resilient to climate change and variability, envisioned under Component 4.

***Output 3.2 – Structural measures for school and housing to respond to climate related risks or threats designed and implemented benefitting approximately 650 people.***

99. The adaptive architecture programme will serve to reduce the vulnerability of 11 communities located in the Ayapel, San Marcos, and San Benito Abad municipalities through the design, construction, and adaptation of houses with materials resistant to changing climatic conditions, while at the same time demonstrate infrastructure alternatives to minimize flooding risk in the future. Sixty (60) existing houses will be adapted to reduce the risk of damage from flooding, benefiting approximately 300 people (60 women, 60 men, 115 girls, and 125 boys). The modification of the houses will include additions that respect the housing concept held by the residents of the project area. These additions are expected to remain dry and can be occupied when flooding of the area is imminent. The options proposed must be low in cost and where possible constructed with materials that are native to the region so that it would be possible for the local population to replicate them both within and outside of the project area. This criterion will also be used in the design and construction of three structural measures (elevated houses or houses on stilts) in the three targeted municipalities (one in each municipality) that will serve each community as a space for gathering and the development of social activities, and for temporary shelter during extreme climate events. Additionally, it would serve as a demonstration housing alternative to be adopted by community members of the project area to protect them from flooding. The selection of the beneficiaries of the adaptive architecture programme and production practices will give priority to the most vulnerable community members and will respect local processes of social organization and relying on trusted agencies as mentioned earlier.

100. Finally, AF funds will support the design and construction of 10 new educational units on stilts and/or floating units. Examples of this type of educational units already exist in the project area, which have been constructed with resources provided by the Ministry of Education. Local consultations conducted during the design phase of the proposed project suggested that communities in the target area recognize the benefits of these units. As such, the project will replicate these models upon request and with adjustments made according to the suggestions and needs of each community. With AF funds, a total of 10 educational units will be constructed, benefiting 350 students (170 girls and 180 boys). The project team will consult with the Ministry of Education and municipal authorities for the placement of the educational units.

Activities under Output 3.2 include:

- AF funds will be used to identify risks and responses and to provide and implement recommendations for remodeling and upgrading 60 existing houses in the target area to make them resilient to climate change.
- AF funds will be used for the construction of three structural measures (elevated houses or houses on stilts) in the three targeted municipalities to address risks from flooding<sup>30</sup>.
- AF funds will be used for the construction 10 educational units (elevated or on stilts) in Ayapel, San Marcos, and San Benito Abad to guarantee that children's education is no interrupted due to intense and prolonged flooding that results from climate change.
- Participatory **technical review** of the effectiveness of the architecture programme as an adaptation strategy and its social benefits.

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<sup>30</sup> Structural measures: Any physical construction to reduce or avoid possible impacts of hazards, such as flood levels, ocean wave barriers, earthquake-resistant construction and evacuation shelters. Source: "Paving the Way for Climate-resilient Infrastructure"

[http://www.beta.undp.org/undp/en/home/ourwork/environmentandenergy/focus\\_areas/climate\\_strategies/green\\_lecrds\\_guidance\\_manualsandtoolkits.html](http://www.beta.undp.org/undp/en/home/ourwork/environmentandenergy/focus_areas/climate_strategies/green_lecrds_guidance_manualsandtoolkits.html)

**Output 3.3** – *At least 250 ha with climate resilient agro-silvopastoral measures established to help vulnerable small-scale farmers to mitigate the effects of flooding.*

101. The adaptive agro-silvopastoral practices supported by AF funds will include combinations or associations of native tree species (forestry, fodder, and/or fruit; 120 to 150 plants/ha) that are resistant to water together with cattle and/or crops in a total of 250 hectares to mitigate the effects of flooding, including: a) limiting erosion, particularly through planting trees in vulnerable areas; b) reversing soil degradation and improving fertility after prolonged flooding through the addition of organic material and nutrients, and enhancing the biological processes of the soil allowing for a fast reestablishment of crops and livestock production; and c) reducing the speed of water flow during flooding, limiting the loss of crops and cattle. In addition, the implementation of agro-silvopastoral practices will add to the diversification of productive activities, while reducing the vulnerability of farmers associated to climate change and variability. The agro-silvopastoral practices implemented will benefit small- and large-scale producers in the Ayapel, San Marcos, and San Benito Abad municipalities, improving ecosystem resilience and acting as soft infrastructure against climate extreme events. Finally, the agro-silvopastoral practices implemented will provide additional environmental benefits such as carbon sequestration, watershed and shore protection, and habitat for biodiversity conservation.

Activities under Output 3.3 include:

- Establish 250 hectares of agro-silvopastoral systems in the rural zone of the project target area (100 hectares in Ayapel, 75 hectares in San Marcos, and 75 hectares in San Benito Abad) that use timber species (oak, cedar, “campano”, “samán”, and “guamo”), native fodder species (“totumo”, “matarraton”, “orejero”, “carbonero”, and “guácimo”), and fruiting species (coconut, “níspero”, “zapate”, among others) in combination or association with semi permanent and permanent crops and/or cattle.
- Monitor and evaluate the effectiveness of the agro-silvopastoral models as an adaptation strategy providing socioeconomic benefits to local farmers (improved productivity and income generation) and environmental benefits (improved soil quality, increased biodiversity, and increased in standing carbon stocks).

**COMPONENT 4 - *Relevant institutional and social structures strengthened for mainstreaming climate risk management and adaptation measures into planning and decision-making processes.***

102. The integration of climate change considerations and agreed-upon adaptation measures into local and regional planning instruments to reduce the vulnerability of key ecosystems and local livelihoods to climate change, requires the development of targeted capacities in risk assessment, and in the development of ecosystem- and community-based adaptation measures among different relevant stakeholders, including members of the 11 targeted communities and local civil authorities in the municipalities of Ayapel, San Marcos, and San Benito Abad. The project will develop a strategy will be developed for strengthening the knowledge and skills of the communities that are vulnerable to climate change. Required new skills will be developed through “platforms for association” that will promote dialogue and exchange of information, best practices, and knowledge among communities and civil authorities. This will serve to build trust, learn from others’ experiences, and encourage effective participation in the decision-making processes to reduce risk and vulnerability in the face of climate change and variability. Although multiple CBOs exist in the project area, the avenues needed to promote a discussion for adaptation to climate change do not exist. The project will overcome this limitation by establishing the platforms for association.

103. With AF funds, a training programme will be developed at individual and community levels to build adaptive capacity and affect behavioral changes. Training activities will be focused on specific issues related to climate change and adaptation (e.g., climate change adaptation strategies to address food security and sustainable livelihoods, sustainable use of natural resources, and planning for adaptation and risk reduction), as well as on the development of adaptation strategies and measures proposed under the four project components. The training programme will benefit 11 local communities and leaders of CBOs participating in the project, in addition to civil authorities and local-level (municipal: mayoral offices and CLOPADs) and regional-level (CVS, CORPOMOJANA, Departmental Governments, and CREPADs) organizations.

104. Currently, there is an overall limited awareness in most communities of the three municipalities regarding climate change impacts and the increased frequency of extreme weather events such as flooding. This has translated into inadequate on-the-ground experience in climate change-resilient production practices, thereby increasing climate-related vulnerability of local communities. At the municipal level, there is limited technical capacity to incorporate hydroclimatological information (i.e., climate scenarios, results of hydroclimatological modeling, and assessments of vulnerability and risk) into local management and planning systems, which prevents them from leading the actions necessary to incorporate adaptation measures into regional and local territorial, environmental, and sectoral planning processes.

105. Component 4 of the project aims to foster climate-related information and practices relevant to the La Mojana subregion among the 11 targeted communities and local civil authorities in the municipalities of Ayapel, San Marcos, and San Benito Abad. AF financing will be used to promote lessons learned with relevant stakeholders to replicate successful experiences in ecosystem- and community-based adaptation measures developed through the project and to facilitate a process to integrate them into local and regional planning policies.

106. The information generated in the first three components will be shared through the use of platforms for association in each municipality, which are open for public discussions and will introduce climate change adaptation topics in a language easily understandable for the members of the communities beginning in the first year of implementation. By encouraging the participation of CBOs, communities, and civil organizations in this multi-stakeholder dialogue, the project aims to catalyze behavioral change among community members to replicate and enhance adaptation measures that are developed through the project in each community taking into account specific climate-related vulnerabilities and resources (human, financial, institutional, etc.). The project expects to catalyze the potential of replication of adaptation measures among other communities by fostering climate-related information, community knowledge and experiences and expected benefits.

107. To strengthen this process, training on flood-related threats and adaptation measures will be delivered to selected members of the 11 targeted communities, local and regional government officials, civil society, among others, to provide tools to actively influence planning and decision-making in the region. The training will compile and disseminate tangible results on the previous components of the project including benefits from the early warning system, the pre-Hispanic systems for flood control, and agro-silvopastoral and gender-sensitive productive practices

108. The project will also facilitate a multi-stakeholder process through meetings and workshops to incorporate all relevant information, results, and best practices generated into the environmental, land use, and development plans for the municipalities of Ayapel, San Marcos, and San Benito Abad. By including stakeholders' feedback on their experience related to the development, implementation and results of the

proposed project, communities, local and regional governments will be more prepared to include climate variability into development plans and related initiatives in the region.

109. AF financing will be used to facilitate the platforms of association and training on flood-related impacts to reinforce and create new knowledge and capabilities for reducing climate change vulnerability in the communities while participating and influencing decision-making at a local and regional levels.

110. Component 4 will encompass the analysis, replication, and up-scaling of the project results to other areas within the Depresión Momposina region. The community platforms for association will also serve to identify lessons learned from the project as a first step in replicating successful experiences. To the extent that there are proven benefits to the target area populations, there will be incentives to replicate these successful experiences in other locations within and outside the targeted municipalities. This replication will be ensured through the inclusion of necessary adaptation measures in the municipalities planning tools (Land Zoning Plans [POTs] and Municipal Development Plans [PDMs]), which according to the law guide development and land use planning activities at the local level. Replication at the local level will also be encouraged through visits by community members to the different project sites, where they may see first hand the experiences of the neighboring communities that are of interest to them and which they may wish to replicate in their locations and/or farms. It is envisioned that by the end of the project, there will be at least 25 CBOs and leaders of the three municipalities (10 in Ayapel, 12 in San Marcos, and 3 in San Benito Abad) and at least nine local and regional government institutions strengthened, promoting adaptive strategies in a coordinated manner, and incorporating lessons learned into their local planning tools.

111. The GoC identifies this project as a priority in the issue of climate change and has conceived it as a spearhead initiative. The GoC envisions that successful activities will be replicated in other areas of the Depresión Momposina as part of the GoC's future investments for the sustainable development of the region and efforts to reduce risk and vulnerability to flooding in this area of the country, which spans more than 2.4 million hectares.

**Output 4.1** - *Lessons learned from interventions codified by MADS and used raise awareness about managing climate change induced flood and drought risks.*

112. To promote community-institutional partnerships, platforms for association, which are understood as a meeting place for open discussion, will be coordinated by community leaders in the project area to promote the exchange of knowledge, experiences and dialogue between the local communities, project staff, and local and regional civic authorities about climate change adaptation and vulnerability assessment, including adaptation measures that will be implemented through Component 3 (adaptive architecture and agroecological practices that are resilient to climate change) and their relation to the projects and activities of Components 1 and 2. In addition, the platforms for association will enable to: a) learn about the communities' capacities, knowledge, and practices of coping with climate-related risks; b) introduce the themes of climate change and adaptation in a language that is easy to understand, using means of communication that are familiar to the communities; c) share information about the successful experiences and lessons learned from the project and its potential for replication in other locations; and d) promote dialogue, negotiation, and partnerships between the representatives of the communities and the municipal authorities (mayors, advisors, planning offices, and CLOPADs) to incorporate the appropriate measures into the local environmental/land use planning and development instruments that will contribute to reducing risk and vulnerability to climate change and variability. The project will establish at least three (3) platforms for association (one for each municipality) during the first year, with the expectation that they continue to operate after the project is finalized through their appropriation by the community members, CBOs, and the local authorities.

Activities under Output 4.1 include:

- Establish at least three platforms of association (one for each municipality in the project area) for discussions around common issues of interest (food security, increase in agricultural productivity, and climate proof infrastructure) and how they relate to climate change and variability) that will incentivize attendance at the discussion meetings. Field visits will be made to interview community leaders, associations, and CBOs (farmers, fishermen, and Community Action Boards) and other civil-based organizations with local credibility (churches and schools) to identify the common issues of interest that will promote dialogue and the meeting places where the platforms for association will be held.
- Define, jointly with local community members, a strategy to strengthen local organizational capacity to adapt to climate change.
- Design and delivery a general public awareness campaign on climate change.

**Output 4.2 - Communities and local authorities in targeted municipalities trained in climate change threats related to flooding and adaptation measures which reduce vulnerability.**

113. Critical technical information is required to support decision making at local and regional level. The project will provide training in climate change threats related to flooding and adaptation measures which reduce vulnerability. Targeted technical training events will be conducted in each municipalities to representatives of 11 communities in the project area and municipal (decision-makers and technical staff from three mayoral offices and three CLOPADs) and regional (decision-makers and technical staff from two CREPADs, two Departmental Governments, CVS, and CORPOMOJANA) authorities to strengthen their understanding of possible solutions to climate change threats related to flooding. This output contributes to strengthening relevant institutional and social structures for mainstreaming climate risk management and adaptation measures by enabling public, private, and communal stakeholders to effectively engage with each other and by providing relevant stakeholders with the tools to actively influencing planning and decision making processes. The training activities will strengthen and create new knowledge about issues related to the interpretation and use of hydroclimatological information, ecosystem-based adaptation, adaptive agroecology, community-based adaptation, and the concepts and benefits of climate change adaptation. The new knowledge developed by the training will also serve to ensure that adaptation measures include the needs of the different groups within the vulnerable communities (i.e., children, women, the elderly, **the handicapped**, and men).

114. The strategy that will be developed by the project to strengthen local capacity will ensure that the communities (**both men and women**) will have the necessary knowledge to participate in and influence the decision-making processes related to reduction of risk and vulnerability in the project area, issues that are directly in their own interest. This strategy, together with the strengthening of organizational capacity that will be accomplished through Output 4.1, will serve to encourage participatory decision-making in the three project municipalities where traditionally the civil authorities have made the decisions about strategies and actions to prevent and address emergencies related to flooding and the effects of climate variability.

Activities under Output 4.2 include:

- Assess specific training needs for target groups and select people to be trained. At the community level, priorities will be given to: a) members of the 11 communities of the project target area; b) members of CBOs; and c) individual selected by their own communities to participate in training events. Additionally, trainee will be required to replicate their newly acquired knowledge and skills

within their community, expressing their commitment through a written letter (training of trainers). Staff from local and regional institutions will be selected based on the relevance of their background and following the institutional procedures defined by each institution for this purpose.

- Organize educational visits for community members and civil authorities to the project sites and other initiatives in the region with adaptation experiences to promote the exchange of knowledge.
- Prepare and adopt training materials (leaflets, brochure, posters, DVDs to disseminate guidance materials and tools related to the interpretation of hydroclimatological information and early warning reports, conventional and traditional techniques for flood management, wetland and ecosystems rehabilitation and management, sustainable/adaptive production (e.g., agricultural and, cattle ranching, natural-fiber craft production), adaptive housing and construction, climate change and variability, risk and vulnerability assessment, and risk reduction and adaptation.
- Conduct training modules in the three targeted municipalities using tools and training techniques that are specific to each targeted group (local communities including women, CBOs, municipal governments, and regional environmental authorities and governments). Training topics will include development and delivery of a specialized course on the range of technical options for improving climate resilience, including ecosystem-based approaches; development and delivery of a specialized course on interpretation of hydroclimatological information and early warning reports.
- Conduct progress/evaluation workshops to assess the impact of training through interviews and capacity assessment questionnaires.

***Output 4.3*** - *Climate risk management considerations built into regional and local territorial, environmental, and sectoral planning tools are articulated with national planning guidelines.*

115. The project will facilitate the incorporation of climate change adaptation considerations into environmental/land use planning and development plans for the municipalities of Ayapel, San Marcos, and San Benito Abad (POTs and PDMs), for CORPOMOJANA and CVS (4-Year Action Plans [PACs] and Regional Environmental Management Plans [PGARs]), and for the Departmental Governments (Departmental Development Plans [PDDs]). This will be achieved through the use of information generated by project Component 1 regarding climatic scenarios, climate variability trends, and vulnerability analyses for the project area. In addition, lessons learned from execution of the project will be used to support the definition of considerations for climate change and adaptation that will be included in local and regional planning tools.

116. The incorporation of climate change adaptation measures into the planning instruments will also be based on progress made at the national level and by other regions in including climate change measures in sectoral, territorial, and environmental planning instruments. More specifically, the project will make use of the lessons learned from the *Integrated National Adaptation Project (INAP)* and the project *Integration of ecosystems and adaptation to climate change in the Colombian Massif*. Both projects were concluded in 2011. The following activities will be undertaken:

Activities under Output 4.3:

- Hold meetings and workshops with mayors of the municipalities and their staff and CBOs to review existing land use planning tools.
- Develop guidelines for the integration of climate change adaptation into planning tools based on the results of the other project components, with the participation of community leaders and technical and

administrative staff from civil authorities (municipalities, CVS, and CORPOMOJANA). The project will make use of citizen participation forums specified by the law to ensure that the guidelines that are agreed to by the communities and local and regional authorities are effectively integrated into the local and regional plans. At the municipal level, in coordination with local communities and CBOs, the proposed guidelines will be presented to the municipal councils, land use planning councils, and mayors, and the guidelines will be discussed prior to the drafting of the PDMs and the Annual Operation Plans (POAs), through which the PDMs are funded and implemented. Guidelines for the integration of climate change adaptation into the POTs will be specified in the PDMs as required by law. Citizen oversight councils will be established through the project in conjunction with local communities to ensure social participation and provide follow-up to the process. At the regional level, the proposed guidelines will be presented and discussed with the following regional authorities: departmental councils, gubernatorial offices (Cordoba and Sucre), and CORPOMOJANA and CVS. At the departmental level, the guidelines will be drafted by the project team and submitted to the departmental planning offices for discussion with their staff to include them in the PDDs. The project will make use of the lobbying power of the MADS (Executing Agency), the National Planning Department (Executing Partner), and UNDP (Implementing Agency) to facilitate the discussion process for the effective incorporation of the adaptation guidelines into the PDDs. In the case of COPOMOJANA and CVS, the guidelines will be drafted and submitted directly for consideration by the Directors' and Planning Offices so that they are incorporated into the PGARs and their PACs. As Responsible Parties in the implementation of Components 2 and 3 of the AF project (refer to Part III, Section A for details) and their involvement in the implementation of other aspects of the project, CORPOMOJANA and CVS staff will coordinate with the project team in drafting and submitting the climate change adaptation guidelines to be included in the planning instruments.

- Synthesize lessons learned from project implementation and make them available to local, regional, and national interest groups through local forums, web pages of CVS and CORPOMOJANA, and the National Climate Change Portal (NCCP) and other internationally recognized knowledge networks such as the UNDP/Adaptation Learning Mechanism (ALM).
- B.** Describe how the project / programme provides economic, social and environmental benefits, with particular reference to the most vulnerable communities, and groups within communities, including gender considerations.

*117.* La Mojana is among the most vulnerable regions to flooding in Colombia and is home to some of the poorest communities in the country. The rainy season of 2010 alone, which coincided with a La Niña event, affected 211,857 people (approximately half of the total population of La Mojana) and flooded more than 20,000 homes. This situation was worsened in 2011 when the country experienced one of the rainiest seasons ever recorded. The main beneficiaries of the project will be the rural and urban communities in three municipalities (Ayapel, San Marcos, and San Benito Abad) of the La Mojana subregion (Depresión Momposina region) that are most vulnerable to the negative impacts of climate change and variability. The three target municipalities present an average NBI of 62.25% which is well above the national average of 27.27%, indicating high levels of poverty and low levels of access to education, housing, health, and basic sanitation and sewer services.

*118.* The design of the project took account of national-level information on vulnerable areas (based on existing Government endorsed vulnerability analysis, as reflected in Figure 3 in the project document), including information on the population affected by the La Niña event of 2010 (Ayapel: 15,140 people affected [31.9% of the municipality population]; San Marcos: 18,870 [34.7%]; San Benito Abad: 20,049 [82.0%]). As well as information on other key determinants of vulnerability such as access to education, housing, basic sanitation, etc. as reflected in the Unsatisfied Basic Needs Index (NBI). According to this

index, municipalities such as Ayapel, 61.55% of population is below the national average, while San Marcos's population is 58.14% and San Benito Abad 67.06%, being the national average of 27.27%

*119. Socioeconomic Benefits:* The project will provide direct socio-economic benefit to 54,000 people (48% of whom are women) in the three target municipalities (representing 11% of the population of La Mojana) by reducing their vulnerability to the effects of climate change and associated extreme flooding. Benefits will be delivered through a local early warning system that will allow rural and urban communities to assess risk for potential flooding (Output 1.4) in a timely manner. The local early warning system will be developed and operated with the full participation of the communities at risk, and will be fed hydroclimatological information (Output 1.3) and vulnerability information (Output 1.2) that is collected and analyzed jointly with local, regional, and national authorities. Since the early warning system will potentially benefit the entire population of the three municipalities (126,000 people) and those of nearby municipalities, as information would be available to the public and other regional and local authorities it is likely to have additional benefits for the entire population of the La Mojana subregion.

*120.* Additionally, under Component 3 (Output 3.1), the project will provide economic alternatives and food security to 13,640 people in 11 communities through the introduction of adaptive agroecological practices (vegetable gardens on stilts, family-based organic food gardens, and native rice crops. Economic benefits specifically directed towards women in the three project municipalities will be delivered through a programme to create natural-fiber crafts from local aquatic plant species. Approximately, a total of 6,440 women will directly benefit from these programmes, which will provide needed income and a stable source of food. The women will receive the appropriate training and technical support for implementing these production practices. Finally, the resilience of up to 100 small- and medium-scale farmers to climate change will be strengthened by establishing 250 hectares of agro-silvopastoral systems that are planted with native trees resistant to flood conditions in combination with crops and /or livestock (Output 3.3).

*121.* The project's socioeconomic benefits for the local communities will also include the development of housing adapted to flood conditions for 60 families (approximately 300 people) as part of an adaptive architecture programme that could be replicated locally and regionally beyond the life of the project (Output 3.2). Additionally, the construction of 10 educational units on stilts and/or floating units resistant to flood conditions will benefit 350 students, mostly children.

*122.* The project will also benefit the local governments of the three target municipalities. The project will raise awareness among local officials about climate change, its impacts, and about adaptation strategies to reduce risk and vulnerability within their jurisdictions. Local communities in the three target municipalities and their leaders and key local and regional stakeholders will be trained to effectively incorporate adaptation considerations into their land and resource use planning strategies. This will support decision-making for the incorporation of climate change adaptation approaches into the municipal development and territorial management plans (Output 4.3), which guide government-based investments, thereby providing adaptation-related benefits for up to 400,000 people living in the three municipalities.

*123.* The GoC has envisioned this project as a spearhead initiative that will be replicated in other areas of the region as part of the government's future investments in sustainable development and efforts to reduce risk and vulnerability to flooding in this area of the country, which covers more than 2.4 million hectares. The project's replication potential could bring socioeconomic benefits to up to 1.7 million people in the larger Depresión Momposina region. Under Component 4, the project will establish a knowledge management system that will allow the dissemination of lessons learned from the project for its replication in other locations of the La Mojana subregion, so that similar socioeconomic benefits will reach other vulnerable people in the area through future investments.

During the project preparation phase no market studies were developed; however, the feasibility of the proposed adaptation measures was assessed with local and regional stakeholders and beneficiaries (local communities) as part of the consultation process, relying on their experience implementing related initiatives in the region. During the project preparation phase no market studies were developed; however, the feasibility of the proposed adaptation measures was assessed with local and regional stakeholders and beneficiaries (local communities) as part of the consultation process, relying on their experience implementing related initiatives in the region. For example, the natural fiber craft programme for women (Output 3.1) was designed considering the successful experiences that the Regional Autonomous Corporation of the Sinú and San Jorge Valleys (CVS) had in promoting similar initiatives within its jurisdiction, particularly with indigenous and local communities in the Sinú River watershed. For this purpose, CVS has partnered with Artesanías de Colombia, a corporation ascribed to the Colombian Ministry of Commerce, Industry, and Tourism, which promotes and contributes to the development of traditional and modern Colombian handicrafts and their marketing. In general, the actions proposed result from the assessment of adaptation needs of vulnerable local communities through a consultation process that included field visits and semi-structured interviews and workshops with the local community members and regional (governments and environmental authorities) and local (municipalities) agencies during the preparation phase.

*124.* The agro-silvopastoral measures that will be established to mitigate the effects of flooding for small land owners (Output 3.3) are expected not only to bring environmental benefits associated with improved regulation of water flow, reduction of sedimentation of the system, and flood control, but they are also expected to increase earnings for the land owners/holders/tenants of the properties who will participate in the project. Improved production yields at the farm level will provide additional gains that will be partially reinvested as a way to contribute to the sustainability of the interventions; to this end, the project will establish agreements with the property owners that will specify their responsibilities in maintaining the agro-silvopastoral measures established through the project.

*125.* AF funding will be provided for technical studies and designs, technical assistance and to purchase equipment, materials, and supplies required for the successful implementation of the four project components. The funding requested from the AF for each project component is specified in the project's detail budget (please refer to Part III, Section E of the Full Project Proposal). Given the impoverished conditions of the local communities, these will be limited to providing in-kind support in the form of voluntary labor for the development of the proposed adaptation measures (i.e., vegetable gardens on stilts, family-based organic food gardens, native rice crops, natural fiber craft programme, and the development of structural measures for school and housing to respond to climate-related risks) as well as their time for the participation in the measures, training events, and the multiple meetings and workshops programmed for the implementation of the project. Additionally, during the life of the project the local communities will also contribute to the maintenance of all goods developed by the AF project as long as this is within their means. It is expected that after project completion, local communities will assume all actions that require their involvement. To this end the project will empower local communities by improving their technical, organizational, and negotiation skills so that they will be able to mobilize the required resources (local and external) jointly with local and regional authorities. The project will facilitate this process with the participation of local communities by incorporating climate risk management considerations into regional and local planning tools (Output 4.3) that should be supported by proper financial plans and allocations from local and regional authorities for their implementation. Empowered local communities and community leaders will be able to follow-up and enforce all implementation of the actions outlined in local and regional planning tools. In every case the project will carry out its activities with the regional and local communities and organizations through agreements between parties in which the obligations and responsibilities are clearly established, in addition to verification and compliance as conditions to execute or continue the activity.

126. The project will be implemented focusing on the needs of vulnerable families and emphasizing the empowerment of women. The vulnerability analysis (Output 1.2) will identify all vulnerable women in the target area and prioritize their participation in the implementation of project activities.

127. Through the project, core women's work groups will be established in the three target municipalities and associative mechanisms will be strengthened for food and craft production. Women will benefit from production techniques that incorporate local knowledge; the technical support for these measures will be funded through the project, and include the management of natural fibers and design, craft dyeing, and marketing. Women will be trained using a "learning by doing" approach that will strengthen their collective capacity to increase food security and craft production through their participation in vulnerability analysis and the EWS, analysis of climate change impacts on their lifestyles, and adjusting adaptive actions according to the potentialities of organized women groups. Strategic partnerships with regional environmental authorities (CORPOMOJANA and CVS), municipal governments, and institutions with extensive experience in the production and marketing of handicrafts such as Artesanías de Colombia, will provide technical assistance to women and facilitate the marketing of the products that will result from the implementation of the proposed adaptation measures.

128. **Environmental benefits:** The project will promote the conservation, sustainable management, and rehabilitation of a complex system of wetlands, which serve as hydrological regulators to the confluence of three major river basins – the Magdalena, Cauca, and San Jorge Rivers. The wetlands are a principal component of the natural flood cycles of the region, providing valuable habitat for animals and plants. They are also vital for local economies and a source of natural resources for the inhabitants of the region. The wetlands' functional capacity will be enhanced through a series of ecosystem-based adaptation measures that will result in healthier systems that contribute to reducing the risk of flooding associated with climate change and variability in the La Mojana subregion. The project will enable the rehabilitation of 700 hectares of critical upstream contributing systems to three locally important wetland/lagoon complexes covering approximately 31,000 hectares (Output 2.3), improving water quality by reducing runoff and sedimentation. This will bring important benefits to local aquatic biodiversity and local and migratory fish species, which support important local fisheries and are a major source of protein for local communities. Rehabilitation efforts will also enhance key habitat for many species of vertebrates and invertebrates that are present in the area. Environmental benefits of the project will also be delivered through the creation of a 2,000-hectare multiple-use protected area (Output 2.4), which will further improve the ecological condition of the wetlands and other ecosystems, and will significantly contribute to the conservation of the rich biodiversity of the region. Measures for flood control and hydrological management (Outputs 2.1 and 2.2) will contribute to the protection of wetlands from prolonged flooding and to rehabilitating their hydrology. As a whole, these proposed interventions will contribute to protect and enhance structural and functional components of the region's wetlands and significantly improve their ability to respond to threats related to climate change, as well as to provide lasting goods and services that will improve the coping capacity and livelihoods of local communities in the face of climate change. Adaptive agroecological practices to be implemented in 250 hectares (Output 3.3) will bring additional environmental benefits in the form of soil and water quality improvement, river bank stabilization, increasing standing carbon stocks, and habitat for biodiversity.

129. In the municipalities of Ayapel, San Marcos, and San Benito Abad of the Mojana subregion, the 2 most relevant anthropogenic factors degrading ecosystems resilience are:

- Conventional pasture (cattle ranching).
- Deforestation

Anthropogenic factors:

130. In the Mojana region, flooded areas have associated vegetation that has adapted to grow in hydrological conditions or from anoxic soils for prolonged periods. The emergent areas have soils with

water saturation and low oxygen concentration that do not allow the development of emergent vegetation or vegetation on solid ground. Tropical forests used to cover the upland areas, however, land cover has been extensively transformed for agricultural use and cattle grazing.\*

131. The agricultural/ranching frontier is still advancing rapidly in some areas, resulting in clearing large number of smaller forest remnants throughout the region. Conversion of tropical forest for conventional pasture -cattle ranching- have a great impact on deforestation. The clearance of forest remnants within the region is driven in part by demand for meat and dairy products. In the municipalities of San Marcos, San Benito Abad and Ayapel, extensive cattle farming (beef cattle and water buffalo) is the principal production activity and requires an extensive area of land (10,000 hectares) and whose owners generally do not live in the area. On the other hand, in the small towns of the rural areas, access to land is linked to agriculture (corn and rice crops), with land parcels usually smaller than 20 hectares and combined with other activities such as raising domesticated animals and small commercial and traditional activities. The conversion of forest to pasture land has major implications for forest-dependent communities.

132. Deforestation has played a major role in the degradation of the region's wetlands and its basins, and has contributed to their sedimentation and clogging. A comparative analysis of satellite imagery from 1997-2004 that was performed as part of the Environmental Management Plan of the Ayapel Wetlands Complex (CVS, 2007) found that the processes of degradation of the Ayapel Wetlands Complex are stronger in the contributing systems, mainly in the Bagre, Barro, Muñoz, Viloría, Grande, and Quebradona canals, due to deforestation and land use change. An analysis of the changes in coverage for the basin of this wetland complex during 1987-2000 showed that during this time period the rate of deforestation was 355 hectares per year (4,615 hectares in 13 years). It showed that 78.56% of the forested area that existed in 1987 was lost.

133. Current cattle ranching and deforestation practices are exacerbating the degradation potential of tropical forest. However, the following actions are being taken by Government, to address deforestation and cattle ranching that otherwise would affect the project site:

134. As an integral part to promote sustainable economic development in the subregion, Colombia's 2010-2014 National Development Plan (NDP) includes as one of its goals the development of a National Adaptation Plan including La Mojana as a priority area for investments in adaptation in the 2010-2014 NDP. The NDP includes the Comprehensive Plan for Environmental Management and Territorial Development of the Region of La Mojana and the proposed project is part of the strategy to implement the comprehensive plan devised for the La Mojana. The Plan envisions the promotion and development of sustainable economic activities for communities given that the sub-region has been severely affected, either directly or indirectly, by cattle ranching and non-sustainable agriculture practices.

135. The Sustainable Development Programme for the La Mojana Region (PDSM) consists of a group of strategies for the economic and social reinvigoration of the La Mojana region as an immediate response to the effects of the 2005 rainy season to implement in the medium- and long-term actions. PDMS strategies have been focusing on management of natural resources, agricultural development, infrastructure, land management, and institutional strengthening.

136. CORPOMOJANA, as the environmental authority for the La Mojana subregion, is responsible for planning and implementing management plans to enforce ecosystems conservation and to promote sustainable practices. CORPOMOJANA's 4-Year Action Plans [PACs] and Regional Environmental Management Plans [PGARs] are the environmental and land use instruments that address and aim to regulate deforestation and cattle ranching practices.

137. Proposed activities addressing directly impacts from flooding and indirectly anthropogenic factors:

138. Moreover, AF financed project will also undertake the following interventions with a view to enhancing climate change risk management but which will also act as incentives and deterrents to the anthropogenic threats:

139. Output 2.4. A 2,000 ha protected area (PA) is established. The proposed project will create a 2,000 hectare multi-use protected area (PA) or IUCN Category VI, aiming to reduce deforestation by conserving ecosystems and habitats and to diminish water flow during rainy season, strengthening flood attenuation helping local communities to better cope with climate variability and flood impacts.

According to IUCN, this category of PA “most of the area is in a natural condition, where a proportion is under sustainable natural resource management, and where low-level non-industrial use of natural resources compatible with nature conservation is seen as one of the main aims of the area”. According to the CIPAV, conversion of conventional pasture practices to silvopastoral systems (SPS), lead to an increase of carbons sinks given avoided deforestation due to an increase in on-farm cattle carrying capacity of animals per ha. The project will promote the use of silvopastoral practices that combine native tree species (forestry, fodder and/or fruit; 120 to 150 plants/ha) that are resistant to water with cattle ranching and crops. The establishment of at least 250 hectares of silvopastoral systems that are planted with native trees resistant to flood conditions in combination with crops and livestock will benefit up to 100 small and medium-size farmers.

140. Output 3.1. Climate resilient agricultural practices adopted. Cattle ranching have been impacting agricultural productivity of local communities and farmers expanding its frontier by increasing rates of deforestation of tropical forest remnants to convert areas into conventional pasture. In addition, flooding has limited the availability of land for agricultural and livestock production and has damaged the structure and productivity of soils suitable for agriculture, as they have remained under water for prolonged periods of time. The proposed project will develop climate change-resilient agricultural practices by employing alternative and traditional forms of productions. It will establish vegetable gardens on stilts that will be maintained in conditions of extended periods of flooding, it will create family-base organic food gardens in community parcels, and it will promote extended use of native rice crops that are more resistant to local flood conditions. These practices will allow local communities to secure other options of food and income generation, other than conventional pasture practices.

141. Output 3.3. At least 250 ha with agro-silvopastoral systems established. The proposed project aim to establish 250 hectares of agro-silvopastoral systems in the rural zone of the project target area (10 hectares in Ayapel, 75 hectares in San Marcos, and 75 hectares in San Benito Abad) that use timber species (oak, cedar, “campano”, “samán”, and “guamo”), native fodder species (“totumo”, “matarraton”, “orejero”, “carbonero”, and “guácimo”), and fruiting species (coconut, “níspero”, “zapate”, among others) in combination or association with semi permanent and permanent crops and/or cattle. The agro-silvopastoral practices supported by AF funds will include combinations or associations of native tree species (forestry, fodder, and/or fruit; 120 to 150 plants/ha) that are resistant to water together with cattle and/or crops in a 100-hectare area to mitigate the effects of flooding, including: a) limiting erosion, particularly through planting trees in vulnerable areas; b) reversing soil degradation and improving fertility after prolonged flooding through the addition of organic material and nutrients, and enhancing the biological processes of the soil allowing for a fast reestablishment of crops and livestock production; and c) reducing the speed of water flow during flooding, limiting the loss of crops and cattle. In addition, the implementation of agro-silvopastoral practices will add to the diversification of productive activities, while reducing the vulnerability of farmers associated to climate change and variability. The agro-silvopastoral practices implemented will benefit small- and large-scale producers in the Ayapel, San Marcos, and San Benito Abad municipalities, improving ecosystem resilience.

142. The risks posed in the Mojana subregion by cattle ranching and deforestation will not compromise the project given that Federal Government initiatives and Departmental planning and policy instruments

are in place to regulate ecosystem conservation and promotion of sustainable economic practices. In addition, deforestation and cattle ranching have been fully considered under project development and some of the proposed interventions (i.e. PA, silvopastoral systems, sustainable agriculture practices, etc) indirectly address them.

C. Describe or provide an analysis of the cost-effectiveness of the proposed project / programme.

*143.* The project will provide direct solutions to problems caused by flooding to 54,000 of the most vulnerable families in the Depresión Momposina region, covering an area of 406,054 ha in the municipalities of Ayapel, San Marcos, and San Benito Abad. Additionally, through the incorporation of climate risk management considerations into municipal planning tools the project will provide long-term benefits for up to 126,000 people in the three municipalities. Also, as the GoC considers this project an initial catalytic step toward providing solutions to climate change-related threats in the entire region of the Depresión Momposina (more than 2.4 million ha), it will be potentially replicated and up-scaled to provide other areas in the region with multiple adaptation benefits. Thus, the AF investment will have a significant impact in a region that is extremely vulnerable to flooding, and which in recent years has seen a significant increase in both the size of the area impacted and the duration of the effects of the impacts as a result of climate change and variability.

*144.* The proposed approach will integrate ecosystem-based adaptation, adaptive agroecology, and community-based adaption measures to address risks and vulnerability associated with climate change. This approach, which is designed to reduce risk to flooding, will help to reduce anticipated costs that will recur during future scenarios of increasing climate change and variability, and which are related to assistance provided during emergencies and disasters resulting from extreme rainfall. Examples of these costs are the following: a) high economic and social costs related to providing food assistance and the relocation of people to non-flooded areas; b) reconstruction and repairing of houses and the replacement of domestic items and utensils; c) restoring soils to their productive levels after prolonged and recurrent floods; and d) replacing crops and livestock. The abovementioned examples, when added to the costs related to the loss of ecosystem goods and services and the subsequent need for the ecosystems' rehabilitation, will continue to be generated in the project area if the adaptation alternatives proposed herein are not duly considered.

*145.* The cost of “doing nothing” is not contemplated by the GoC, as this will eventually force the migration of people to other locations with very high social consequences such as the disruption of community cohesion, loss of employment, social conflicts, and risk to crime. These social costs are difficult to monetize, but are recognized as high.

*146.* Alternatives other than those proposed herein have been considered, but are deemed as less cost-effective than the proposed approach. One of these is outlined in a study that is currently being developed by the UNC through an Institutional Agreement with the DNP to make recommendations regarding necessary and prioritized projects for environmental and land use planning in the La Mojana subregion. These investment recommendations will be directed towards providing engineered solutions to flooding, such as that which occurred during 2010-2011 in 11 municipalities of the La Mojana subregion, including the three project municipalities. More specifically, recommendations will be related to additional works associated with a dike recently constructed at the Cauca River along the Nechí – Achí stretch to the east of the target area that is critical for regulating water flows and controlling floods in the target area; and b) construction of a bypass to relieve pressure from flooding along a canal parallel to the existing road between the towns of San Marcos, Majagual, and Achí (north of the project target area). Although there are still no cost estimates for this investment alternative since the study will not be available until March

2012, this solution is expected to have a significantly higher cost than what is proposed through this AF project. The initial investment for the construction of the dike with a length estimated at 67 kilometers along the Cauca River between the towns of Nechi – Achí had a cost of USD67 million. Construction began in 2006 and to date only 55 kilometers of the dike have been constructed. In addition, during the recent rainfall period the dike experienced a rupture at a critical point, which contributed to increasing the impact of the floods that occurred in the La Mojana subregion. This investment is indicative of the cost of highly technical solutions, which is even greater when the cost of maintaining this type of infrastructure is considered, and whose impact can be uncertain as it is not guaranteed to be a long-term solution to the risk of extreme flooding. The proposed AF project also envisions investments in small-scale hydraulic infrastructure (Component 2; USD3,758,000). This will involve the development of an ecosystem-based adaptation strategy to climate change through small-scale hydraulic works complemented with actions for the rehabilitation, conservation, and management of the natural wetland systems so that their water regulation functions can be reestablished and protected, and together help to control flooding in a sustainable manner. This approach is considered far more cost-effective than the alternative which relies on engineering solutions to the threats related to climate change, which as mentioned earlier are costly and may prove to be non-sustainable. Under this component, over 31,000 hectares of wetlands will benefit from protection and rehabilitation measures that will enhance their ecological functions to help them withstand the effects of climate change while providing lasting ecosystem goods and services as well as adaptation benefits to local communities.

*147.* The project also proposes concrete activities for the development of fine-scale hydroclimatological information and a climate change monitoring system that will provide detailed and timely information to facilitate local decision-making regarding adaptation to climate change (Component 1). This includes the participatory development and operation of a local early warning system with local communities so that their needs regarding risk and vulnerability reduction are considered, as well as their knowledge about climate variability. The alternative is the status quo, in which hydrological information is collected, analyzed, and distributed only by IDEAM following a top-to-bottom approach and where information is used to satisfy national and regional needs for analyzing and forecasting climate change. In addition, the alternative develops vulnerability and risk scenarios at coarse scales that limit the possibility of developing adaptation strategies that will respond to needs of local communities. It is argued that the proposed outcome is more cost-effective; with an investment of USD1,564,000 the existing hydroclimatological information system will be enhanced with fine-scale data that will facilitate decision-making for adaptation to climate change at the local level (i.e., municipalities and local communities).

*148.* In addition, the project strategy proposes to implement measures to allow the diversification of food production sources and the creation of surpluses for the vulnerable communities through the introduction of adaptive agroecological practices and housing alternatives to allow them to better cope with future and possibly more frequent extreme climate events. This strategy will be implemented with the active participation of the most vulnerable communities, for whom the project will develop actions that strengthen their organizational capability as well as their knowledge of issues related to climate change and variability. These newly acquired skills will be fundamental for the sustainability of actions developed by the project and the replication of the most successful experiences. Through the active participation of the communities in incorporating climate risk management measures and adaptation into local land use, environmental, and sector planning instruments, which will be done in coordination with local and regional civil authorities, adaptation to climate change will be ensured as an integral part of the local development and land use plans based on the real needs of the most vulnerable population. None of the other alternatives proposes a similar strategy that allows the inhabitants and the ecosystems of the project target area to coexist and become more resilient to the increasing effects of climate change.

*149.* The project has been designed so that most of the project budget is directed toward the implementation of concrete technical solutions. Ninety-three percent of the cost of the project (not

including project execution costs) will be invested in concrete technical solutions. The cost-effectiveness of the project will also be reflected at the operational level in the following ways: a) the absorptive capacity of Colombia and its institutions to carry out development projects in a timely and cost-effective manner must be emphasized. The project will build upon the recognized capacity of some key national and regional institutions for the execution of the proposed intervention. The project will rely on the extensive experience of IDEAM for the development of climate change scenarios. Similarly, the project will make use of the CVS and CORPOMOJANA experience in providing technical assistance and implementing projects for the conservation and management of natural resources, environmental protection, and sustainable development. In this manner some of the successful experiences that CVS and CORPOMOJANA have developed and that have adaptive value will be replicated; b) the project will make use of the lessons learned and best practices from projects that are being implemented related to climate change in the country (see section F); and c) the Project Implementation Unit will operate directly in the project area, which will enable the best use of resources and reduction of project management costs, as well as closer oversight of project activities and the progress of the project's technical components.

150. Finally, all AF investments be replicated and scaled up. Colombia's 2010-2014 National Development Plan (NDP) includes as one of its goals the development of a National Adaptation Plan, as well as the development of territorial and sectoral adaptation plans, which will be supported by the recently created National Climate Change System. The importance of the La Mojana subregion for the GoC is reflected in its inclusion as a priority area for investments in adaptation in the 2010-2014 NDP. The NDP includes the Comprehensive Plan for Environmental Management and Territorial Development of the Region of La Mojana and the proposed project is part of the strategy to implement the comprehensive plan devised for the La Mojana.

151. The proposed project will be used by the GoC as a pilot initiative that will provide expertise in addressing climate change adaptation at a regional level by generating and integrating relevant climate information into decision-making, strengthening capacity among diverse national and sub-national agencies to address climate change and integrating lessons learned and knowledge in the development of adaptation measures in other regions of the country.

152. AF funds will provide the foundation for the GoC to replicate and enhance interventions in other regions of the country based on the experience and results generated from the proposed project and to scale-up investments in the Mojana subregion to extend beneficiaries.

**D.** 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 programmes of action, or other relevant instruments, where they exist.

153. The proposed project is consistent with Colombia's National Development Plan (NDP) for 2010-2014 and its proposal to reduce vulnerability and adapt to climate change. Environmental sustainability is one of the NDP's four lines of action, and is considered a national priority essential to the population's well-being and a principle of equity with future generations. The NDP also promotes sustainable development, which also serves to prepare the country to face the consequences of climate change. *Chapter 6, Environmental Sustainability and Risk Prevention* of the NDP defines the strategic guidelines and actions the country should follow in the coming years to reduce vulnerability and adapt to climate change through the implementation of sectoral and territorial adaptation plans. Identifying and prioritizing measures to prepare the country to adapt to climate change is proposed in the NDP and is directly related to the project proposed herein. This includes a vulnerability analysis performed within the framework of a National Adaptation Plan that is based on a financial strategy that incorporates national and international

collaboration and the strengthening of information-gathering for sectoral and territorial vulnerability analyses. In addition, sectoral and land use planning should be developed for strategic projects that incorporate sustainability criteria in priority areas of the Depresión Momposina such as La Mojana as a way to strengthen the protection and restoration of biodiversity and ecosystem services. The NDP proposes to incorporate criteria for localizing production using updated data that consider: a) the current and potential uses of the land, b) the adequate management of water resources, c) the development of risk scenarios for the agricultural sector, and d) the need to develop production systems that are more resistant to extreme climatic events.

154. The GoC is currently developing the National Plan for Adaptation to Climate Change (PNACC), which seeks to identify, evaluate, prioritize, finance, implement, and monitor nationally appropriate adaptation measures (actions, interventions, regulations, policies, programmes, projects) in economic sectors, territories, and ecosystems in order to reduce their vulnerability. The PNACC currently has three lines of action: a) analytical processes and information with the objective of generating information, instruments, and appropriate methodologies for climatic risk management and adaptation; b) strengthening of skills to integrate the management of climatic risks and adaptation into policies and planning instruments; and c) monitoring, evaluation, and adjustment in order to evaluate the progress made in managing climatic risks and adaptation. The project proposed herein is consistent with the approaches contained in the PNACC and its lines of action.

155. In 2006 the GoC approved Document 3241 of the National Council of Economic and Social Policies (CONPES), which consists of a group of strategies for the economic and social reinvigoration of the La Mojana region as an immediate response to the effects of the 2005 rainy season, and to implement in the medium- and long-term, the actions defined as part of the Sustainable Development Programme for the La Mojana Region (PDSM), which is coordinated by the DNP with technical support provided by the Food and Agriculture Organization of the United Nations (FAO). As part of the PDSM, studies were developed and strategies agreed upon with the regional stakeholders for environmental planning and management of natural resources, agricultural development, infrastructure, land management, and institutional strengthening. The project proposed herein is consistent with the medium- and long-term needs for the region identified in the PDSM.

156. The CONPES 3700/2011 document entitled *Institutional strategy for the articulation of policies and actions on climate change in Colombia* emphasizes the need for the country to understand and take action against climate change as part of the economic and social development policies and actions. In this sense, opportunities should be sought for the regions and territories of the country to integrate this topic into their planning processes, articulate all stakeholders for the adequate use of resources, diminish their exposure and vulnerability to risk, strengthen communities' ability to respond to threats from extreme climatic events, and prepare the country to move in the direction of sustainable development, creating competitiveness and efficiency. The strategy recognizes the urgent need to make use of adequate adaptation and mitigation measures, and establish the framework within which they will be developed. The project is framed within the guidelines that are established by this GoC policy document.

157. The project is also fully aligned with the Second National Communication to the UNFCCC. In its chapter on adaptation (*Chapter 5*), recommendations for action and eight general guidelines for adaptation in the country are provided, which must be developed as part of a multi- and inter-sectoral agreement, and through adjustments to the development planning instruments at the local, regional, and national levels. The Second National Communication recommends that adaptation measures be focused on the most vulnerable populations, the most degraded environments and ecosystems, the country's infrastructure and productive sectors, water resources, and the articulation of the planning instruments that include climatic criteria. The project is fully articulated with these recommendations and will make

specific contributions to their implementation through the proposed actions in each of its four components.

158. The project is also consistent with the Colombia National Policy for Interior Wetlands (2002) and its strategies for the sustainable management, and use, conservation, and restoration of wetlands. The National Policy for Interior Wetlands states that: a) the management and use of wetlands should be incorporated into the land use planning strategies of the country; b) future ecological loss should be prevented and the existing wetlands should be maintained; and c) affected wetlands should be restored. The adaptation measures proposed by the project will contribute to improving the role of wetlands in La Mojana to protect against storms and floods, retain sediments, and serve as wildlife habitat. In addition, adaptation measures will contribute to improving the supply of fishing resources for the local communities.

159. The project is also aligned with the development action framework of the United Nations Development Assistance Framework (UNDAF) for Colombia. More specifically, the project is consistent with the UNDAF Outcome 2, which has as a relevant Country Programme outcome: “National capacity consolidated to promote environmental sustainability, management of disaster risks and sustainable planning,” with the related output “Public institutions and organizations strengthen their capacity to formulate and implement environmental management programmes and initiatives that guarantee the supply and maintenance of environmental goods and services (with emphasis on conservation, restoring and sustainable use of strategic ecosystems).” The UNDP in Colombia works to guarantee the integration of energy and environmental and natural resource considerations into the strategies of poverty reduction and sustainable development. Also, it gives attention to all cross-cutting issues such as environmental governance, climate change, gender, and links between sustainable environmental management and poverty reduction. It aims for the inclusion of the local approach in development strategies. In order to do so, UNDP focuses its work on the following strategic areas: a) development of frameworks and strategies for sustainable development; b) adaptation and mitigation of climate change and effective governance of water; c) access to sustainable energy; d) sustainable management of soil and land against desertification and degradation; e) conservation and sustainable use of biodiversity; f) planning of national policy against the degradation of the ozone layer; and g) persistent organic pollutants.

160. The creation of the proposed PA (Output 2.4), its zoning, and natural resource use regulations are elements that will determine how future land use plans and land use policies will be developed in the municipality of San Marcos. The PA will be a key component of the land use plan of the municipality, with clearly defined objectives regarding its uses, which will be restricted to conservation and the sustainable use of its resources. These objectives will be defined in the PA’s management plan, which will also make specific reference to how the PA is articulated to the municipality’s POTs and PDMs. Similarly, the PA will be aligned with land use planning at the regional level. Since the PA will be within CORPOMOJANA’s jurisdiction it will be align with COPOMOJANA’s PGARs and its PACs. As the environmental authority for the La Mojana subregion, CORPOMOJANA will be responsible for its planning and the implementation of its management plan, including the enforcement of its conservation and sustainable resource use objectives. The PA will be created following the legal requirements for establishing new PAs that will be included in the SINAP; thus the PA will be part of the national network of PAs and will be aligned with all policies and plans that regulate and guide PAs in the country, including restrictions regarding land and natural resources use. The SINAP is divided into regional subsystems of PAs; because of its location in the Caribbean region of Colombia, the PAs to be created as an ecosystem-based adaptation measure will be part of the Caribbean Subsystem of PAs (SIRAP).

161. Finally, it must be added that the GoC, in light of the devastating impacts of climate-related emergencies experienced in Colombia during the 2010 and 2011 rainy season, created the National Adaptation Fund (AF) to help to rebuild the national infrastructure damaged by these climatic events, as

well as provide needed support to the affected populations. Nevertheless, the National AF does not give consideration to developing an approach that would serve to mitigate the effects of climate change; instead it funds short-term reconstruction solutions to infrastructure damaged by flooding, landslides, and other effects resulting from extreme rains. As such, the GoC considers that the project presented herein (the AF project), will provide the guidelines for this type of approach for implementation within the National AF. Successful results of the AF project proposed herein have a great potential to be replicated through similar projects that will be designed and implemented throughout many regions of the country through the National AF. To ensure that the National AF incorporates lessons learned in the future projects to be implemented; representatives from the institutions that comprise the National AF (i.e., MADS, IDEAM, and DNP) will form part of the AF Project Steering Committee.

**E. Describe how the project / programme meets relevant national technical standards, where applicable, such as standards for environmental assessment, building codes, etc.**

162. The national technical standards applicable to project Component 1 are specifically linked to the official national guidelines and protocols for the production of hydrometeorological information established by IDEAM. These include *Climate System Guidelines, Chapter II: Basic variables and protocols*, *Meteorological Observer's Handbook*, and the *Manual for the Operation, Inspection, and Maintenance of Meteorological Stations*. Also, to the standards set in the international *Guide to Meteorological Instruments and Methods of Observation*, the World Meteorological Organization – WMO document *Technical Note and Project Organization Meteorological Network of Colombia*, and other international standards.

163. Colombian Decree 2820-2010 provides guidance for the regulation of national Environmental Impact Assessments (EIAs). According to the decree (Title 2), the construction of hydraulic engineering projects in the La Mojana subregion is subject to national licensing environmental requirements and standards. Participatory EIAs will be performed for hydraulic works recommended by the UNC that are related to climate change adaptation in the La Mojana subregion. These EIAs have been factored into the expected timeframe for this initiative; the studies will be conducted as part of the proposed activities related to project Output 2.1 and will be carried out during the last two trimesters of Year 1 of the project. The associated hydraulic works will be performed during Year 2 of the project as indicated in the GANTT chart in Section E (Part II) of this project document. Financial support to conduct the EIAs will be provided by the MADS and co-financed by the GoC, letters of commitment from the GoC to provide co-financing are included in Annex I to support this proposal. Similarly, the construction of a dike at the confluence of the Sejeve stream and the San Jorge River (in the municipality of Ayapel) will require an EIA, which will be funded and carried out by the CVS and submitted to the MADS for approval. The analysis performed during the project preparation phase indicated that the rehabilitation of water flows from 11 streams within the jurisdiction of CORPOMOJANA does not require an EIA. **The technical specifications of the works proposed in Output 2.1 are described in Annex E.**

164. The MADS has developed “guidelines for technical assistance for the construction of state-subsidized housing.” These guidelines will be directly linked with the adaptive architecture programme of the project proposed in Component 3. The three main obligatory technical standards that form the basis of the guidelines are the following: a) Earthquake-Resistant Buildings – NSR-10; b) Technical Regulation of Drinking Water and Basic Sanitation – 2000 RAS, Wastewater Treatment Regulation Chapter (Art. 153-159); and c) Technical Regulation for Electrical Installations - RETIE. These guidelines are in addition to other voluntary recommendations regarding best practices for construction, water and sewage systems, and energy efficiency. Any new construction must first be licensed by the local mayoral office under strict compliance with the abovementioned technical regulations. Although to date these rules have not been consistently enforced, the implementation of this project will be conducted in strict compliance with these regulations.

165. Guidance for incorporating risk management into territorial planning instruments has been developed in Colombia; however, this guidance does not provide consideration of risks associated with climate change. Project Component 1 is proposed to fill this gap with the generation of additional hydroclimatological information as described in this project document. The methodology developed in the Second National Communication to the UNFCCC (2010) to address vulnerability assessments at territorial levels will be reviewed and adjusted if required to conform to the particularly circumstances of the project target area.

166. All planned activities will be implemented within the territorial jurisdiction of municipalities and townships legally constituted and recognized by the Colombian law. Additionally, all planned activities will be conducted in compliance with the mandates of land use plans and development plans approved by the Municipal Councils of each target municipality (Ayapel, San Marcos, and San Benito Abad) as well as according to the land uses as allowed by the Law of Territorial Development of Colombia (1997).

167. With regard of tenurial and land rights, the project will only implement actions with land owners/holders that can prove the legal status of their form of ownership based on an analysis of land property and land use rights. All the planned activities will be implemented within the jurisdictions of three legally established municipalities and townships in La Mojana Subregion, which are fully recognized as part of the political and administrative division of Colombia. Additionally, all the planned activities will be developed in compliance with the mandates of the regulations regarding development and land use for each municipality and that have been approved by the Municipal Councils according to the guidance set in Colombia's Law on Territorial Development (1997). Similarly, , the project will only implement actions with land owners and/or land holders that can prove the legal status of their land tenure.

168. Although there is an unequal distribution of land and marginal and vulnerable people around the project target area, these conditions do not imply that marginal and vulnerable people cannot prove or demonstrate land tenure (owner / holder), since according Colombian legislation regarding land and property rights a land owners (with property title) or land holders (without property title) have the same rights as established in the Civil Code. What this means in practice is that marginalized and vulnerable farmers will also benefit from the project. Additionally, and given the objectives of improving the socio-economic conditions and providing food security to the most vulnerable populations, the project will only implement activities with vulnerable communities and not with those who, despite proof of property rights, own land parcels over 5 hectares. The project will establish 250 ha of silvopastoral systems in the rural area of the project's target area (100 ha in the municipality of Ayapel, 75 ha in the municipality of San Marcos, and 75 ha in the municipality of San Benito Abad). The project will only engage with landowners of less than 5 ha to prevent that AF funds are used to benefit large landowners reducing the risk of inequity during project implementation. The project will verify the ownership of the properties with the land planning municipal offices and cadastral records, when available.

169. There is no conflict of communal lands; during the project preparation the Colombian Ministry of Justice certified that there are no indigenous or Afro-Colombian communities residing in the project target area that merit special considerations regarding tenure and/or ownership of communal lands. Therefore, in accordance with Colombian Decree 1320-1998, the project will not be required to perform additional consultation with indigenous or Afro-Colombian community officials.

170. The establishment of a multiple-use PA will be based on a detailed and tailored management plan, which will include the type of conservation status rank according to IUCN scale (1 = critically imperiled, 5 = secure), human and financial resources to design and manage the PA based on a timeframe, in-depth threat analysis, specific management alternatives, monitoring plan and expected benefits and contribution

to local communities, among others. Since the new PA will be included as part of SINAP, it will be subjected to all national and regional PA regulations. Thus, CORPOMOJANA will enforce the relevant laws to mitigate encroachment threats and non-sustainable uses of natural resources, as well as provide surveillance with support from the Municipality of San Marcos and the local police office. More importantly, the sustainable climate change-resilient agroecological measures implemented by the AF project will provide new economic options to the community in terms of production and income, fostering the interest to preserve the area in its current state. The planned methods of verification of the PA will include but are not limited to satellite images of boundaries and conservation state, GIS studies provided by CORPOMOJANA, the national parks system authority (UAESPNN) and IDEAM, and field visits. The management plan of the PA will include specific verification measures and will detail the allowed uses and restrictions for the PA, which will be agreed upon with local communities as part of the consultation process for its creation.

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

171. The proposed project will create synergies and coordinate action with other related initiatives. Efforts will not be duplicated but rather will be complemented by incorporating adaptation measures to climate change into the planning and programming of these initiatives. During the project design phase, efforts have been made to fully identify potential coordination mechanisms with all relevant ongoing or planned initiatives; these efforts will continue during the implementation phase of this project. The relevant ongoing projects for the project area are:

172. The project *Strengthening the Institutional Capacities for the Implementation of Local Risk Management Practices as an Adaptation Measure to Climate Change in the Islands and Coasts of the Colombian Caribbean* (GIR Caribbean) is being developed with financial support provided by the European Union. The UNDP is coordinating the administrative and technical aspects of project implementation, and the Department of Risk Management (DGR), as managing director of the National System of Prevention and Attention to Disasters (SNPAD), will carry out national coordination. It is important to mention that there is no geographical overlap between the two projects. The GIR project will not implement on the ground activities in the three selected municipalities for the proposed AF project. These two projects will both support climate change adaptation initiatives in Colombia, with the EU project focusing on capacity building approaches and disaster risk reduction (DRR) strategies and the Adaptation project on on-the ground implementation of community-based and ecosystem-based adaptation approaches. Staff from the UNDP involved in the GIR Caribbean project have been consulted during the project preparation phase and participated in two of the project preparation and consultation workshops, during which coordination mechanisms between the two initiatives were discussed and agreed upon. Although both projects will be implemented in the Caribbean region, because of the broad regional nature of the GIR Caribbean initiative and its proposed actions no duplication of efforts will occur. To coordinate actions, the project team of the project proposed herein will participate in forums and meetings related to the GIR Caribbean initiative and will benefit from training on the development of methods for incorporating climate change considerations into territorial and sectoral planning instruments.

173. The project will also complement efforts undertaken through the Institutional Agreement between the DNP and UNC whereby the UNC is tasked with conducting studies, analyses, and making recommendations regarding necessary and prioritized projects for environmental and land use planning in the La Mojana subregion. The Agreement, having a total cost of USD710,817<sup>31</sup>, outlines the following objectives to be accomplished: a) review and evaluation of proposals or technical concepts for the design and construction of the marginal dike in the Río Cauca between the towns of Nechí and Achí; b) develop a study of the construction of a canal parallel to the existing road between San Marcos-Majagual-Achí; c)

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<sup>31</sup> Col \$1,272,362,224 (\$1 USD = \$1,790 Col). The DNP provided 72% of the funds; the remaining are in-kind contributions from the UNC.

identify and prioritize the receptor streams for the dike waters that require decontamination; and d) assess the practices and tools developed for land use planning and development, environmental management of water resources, and disaster risk in all municipalities of the La Mojana subregion. Staff from the DNP were consulted about this government-led initiative and participated in one of the project preparation workshops and field visit to the project's target area, during which coordination mechanisms between the two initiatives were discussed. Because the Agreement between the DNP and UNC will mostly result in recommendations for future investments, and because of the regional nature of the actions that will be proposed, there will be no duplication of efforts. Additionally, DNP staff will be invited to be part of the Project's Steering Committee which will guarantee continued dialogue and coordination of actions between DNP staff and the project team.

174. During the project preparation phase, consultations were made with other potential funding sources, including the World Bank (WB), the Inter-American Development Bank (IADB) other UN agencies and bilateral donors. Currently, there are no relevant on-going or planned climate change related initiatives targeting the target area of La Mojana subregion that are being funded through these agencies.

175. During project implementation, the project team will maintain close contact with development initiatives under preparation and seek to identify synergies, where appropriate, including the Global Environment Facility (GEF)/ IADB Special Climate Change Fund (SCCF) project *Adaptation to Climate Impacts in Water Regulation and Supply for the Area of Chingaza- Sumapaz-Guerrero* (PIF currently under consideration for GEF CEO approval). The objective of the project is to strengthen the hydrological buffering and regulation capacity of the upper watershed of Chingaza-Sumapaz-Guerrero that supplies drinking water to the Bogotá metropolitan area and the adjoining rural municipalities. There is no geographical overlap with the project area, as the target areas for the proposed SCCF/IADB project are Páramo ecosystems and watersheds in central Colombia's eastern mountain region.

176. It is worth mentioning that the project will also incorporate lessons learned from two recently concluded projects, implemented outside of the target area of the proposed AF project, but related to climate change adaptation as follows:

177. The Integrated *National Adaptation Project (INAP): High Mountain Ecosystems, Caribbean Islands and Human Health*", was funded by the GEF. This project was executed from 2006 through 2011 by IDEAM, Conservation International and coordinated by the National Institute of Health and the Ministry of Health, with the WB serving as the Implementing Entity. The main objective of the INAP was to "improve Colombia's understanding and assessment of impacts, vulnerability, and adaptation to climate change, climate variation, and extremes by supporting efforts to define and implement specific pilot adaptation measures and policy options to address anticipated climate impacts." The target areas of this project were high mountain ecosystems, páramos, and coastal marine ecosystems; as such there is no geographic overlap with the proposed AF project.

178. The INAP project adopted an ecosystem-based approach (EbA) to adaptation in order to address climate change impacts, by focusing on high mountain ecosystems, insular areas and on health concerns related to the expansion of areas for vectors linked to malaria and dengue, identified as priority areas in the National Communications and other studies.

179. The AF project will incorporate the lessons learned during the execution of the INAP project in the following regard: a) the importance of expanding the national network of hydrometeorological stations to obtain more accurate and reliable information to assess climate change effects and understand climate variability, which will provide information regarding the implementation of Component 1; b) the implementation of EbA measures, including strengthening PA management, ecosystem restoration and conservation, which has provided information in the design of project Component 2 and will also inform

its implementation; c) the development of adaptive production systems and the implementation of agro-silvopastoral systems (Component 3); d) how to make information and data regarding climate change and variability available for policy development, which will be instrumental in the implementation of Output 4.3; and e) the impacts caused by climate change on human health, which will be considered in the development of structural measures for school and housing (Output 3.2) by incorporating healthy environments for the houses and schools that will be updated and constructed as adaptation measures to climate change in the target area. Additionally, through the INAP project, climate change and variability scenarios were developed at the national level and then re-scaled (mountainous region in eastern Colombia and the Colombian Massif in the southwestern region of the country) using detailed information that was gathered after strengthening the hydrometeorological stations network in these areas. The methodology used by IDEAM for such purpose will be instrumental in the implementation of Component 1 of the proposed project. Lessons learned from this project have already been synthesized, area available at [www.cambioclimaticomacizo.org](http://www.cambioclimaticomacizo.org), and were reviewed during project preparation.

180. The second initiative that will provide lessons learned to the AF project, in addition to information and methodological guidelines, is the Joint Programme *Integration of ecosystems and adaptation to climate change in the Colombian Massif*, which was financed through the Millennium Development Goals Achievement Fund (MDG-F) with supporting funds from the Spanish Government and implemented by four UN agencies (UNDP, FAO, The United Nations Children's Fund - UNICEF, and Pan American Health Organization/World Health Organization - PAHO/WHO). This joint programme was implemented in partnership with IDEAM, MADS, and DNP. The UNDP was the lead agency of this joint programme, and during the design of the proposed AF project ensured that all relevant lessons learned from the programme were taken into account. This includes the development of participatory vulnerability analysis, the design of a local early warning system, and community-based adaptation measures. Similarly, the UNDP will ensure that lessons learned are properly incorporated during project implementation. Lessons learned from this project have already been synthesized, area available at [www.conservation.org.co/](http://www.conservation.org.co/), and were reviewed during project preparation.

181. The AF project will include technical assistance from institutions that participated in the implementation of these projects (e.g., IDEAM and MADS), which will facilitate the incorporation of lessons learned and knowledge from other climate change adaptation initiatives.

182. Summary of complementarities between past, current and potential projects and the proposed AF project:

Project Title	Main Objective	Geographic Area	Status	Adaptation Approach	Potential synergies and coordination Mechanisms:
<b>GIR Caribbean UNDP-EU</b>	Strengthen the institutional capacities for the implementation of local risk management practices as an adaptation measure to climate change in the islands and coasts of the Colombian Caribbean (GIR Caribbean)	Eight (8) pilot experiences will be developed in eight (8) departments of the Caribbean region  There is no overlap with the municipalities selected for the AF proposed initiative.	Ongoing - Recently began implementation	Prevention of climate related risks through institutional strengthening g. (Prevalent DRR approach)	The GIR Caribbean project does not focus on the implementation of concrete adaptation measures in the 3 targeted municipalities  Complementarities are also envisioned within the context of project component 4 (Capacity building and awareness)  To coordinate actions and assure synergies the project team of the AF project will participate in forums and meetings related to the GIR Caribbean initiative and will benefit from training on the development of methods for incorporating climate change considerations into territorial and sectoral planning instruments
<b>Integration of ecosystems and</b>	Promote the integrated management of	Colombia, Massif –	Closed	Community-based	Lessons learned related to the development of participatory vulnerability analyses,

<p><b>adaptation to climate change in the Colombian Massif</b></p> <p><b>MDG-Fund</b> (Joint Programme UNDP, FAO, UNICEF, and PAHO/WHO)</p> <p>The Programme was implemented in partnership with IDEAM, MADS, DNP, and local indigenous communities. The UNDP served as the lead agency</p>	<p>ecosystems in a mountainous region of Colombia to ensure the supply of environmental goods and services, incorporating considerations for climate change adaptation</p>	<p>Department of Cauca</p> <p>There is no overlap with the AF proposed initiative</p>		<p>approach</p>	<p>design of a local early warning system, and community-based adaptation measures will be incorporated into the proposed AF project during project implementation</p> <p>UNDP and national partnering institutions have been actively involved in the design of the AF project, sharing lessons learned, and providing feedback on the proposed AF project leveraging complementarities</p> <p>UNDP and national partnering institutions for this project will be serving as members of the Project Steering Committee for the AF proposed project</p>
<p><b>Integrated National Adaptation Project (INAP) (WB-GEF)</b></p>	<p>Improve Colombia's understanding and assessment of impacts, vulnerability, and adaptation to climate change, climate variation, and extremes by supporting efforts to define and implement specific pilot adaptation measures and policy options to address anticipated climate impacts</p>	<p>High mountain ecosystems, páramos, and coastal marine ecosystems</p> <p>There is no overlap with the AF proposed initiative</p>	<p>Closed</p>	<p>Ecosystem-based approach (EbA)</p>	<p>The AF project will take advantage of the lessons learned by IDEAM during implementation of the INAP regarding two main components: 1) how to make information and data regarding climate change and variability available for policy development; and 2) the lessons learned regarding the impacts caused by climate change on human health</p> <p>IDEAM served as the implementing agency of the INAP, and has been fully involved during the development of the AF project. In addition, IDEAM will be the responsibility party for the AF project Component 1 and will take an active role as a member of the Project Steering Committee</p>
<p><b>Adaptation to Climate Impacts in Water Regulation and Supply for the Area of Chingaza-Sumapaz-Guerrero (IADB/GEF)</b></p>	<p>Strengthen the hydrological buffering and regulation capacity of the upper watershed of Chingaza-Sumapaz-Guerrero that supplies drinking water to the Bogotá metropolitan area and the adjoining rural municipalities</p>	<p>Páramo ecosystems and watersheds in central Colombia's eastern mountain region, Department of Cundinamarca</p> <p>There is no overlap with the AF proposed initiative</p>	<p>PIF currently under consideration for GEF CEO approval</p>	<p>Water Management</p>	<p>Project team will maintain close contact with development initiatives under preparation and seek to identify synergies, where appropriate</p>

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

183. Results from the project will be disseminated both within and outside of the La Mojana subregion through a number of existing information-sharing networks and forums. The MADS (project Executing Entity) conceived this project as a pivotal experience for developing basic tools and information to reduce the vulnerability of local communities and local ecosystems to the effects of climate change, and to facilitate the incorporation of adaptation measures into policy and planning processes at the local and regional levels. At the national level, the project will capture and disseminate lessons learned through the

National Climate Change System and its Web Portal (<http://www.cambioclimatico.gov.co>), which is administered by IDEAM and MADS. This Web page was developed within the context of the Second National Communication to the UNFCCC as way to provide access to the public for climate change-related information and to improve national capacity. In this way the project results will be shared with a wide variety of stakeholders at the national level.

*184.* At the local level, community platforms for association and dialogue will serve to identify lessons learned from the project and share knowledge among stakeholders (community members, community leaders, CBOs, and civil authorities) and will be the basis for replicating successful experiences at the local level. Additionally, lessons learned will be shared locally through printed material (booklets and leaflets) and videos, which will be developed as part of the planned activities for Output 4.1 for sharing information about the successful experiences and lessons learned from the project and its potential for replication in other locations. Also, community members and other local stakeholders will participate in educational visits for knowledge exchange (community meetings, field trips, tours, and cultural activities) to other wetland areas in the region where climate change adaptation-related initiatives are underway (e.g., Sinú River and El Dique Canal/Magdalena River), as part of the activities under Output 4.2. These will be unique opportunities to learn from on-the-ground/face-to-face experiences and to share knowledge with other vulnerable communities in the Caribbean region.

*185.* Methodological guidelines will be developed for local governments that will include lessons learned in support of the incorporation of climate change adaptation considerations into environmental/land use planning and development plans for the target area municipalities (Output 4.3). Additionally, radio clips, regional television clips, and participatory systematization of lessons learned will complement the sharing of information.

*186.* Lessons learned will also be shared regionally and globally through the ALM, which is a collaborative knowledge-sharing platform for sharing adaptation experiences and good practices through an open/global learning process. The UNDP is operating the ALM in close partnership with the UNFCCC, the United Nations Environment Programme (UNEP), the WB, the GEF, and specialized UN agencies including the FAO.

*187.* Project costs for disseminating knowledge and lessons learned from the project are USD12,500 (an average of USD2,500 per year) and have been properly budgeted. Additionally, local level mechanisms for knowledge-sharing were properly budgeted as part of the activities to be completed through Component 4.

**H.** Describe the consultative process, including the list of stakeholders consulted, undertaken during project preparation, with particular reference to vulnerable groups, including gender considerations.

*188.* During the project preparation phase, consultations with interested parties were carried out through planning workshops, various focus group sessions, and semi-structured interviews and meetings with the national institutions proposing the project, as well as with institutions and communities in the target area of the project. The consulting process helped to clearly identify the roles and responsibilities of the principal participants in the project, to guarantee their full knowledge regarding the formulation of the project and its objectives, and to take advantage of the experience and capabilities of the participants in the definition of the project strategy and activities.

*189.* The project preparation process included holding meetings with staff from the Ministry of Foreign Relations, MADS, and IDEAM to define the scope of the proposal and the mechanisms to include other

national-level stakeholders, as well as regional- and local-level stakeholders. Following this, meetings were held with the DNP to identify ongoing projects and activities that are prioritized by the national government to address the impacts of the La Niña phenomenon in the region of the Depresión Momposina.

190. In order to clarify the objectives, scope, and results of the project, bilateral meetings and interviews were held with the focal points-of-contact of the previously mentioned organizations. Following this, focal-point plenary meetings were held to define the project's results framework. During the process, two workshops were held, the first with the national institutions mentioned above, and the second with the participation of other institutions such as the CORPOICA, the CVS, CORPOMOJANA, and the Omacha Foundation, a non-governmental organization working in the project's target area for community-based conservation and the management of wetlands and aquatic wildlife.

191. During the time between the two workshops, a field visit (mission) was made to the municipalities of San Marcos and Ayapel, during which semi-structured interviews and meetings with focus groups from regional institutions (CVS and CORPOMOJANA) were held. At the local level, consultations were held with the mayoral offices of Ayapel and San Marcos and the producers' associations in the towns of Sincelejito and Cecilia in the municipality of Ayapel.

192. Additionally, a local consultation workshop was held to present the project and its scope to local organizations and institutions. This workshop was the opportunity for local stakeholders to provide feedback to the project formulation team regarding the proposed project strategy, components, and expected outcomes. The discussion and review of the project proposal provided important inputs and local contributions to create consensus regarding the component indicators (regional and local information) to adjust the baseline and reach agreements on the proposed project goals and activities.

193. The local workshop was attended by delegates from the Departments of Córdoba and Sucre, who are charged with the coordination of actions of the CREPAD. These regional committees coordinate the efforts of local and regional authorities to prevent and mitigate climate-change risks, as well as the organization and logistics for emergency responses and disaster rehabilitation at the regional and local levels. These regional-level adaptation actions and measures will be included in development and land use planning instruments in order to reduce vulnerability and the negative effects of flooding and droughts.

194. At the local level, staff from the municipal offices of Ayapel and San Marcos was consulted. These municipal agencies have jurisdiction in the areas where communities affected by impacts from flooding and extreme climate events. Some of the adaptation measures adopted by the municipalities are related to housing, health, public services, education, food security, and emergency responses to affected communities during disaster events. The local community of Sincelejito, which is one of the most vulnerable communities in the target area, contributed to the consultation process with information regarding local adaptation measures related to production initiatives (agricultural and fishing) that were developed during prior flood events taking place from 2005 until 2011. The local workshop was also attended by CVS and CORPOMOJANA and the Omacha Foundation whose principal contributions was the adjustment of the project baseline, the identification of critical areas to implement actions for rehabilitating wetlands, and proposed sustainable productive activities for the benefit of local communities in the project area.

195. In the project target area 48% of the population are women; however, stereotypes and cultural perceptions about women have traditionally limited their participation in decision-making and planning. During the project preparation, adaptation alternatives were specifically proposed to help overcome existing inequalities in development and production opportunities for women as well as biased social

perceptions of the roles of women and men, to contribute equally in the reduction of their vulnerability, and to promote awareness among all stakeholders about the important role of women in the development and implementation of climate change adaptation measures.

196. In addition, representatives of Social Pastoral from the Departments of Sucre and Córdoba (Dioceses of of the Department of Sucre and Montelíbano municipality) attended the workshop. This organization represents NGOs that are charged with implementation actions (cultural activities and social support) to provide humanitarian assistance to families affected by extreme rainfall events with financial resources provided by the national government through its National Calamity Fund.

197. In addition to defining the role of the stakeholders in the project and identifying mechanisms for their participation, the consultation process identified areas in which additional institutional support may be required to guarantee the sustainability of the project's actions. This included consultations with the Colombian-Netherlands Water Partnership (CNWP), which is an alliance between the two countries to improve the implementation of integral water management in Colombia as a measure of climate adaptation by providing to Colombia proven international Dutch experience in integral water management. The CNWP could be a potential source of funding to complement actions in all of the project's components. This in turn, may contribute to the sustainability of the project's actions.

198. The following table summarizes the stakeholders consulted during this process:

<b>Organization(s) or person(s) consulted</b>	<b>Role/Responsibility</b>	<b>Issues addressed</b>	<b>Components analyzed</b>
Ministry of Environment and Sustainable Development (MADS)	<ul style="list-style-type: none"> <li>– Institution proposing the project to the Adaptation Fund on behalf of the GoC.</li> <li>– Provided conceptual and technical guidance for project formulation.</li> </ul>	<ul style="list-style-type: none"> <li>– Project scope.</li> <li>– Project management arrangements.</li> <li>– Selection of project's target area.</li> <li>– Review of project document and feedback.</li> </ul>	1, 2, 3, and 4
Institute of Hydrology, Meteorology, and Environmental Studies (IDEAM)	<ul style="list-style-type: none"> <li>– Provided meteorological and climatic information for the project area as well as information regarding the impact of the ENSO phenomenon in the Caribbean region and target municipalities.</li> <li>– Conceptual and technical development of project Component 1.</li> </ul>	<ul style="list-style-type: none"> <li>– Technical and advisory information about the project area regarding its vulnerability to variability and climate change.</li> <li>– Climatic and spatial information for project development.</li> </ul>	1 and 3
United Nations Development Programme (UNDP)	<ul style="list-style-type: none"> <li>– Provided technical and administrative support during project formulation and facilitated logistics for the field visit to the project area.</li> </ul>	<ul style="list-style-type: none"> <li>– Project scope and design.</li> <li>– Management arrangements.</li> <li>– Institutional relationships.</li> <li>– Selection of project's target area.</li> </ul>	1, 2, 3, and 4
National Planning Department (DNP)	<ul style="list-style-type: none"> <li>– Supplied information regarding the government's investment priorities in the project area and the development projects that have been approved.</li> <li>– Participated in the</li> </ul>	<ul style="list-style-type: none"> <li>– Information about ongoing projects and agreements to define current and projected infrastructure improvements in the project area to address flooding.</li> <li>– Analysis of the different</li> </ul>	2, 3, and 4

	consultation process and field visit with regional and local stakeholders.	government-sponsored initiatives in the area and coordination mechanisms with the project.	
Ministry of Foreign Relations	– Provided overall guidance to project formulation.	– Project scope and design.	1, 2, 3, and 4
Regional Autonomous Corporation of the Sinú and San Jorge Valleys (CVS)	– Provided information about the ongoing projects and the investments that are currently being proposed and/or implemented for the conservation and sustainable use of the ecosystems and natural resources in the Ayapel area. – Contributed with an analysis of condition of the wetlands in the Ayapel Integrated Management District.	– Planning for flooding and erosion control currently underway in the San Jorge River watershed and management of wetlands in the Municipality of Ayapel. – Community-based projects and ecological and hydrological rehabilitation processes in the Ayapel Integrated Management District. – Analysis of the impact of infrastructure development (dikes, canals, and roads) on the hydrology of the wetlands in the region.	2 and 3
Producers' association of the community of Sincelejito (Municipality of Ayapel)	– Provided an analysis of the impacts of flooding in the community of Sincelejito. – Relations with institutions during emergency situations and the perception of the community regarding adaptation processes.	– Community-based flood management. – Institutional relationships. – Food security and production options (fishing and agriculture) in the face of extreme climatic events. – Condition of housing and expectations for improvement according to their way of life. – Water management and impact on health.	2 and 3
Fishermen's association of the community of Cecilia (Municipality of Ayapel)	– Provided an analysis of the impacts of flooding in the community of Sincelejito. – Relations with institutions during emergency situations and the perception of the community on adaptation processes.	– Community-based flood management – Institutional relationships. – Food security and fishing in the face of extreme climatic events. – Condition of housing and expectations for improvement according to their way of life. – Water management and impact on health.	2 and 3
Ayapel Mayoral Office	– Provided information about the local population and infrastructure affected by of rains and flooding associated with the 2010-2011 the La Niña phenomenon, and about flood management options for the local government.	– Land use/management alternatives and production practices. – Feasibility of the relocation of the population affected by flooding.	3 and 4

Omacha Foundation	<ul style="list-style-type: none"> <li>– Provided on-the-ground support during the field visit to the municipality of Ayapel.</li> <li>– Provided information about the actions being carried out for the implementation of the management plan for the Ayapel Integrated Management District</li> </ul>	<ul style="list-style-type: none"> <li>– Strategies to promote community organizations and involvement.</li> <li>– Alternatives for improving the food security of local communities</li> <li>– Protection and management of ecosystem and aquatic sensitive species.</li> </ul>	2 and 3
Corporation for the Sustainable Development and the Mojana and the San Jorge (CORPOMOJANA)	<ul style="list-style-type: none"> <li>– Provided an analysis of the current condition of the wetlands in the La Mojana region and the social and ecological impacts of the 2010-2011 flood events.</li> <li>– Supplied information regarding projects approved by the Environmental Compensation Fund.</li> </ul>	<ul style="list-style-type: none"> <li>– Status of the hydrology of wetlands and streams, as well as the wildlife in the San Marcos wetland system.</li> <li>– Regional initiatives for the development of adaptive housing for flood-prone areas.</li> </ul>	2 and 3
Departmental Government of Sucre	<ul style="list-style-type: none"> <li>– Provided information about the local population and infrastructure affected by rains and flooding associated with the 2010-2011 the La Niña phenomenon, and about flood management options for the regional government.</li> </ul>	<ul style="list-style-type: none"> <li>– Regional projects and infrastructure improvements for flood control in the Department of Sucre (San Marcos and San Benito Abad municipalities).</li> <li>– Support and assistance to flooded towns.</li> <li>– Regional initiatives for the development of adaptive housing for flood-prone areas.</li> </ul>	3 and 4
CREPAD – Sucre	<ul style="list-style-type: none"> <li>– Provided information about actions carried out at the regional level to assist population and infrastructure affected by rains and flooding associated with the 2010-2011 the La Niña phenomenon.</li> <li>– Provided information about early alert systems existing in the region to prevent the effects of flooding.</li> </ul>	<ul style="list-style-type: none"> <li>– Regional projects and infrastructure improvements for flood control in the Department of Sucre (San Marcos and San Benito Abad municipalities).</li> <li>– Support and assistance to flooded towns.</li> <li>– Regional initiatives for the development of adaptive housing for flood-prone areas.</li> </ul>	1 and 4
San Marcos Mayoral Office	<ul style="list-style-type: none"> <li>– Provided information about the local population and infrastructure affected by rains and flooding associated with the 2010-2011 the La Niña phenomenon, and about flood management options for the local government.</li> </ul>	<ul style="list-style-type: none"> <li>– Local projects and infrastructure improvements for flood control in the San Marcos municipality.</li> <li>– Support and assistance to flooded towns.</li> <li>– Regional initiatives for the development of adaptive housing for flood-prone areas.</li> </ul>	3 and 4
Colombian Corporation for Agricultural Research (CORPOICA)	<ul style="list-style-type: none"> <li>– Provided information about research and food production alternatives for the La Mojana region, with consideration</li> </ul>	<ul style="list-style-type: none"> <li>– Food security and alternatives to improve agricultural production and fisheries.</li> </ul>	3

	given to increase in flooding.		
Pastoral Social (Dioceses of the Department of Sucre and Montelíbano municipality)	<ul style="list-style-type: none"> <li>– Provided information regarding humanitarian assistance to families affected by the 2010-2011 rainy season with financial resources from the national government.</li> </ul>	<ul style="list-style-type: none"> <li>– Support and assistance to flooded towns.</li> <li>– Regional initiatives for the development of adaptive housing for flood-prone areas.</li> <li>– Food security and fishing in the face of extreme climatic events.</li> <li>– Condition of housing and expectations for improvement according to communities' expectations.</li> <li>– Water management and impact on health.</li> </ul>	3 and 4
Mercy Corps	<ul style="list-style-type: none"> <li>– Provided information regarding humanitarian assistance to families affected by the 2010-2011 rainy season.</li> </ul>	<ul style="list-style-type: none"> <li>– Support and assistance to flooded towns.</li> <li>– Food security in the face of extreme climatic events.</li> <li>– Water management and impact on health.</li> </ul>	3 and 4

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

***Component 1 - The existing HEIS is strengthened and used by local- and regional-level stakeholders, improving their resilience to the impacts of climate change.***

***Baseline (without the AF investment)***

199. IDEAM currently has information about climate change in Colombia that is used in the decision-making processes for national programmes to reduce vulnerability to the impacts of climate change and to develop adaptation strategies. This includes the formulation of various studies and the use of hydrometeorological information<sup>32</sup> to determine the effects of climate change already observed in the country, and the development of the climatic scenarios that will likely occur during the next decades. This information was used to determine that Colombia has registered a temperature increase of 0.2°C to 0.3°C per decade and a monthly precipitation decrease of between 2 and 3 millimeters (mm) per decade between 1961 and 1990. It has also been used to make projections about the changes that will occur in the period from 2010 to 2090. These scenarios have shown that due to the effects of climate change, temperatures in Colombia would increase between 1°C and 4°C and would create a significant variation (between 15 and 30%) in precipitation for the period of 2070 to 2090. Among the most likely affected areas is the Caribbean region, where the Depresión Momposina region and the project area are located.

200. IDEAM also has an environmental alert and advisory system for hydrometeorological events that is used by the SNPAD, the National Environmental System (SINA), and is available to the public through the internet, radio stations, television, and other media. IDEAM also issues daily alerts and early warnings about the occurrence of fires using the SIGPI model (Geographic Information System for Fire Prevention), which incorporates threats derived from climate factors (daily accumulated precipitation and daily maximum temperature), biological factors (susceptibility of land cover to fires), and anthropogenic

<sup>32</sup> IDEAM has hydrological, meteorological, and environmental data in historical series that have been collected over several decades, and which by 2010 relied on 2,134 conventional hydrometeorological stations and 446 automated hydrometeorological stations that are distributed throughout the country.

factors (proximity to populated areas), in order to identify areas that are at risk to fires. All of the information is integrated into a HEIS, which is part of the Environmental Information System of Colombia (SIAC).

201. IDEAM is also developing sensitivity indices and vulnerability scenarios for the entire Caribbean region (1:1,500,000 scale) in order to determine the sensitivity of the region's land, vegetation, and productive systems to climate change, as well as the level of vulnerability of the populated areas to extreme climatological variations.

202. Despite the systems that are currently in place, the network of hydrometeorological stations in the project target area is limited. The hydrometeorological information generated by the existing stations only provides partial data about the region's hydroclimatological conditions, and decision-making regarding adaptation is only possible using coarse-scale hydroclimatological information (national [scale 1:4,000,000] and Caribbean region [1:1,500,000]). Without the AF investment, the ability of the local government authorities and community members to directly address risks related to extreme weather events in their areas will continue to be limited because the information upon which they base their decisions is not detailed enough to properly forecast climate variations.

***Additionality (with the AF investment)***

203. AF support will enable the development of a fine-scale hydroclimatological information and climate change monitoring system to provide detailed and timely information to feed a local early warning system, benefitting three municipalities with an estimated vulnerable population of 54,000 in the Depresión Momposina region. Additionally, the climate change-related information will be used to support decision-making at the regional and local levels so that development and land use planning will properly incorporate climate change considerations including ecosystem-based adaptation, introduction of resilient agriculture and production practices, and community-based adaptation. Specifically, the AF investment will generate needed regional information (i.e., hydrologic and hydraulic climate change-related modeling for the Depresión Momposina region) and local information (i.e., climate data obtained through an updated hydrometeorological network; and climate scenarios, trends in climate variability, and vulnerability analysis at fine scales [1:3,000 and 1:25,000]). The climate change information will be generated and used in a coordinated manner among national, regional, and local institutions and with local communities so that information reaches the most vulnerable populations in the area.

***Component 2 - Rehabilitation of wetlands and their hydrology in the target area as a means to reduce risk to flooding and drought associated with climate change and variability.***

***Baseline (without the AF investment)***

204. Wetlands are a vital element of the La Mojana subregion, in that they provide a range of ecological goods and services that constitute an important aspect of the regional and local economies. In the target area, the Ayapel lagoon/wetlands complex (in the Ayapel municipality); the San Marcos, Palo Alto, Tofeme, and La Caimanera wetlands (in the San Marcos municipality); and the Olaya, La Villa La India, Grande, and Pisisi wetlands (in the San Benito Abad municipality) are regionally important. These wetlands help to reduce the impacts caused by flooding, store water, maximize the settling processes of suspended materials and sediments, and serve as vital habitat (refuge, feeding grounds, and shelter) to a great number of animal and plant species, including bird and fish migratory species.

205. Unfortunately, the wetlands of the region and their associated ecosystems<sup>33</sup> are being adversely impacted by unsustainable development and production activities, and by climate change. In particular,

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<sup>33</sup> Other ecosystems highlighted within the ecological system of La Mojana include forests and natural grasses, secondary growths, aquatic vegetation native to the wetlands and river beaches, and flooded forests (known locally as "zapales"). The

the construction of canals and the filling of natural drainage areas have dried out the wetlands, thereby altering their hydrology, reducing their function in regulating water flows, and diminishing their capacity to respond to extreme climate events.

206. Deforestation has played a major role in the degradation of the region's wetlands and its basins, and has contributed to their sedimentation and clogging. A comparative analysis of satellite imagery from 1997-2004 that was performed as part of the Environmental Management Plan of the Ayapel Wetlands Complex (CVS, 2007) found that the processes of degradation of the Ayapel Wetlands Complex are stronger in the contributing systems, mainly in the Bagre, Barro, Muñoz, Viloría, Grande, and Quebradona canals, due to deforestation and land use change. An analysis of the changes in coverage for the basin of this wetland complex during 1987-2000 showed that during this time period the rate of deforestation was 355 hectares per year (4,615 hectares in 13 years). It showed that 78.56% of the forested area that existed in 1987 was lost. This percentage did not account for the forests that have been exposed to selective logging and the areas of regeneration that have been altered to allow for extensive cattle ranching.

207. The processes of deforestation and the impact on wetlands and lagoons are similar throughout other areas of the La Mojana subregion, as reported in the Environmental Management Plan of the wetlands associated with the lower watershed of the San Jorge River in the municipalities of San Marcos, Caimito, and San Benito Abad (CORPOMOJANA, 2000). This plan, as well as the Environmental Management Plan of the Ayapel Wetlands Complex, has recommended the rehabilitation and restoration of the wetlands and their upstream contributing systems as an important measure to re-establish some of the wetlands' hydrological and ecological functions. However, little progress has been made so far, and the recent flood events in La Mojana have made the need to rehabilitate and protect these wetlands all the more urgent.

*Additionality (with the AF investment)*

208. AF resources will be used to repair damaged ecological functions of wetlands to climate change in the project target area including the mitigation of the effect of prolonged flooding. This will be achieved by rehabilitating 700 hectares in the upstream contributing system to three key lagoon/wetland complexes, which will reduce the sedimentation rate of the lagoons and improve their ability to store excess water during extreme weather events and flooding. AF funds will also enable the creation of a 2,000-hectare multiple-use PA that will limit the use of the wetlands and minimize human impacts by only allowing sustainable activities within the area and preserving the wetlands' integrity. This will reduce the vulnerability of the wetlands to climate change, as healthier wetlands (i.e., wetlands with improved structure and ecological functions) are more resilient than altered systems. Additionally, the protection of wetlands and their sustainable use will allow a long-term supply of ecosystem services that will improve the coping capacity and livelihoods of the local communities. Repairing wetlands functions will also be improved through the implementation of hydraulic works in critical areas (dikes, and unclogging of water courses) that will aid in controlling the impacts of excess water and prolonged flooding resulting from extreme weather events. Finally, AF resources will help to reestablish traditional pre-Hispanic systems that control flooding and reduce the risk of river overflows due to climate change. As a whole, these measures will provide a multipart solution to the stresses that climate change and variability are imposing on local wetlands. They constitute a model approach of ecosystem-based adaptation that has a potential for replication in other parts of the Depresión Momposina region that are experiencing similar risks.

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flooded forests help to retain sediment originating from the rivers and are a productive source of organic material for the aquatic systems. In addition, they provide refuge, shade, and food for the wild fish and bird species of the region.

***Component 3 - Introduction of climate change-resilient agroecological practices and adapt building designs helps local communities to reduce their vulnerability to the impacts of climate change.***

***Baseline (without the AF investment)***

209. Climate change is likely to have long-term effects on food production and options for income-generation for local populations in La Mojana, particularly the rural communities that are the poorest and most vulnerable. Under the threat of climate change, there is an increasing risk that the traditional systems of production upon which the most vulnerable communities depend (small scale agriculture and cattle ranching) will be affected by extreme flooding, since the region has lost its buffer capacity and resilience to climate variation. The need to promote the production activities that are adapted to the climatic cycles of the region and their associated events (periodic flooding combined with short dry seasons) is widely recognized by the GoC and the civil sector. Plans have been defined and projects identified in response to this need, such as the *Priority Regional Action Plan for the Sustainable Development of La Mojana*, which ended in 2008 and the *Food Security Project for the Region of La Mojana* (DNP, 2004), to develop production initiatives that increase the availability, access, and use of agricultural products for families at risk through the diversified and self-sustainable local production of food. Despite these efforts, the tendency to rely on production systems that are not adapted to new climatic conditions persist. Local farmers have not yet realized the need to minimize climate change risks in their forms of production. As their traditional production practices are finely tuned to seasonal climate variations that are predictable and of which they have knowledge and experience, local farmers have not yet been made aware of the need to minimize climate change risks in their production processes. Under new conditions of climatic uncertainty these forms of production are being disrupted and their traditional techniques may not prove to be sufficient in sustaining production leading to a situation of food insecurity.

210. The increase vulnerability of local communities is due in part to the lack of adequate on-the-ground experience in promoting resiliency to climate change by combining traditional knowledge with appropriate conventional technologies that will guarantee a diversified and sustainable supply of agricultural and protein-based products, contributing to food security and the generation of income for the most vulnerable populations of La Mojana. Without the support of the AF, these vulnerable populations will continue to rely on production technologies that make farming and production highly vulnerable to flooding and will continue to lose crops, cattle, and housing due to the intensification of the rainy season and impacts from forecasted La Niña events.

***Additionality (with the AF investment)***

211. The AF investment will be used to encourage small farmers and vulnerable families in the 11 identified communities to use production practices that are adapted to the changing climatic cycles and flood conditions of the region. This will be achieved through the development of agricultural and cattle production practices that are resilient to climate change, in combination with traditional farming practices that have been proven to be the most resilient to the effects of climate change. Additionally, AF funds will promote the use by small- size farmers of agro-silvopastoral models to diversify production, cope with the climatic threats that directly affect them, and contribute to increasing their production capacity by using a more efficient form of production. Finally, AF funds will support in the development of an adaptive architecture programme that will include adapting existing houses that have been affected by flooding to make them more resilient to the effects of extreme climate-related events. The project will construct of three structural measures (elevated houses or houses on stilts) in the three targeted municipalities which will serve as alternatives to cope with flooding, and the design and construction of educational units built on stilts that will benefit the school-age population in selected communities within the project's target area.

***Component 4 - Relevant institutional and social structures strengthened for mainstreaming climate risk management and adaptation measures into planning and decision-making processes.***

***Baseline (without the AF investment)***

212. The national and regional governments, with technical assistance provided by the international community, have developed various initiatives during the last decade to resolve emergency situations caused by excessive rainfall and to support communities in the La Mojana subregion. These strategies are designed to promote development in the region that focuses on risk management, provides support for municipal plan development, establishes institutional agreements to design sustainable development programmes with the participation of local stakeholders, and strengthens public and private institutions and CBOs by promoting public, private, and social partnerships to foster cooperation among the groups. Nevertheless, these strategies have had only limited effect because of technical and budgetary restrictions on their implementation, and the lack of consideration of climate change and its effects. In addition, proposals for land use, environmental, and development plans have not been conceived as strategies for adapting to climate change, but as ex post support against disasters and as mechanisms to decrease risk to flooding within the aid context.

213. The Second National Communication to the UNFCCC identifies the need for citizen participation in developing adaptation measures and collaboration among local and regional authorities, communities, and economic sectors to achieve the proposed objectives of adaptation for the most vulnerable communities. The proposed guidelines for adaptation in the Second National Communication to the UNFCCC are to be included as part of the PNACC, which is currently being developed by the GoC; thus, there has been a slow development of adaptation measures in the country with only a few participatory planning experiences for adapting to climate change.

214. Without the AF investment it will not be possible in the near term to incorporate adaptation measures into territorial, environmental, or sectoral planning instruments in the La Mojana subregion. There will continue to be a low level of capacity among the local stakeholders (regional and local governments and CBOs) to lead the actions necessary to formulate a land use and management structure that facilitates the development of adaptive measures that are effective and sustainable. Local governmental and social organizations will continue to be weak and social and environmental vulnerability will persist, and possibly increase, due to the absence of strategies to reduce the conditions of risk to future floods and events related to climatic change and variability.

***Additionality (with the AF investment)***

215. This project will help to strengthen the community of institutional capacities that is needed to integrate climate change and adaptation considerations into territorial, environmental, and sectoral planning. More specifically, the AF investment will allow the development of community-institutional partnerships that will facilitate joint decision-making for the incorporation of climate change adaptation measures into regional and municipal land use plans, natural resources management plans, and development plans. Through the implementation of Component 1, the AF investment will provide regional and local stakeholders with the hydroclimatological information needed to make informed decisions in their planning efforts. Additionally, the training of technical staff from the three municipalities (Ayapel, San Marcos, and San Benito Abad), the Regional Autonomous Corporations - CARs (CORPOMOJANA and CVS), and members from CBOs on conventional and traditional techniques for flood management and control will contribute to improving their skills and building the confidence to face existing and future challenges of the effects of climate change. Capacities will be further strengthened through the sharing of knowledge by means of a number of national and international information-sharing networks and forums. Sharing of knowledge and information will also be key in up-

scaling successful results to other low lying and vulnerable areas within the Depresión Momposina region.

**J. Describe how the sustainability of the project/programme outcomes has been taken into account when designing the project.**

***Financial sustainability***

216. The sustainability of project outputs for Component 1 will be achieved through their incorporation into IDEAM's organizational programming. More specifically, the hydroclimatological stations to be updated by the project (i.e., replacing existing conventional hydroclimatological stations with automated stations) will be incorporated into the national hydroclimatological network administered by IDEAM, who will assume the maintenance of the stations as well as the cost of gathering, processing, analyzing, and distributing climate-related information after the AF project is finalized. This will allow for the continued generation of information to feed the forecasts, analysis of climate variability, as well as generation of climate risk and vulnerability scenarios for the target area. As part of the activities planned for Output 1.4, a financial strategy will be developed by IDEAM in conjunction with regional and local authorities and local communities for the sustainability of the local early warning system. The financial sustainability strategy will be developed during Year 2 of project implementation.

217. The sustainability of project outputs for Component 2 will be achieved by incorporating the adaptation measures to be implemented as part of the regional environmental authorities programming (i.e., PACs); actions to be developed in the Ayapel municipality will be included into CVS work while those for the San Marcos and San Benito Abad will be part of CORPOMOJANA's regular programming. The inclusion of the planned PA in the SINAP will allow it to benefit from long-term programming and future projects that will include PAs in the Caribbean region; this will provide CORPOMOJANA with additional resources and benefits for the implementation of the PA's management plan and its role as an ecosystem-based adaptation measure.

218. The sustainability of the outputs for Component 3 will be ensured by empowering local communities to mobilize financial resources (local and external) jointly with local and regional authorities and to involve national-level agencies such as the Ministry of Education and the Ministry of Commerce, as well as NGOs in the actions required for sustaining all of the adaptation measures implemented after the project's end. Through Component 4 the project will strengthen the knowledge and skills of local communities and civil authorities in the target area so that they can lead the efforts to reduce their vulnerability to climate change and variability. Additionally, through Output 4.3 the project will facilitate the incorporation of climate change adaptation considerations and guidelines into environmental/land use planning and development plans for the municipalities of Ayapel, San Marcos, and San Benito Abad (POTs and PDMs), for CORPOMOJANA and CVS (PACs and PGARs), and for the PDDs, which will guide all climate change adaptation-related investment in the medium term for the project area and benefit of the most vulnerable communities.

***Social sustainability***

219. Social sustainability will be achieved through the active participation of local communities in the implementation of the adaption measures proposed by the project. Community groups, community members, and women participation will be fostered and strengthened through the implementation of concrete adaptation measures that will promote social organization and provide alternatives for income generation and food production to enable individuals to better cope with the impacts of climate variability. The adaptation measures that are being proposed and that will directly benefit local communities and respond to their adaptation needs were identified jointly with members of the local communities in the target area. Thus, the proposed adaptations measures are community-driven and will

be implemented as part of a collaborative effort between community members and local and regional authorities. This approach, which includes capacity-building and awareness-raising related to climate change adaptation, will empower the participating social groups and will promote social organization for the development and implementation of strategies to reduce risk related to climate change.

220. The natural fiber craft program for women (Output 3.1) was designed considering the successful experiences that the CVS had in promoting similar initiatives within its jurisdiction, particularly with indigenous and local communities in the Sinú River watershed. For this purpose, CVS has partnered with Artesanías de Colombia, a corporation ascribed to the Colombian Ministry of Commerce, Industry, and Tourism, which promotes and contributes to the development of traditional and modern Colombian handicrafts and their marketing nationally and internationally.

221. Artesanías de Colombia has developed diverse projects with local and indigenous communities to promote craft as a source of jobs and income generation among communities, which ultimately empower women in each community and foster their participation in decision-making, providing control and means of artisanal production. In the context of the Mojana sub-region where participation of women in the local economy is weak, AF funds will enable groups of women to organize and decide upon a participatory manner with advice from Artesanías de Colombia which artisanal production can be developed or strengthened based on community techniques and available resources.

222. It is expected for the craft-making activities to be economically sustainable based on the proven business model of Artesanías de Colombia, where crafts are sold nationwide with the possibility to be exported depending on the demand of specific crafts. Artesanías de Colombia will charge a fee for marketing and transportation activities, providing the remaining income to the communities, therefore women leaders of the community will decide if to diversify or increase their craft production or use funds in other activities. Artesanías de Colombia aims to include La Mojana sub-region crafts under two possible schemes of financing: national investment project or international sources of funding, depending on the activities agreed by women in each community.

### ***Environmental sustainability***

223. The environmental sustainability of the project will be achieved through the implementation of a series of measures using an ecosystem-based adaptation approach. More specifically, the project will allow the sustainable management, conservation, and rehabilitation of wetlands and lagoons to provide services (e.g., water storage capacity and flood-buffering capacity) that will enable local communities in the target area to adapt to climate change impacts. The sustainability of these actions will be achieved by ensuring that these processes are not reversed (i.e., renewed ecosystem degradation); to this end, the project will actively involve local communities, landowners, and local and regional authorities in the conservation and rehabilitation efforts so that all related actions build awareness among local stakeholders as to the role of wetlands and other ecosystems in mitigating the effects of climate change, and incorporate concepts of ecosystem-based adaptation into local land use planning tools (e.g., land use zoning plans and development plans). The proposed project will allow the establishment of a protected area as a climate change mitigation strategy, to be included as part of the national system of protected areas; thus, it will be subjected to all national norms for protected areas, thereby providing a legal basis to enable its long-term management as an multiple-use area with climate change adaptation objectives.

### ***Institutional sustainability***

224. The foundation for the project's institutional sustainability is the community-institutional partnerships that will be build to promote the exchange of knowledge, experiences, and dialogue among the local communities, project staff, and local and regional civic authorities about climate change adaptation and vulnerability. Institutional sustainability is also associated with the capacity of local

communities and of local and regional authorities to influence collective decisions regarding the implementation of climate change adaptation measures in the target area and the La Mojana subregion. In this regard, the project will facilitate the incorporation of climate change adaptation considerations into local and regional environmental/land use planning and development plans, which will guarantee the institutional support of project actions and results after the project is completed. This will be further strengthened by articulating the planning instruments (i.e., environmental/land use plans and development plans) with the progress made at the national level in terms of climate change adaptation. Finally, the project will provide training in different topics related to climate change and adaptation to staff of local, regional, and national-level institutions directly involved in the reduction of risk and vulnerability of local communities and ecosystems. Improved institutional knowledge and skills will be instrumental in the development and implementation of adaptation measures during the life of the project and in the future, as well as for the replication of successful activities in other areas of the Depresión Momposina region and the country.

225. The proposed project's strategy and institutional arrangement are in line with the roles and responsibilities of the GoC's participating entities in climate change adaptation mitigation and adaptation (e.g., IDEAM, MADS, CORPOMOJANA, and CVS), as well as with the objectives and proposed actions within the Climate Change National System (recently created); the project will strengthen the institutions involved in project implementation to facilitate the development of their objectives regarding adaptation to climate change.

226. IDEAM is the hydrological and meteorological authority in Colombia and is responsible by law for the management of Colombia's environmental information system. IDEAM, as the Responsible Party for Component 1, as described in the implementation arrangement section of the proposal (refer to Part III, section A), was an active participant in the formulation of the project, and in addition to implementing Component 1, will provide technical support to the project regarding environmental and climatological aspects when required. The proposed interventions in Component 1 will be coordinated by IDEAM's Hydrology Branch with the support of the Meteorology Branch for the generation of climate change scenarios and of the Environmental Studies Branch concerning the analysis of the vulnerability of the target area and local communities. For the implementation of the activities in Component 1 (Outputs 1.1, 1.2, and 1.3), IDEAM will hire consultants within their consultant roster that have lengthy experience working with IDEAM. The technical staff from IDEAM's Hydrology Branch will supervise and guarantee the high quality and timely deliverable of project results. Regarding Output 1.4 (early warning system), IDEAM's staff will be directly responsible for operating spatial and hydrological models that will serve as tools for delivering risk warning messages to vulnerable communities and local authorities. Additionally, IDEAM's staff will be directly involved in defining the financial sustainability strategy for the early warning system. IDEAM's management of the hydrometeorological monitoring network includes coordination protocols and agreements between IDEAM and regional environmental authorities (CORPOMOJANA and CVS) as well as with local stakeholders (municipalities and CREPADs) for its effective operation; IDEAM's staff will ensure that all protocols and coordination mechanisms are followed for updating and operating the hydrometeorological network in the project target area.

## PART III: IMPLEMENTATION ARRANGEMENTS

A. Describe the arrangements for project / programme implementation.

227. The GoC will execute the project with the support of the UNDP under the **National Implementation Modality** (NIM). The MADS will be the Executing Entity responsible for ensuring that the objectives and components of the project are delivered, and that resources are allocated and disbursed in an efficient and effective manner. The MADS will have the technical and administrative responsibility

for applying AF inputs in order to reach the expected Outcomes/Outputs as defined in this project document. The MADS will be responsible for the timely delivery of project inputs and outputs, and in this context, for the coordination of all other responsible parties, including other government agencies, regional and local government authorities.

228. Upon the request of the GoC, UNDP will serve as the Multilateral Implementing Entity for this project. Services that UNDP will provide to the Implementing Partner in support of achieving project Outcomes/Outputs are outlined in Annex A. UNDP's services will be provided by staff in the UNDP Country Office (Bogotá), UNDP Regional Centre for Latin American and the Caribbean (Panama City, Panama), and UNDP Headquarters (New York).

229. UNDP will provide support to the National Project Director and the Project Coordinator in order to maximize its reach and impact as well as for the delivery of quality products. Moreover, it will be responsible for administering resources in accordance with the specific objectives defined in the Project Document, and in keeping with its key principles of transparency, competitiveness, efficiency, and economy. The financial management and accountability for the resources allocated, as well as other activities related to the execution of project activities, will be undertaken under the supervision of the UNDP Country Office (UNDP CO) with the UNDP's Regional Technical Advisor in Panama. UNDP will undertake the internal monitoring of the project and of evaluation activities, taking into account from the outset local capacities for administering the project, capacity limitations and requirements, as well as the effectiveness and efficiency of communications between all institutions that are relevant to the project.

230. UNDP would be fully accountable for the effective implementation of this project. As a Multilateral Implementing Entity, UNDP is responsible for providing a number of key general management and specialized technical support services. These services are provided through UNDP's global network of country, regional, and headquarters offices and units and include assistance in project formulation and appraisal; determination of execution modality and local capacity assessment; briefing and de-briefing of project staff and consultants; general oversight and monitoring, including participation in project reviews; receipt, allocation, and reporting to the donor of financial resources; thematic and technical backstopping; provision of systems, IT infrastructure, branding, and knowledge transfer; research and development; participation in policy negotiations; policy advisory services; programme identification and development; identifying, accessing, combining and sequencing financing; troubleshooting; identification and consolidation of learning; and training and capacity building.

231. As outlined in UNDP's application to the AF Board for accreditation as a Multilateral Implementing Entity, UNDP employs a number of project execution modalities determined on country demand, the specificities of an intervention, and a country context. Under the NIM proposed for the project, UNDP selects a government entity as the Executing Entity based on relevant capacity assessments performed by UNDP. The Executing Entity is the agency entrusted with and fully accountable to UNDP for successfully managing and delivering project outputs. It is responsible to UNDP for activities including: the preparation and implementation of project work plans and annual audit plans; preparation and operation of project budgets and budget revisions; disbursement and administration of funds; recruitment of national and international consultants and project personnel; financial and progress reporting; and monitoring and evaluation. However, as stated above, UNDP retains ultimate accountability for the effective implementation of the project.

232. Implementation of the project will be carried out under the general guidance of a **Project Steering Committee** (PSC). The PSC will be responsible for approving key management decisions of the project and will play a critical role in assuring the technical quality, financial transparency and overall development impact of the project. The PSC will be composed of designated senior-level representatives from the MADS, IDEAM, DNP, CORPOMOJANA, CVS, and the Alexander von Humboldt Research

Institute (IAVH). A complete list of PSC members and their designated alternates will be provided in the inception report. Terms of Reference (ToRs) for the PSC are included in Annex G.

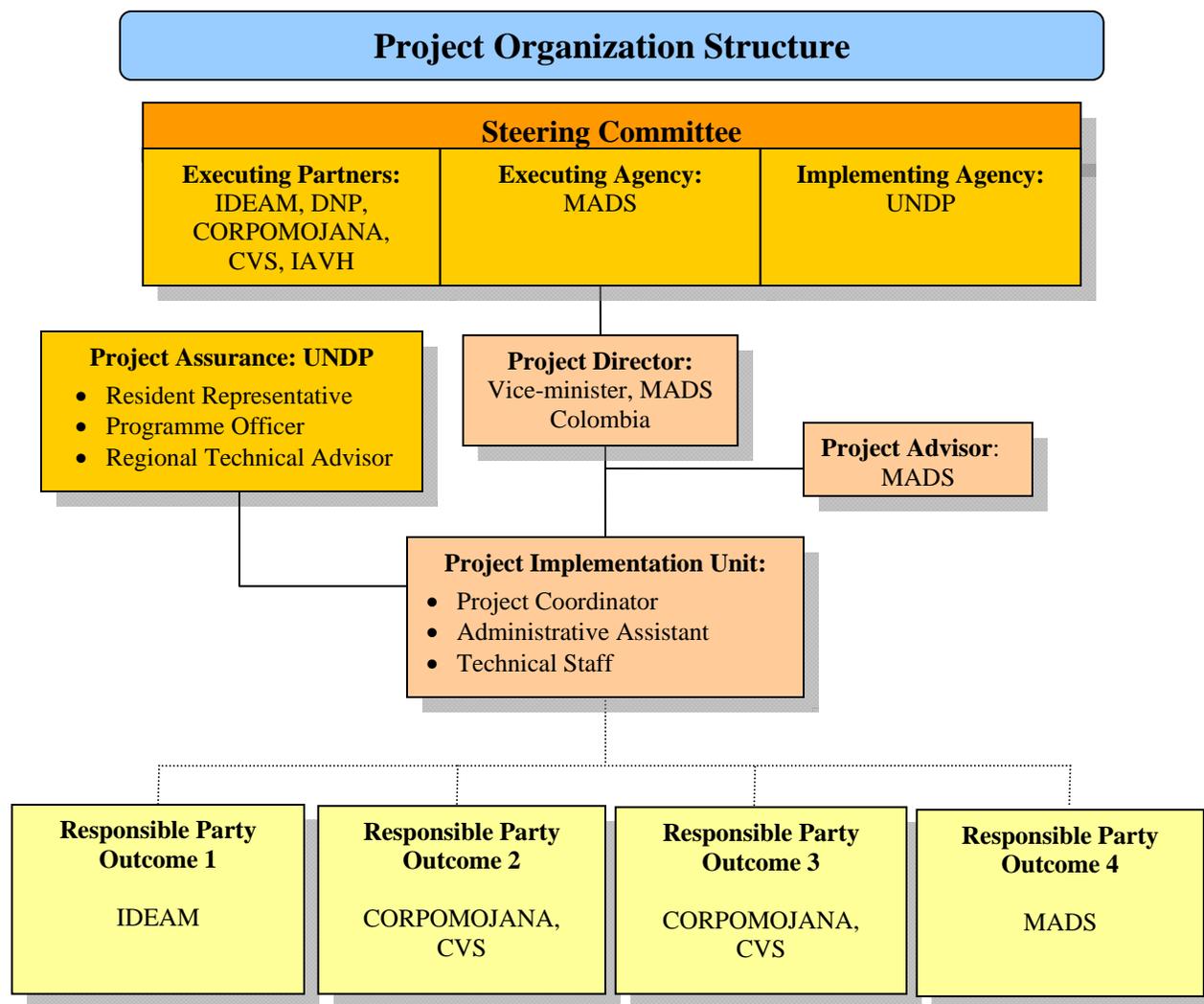
233. The **National Project Director** (NPD) will be the Vice Minister of the MADS (or the person designated by him/her) and will be responsible for orienting and advising the NPC on GoC policy and priorities. The NPD will also be responsible for maintaining regular communication with lead agencies (IDEAM, DNP, IAVH, CORPOMOJANA, and CVS) and ensuring that their interests are addressed and communicated effectively. Additionally, the NPD will define Letters of Agreement (LoA) with relevant counterparts for support in project execution of specific components, including IDEAM, CVS, and CORPOMOJANA. The costs of the NPD role will be borne by the Government of Colombia as in-kind contribution to the project. ToRs for the NPD are included in Annex G.

234. The **Project Coordinator** (PC) will be a dedicated professional designated for the duration of the project (5 years). The PC's prime responsibility is to ensure that the project produces the results specified in the Project Document to the required standard of quality and within the specified constraints of time and cost. The PC, in coordination with the NDP, will prepare an Annual Work Plan (AWP) that incorporates project activities and results to be delivered through the Plan. The AWP will define the execution timeframe for each activity and the responsible parties for its implementation. The first AWP will be finalized and incorporated into the Project Document within 30 days of its signature. The participation of project counterparts will be essential for the success of the planning phase, during which the AWP will be prepared. ToRs for the PC are included in Annex G.

235. The PC will be supported by a core team of technical and support staff consisting of technical specialists who will serve as focal points for the implementation of activities under components 1, 2, and 3, a junior-level professional who will provide overall technical support to the project, and an administrative and finance assistant (ToRs for the administrative and finance assistant are included in Annex G). The PC and the core team will form the Project Implementation Unit (PIU) to be locally located to execute project activities and oversee progress of technical project components, including day-to-day operations of the project, and the overall operational and financial management and reporting.

236. To deliver specific outputs as outlined in the project's results framework, the MADS will delegate such responsibilities to external partners (to be referred to as **Responsible Parties**) through direct contracting. The MADS will bear responsibility for the delivery of those Outputs and put in place adequate measures to oversee such work. Such institutions will be contracted through appropriate modalities (as advised by UNDP). The corresponding LoA will be annexed to the project document that will be signed between UNDP and the Government of Colombia once the AF project document has been endorsed.

237. The organigram of the project follows; details of programme execution costs are included in Annex B.



**B. Describe the measures for financial and project / programme risk management.**

238. Key risks underlying the project have been analyzed during the formulation phase in connection with the target sites of the project. Over the course of the project, a UNDP risk log will be regularly updated in intervals of no less than every six months in which critical risks to the project have been identified. The risks facing the project and the risk mitigation strategy (countermeasures) are summarized below:

No.	Type	Risk Description	Level*	Mitigation Strategy
1	Political	There is uncertainty regarding the local political will to incorporate adaptation measures into planning instruments.	M	<ul style="list-style-type: none"> <li>Participation of policy and decision-makers in workshops during the project preparation phase and consultation through various meetings and communications about the project's strategy, components, and expected outcomes.</li> <li>Active participation of policy and decision-makers in key moments during the life of the</li> </ul>

No.	Type	Risk Description	Level*	Mitigation Strategy
				<p>project (approval, inception, implementation, and mid-term and final evaluations).</p> <ul style="list-style-type: none"> <li>• Dialogue and exchange of information among key stakeholder through “platforms for association” to promote awareness and ownership of adaptation and climate risk reduction processes.</li> </ul>
2	Institutional	Decision-making processes at the regional and local levels are slow.	L	<ul style="list-style-type: none"> <li>• Project Implementation Unit will operate directly in the project area to promote decision-makers’ involvement in the project and keep authorities and decision-makers informed about the development and achievements of the project.</li> <li>• Permanent political and technical support will be provided to the project and its stakeholders by the agencies of the GoC that are involved in the project (IDEAM, MADS), as well as coordination of actions with the project team and regional and local stakeholders.</li> </ul>
3	Regulatory	There are conflicting interests among stakeholders with respect to land ownership and access to and use of natural resources.	M	<ul style="list-style-type: none"> <li>• The project will benefit multiple stakeholders with diverse production interests, including subsistence farmers and small- and medium-size landowners, through the implementation of adaptive agroecological initiatives.</li> </ul>
4	Political	There is weak governance and security issues in the region.	M	<ul style="list-style-type: none"> <li>• A training programme will contribute to strengthening civil authorities at the local level (municipal: mayoral offices and CLOPADs) and regional level (CARs, Departmental Governments, and CREPADs).</li> <li>• Permanent communication between the project team with local authorities.</li> </ul>
5	Operational	There is resistance from some stakeholders in adopting the proposed measures.	L	<ul style="list-style-type: none"> <li>• A training programme for community members, community leaders, and civil authorities will raise awareness about locally important issues related to climate change and adaptation.</li> <li>• Three platforms of association (one for each municipality in the project area) will promote dialogue and build trust among stakeholders and facilitate incorporation of lessons learned and replication in the target area.</li> <li>• To mitigate the risk related with acceptance by local stakeholders of the proposed multi-use PA the project will held meetings and working groups from the start of the project to create awareness about the role of the PA as climate change adaptation strategy. Additionally, the project will make use of the lessons learned from the declaration process of the nearby PA/Management District of Ayapel that was established in 2009.</li> </ul>

No.	Type	Risk Description	Level*	Mitigation Strategy
6	Financial	Delays in executing funding at the regional level.	L/M	<ul style="list-style-type: none"> <li>• Project activities have been designed and paced to ensure a reasonable chance of completion after the timeframe of the project.</li> <li>• UNDP and MADS will provide permanent support for the mobilization of funds, contracting, monitoring, and financial reporting.</li> <li>• UNDP will develop a financial capacity assessment for all regional responsible parties and will provide specific technical assistance and management support to each agency based on the results of such assessments.</li> </ul>
7	Financial	GoC is not able to leverage sufficient financial resources for the sustainability of project actions.	L	<ul style="list-style-type: none"> <li>• A financial sustainability strategy for the early warning system will be developed beginning in Year 2 of project implementation.</li> <li>• The project will strengthen the institutional basis for accessing public and private sources of climate change finance in the future to attract additional sources of funding.</li> <li>• UNDP will provide support to the GoC in securing and mobilizing climate change-related financing.</li> </ul>

239. A comprehensive risk management strategy will be a core component of project management activities. This is in line with UNDP's stringent risk management approach which is corporate policy. The respective UNDP CO provides support to the project team and executing agency for constant and consistent risk monitoring, and the results are tracked and reported in UNDP's internal risk monitoring system. Risks will be entered into the UNDP's Atlas (project management system) and will be systematically monitored as part of the M&E process by UNDP staff carrying out their oversight related tasks. The results are also reported in the yearly evaluation undertaken for each project.

240. In addition to this, and again in keeping with UNDP practice, a dedicated budget line exists for Monitoring and Evaluation (M&E), to ensure that the necessary resources are allocated to execute the M&E framework.

C. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan. Include break-down of how Implementing Entity's fees will be utilized in the supervision of the monitoring and evaluation function.

241. Project M&E will be in accordance with established UNDP procedures and will be carried out by the project team under the oversight of the UNDP Country Office. Dedicated support by the technical adaptation teams in the UNDP Panama Regional Center and UNDP New York will be provided on a regular basis. The Results Framework defines execution indicators for project implementation as well as the respective means of verification. The monitoring and evaluating system for the Project will be established based on these indicators and means of verification. Periodic monitoring of implementation progress will be undertaken by the UNDP-CO through quarterly meetings with the project proponent, or more frequently as deemed necessary. This will allow parties to take stock and to troubleshoot any problems pertaining to the project in a timely fashion to ensure smooth implementation of project activities.

242. A **Project Inception Workshop** will be conducted within two months of project start up with the full project team, relevant government counterparts, and UNDP. The Inception Workshop is crucial to

building ownership for the project results and to plan the first year AWP. A fundamental objective of the Inception Workshop will be to present the modalities of project implementation and execution, document mutual agreement for the proposed executive arrangements amongst stakeholders, and assist the project team to understand and take ownership of the project’s goals and objectives. Another key objective of the Inception Workshop is to introduce the project team which will support the project during its implementation. An Inception Workshop Report will be prepared and shared with participants to formalize various agreements decided during the meeting.

243. A UNDP **risk log** will be regularly updated in intervals of no less than every six months in which critical risks to the project have been identified. **Quarterly Progress Reports** will be prepared by the Project team and verified by the Project Board. **Annual Project Reports** will be prepared to monitor progress made since project start and in particular for the previous reporting period. These annual reports include, but are not limited to, reporting on the following:

- Progress made toward project objective and project outcomes - each with indicators, baseline data and end-of-project targets (cumulative);
- Project outputs delivered per project Outcome (annual);
- Lessons learned/good practices;
- Annual expenditure reports;
- Reporting on project risk management.

244. Government authorities, members of the project PSC, and UNDP staff will conduct regular field visits to project sites based on the agreed schedule in the project’s Inception Report/Annual Work Plan to assess first hand project progress.

245. In terms of financial monitoring, the project team will provide UNDP with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of funds according to the established procedures set out in the Programming and Finance manuals. The Audit will be conducted in accordance with UNDP Financial Regulations and Rules and applicable audit policies on UNDP projects by a legally recognized auditor of the GoC, or by a commercial auditor engaged by the GoC.

246. The project will undergo an independent **Mid-Term External Evaluation** at the mid-point of project implementation, which will determine progress being made toward the achievement of outcomes and identify course correction if needed. It will focus on the effectiveness, efficiency, and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation, and management. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project’s term. A **Final External Evaluation** will be conducted 3 months before project closure and will focus on the same issues as the Mid-Term Evaluation. The Final Evaluation will also look at the impact and sustainability of project results.

247. The budgeted M&E plan is as follows and the break-down of how Implementing Entity’s fees will be utilized in the supervision of the M&E function is included in Annex A.

Type of M&E activity	Responsible Parties	Budget (USD) <i>(does not include staff time)</i>	Time frame
Inception Workshop (IW)	▪ Project Coordinator	3,000	Within first two months

	<ul style="list-style-type: none"> <li>▪ UNDP-CO</li> </ul>		of project start up
Inception Report	<ul style="list-style-type: none"> <li>▪ Project team</li> <li>▪ UNDP-CO</li> </ul>	None	Within one month of IW
Measurement of Means of Verification for Project Purpose Indicators	<ul style="list-style-type: none"> <li>▪ Project Coordinator</li> </ul>	None	Start, mid, and end point of project implementation
Measurement of Means of Verification for Project Progress and Performance (measured on an annual basis)	<ul style="list-style-type: none"> <li>▪ Project Coordinator</li> </ul>	None	Annually prior yearly reports and to the definition of annual work plans
Quarterly Reports	<ul style="list-style-type: none"> <li>▪ Project team</li> </ul>	None	Quarterly
Annual Reports	<ul style="list-style-type: none"> <li>▪ Project team</li> <li>▪ Executing Agency</li> <li>▪ UNDP-CO</li> </ul>	None	At the end of each year
Meetings of the Project Steering Committee (SC)	<ul style="list-style-type: none"> <li>▪ Project Coordinator</li> <li>▪ UNDP-CO</li> <li>▪ Project Director</li> </ul>	None	After the inception workshop and thereafter at least once a year.
Technical Reports	<ul style="list-style-type: none"> <li>▪ Project team</li> <li>▪ External consultants</li> </ul>	8,000	To be determined by Project team and UNDP CO
Mid-term External Evaluation	<ul style="list-style-type: none"> <li>▪ Project team</li> <li>▪ UNDP-CO</li> <li>▪ External consultants</li> </ul>	25,000	At the mid-point of project implementation.
Final External Evaluation	<ul style="list-style-type: none"> <li>▪ Project team</li> <li>▪ UNDP-CO</li> <li>▪ External consultants</li> </ul>	35,000	At the end of project implementation
Final Report	<ul style="list-style-type: none"> <li>▪ Project team</li> <li>▪ UNDP-CO</li> </ul>	None	At least one month before the end of the project
Visits to Field Sites (UNDP staff travel costs to be charged to IA fees)	<ul style="list-style-type: none"> <li>▪ SC members</li> <li>▪ GoC representatives</li> <li>▪ UNDP CO</li> </ul>	15,000	Yearly
Publication of Lessons Learned	<ul style="list-style-type: none"> <li>▪ Project Team</li> </ul>	12,500	Yearly
Audit	<ul style="list-style-type: none"> <li>▪ UNDP-CO</li> <li>▪ Project team</li> </ul>	22,500	Following UNDP finance regulations and rules
<b>TOTAL INDICATIVE COST</b>		<b>121,000</b>	

D. Include a results framework for the project proposal, including milestones, targets and indicators and sex-disaggregate targets and indicators, as appropriate. The project or programme results framework should align with the goal and impact of the Adaptation Fund and should include at least one of the core outcome indicators from the AF's results framework that are applicable.

	<b>Indicator</b>	<b>Baseline</b>	<b>End of Project Targets</b>	<b>Verification Mechanisms</b>	<b>Risks and Assumptions</b>
<b>Project objective:</b> To reduce the vulnerability of communities and ecosystems in the region of La Depresión Momposina to flood and drought risks associated with climate change and variability.	Number of poor households in three municipalities in the project area vulnerable to climate-related events (disaggregated by gender).	– La Mojana was severely affected by the La Niña event of 2010-2011. Approximately 211,857 people (43.4% of the total population) were affected in 2010 by flooding in this area. The three target municipalities present an average NBI of 62.25% which is well above the national average of 27.27%, indicating high levels of poverty and low levels of access to education, housing, health, and basic sanitation and sewer services.	– By the end of the project, at least 54,000 of the most vulnerable people (10,800 families) in the municipalities of Ayapel, San Marcos, and San Benito Abad of the Depresión Momposina region, covering an area of 406,054 ha, will benefit from the proposed direct solutions to problems caused by flooding.	– Surveys – Vulnerability and risk assessments	– Decision-makers at all levels are willing to mainstream climate change considerations into planning and programming in a timely manner. – Availability of climate-related information and agroecological models encourage local communities to implement adaptation measures. – There are no substantial changes in the land use/cover.
<b>Outcome 1:</b> The existing hydroclimatological and ecological information system (HEIS) is strengthened and	Number of hydroclimatological stations in La Mojana reporting climate-related data as part of the national network.	– The project area has: a) two (2) automated flow stations linked to IDEAM's alert system (in the Cauca River near the project area); b) five (5) precipitation-measuring	– By the end of the project at least two (2) automated hydrological stations, two (2) automated climatological stations, and five (5) automated precipitation stations, some	– Field reports – Climate-related databases – Project reports: annual reports; mid-term and final evaluations	– Hydroclimatological and ecological information is available in a timely manner. – Rural communities take advantage of the

<p>used by local- and regional-level stakeholders, improving their resilience to the impacts of climate change.</p>		<p>stations; c) two (2) climatological stations; d) one (1) water level-measuring station in the San Marcos lagoon/wetlands complex; and e) one (1) water level-measuring station in the Ayapel lagoon/wetlands complex.          – There are no local monitoring networks.</p>	<p>with satellite transmission operating.</p>		<p>available information.</p>
	<p>Number of institutions and local- and regional-level stakeholders that have access to climate change-related information and integrate it into their work.</p>	<p>– There is only a national-level climate change effects scenario evaluation tool in use.</p>	<p>– By the end of the project direct access at the local and regional levels to information related to climate change is increased in the three targeted municipalities as follow:          a) three mayoral offices (Ayapel, San Marcos, and San Benito Abad); b) three CLOPADs; c) two CREPADs; d) two CARs (CVS and CORPOMOJANA); and e) eleven CBOs.</p>	<p>– Local surveys          – Information request and access logs          – Documents for locally developed plans and projects          – Project reports: annual reports; mid-term and final evaluations</p>	
	<p>Number of rural communities and local and regional institutions in the target area benefiting from an early warning system that reduces risks to extreme</p>	<p>– There is no early warning system in the project area; the only warnings provided are alerts regarding the Cauca River and rainfall that IDEAM issues through periodic bulletins.          – Daily bulletins from</p>	<p>– 100% of rural communities (6,440 women and 6,860 men) and local and regional institutions in the project area benefit from an early warning system after 5 years.</p>	<p>– Early warning reports          – Surveys          – Project reports: annual reports; mid-term and final evaluations</p>	

	climate events.	CVS based on IDEAM's reports.			
<b>Outcome 2:</b> Rehabilitation of wetlands and their hydrology in a target area as a means to reduce risk to flooding and drought associated with climate change.	Percentage of households in La Mojana that benefit from infrastructure to control flooding (disaggregated by gender).	– A provisional work in the Sejeve area to control flooding and 146 affected families in 2010 in the towns of Sincelejito, Cecilia, and Sejeve (Ayapel municipality). – Zero (0) infrastructure and 500 affected families in 2010 in the towns of El Pital, Cuenca y Las Flores (San Marcos municipality). – Zero (0) infrastructure and 138 affected families in 2010 in the towns of Las Chispas, Pasifiere, Tornobán, Chinchorro y El Torno (San Benito Abad municipality).	– By the end of the project, at least 50% of the families in the three targeted municipalities benefit from infrastructure to control flooding, as follow: <ul style="list-style-type: none"> <li>• At least 50% of the families (656 women and 712 men) in the towns of Sincelejito, Cecilia, and Sejeve (Ayapel municipality).</li> <li>• At least 50% of the families (746 women and 808 men) in the towns of El Pital, Cuenca y Las Flores (San Marcos municipality)</li> <li>• At least 50% of the families (3,534 women and 3,820 men) in the towns of Las Chispas, Pasifiere, Tornobán, Chinchorro y El Torno (San Benito Abad municipality).</li> </ul>	– Surveys and field reports – Project evaluations: annual reports; mid-term and final evaluations	– Local and regional planners, landowners, farmers, and local communities understand the value of combining conventional and traditional flood control systems to reduce risk. – Environmental authorities and local communities work together to incorporate ecosystem conservation measures into risk reduction strategies.
	Area (hectares [ha]) of pre-Hispanic flood systems recovered	– Zero (0)	– Ninety (90)	– Field reports by IDEAH – Geo-referenced field and topographic maps – MOUs with local stakeholders	

				(landowners, farmers, and members of local communities)	
Area (ha) of rehabilitated wetlands that help to reduce vulnerability to climate change.	<ul style="list-style-type: none"> <li>- 250 hectares reforested with <i>Acacia magnum</i> in 2004 along the La Quebradona stream in the Ayapel lagoon/wetlands complex (Ayapel municipality).</li> <li>- 120 hectares reforested in 2004 with oak trees along the Muñoz, San Mateo and Trejos streams (San Marcos municipality; most trees were lost in 2005 due to flooding).</li> <li>- Zero (0) ha rehabilitated in the San Benito Abad municipality.</li> </ul>	<ul style="list-style-type: none"> <li>- By the end of the project at least 700 hectares in the upstream contributing system to three key lagoon/wetland complexes, rehabilitated, as follow: <ul style="list-style-type: none"> <li>• 550 ha rehabilitated in the upstream contributing system to the Ayapel lagoon/wetland complex (Barro, Muñoz, Viloría, La Quebradona, and La Escobilla streams).</li> <li>• 75 ha rehabilitated in the upstream contributing system to the San Marcos lagoon/wetland complex (western bank of the San Jorge River along the Santiago and Canoas creeks).</li> <li>• 75 ha rehabilitated in the upstream contributing system to the San Benito Abad wetlands (Grande and Corozal creeks).</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>- Rehabilitation plans</li> <li>- Field surveys</li> <li>- Project reports: annual reports; mid-term and final evaluations</li> </ul>		
Number of conservation and	<ul style="list-style-type: none"> <li>- One (1) regional protected area (PA) in the</li> </ul>	<ul style="list-style-type: none"> <li>- One (1) additional multi-use PA covering 2,000 ha</li> </ul>	<ul style="list-style-type: none"> <li>- Technical reports</li> <li>- Participatory</li> </ul>		

	management tools approved and implemented.	target area of the project: Integrated Management District of Ayapel, covering 145,000 ha.	protects the La Caimanera wetlands, its associated ecosystems, and pre-Hispanic remains for flood control and hydrological management in the San Marcos municipality.	agreements – Resolution of the Board of Directors of the Environmental Authority to establish the PA – Official gazette – Satellite images of boundaries to assess conservation state	
<b>Outcome 3:</b> Introduction of climate change-resilient agroecological practices and building designs helps local communities to reduce their vulnerability to the impacts of climate change.	Number of local agroecological initiatives that are resilient to climate change adopted by the communities (disaggregated by gender) in the target area of the project.	<ul style="list-style-type: none"> <li>– In the Ayapel area the following is in progress: a) nine trials using gardens built on stilts (known locally as “trojas”) that cover 0.86 ha and benefit 178 families.</li> <li>– In the San Marcos and San Benito area, the following has been developed: a) productive farmyards with 12 CBOs; and b) 80 organic gardens on river flats, covering 20 ha.</li> </ul>	<ul style="list-style-type: none"> <li>– By the end of the project at least six (6) local agroecological initiatives implemented in the target municipalities as follow: <ul style="list-style-type: none"> <li>• Twenty (20) additional vegetable gardens built on stilts for growing vegetables and tubers (e.g., onion, lettuce, yam, pumpkin, squash, and tomato), covering two (2) ha in the Ayapel municipality and that benefit 415 families (996 women and 1,079 men).</li> <li>• Sixty (60) family-based organic food gardens for fast growing varieties of vegetables, tubers, and fruits (e.g., beans, cassava, corn, yam, pumpkin, squash, watermelon, and</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>– Field surveys and inventories</li> <li>– Field reports</li> <li>– Monitoring databases</li> <li>– Project technical reports</li> </ul>	<ul style="list-style-type: none"> <li>– Agroecological models and adaptive housing prove to be beneficial to local farmers.</li> <li>– There is a good understanding among local stakeholders regarding access to and use of the land and natural resources in the project area.</li> </ul>

			<p><b>cantaloupe</b>) (2 ha/family) located in two community parcels on river flats (one in the San Marcos municipality and the other in the municipality of San Benito Abad).</p> <ul style="list-style-type: none"> <li>• 440 ha of native rice crops (<b>resistant to wet conditions, low cost, and no use of agrochemicals</b>) in 11 towns in the project area and that benefit 2,640 families (<b>6,340 women and 6,860 men</b>).</li> <li>• A programme to develop natural-fiber crafts benefiting <b>up to 120</b> women in the three municipalities.</li> </ul>		
	<p>Number of adaptive structural architectural measures undertaken in the target area to reduce vulnerability to flooding.</p>	<ul style="list-style-type: none"> <li>– 10 educational units built on stilts in the communities of Cecilia (3), El Totumo (4), El Cuchillo (1), and La Coquera (2) (Ayapel municipality) with the support of the Education Ministry.</li> <li>– Proposal to build 8 classrooms in the municipality of Ayapel.</li> <li>– There are no adaptive</li> </ul>	<ul style="list-style-type: none"> <li>– By the end of the project at least 70 housing and school structural measures implemented in the target area, as follow: <ul style="list-style-type: none"> <li>• Ten (10) additional educational units built on stilts and/or floating in order to address flood risks in the municipalities of Ayapel, San Marcos,</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>– Architectural designs and floor plans</li> <li>– Local surveys</li> <li>– Field reports</li> <li>– Project reports: annual reports; mid-term and final evaluations</li> </ul>	

		housing units in the municipalities of Ayapel, San Marcos, and San Benito Abad; however, some designs have been developed.	and Benito Abad, and benefiting 350 students (170 girls and 180 boys). <ul style="list-style-type: none"> <li>• Sixty (60) existing houses adapted to reduce the risk of rural populations (60 women, 60 men, 115 girls, and 125 boys) to impacts from flooding in the municipalities of Ayapel, San Marcos, and San Benito Abad, benefiting approximately 300 people.</li> <li>• Three (3) communal buildings/housing models on stilts and/or floating houses to address risk from flooding (one for each municipality).</li> </ul>		
	Number of ha established with agro-silvopastoral systems in the target area of the project.	– 50.7 ha established in agro-silvopastoral systems for three users in the rural area of the Ayapel municipality. – Zero (0) ha in the municipalities of San Marcos and San Benito Abad.	– An additional 250 ha established in agro-silvopastoral systems in the rural area of the project’s target area (100 ha in the municipality of Ayapel, 75 ha in the municipality of San Marcos, and 75 ha in the municipality of San Benito Abad).	– Reports and field verifications – Project reports: annual reports; mid-and final evaluations	
<b>Outcome 4:</b>	Number of public agencies and CBOs	– There are 7 active civil organizations	– 25 CBOs, including a women association of craft	– Minutes of the meetings	– Stakeholders successfully establish

<p>Relevant institutional and social structures strengthened for mainstreaming climate risk management and adaptation measures into planning and decision-making processes.</p>	<p>that jointly participate in climate risk management and adaptation planning.</p>	<p>(AGROPISCA, ASOPECE, ASODEPACA, ASOPESIN, ASOAGROLLERAS, ASONEGRITOS, and ASOPESPAL) in the Ayapel municipality; however, they currently do not address the issue of adaptation to climate change.</p> <ul style="list-style-type: none"> <li>- There are 8 active civil organizations (FIDES, AGROMOJANA, COOAGRISANMARCOS, Comité de Mujeres, COPEVI, ACUASUCRE, Asociación de Pescadores, and SERVIPESCA) in the San Marcos municipality; however, they currently do not address the issue of adaptation to climate change.</li> <li>- There are 38 civil organizations in the San Benito Abad municipality; however, it is unknown how many are active.</li> <li>- There are 9 public agencies (MADS, IDEAM, CVS, CORPONOJANA, departmental governments of Córdoba and Sucre, and mayoral offices of Ayapel,</li> </ul>	<p>weavers, and community leaders of the 3 municipalities (10 in Ayapel, 12 in San Marcos, and 3 in San Benito Abad, of which at least 3 are women) are strengthened and promoting skills for adaptation in their communities and which are articulated with the local, regional, and national public agencies.</p> <ul style="list-style-type: none"> <li>- Nine (9) public agencies are strengthened and promoting measures for adapting to climate change in the target area, and which are articulated with CBOs.</li> </ul>	<ul style="list-style-type: none"> <li>- Agreements between agencies and CBOs</li> <li>- Project reports: annual reports; mid-term and final evaluations</li> </ul>	<p>mechanisms for cooperation and joint work.</p> <ul style="list-style-type: none"> <li>- Willingness by decision-makers to incorporate adaptation considerations into planning mechanisms.</li> <li>- Institutions and individuals recognize the value of training and apply new skills.</li> <li>- Lessons learned are identified and analyzed in a timely manner, supporting the effective sharing of knowledge.</li> </ul>
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		San Marcos, and San Benito Abad) with knowledge about climate change issues in the target area, but that currently do not adequately articulate with the CBOs.			
	Number of local and regional plans that mainstream adaptation to climate change considerations.	<ul style="list-style-type: none"> <li>- Regional Environmental Corporations – CARs (CVS and CORPOMOJANA) have Regional Environmental Management Plans (PGARs) and 4-Year Action Plans (PACs) that consider climate change issues but do not include strategies to reduce vulnerability or adaptation considerations.</li> <li>- The Departmental Development Plans (PDDs) for Córdoba and Sucre include strategic guidelines for risk management and disaster prevention, but do not make reference to climate change and adaptation.</li> <li>- The three municipalities have Land Zoning Plans (POTs) and Municipal Development Plans (PDMs) that include strategic guidelines for risk management and disaster</li> </ul>	<ul style="list-style-type: none"> <li>- Twelve (12) plans that incorporate considerations for adaptation to climate change: a) two PGARs for the CARs; b) two PACs the CARs; c) two PDDs for departmental governments; d) three municipal POTs; and e) three municipal PDMs</li> </ul>	<ul style="list-style-type: none"> <li>- Meeting minutes from the presentation of proposals before the agencies in charge of planning and land use instruments.</li> <li>- Published planning instruments</li> </ul>	

		prevention, but only include a general mention of climate change and its effects (floods, landslides, avalanches).			
	Number of government staff (local, regional, and national) and community members who effectively apply new skills to climate change risk reduction (disaggregated by gender).	<ul style="list-style-type: none"> <li>- Basic emergency management training for flood risks has been conducted for the communities of Cecilia, Sincelejito, and Sejeve (Ayapel municipality), Viloría (San Marcos municipality), and Las Chispas (San Benito Abad municipality) with support from CARITAS – Germany, the diocese of Sucre and Montelíbano (Sucre) and the National Secretariat of Pastoral Social.</li> <li>- The community has basic knowledge about ecological rehabilitation and houses or other constructions on stilts, but has not connected this with reduced climatic risk and adaptation.</li> <li>- The community has medium-level knowledge about traditional and alternative systems for agricultural production.</li> <li>- The CARs (CVS and</li> </ul>	<ul style="list-style-type: none"> <li>- At least 50% of the population in 11 communities (including approximately 3,170 women) in the project area, the three mayoral offices, the CLOPADs, the two CARs, and the two CREPADs (Córdoba and Sucre) have adequate knowledge about measures of adaptation to climate change that are proposed by the project, including interpretation and use of hydroclimatological information, ecological rehabilitation and wetlands conservation, agroecological practices and adaptive architecture; and their roles in adapting to the impacts of climate change.</li> </ul>	<ul style="list-style-type: none"> <li>- Training protocols</li> <li>- Training attendance lists and databases</li> <li>- Capacity development evaluation reports</li> <li>- Project evaluations: annual reports; mid-term and final evaluations</li> <li>- Proposals developed at the local level for the implementation of adaptation measures in the target area.</li> </ul>	

		<p>CORPOMOJANA) have basic knowledge about climatic change and adaptation.</p> <ul style="list-style-type: none"> <li>- CARs have a high level of knowledge about: a) ecological rehabilitation and b) alternative and traditional agricultural systems.</li> </ul>			
	<p>Lessons learned from pilot activities in La Mojana disseminated through the National Climate Change Portal (NCCP) and the Adaptation Learning Mechanism (ALM).</p>	<ul style="list-style-type: none"> <li>- Zero (0)</li> </ul>	<ul style="list-style-type: none"> <li>- At least <b>ten</b> (10) lessons learned for each project component, <b>including one gender-related lesson learned</b>, are disseminated through the NCCP and the ALM.</li> </ul>	<ul style="list-style-type: none"> <li>- NCCP and ALM web pages and electronic registries.</li> <li>- Number of visits to web page</li> <li>- Active links and feedback related to the project within the NCCP.</li> </ul>	

E. Include a detailed budget with budget notes, a budget on the Implementing Entity management fee use, and an explanation and a breakdown of the execution costs.

Project Outcome/Atlas Activity	Responsible Party/Implementing Agent	Donor Name	Budget Description	2012	2013	2014	2015	2016	Total (USD)	Budget Notes
<b>OUTCOME 1: The existing hydroclimatological and environmental information system (HEIS) is strengthened and used by local- and regional-level stakeholders, improving their resilience to the impacts of climate change</b>										
Output 1.1 - Hydrologic and hydraulic models for the Depresión Momposina region and the project's target area support medium- and long-term decision-making.	IDEAM/MADS	Adaption Fund	Local Consultants	81,310	88,320				169,630	1
			Travel	41,700	4,060				45,760	2
			Rental & Maint Info Tech Eq	3,640	28,120				31,760	3
			Miscellaneous Expenses	2,350	2,500				4,850	4
			<b>Sub-Total Output 1.1</b>	<b>129,000</b>	<b>123,000</b>				<b>252,000</b>	
Output 1.2 - Climate scenarios, trends in climate variability, and vulnerability analysis for the target area supports decision-making for planning instruments and the implementation of adaptation measures.			Local Consultants	152,535	130,470				283,005	5
			Travel	3,553	7,176				10,729	6
			Materials and Goods	31,765	3,000				34,765	7
			Workshops & meetings	3,400	5,250				8,650	8
			Rental & Maint Info Tech Eq	15,247	14,604				29,851	9
			Miscellaneous Expenses	3,500	5,500				9,000	10
			<b>Sub-Total Output 1.2</b>	<b>210,000</b>	<b>166,000</b>				<b>376,000</b>	
Output 1.3 - Mechanisms for gathering, processing, and managing hydroclimatological information at the regional and local levels are strengthened and articulated with the national hydroclimatological network.			Local Consultants	10,590	84,810	84,810	84,810	84,810	349,830	11
			Contractual Services – Companies	70,865					70,865	12
			IT Equipment	190,545					190,545	13
			Rental & Maint Info Tech Eq		13,690	13,690	13,690	13,690	54,760	14
			Miscellaneous Expenses	1,000	500	500	500	500	3,000	15
	<b>Sub-Total Output 1.3</b>	<b>273,000</b>	<b>99,000</b>	<b>99,000</b>	<b>99,000</b>	<b>99,000</b>	<b>669,000</b>			
Output 1.4 - An early warning system developed at the local level to prepare local	Contractual Services – Individuals		160,130	16,480	16,480	16,480	209,570	16		
	Travel		5,250	2,838	2,838	2,838	13,764	17		

Project Outcome/Atlas Activity	Responsible Party/Implementing Agent	Donor Name	Budget Description	2012	2013	2014	2015	2016	Total (USD)	Budget Notes
communities to reduce their vulnerability to extreme weather events.			Materials and Goods		625	625	625	625	2,500	18
			Workshops & meetings		4,500	1,500	1,500	1,500	9,000	19
			Rental & Maint Info Tech Eq		21,495	1,057	1,057	1,057	24,666	20
			Miscellaneous Expenses		5,000	1,500	500	500	7,500	21
			<b>Sub-Total Output 1.4</b>		<b>197,000</b>	<b>24,000</b>	<b>23,000</b>	<b>23,000</b>	<b>267,000</b>	
			<b>Sub-Total Outcome 1</b>	<b>612,000</b>	<b>585,000</b>	<b>123,000</b>	<b>122,000</b>	<b>122,000</b>	<b>1,564,000</b>	
<b>OUTCOME 2: Rehabilitation of wetlands and their hydrology in the target area as a means to reduce risk to flooding and drought associated with climate change and variability.</b>										
Output 2.1 - Hydraulic works (infrastructure development, dredging, and unclogging of water courses) for flood control and hydrological management are in place in the target area.			Local Consultants	11,000	32,075	23,850	23,850	23,825	114,600	22
			Travel		1,550	775	775	775	3,875	23
			Contractual Services – Companies	250,000	850,000				1,100,000	24
			Materials and Goods		250	250	250	250	1,000	25
			Workshops & meetings		500	500	500	500	2,000	26
			Miscellaneous Expenses		625	625	625	650	2,525	27
			<b>Sub-Total Output 2.1</b>	<b>261,000</b>	<b>885,000</b>	<b>26,000</b>	<b>26,000</b>	<b>26,000</b>	<b>1,224,000</b>	
Output 2.2 - Traditional pre-Hispanic systems of flood control, agricultural production, management of fluvial systems, and responses to drought are reestablished in the target area.	CVS, CORPOMOJANA/MADS	Adaptation Fund	Local Consultants	45,800	30,000	10,590	10,590	10,590	107,570	28
			Travel	3,900		1,460	1,460	1,460	8,280	29
			Contractual Services – Companies		115,000	33,050	33,050	33,050	214,150	30
			Materials and Goods	800		900	900	900	3,500	31
			Workshops & meetings	1,500	1,500	1,300	1,300	1,300	6,900	32
			Miscellaneous Expenses	1,000	500	700	700	700	3,600	33
			<b>Sub-Total Output 2.2</b>	<b>53,000</b>	<b>147,000</b>	<b>48,000</b>	<b>48,000</b>	<b>48,000</b>	<b>344,000</b>	
Output 2.3 - Ecosystems associated with the hydrodynamics of the			Local Consultants	37,095	23,310	36,030	36,030	36,030	168,495	34
			Travel	1,805	5,500	5,500	4,000	4,000	20,805	35

Project Outcome/Atlas Activity	Responsible Party/Implementing Agent	Donor Name	Budget Description	2012	2013	2014	2015	2016	Total (USD)	Budget Notes
target area are rehabilitated, enhancing their ability to mitigate the effects of flooding.			Contractual Services – Companies		426,663	427,620	428,020		1,282,303	36
			Materials and Goods	600	5,927	2,250	1,750	1,750	12,277	37
			Workshops & meetings		1,825	1,825	575	575	4,800	38
			Miscellaneous Expenses	500	775	775	625	645	3,320	39
			<b>Sub-Total Output 2.3</b>	<b>40,000</b>	<b>464,000</b>	<b>474,000</b>	<b>471,000</b>	<b>43,000</b>	<b>1,492,000</b>	
Output 2.4 - A 2,000-hectare protected area (PA) is established providing long-term ecosystem goods and services improving the coping capacity and livelihoods of local communities in the face of climate change.			Local Consultants	13,500	193,100	51,980	52,405		310,985	40
			Travel	3,000	3,800	3,520	7,750		18,070	41
			Contractual Services – Companies				20,000		20,000	42
			Materials and Goods	3,000	4,100	3,000	4,500		14,600	43
			Workshops & meetings	15,000	6,000	7,000	17,500		45,500	44
			Miscellaneous Expenses	1,500	8,000	2,500	4,845		16,845	45
			<b>Sub-Total Output 2.4</b>	<b>36,000</b>	<b>215,000</b>	<b>68,000</b>	<b>107,000</b>		<b>426,000</b>	
			<b>Sub-Total Outcome 2</b>	<b>390,000</b>	<b>1,711,000</b>	<b>616,000</b>	<b>652,000</b>	<b>117,000</b>	<b>3,486,000</b>	
<b>OUTCOME 3: Introduction of climate change-resilient agroecological practices and building designs helps local communities to reduce their vulnerability to the impacts of climate change.</b>										
Output 3.1 - Climate change-resilient agricultural and women-oriented production practices (vegetable and organic gardens on stilts and native rice) adopted in the target area.	CVS, CORPOMOJANA/MADS	Adaptation Fund	Local Consultants	10,590	34,150	34,150	34,150	34,150	147,190	46
			Travel		2,060	2,060	2,065	2,065	8,250	47
			Contractual Services – Companies	182,410	226,540	226,540	125,505	125,505	886,500	48
			Miscellaneous Expenses		1,250	1,250	1,280	1,280	5,060	49
			<b>Sub-Total Output 3.1</b>	<b>193,000</b>	<b>264,000</b>	<b>264,000</b>	<b>163,000</b>	<b>163,000</b>	<b>1,047,000</b>	
Output 3.2 - Structural measures for housing and school to respond to climate-related risks or threats designed and implemented benefitting			Local Consultants	11,000	45,435	45,435	10,590	10,590	123,050	50
			Travel		5,000	5,000			10,000	51
			Contractual Services – Companies		430,565	430,565	17,410	16,410	894,950	52

Project Outcome/Atlas Activity	Responsible Party/Implementing Agent	Donor Name	Budget Description	2012	2013	2014	2015	2016	Total (USD)	Budget Notes
approximately 650 people.			Materials and Goods		2,000	2,000			4,000	53
			<b>Sub-Total Output 3.2</b>	<b>11,000</b>	<b>483,000</b>	<b>483,000</b>	<b>28,000</b>	<b>27,000</b>	<b>1,032,000</b>	
Output 3.3 - At least 250 ha with climate-resilient agro-silvopastoral measures established to help vulnerable small-scale farmers to mitigate the effects of flooding.			Local Consultants	34,150	34,150	34,150	34,150	34,150	170,750	54
Travel			1,700	1,700	1,700	1,700	1,700	8,500	55	
Contractual Services – Companies									56	
Materials and Goods			90,750	90,750	90,750	90,750	90,750	453,750	57	
Miscellaneous Expenses			1,200	1,200	1,200	1,200	1,200	6,000	58	
<b>Sub-Total Output 3.3</b>			<b>129,000</b>	<b>129,000</b>	<b>129,000</b>	<b>129,000</b>	<b>129,000</b>	<b>645,000</b>		
<b>Sub-Total Outcome 3</b>			<b>333,000</b>	<b>876,000</b>	<b>876,000</b>	<b>320,000</b>	<b>319,000</b>	<b>2,724,000</b>		
<b>OUTCOME 4: Relevant institutional and social structures strengthened for mainstreaming climate risk management and adaptation measures into planning and decision-making processes</b>										
Output 4.1 - Lessons learned from interventions codified by MADS and used to raise awareness about managing climate change-induced flood and drought risks.	MADS	Adaptation Fund	Local Consultants	14,725	4,500	4,500	4,500	4,500	32,725	59
			Travel	7,300	1,425	1,425	1,425	1,425	13,000	60
			Materials and Goods	2,000	1,500	1,500	1,500	1,500	8,000	61
			Workshops & meetings	15,000	11,000	10,000	10,000	10,000	56,000	62
			Miscellaneous Expenses	2,975	575	575	575	575	5,275	63
			<b>Sub-Total Output 4.1</b>	<b>42,000</b>	<b>19,000</b>	<b>18,000</b>	<b>18,000</b>	<b>18,000</b>	<b>115,000</b>	
			Output 4.2 - Communities and local authorities in targeted municipalities trained in climate change threats related to flooding and adaptation measures which reduce vulnerability.	Local Consultants	5,760	11,650	11,650	11,650	11,650	52,360
Travel			6,940	6,700	6,700	6,700	6,700	33,740	65	
Materials and Goods			1,500	2,000	2,000	2,000	2,000	9,500	66	
Workshops & meetings			16,300	12,800	12,800	12,800	12,800	67,500	67	
Miscellaneous Expenses			1,500	850	850	850	850	4,900	68	
<b>Sub-Total Output 4.2</b>			<b>32,000</b>	<b>34,000</b>	<b>34,000</b>	<b>34,000</b>	<b>34,000</b>	<b>168,000</b>		
Output 4.3 - Climate risk management considerations built into regional and local			Local Consultants		16,200	16,200	16,200	16,200	64,800	69
	Travel	2,000	4,325	5,100	3,100	2,395	16,920	70		
	Materials and Goods	750	1,500	750	750	750	4,500	71		

Project Outcome/Atlas Activity	Responsible Party/Implementing Agent	Donor Name	Budget Description	2012	2013	2014	2015	2016	Total (USD)	Budget Notes
territorial, environmental, and sectoral planning tools are articulated with national planning guidelines.			Workshops & meetings	12,000	19,500	7,500	7,500	6,750	53,250	72
			Miscellaneous Expenses	1,250	1,475	1,450	1,450	905	6,530	73
			<b>Sub-Total Output 4.3</b>	<b>16,000</b>	<b>43,000</b>	<b>31,000</b>	<b>29,000</b>	<b>27,000</b>	<b>146,000</b>	
			<b>Sub-Total Outcome 4</b>	<b>90,000</b>	<b>96,000</b>	<b>83,000</b>	<b>81,000</b>	<b>79,000</b>	<b>429,000</b>	
<b>Project/Programme Execution</b>										
<b>Monitoring &amp; Evaluation</b>	<b>MADS</b>	<b>Adaptation Fund</b>	Consultants	4,100	4,500	20,600	4,500	26,350	60,050	74
			Travel	3,000	3,000	9,960	3,000	12,530	31,490	75
			Contractual Services – Companies	7,900	4,500	5,440	4,500	7,120	29,460	76
			<b>Sub-Total M&amp;E</b>	<b>15,000</b>	<b>12,000</b>	<b>36,000</b>	<b>12,000</b>	<b>46,000</b>	<b>121,000</b>	
<b>Project Management</b>			Contractual Services - Individuals	91,140	91,140	91,140	91,140	91,140	455,700	77
			Travel	105,000	14,000	14,000	14,000	14,000	161,000	78
			IT Equipment	5,460					5,460	79
			Communications	4,200	3,400	3,400	3,400	3,400	17,800	80
			Rental & Maintenance Premises	14,400	14,400	14,400	14,400	14,400	72,000	81
			Equipment & Furniture	7,500					7,500	82
			Supplies	1,300	1,300	1,300	1,300	1,300	6,500	83
			Miscellaneous Expenses	3,000	2,760	2,760	2,760	2,760	14,040	84
	<b>Sub-Total Project Management</b>	<b>232,000</b>	<b>127,000</b>	<b>127,000</b>	<b>127,000</b>	<b>127,000</b>	<b>740,000</b>			
				<b>Sub-Total Project Management and M&amp;E</b>	<b>247,000</b>	<b>139,000</b>	<b>163,000</b>	<b>139,000</b>	<b>173,000</b>	<b>861,000</b>
<b>TOTAL Project/Programme Cost</b>				<b>1,672,000</b>	<b>3,407,000</b>	<b>1,861,000</b>	<b>1,314,000</b>	<b>810,000</b>	<b>9,064,000</b>	

## Budget Notes

1	Contracts for national experts for the development of H-H models for the region of the Depresión Momposina and the project target area. <b>Consultants include:</b> Activity 1.1.1. Bathymetry for the Cauca and Magdalena River: Engineer (1) and Technician (2). Activity 1.1.2. Bathymetry for lagoons/wetlands in the project target area: Engineer (1) and Technician (1). Activity 1.1.3. Hydroclimatic characterization: Hydrology Engineer (1) and Meteorologist (1). Activity 1.1.4. H-H modeling: Hydrology Modeling Engineer (1) and Assistant Engineer (1).
2	Travel costs for field surveys related to bathymetry analysis and H-H model calibration.
3	Rental of IT equipment for H-H modeling.
4	Miscellaneous costs associated with H-H modeling.
5	Contracts for national experts for the development of climate scenarios, trends in climate variability, and vulnerability analysis for the target area. <b>Consultants include:</b> Activity 1.2.1. Methodology for the CC vulnerability analysis: Ecologist (1), Biologist (1), Statistician (1), and Economist (1). Activity 1.2.2. CC scenarios: Meteorologist (1). Activity 1.2.3. Analysis of runoff changes: Hydrology Engineer (1). Activity 1.2.4. Flood-risk maps: Hydrology Engineer (1), GIS Expert (1), Engineer for satellite image processing (1), Hydrology Engineer for satellite image/data analysis (1), and Meteorologist for satellite image/data analysis (1). Activity 1.2.5. Vulnerability and climatic trends: Hydrology Engineer (1), GIS Expert (1).
6	Travel costs for field surveys related to the development flood-risk maps.
7	Satellite images for climate, risk, and vulnerability analysis.
8	Workshops and meetings to define climate the change vulnerability analysis methodology jointly with local stakeholders.
9	Rental of IT equipment for climate, risk, and vulnerability analysis.
10	Miscellaneous costs associated with climate, risk, and vulnerability analysis.
11	Contracts for national experts for validating and storing hydroclimatological information. <b>Consultants include:</b> Activity 1.3.1. Automated hydrometeorological stations: no local consultants required. IDEAM's staff will be responsible for purchasing all the necessary equipment. Activity 1.3.2. Validating and storing information: Hydrology Engineer (1), Meteorologist (1), and Technician (1). Activity 1.3.3. Monthly information updates: covered as part of IDEAM's co-financing.
12	Contractual services for the installation of automated hydrometeorological stations.
13	Automated hydrometeorological stations: hydrology (2), precipitation (5), and climate (2).
14	Rental of IT equipment for validating and storing hydroclimatological information.
15	Miscellaneous costs associated with validating and storing hydroclimatological information.
16	Contractual services for the development of an early warning system for the project target area.
17	Travel to project target area for the development of an early warning system.
18	Office, printing, and field materials related to the development of an early warning system.
19	Workshops and meetings to define vulnerability scenarios jointly with local stakeholders.
20	Rental of IT equipment for the development of an early warning system for the project target area.
21	Miscellaneous costs associated with the development of an early warning system for the project target area.
22	Contracts for project staff (1, part time) and a national consultant for providing technical assistance, supervision, and monitoring of impacts of hydraulic works for flood control and hydrological management.
23	Travel costs associated with the monitoring of impacts of hydraulic works for flood control and management.
24	Contractual services for: a) hydraulic characterization of critical areas, b) assessment of natural and overflow streams and obstructions, and c) hydraulic works for flood control and management.
25	Office and field materials for monitoring of impacts of hydraulic works for flood control and management.
26	Costs of workshops and meetings related to the monitoring of impacts of hydraulic works for flood control and management.
27	Miscellaneous costs associated with the monitoring of impacts of hydraulic works for flood control and management.
28	Contracts for project staff (1, part time) and national consultants for the traditional pre-Hispanic systems of flood control, agricultural production, management of fluvial systems, and responses to drought.

29	Travel costs associated with identifying areas of pre-Hispanic systems for rehabilitation and the monitoring of activities.
30	Contractual services for rehabilitating and reestablishing traditional pre-Hispanic systems/models for hydrological management and production.
31	Office and field materials related to identifying areas of pre-Hispanic systems for rehabilitation and for the monitoring of activities.
32	Costs of workshops and meetings with landowners and local authorities regarding the reestablishment of traditional pre-Hispanic systems for hydrological management and production.
33	Miscellaneous costs associated with the reestablishment of traditional pre-Hispanic systems for hydrological management and production.
34	Contracts for project staff (1, part time) and national consultants for providing technical assistance, supervision, and monitoring of ecosystem rehabilitation in the target area.
35	Travel costs associated with environmental assessment of contributing watersheds and rehabilitation monitoring and reporting programme
36	Contractual services for implementing ecological rehabilitation measures in selected contributing watersheds to key lagoon/wetland complexes.
37	Office and field materials related to environmental assessment of contributing watersheds, development of rehabilitation protocols, and rehabilitation monitoring and reporting programme.
38	Costs of workshops and meetings with landowners and local authorities regarding the development of rehabilitation protocols and assessment of rehabilitation impacts.
39	Miscellaneous costs associated with the environmental assessment of contributing watersheds, development of rehabilitation protocols, and rehabilitation monitoring and reporting programme.
40	Contracts for project staff (1, part time) and national consultants for the declaration of a 2,000-hectare multiple-use PA as an adaptive measure.
41	Travel costs associated with the declaration of a 2,000-hectare multiple-use PA.
42	Office and field materials related to the declaration of a 2,000-hectare multiple-use PA.
43	Contractual services for the demarcation of boundaries of the PA.
44	Costs of workshops and meetings with local and regional stakeholders to establish agreements, discuss, and inform about the declaration of a 2,000-hectare multiple-use PA.
45	Miscellaneous costs associated with the declaration of a 2,000-hectare multiple-use PA.
46	Contracts for project staff (1, part time) and national consultants for the implementation of climate change-resilient production practices in the target area.
47	Travel costs associated with the development of a programme for the sustainable use of natural fibers by women and the assessment of the adaptation benefits of agroecological practices.
48	Contractual services for implementing: a) vegetable gardens on stilts, b) ecological vegetable gardens in river flats, and c) native rice crops for food security & surplus.,
49	Miscellaneous costs associated with the development of a programme for the sustainable use of natural fibers by women and the assessment of the adaptation benefits of agroecological practices.
50	Contracts for project staff (1, part time) and national consultants for the development of an adaptive architecture programme in flood-prone areas.
51	Travel costs associated with architectural designs, and technical and logistic support to the adaptive architecture programme.
52	Contractual services for a) updating houses to reduce flood impacts, b) construction of housing models on stilts and/or floating houses, c) construction of educational units on stilts, and d) school transportation programme.
53	Materials related to architectural designs for adaptive housing and constructions.
54	Contracts for project staff (1, part time) and a national consultant for technical support for the development of agro-silvopastoral models to reduce vulnerability of local farmers and for the assessment of the adaptation benefits of agroecological practices.
55	Travel costs associated with technical support for the development of agro-silvopastoral systems.
56	Contractual services for the development of agro-silvopastoral systems in the rural zone of the project target area.
57	Field and farm materials related to technical support for the development of agro-silvopastoral systems.
58	Miscellaneous costs associated with technical support for the development of agro-silvopastoral systems.
59	Contracts for national consultants for facilitating the creation of platforms of association to strengthen local communities for the implementation of adaptation measures.
60	Travel costs associated with the creation of platforms of association.
61	Office and field materials related to the creation of platforms of association.
62	Costs of workshops and meetings with local and regional stakeholders for the development of a strategy to strengthen local capacity to adapt to climate change and the creation of at least three platforms of association.
63	Miscellaneous costs associated with the development of a strategy to strengthen local capacity to adapt to climate change and the creation of at least three platforms of association.
64	Contracts for national consultants for capacity building of local and regional stakeholders regarding climate change and adaptation.
65	Travel costs associated with capacity building of local and regional stakeholders: a) educational visits for knowledge exchange, b) training modules, and c) assessment of training impact.

66	Training materials associated with: a) educational visits for knowledge exchange, b) training modules, and c) assessment of training impact.
67	Costs of workshops and meetings for capacity building of local and regional stakeholders: a) educational visits for knowledge exchange, b) training modules, and c) assessment of training impact.
68	Miscellaneous costs associated with the implementation of the climate change and adaptation capacity building programme for local and regional stakeholders.
69	Contracts for national consultants for facilitating the incorporation of climate change adaptation considerations into local and regional environmental, land use, and development plans.
70	Travel costs associated with training of project staff in methodologies to include climate risk management practices in sectoral and territorial planning instruments, and for the development guidelines for the integration of climate change adaptation into planning tools.
71	Office and planning materials related to reviewing existing land use planning tools and development of guidelines for including climate change adaptation considerations into planning tools.
72	Costs of workshops and meetings with local and regional stakeholders for reviewing existing land use planning tools and development of guidelines for including climate change adaptation considerations into planning tools.
73	Miscellaneous costs associated with the incorporation of climate change adaptation considerations into local and regional environmental, land use, and development plans.
74	Contracts for external mid-term and final evaluations, review and systematization of lessons learned and best practices and technical reports on specific topics related to the project.
75	Travel costs for external mid-term and final evaluations, and field visits by Project Steering Committee.
76	Contracts for project inception workshop; mid-term and final evaluation-related workshops; and external audit (5).
77	Project staff: a) Project coordinator: project planning, day-to-day project management, reporting, etc.; b) Professional 1: project management support; c) Financial Assistant: financial management, accounting, purchasing, and reporting.
78	PMU travel for project supervision, monitoring, and support to technical components. Includes: a) two vehicles (1 car and 1 boat), gas, maintenance; and b) air travel and daily subsistence allowance (DSA).
79	PMU equipment: five computers, one fax/printer.
80	PMU communication cost (includes four cell phones).
81	PMU office rental & utilities (60 months).
82	PMU office furniture: 6 desks, 6 chairs, one video beam, one video camera, other.
83	PMU office supplies.
84	Incidental expenses related to project management.



Output 4.1 - Lessons learned from interventions codified by MADS and used raise awareness about managing climate change-induced flood and drought risks.	10,500	10,500	10,500	10,500	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	3,000	115,000	
Output 4.2 - Communities and local authorities in targeted municipalities trained in climate change threats related to flooding and adaptation measures which reduce vulnerability		10,667	5,333	5,333	10,667	5,950	9,350	9,350	9,350	9,350	9,350	9,350	9,350	9,350	9,350	9,350	9,350	9,350	9,350	9,350	9,350	9,350	168,000	
Output 4.3 - Climate risk management considerations built into regional and local territorial, environmental, and sectoral planning tools are articulated with national planning guidelines	2,800	4,400	4,400	4,400	10,750	10,750	10,750	10,750	10,750	7,750	7,750	7,750	7,750	7,750	7,250	7,250	7,250	7,250	7,250	7,250	6,750	6,750	146,000	
Project Execution, M&E	61,750	61,750	61,750	61,750	34,750	34,750	34,750	34,750	34,750	40,750	40,750	40,750	40,750	40,750	34,750	34,750	34,750	34,750	34,750	34,750	43,250	43,250	861,000	
<b>Total</b>					<b>1,672,000</b>					<b>3,407,000</b>					<b>1,861,000</b>					<b>1,314,000</b>			<b>810,000</b>	<b>9,064,000</b>

### Disbursement schedule

	Upon Agreement signature	One Year after Project Start	Year 2	Year 3	Year 4	Total
Scheduled Date	12-Mar	13-Mar	14-Mar	15-Mar	16-Mar	
Project Funds	1,672,000	3,407,000	1,861,000	1,314,000	810,000	9,064,000
Fee	308,176	85,272	173,757	94,911	67,014	770,440
<b>Total</b>	<b>1,757,272</b>	<b>3,580,757</b>	<b>1,955,911</b>	<b>1,381,014</b>	<b>851,310</b>	<b>9,834,440</b>

**PART IV: ENDORSEMENT BY GOVERNMENT AND CERTIFICATION BY THE IMPLEMENTING ENTITY**

**A. RECORD OF ENDORSEMENT ON BEHALF OF THE GOVERNMENT<sup>34</sup>** *Provide the name and position of the government official and indicate date of endorsement. If this is a regional project/programme, list the endorsing officials all the participating countries. The endorsement letter(s) should be attached as an annex to the project/programme proposal. Please attach the endorsement letter(s) with this template; add as many participating governments if a regional project/programme:*

<p><i>Mr. Carlos Castaño, Vice-Minister, Ministry of Environment and Sustainable Development (MADS) &amp; Designated Authority for the Adaptation Fund</i></p>	<p><i>Date: December 19, 2011</i></p>
--	---------------------------------------

**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*

<p>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, understands that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.</p>	
<p>  <i>Yannick Glemarec Executive Coordinator, UNDP/GEF</i></p>	
<p>Date: February 8th 11, 2012</p>	<p>Tel. and email:+1-212-906-5143; <a href="mailto:Yannick.glemarec@undp.org">Yannick.glemarec@undp.org</a></p>
<p>Project Contact Person: Reis López Rello; Regional Technical Advisor Tel. And Email: (507) 302-4628; reis.lopez.rello@undp.org</p>	

<sup>6</sup>. 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.

## **LIST OF ANNEXES**

- Annex A: UNDP fees for Support to Adaptation Fund Project**
- Annex B: Programme Execution Costs**
- Annex C: Alignment of Project Objectives/Outcomes with Adaptation Fund Results Framework**
- Annex D: Methodological framework for assessing vulnerability**
- Annex E: Technical specifications of the works proposed in Output 2.1**
- Annex F: Pictures of the Project Target Area**
- Annex G: Terms of Reference**
- Annex H: Letters of Endorsement and Support**
- Annex I: Co-financing Letters**
- Annex J: List of Acronyms**

## ANNEX A

### UNDP fees for Support to Adaptation Fund Project

The implementing entity fee will be utilized by UNDP to cover its indirect costs in the provision of general management support and specialized technical support services. The table below provides an indicative breakdown of the estimated costs of providing these services. If the national entity carrying out the project (i.e., MAVDT) requests additional Implementation Support Services (ISS), an additional fee will apply in accordance with UNDP fee policy regarding ISS and would be charged directly to the project budget.

Category	Indicative Services <sup>35</sup> Provided by UNDP <sup>36</sup>	Estimated Cost of Providing Services <sup>37</sup> (USD)
<b>Identification, Sourcing and Screening of Ideas</b>	<ul style="list-style-type: none"> <li>• Provide information on substantive issues in adaptation associated with the purpose of the Adaptation Fund (AF).</li> <li>• Engage in upstream policy dialogue related to a potential application to the AF.</li> <li>• Verify soundness and potential eligibility of identified idea for AF.</li> </ul>	38,522
<b>Feasibility Assessment / Due Diligence Review</b>	<ul style="list-style-type: none"> <li>• Provide up-front guidance on converting general idea into a feasible project/programme.</li> <li>• Source technical expertise in line with the scope of the project/programme.</li> <li>• Verify technical reports and project conceptualization.</li> <li>• Provide detailed screening against technical, financial, social and risk criteria and provide statement of likely eligibility against AF requirements.</li> <li>• Determination of execution modality and local capacity assessment of the national executing entity.</li> <li>• Assist in identifying technical partners.</li> <li>• Validate partner technical abilities.</li> <li>• Obtain clearances from AF.</li> </ul>	115,566
<b>Development &amp; Preparation</b>	<ul style="list-style-type: none"> <li>• Provide technical support, backstopping and troubleshooting to convert the idea into a technically feasible and operationally viable project/programme.</li> <li>• Source technical expertise in line with the scope of the project/programme needs.</li> <li>• Verify technical reports and project</li> </ul>	154,088

<sup>35</sup> This is an indicative list only. Actual services provided may vary and may include additional services not listed here. The level and volume of services provided varies according to need.

<sup>36</sup> Services are delivered through UNDP's global architecture and 3 tier quality control, oversight and technical support system: local country offices; regional technical staff; and headquarters specialists.

<sup>37</sup> The breakdown of estimated costs is indicative only.

	<p>conceptualization.</p> <ul style="list-style-type: none"> <li>• Verify technical soundness, quality of preparation, and match with AF expectations.</li> <li>• Negotiate and obtain clearances by AF.</li> <li>• Respond to information requests, arrange revisions etc.</li> </ul>	
<b>Implementation</b>	<ul style="list-style-type: none"> <li>• Technical support in preparing TORs and verifying expertise for technical positions.</li> <li>• Provide technical and operational guidance project teams.</li> <li>• Verification of technical validity / match with AF expectations of inception report.</li> <li>• Provide technical information as needed to facilitate implementation of the project activities.</li> <li>• Provide advisory services as required.</li> <li>• Provide technical support, participation as necessary during project activities.</li> <li>• Provide troubleshooting support if needed.</li> <li>• Provide support and oversight missions as necessary.</li> <li>• Provide technical monitoring, progress monitoring, and validation and quality assurance throughout.</li> <li>• Allocate and monitor Annual Spending Limits based on agreed work plans.</li> <li>• Receipt, allocation, and reporting to the AFB of financial resources.</li> <li>• Oversight and monitoring of AF funds.</li> <li>• Return unspent funds to AF.</li> </ul>	346,698
<b>Evaluation and Reporting</b>	<ul style="list-style-type: none"> <li>• Provide technical support in preparing TOR and verify expertise for technical positions involving evaluation and reporting.</li> <li>• Participate in briefing / debriefing.</li> <li>• Verify technical validity / match with AF expectations of all evaluation and other reports</li> <li>• Undertake technical analysis, validate results, and compile lessons.</li> <li>• Disseminate technical findings.</li> </ul>	115,566
<b>Total</b>		770,440

**ANNEX B****Programme Execution Costs**

Award id:

Project id:

	<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>	<b>Year 5</b>	<b>Total</b>
Project Coordinator Salary	45,900	45,900	45,900	45,900	45,900	<b>229,500</b>
Project Professional Salary	28,260	28,260	28,260	28,260	28,260	<b>141,300</b>
Project Admin/Finance Assistant Salary	12,360	12,360	12,360	12,360	12,360	<b>61,800</b>
Field Assistant (Boat Driver) Salary	4,620	4,620	4,620	4,620	4,620	<b>23,100</b>
Travel	105,000	14,000	14,000	14,000	14,000	<b>161,000</b>
IT Equipment	5,460					<b>5,460</b>
Communications	4,200	3,400	3,400	3,400	3,400	<b>17,800</b>
Rental & Maintenance Premises	14,400	14,400	14,400	14,400	14,400	<b>72,000</b>
Equipment & Furniture	7,500					<b>7,500</b>
Supplies	1,300	1,300	1,300	1,300	1,300	<b>6,500</b>
Miscellaneous Expenses	3,000	2,760	2,760	2,760	2,760	<b>14,040</b>
Project Inception Workshop	3,000					<b>3,000</b>
Mid-Term Evaluation			25,000			<b>25,000</b>
Final Evaluation					35,000	<b>35,000</b>
Technical Reports	1,600	1,600	1,600	1,600	1,600	<b>8,000</b>
Visits to Field Sites (SC members)	3,400	3,400	2,400	3,400	2,400	<b>15,000</b>
Publication of Lessons Learned	2,500	2,500	2,500	2,500	2,500	<b>12,500</b>
Audit	4,500	4,500	4,500	4,500	4,500	<b>22,500</b>
<b>TOTAL</b>	<b>247,000</b>	<b>139,000</b>	<b>163,000</b>	<b>139,000</b>	<b>173,000</b>	<b>861,000</b>

## ANNEX C

### Alignment of Project Objectives/Outcomes with Adaptation Fund Results Framework

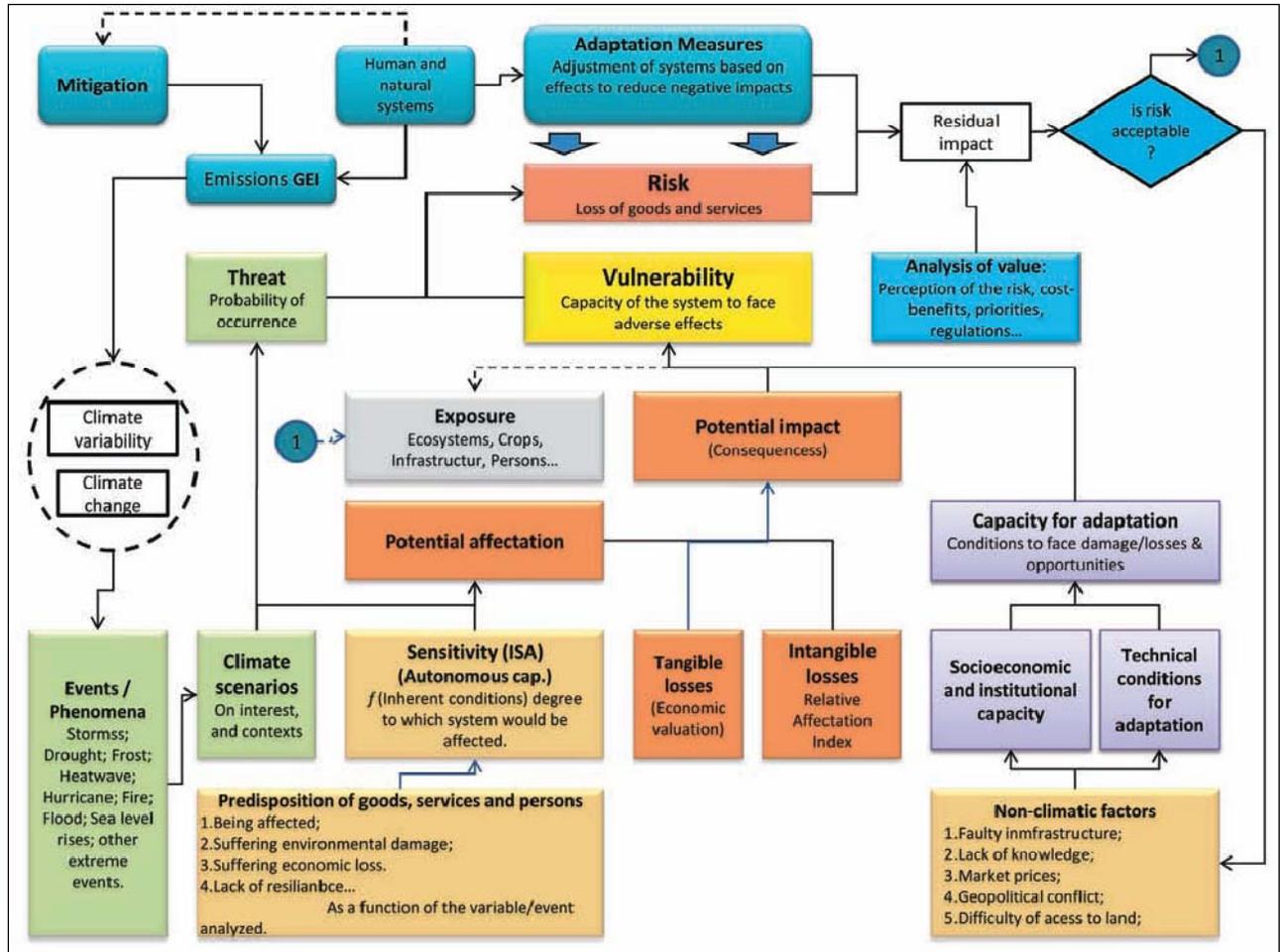
Project Objective(s) <sup>38</sup>	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator
To reduce the vulnerability of communities and ecosystems in La Mojana to flood and drought risks associated with climate change and variability.	Number of poor households in the La Mojana region that are vulnerable to climate-related events (disaggregated by gender)	<b>Outcome 2:</b> Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2.2. Number of people with reduced risk to extreme weather events
Project Outcome(s)	Project Outcome Indicator(s)	Fund Output	Fund Output Indicator
1. An enhanced HEIS strengthens local capacity and facilitates decision-making for adaptation to climate change.	Number of institutions and local- and regional-level stakeholders that have access to climate change-related information and integrate it into their work (disaggregated by gender)	<b>Output 2.1:</b> Strengthened capacity of national and regional centres and networks to respond rapidly to extreme weather events	<b>2.1.1.</b> No. of staff trained to respond to, and mitigate impacts of, climate-related events
	Number of rural communities and local and regional institutions in the target area benefiting from an early warning system that reduces risks to extreme climate events.	<b>Output 1:</b> Risk and vulnerability assessments conducted and updated at a national level	<b>1.2</b> Development of early warning systems
2. The buffering and water regulation capacity of wetlands has been restored in a multiple-use landscape, reducing the vulnerability of local communities and increasing the resilience of ecosystems to the impacts of climate change.	Percentage of households in La Mojana that benefit from infrastructure to control flooding (disaggregated by gender).	<b>Output 2.2:</b> Targeted population groups covered by adequate risk reduction systems	<b>2.2.1.</b> Percentage of population covered by adequate risk-reduction systems
	Area (hectares [ha]) of restored wetlands that help to increase resilience to climate change.	<b>Output 5:</b> Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	<b>5.1.</b> No. and type of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type of assets)

<sup>38</sup> The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

	Number of conservation and management tools approved and implemented.	<b>Output 5:</b> Vulnerable physical, natural, and social assets strengthened in response to climate change impacts, including variability	<b>5.1.</b> No. and type of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type of assets)
3. Strengthened local communities implementing adaptation measures to increase their resilience to the impacts of climate change and improve their quality of life.	Number of local agroecological initiatives that are resilient to climate change adopted by the communities in the target area of the project.	<b>Output 6:</b> Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	<b>6.1.2.</b> Type of income sources for households generated under climate change scenario
	Number of ha established with agro-silvopastoral systems in the target area of the project.	<b>Output 6:</b> Targeted individual and community livelihood strategies strengthened in relation to climate change impacts, including variability	<b>6.1.2.</b> Type of income sources for households generated under climate change scenario
4. Strengthened national, regional, and local institutions and organizations for implementing planned adaptation measures to climate change and replicating lessons learned.	Number of local and regional plans that mainstream adaptation to climate change considerations.	<b>Output 7:</b> Improved integration of climate-resilience strategies into country development plans	<b>7.1.</b> No., type, and sector of policies introduced or adjusted to address climate change risks

ANNEX D

Methodological framework for assessing vulnerability



Source: IDEAM-Cabrera & Lamprea, 2010. Con insumos de diferentes modelos. In: República de Colombia. 2010. Segunda Comunicación Nacional ante la Convención Marco de las Naciones Unidas sobre Cambio Climático. 2010.

## Annex E

### Technical specifications of the works proposed in Output 2.1

The works to be performed to **control flooding and erosion in the town of Sejeve** will be developed in two phases and will help protect 20,000 hectares from flooding in the Ayapel (Córdoba) and San Marcos (Sucre) municipalities. The first phase consists of provisional works that will include the construction of support structures (piles and sand bags) and the construction of levees. The piles will be of water-resistant wood (4" x 4"), which will vary in length according to the site requirements, with a maximum separation of 1 meter. They will be held in place horizontally by 2" x 2" wooden slats in varying lengths with open spaces of 0.1 meter along the total length, and underpinning each vertical element with 4" x 4" support structures. The piles and shoring will form a structure that will be used to enclose a filling composed of polyethylene sacks containing clayey material, which will form a dyke to protect the river bank in locations where required. The piles or columns will be constructed where needed and all necessary precautions will be taken to ensure that these are firmly in place and will not become displaced when the structure is filled with the bags. The fill and/or dykes will be composed of material from excavations performed at the sites or from lateral borrow soil, and their purpose is to avoid overflow of the river. They shall be stable, and shall not allow infiltration through their structure nor in the point of contact with the natural terrain. In addition, they shall not be overflowed during river high water conditions.

The second phase includes permanent works that will consist of outlining and rock-filling the bank along a 2-kilometer length and the creation of new dykes to mitigate erosion and stabilize the affected riverbank. Finally, an 8-meter-wide terrace will be constructed, which will be protected superficially with a 30-centimeter-wide retaining wall and a slope profile towards the San Jorge River of 3H:1V, in addition to a 50-centimeter protective coating of rockfill to control erosion.

The actions for the **rehabilitation of water flows of 11 streams** within the jurisdiction of CORPOMOJANA will be carried out in areas of water bodies that contribute to the San Marcos and San Benito Abad wetlands and will include the recovery and clearance of 128 kilometers of clogged and/or altered stream channels. The specific activities to be developed include: a) identification and prioritization of the natural and overflow streams that are clogged and/or altered; b) determining the exact sites along streams for the construction of bridges and box culverts that will allow the re-establishment of water flows; c) analysis of the technical functionality of existing box culverts and adaptation of those which do not meet the technical requirements for normal water flows; d) plugging of artificial openings and water jets; and e) manual removal of vegetation (living or dead) and sediments not removed with the natural flow of water, once restored.

**ANNEX F**

**Pictures of the Project Target Area**



i) Flooded school in the town of Cecilia (Municipality of Ayapel)



ii) Solution to flooding for schools in the target area



iii) Flooding in the project target area



iv) Flooding in the project target area



v) Aerial view of a traditional pre-Hispanic system for flood control and hydraulic management.

## ANNEX G

### Terms of Reference

#### *Project Steering Committee (SC)*

**Overall responsibilities:** The Project SC will be composed by representatives of the MADS, IDEAM, DNP, CORPOMOJANA, CVS, IAVH and UNDP. The final composition of the SC will be defined during the inception workshop. The National Project Director will be the Executive Member nominated by the MADS, and is expected to be a senior official not below the rank of Vice-Minister. The SC is responsible for making by consensus management decisions for the project when guidance is required by the Project Coordinator (PC), for approval of project plans and revisions. The SC decisions should be made in accordance to standards that shall ensure best value to money, fairness, integrity, transparency, and effective international competition. In case a consensus cannot be reached, final decision shall rest with the UNDP Programme Manager. Project reviews by this group are made at designated decision points during the running of a project, or as necessary when raised by the PC. This group is consulted by the Project Manager for decisions when PM tolerances (normally in terms of time and budget) have been exceeded.

Based on the approved annual work plan (AWP), the SC may review and approve project quarterly plans when required and authorizes any major deviation from these agreed quarterly plans. The SC ensures that required resources are committed and arbitrates on any conflicts within the project or negotiates a solution to any problems between the project and external bodies.

#### **Specific responsibilities:**

- Provide overall guidance and direction to the project, ensuring it remains within any specified constraints;
- Address project issues as raised by the PC;
- Provide advice and guidance on efficient and timely execution of the project, when required;
- Ensure that project's policy recommendations are integrated within the policies of respective sectors or levels that each member represents;
- Provide guidance and agree on possible countermeasures/management actions to address major issues and risks;
- Provide guidance and agree on possible countermeasures/management actions to address specific risks;
- Agree on PC tolerances in the Annual Work Plan and quarterly plans when required;
- Conduct regular meetings to review the Project Quarterly Progress Report and approve major revisions;
- Ensure that AF resources are committed exclusively to activities that relate to achievement of the project objective;
- Provide direction and recommendations to ensure that the agreed deliverables are produced satisfactorily according to plans;
- Appraise the Project Annual Review Report and make recommendations for the next AWP, Review and approve end project report, make recommendations for follow-on actions;
- Provide ad-hoc direction and advice for exception situations when PC tolerances are exceeded;
- Assess and decide on project changes through revisions;

- Assure that all Project deliverables have been produced satisfactorily;
- Review and approve the Final Project Review Report, including Lessons-learned;
- Make recommendations for follow-on actions;
- Notify operational completion of the project to the AF Board.

### ***National Project Director (NPD)***

The National Project Director (NPD) will be a public servant appointed by the Ministry of Environment and Sustainable Development, on behalf of the government, for the project. Its role is to ensure that the project is focused throughout its life cycle on achieving its objectives and delivering outputs that will contribute to higher level outcomes. The Executive has to ensure that the project gives value for money, ensuring a cost-conscious approach to the project, balancing the demands of beneficiary and supplier.

The NPD will be responsible for overseeing overall project implementation on a regular basis and ensuring that the project outcomes are achieved. This function is not funded through the project and will be covered as in-kind contribution. On behalf of the Implementing Agency, the NPD is accountable to the UNDP for the appropriate use of the project resources provided by AF. The NPD, assisted by the PC, will report to the SC on the progress of the Project. Other NPD responsibilities are:

- Ensure that there is a coherent project organization structure and logical set of plans;
- Set tolerances in the AWP and other plans as required for the Project Coordinator;
- Monitor and control the progress of the project at a strategic level;
- Ensure that risks are being tracked and mitigated as effectively as possible;
- Brief relevant stakeholders about project progress;
- Organize and chair Project SC meetings;
- Approve project Annual work plans and budget revisions;
- Approve annual project status and financial reports;
- Ensure that Colombian legislation, rules and procedures are fully met in the course of the project implementation;
- Oversee implementation of Project SC directives;
- Report to UNDP and the Project SC on the use of the project resources and achievement of the project outputs.

### ***Project Coordinator (PC)***

The PC has the authority to run the project on a day-to-day basis on behalf of the Project SC within the constraints laid down by the SC. The Project Manager is responsible for day-to-day management and decision-making for the project. The PC prime responsibility is to ensure that the project produces the results specified in the project document, to the required standard of quality and within the specified constraints of time and cost.

The Implementing Partner appoints the PC, who should be different from the Implementing Partner's representative in the SC and different to the NPD.

Specific responsibilities would include:

#### *Overall project management:*

- Manage the realization of project outputs through activities;

- Provide direction and guidance to project team(s)/ responsible party(ies);
- Liaise with the SC to assure the overall direction and integrity of the project;
- Identify and obtain any support and advice required for the management, planning and control of the project.

*Responsible for project administration:*

- Liaise with any suppliers;
- Plan the activities of the project and monitor progress against the initial quality criteria;
- Mobilize goods and services to initiative activities, including drafting TORs and work specifications;
- Monitor events as determined in the Monitoring Plan, and update the plan as required;
- Monitor financial resources and accounting to ensure accuracy and reliability of financial reports;
- Manage and monitor the project risks as initially identified in the Project Brief appraised by the LPAC, submit new risks to the SC for consideration and decision on possible actions if required; update the status of these risks by maintaining the Project Risks Log;
- Be responsible for managing issues and requests for change by maintaining an Issues Log;
- Prepare the Project Quarterly Progress Report (progress against planned activities, update on Risks and Issues, expenditures) and submit the report to the NPD and SC;
- Prepare the Annual review Report, and submit the report to the SC;
- Based on the review, prepare the AWP for the following year, as well as Quarterly Plans if required;
- Prepare Final Project Review Reports to be submitted to the Project SC;
- Identify follow-on actions and submit them for consideration to the SC;
- Manage the transfer of project deliverables, documents, files, equipment and materials to national beneficiaries;
- Prepare final CDR/FACE for signature by UNDP and the Implementing Partner.

***Administrative and Finance Assistant***

**Project Administrator/Finance Assistant**

The Project Administrator/Finance Assistant is responsible for the financial and administrative management of the project activities and assists in the preparation of quarterly and annual work plans and progress reports for review and monitoring by the PB. This position also provides support to the Project Coordinator for the day-to-day management of the project. The Project Administrator/Finance Assistant will have the following responsibilities:

*Financial management:*

- Responsible for providing general financial and administrative support to the project;
- Take own initiative and perform daily work in compliance with annual work schedules;
- Assist project management in performing budget cycle: planning, preparation, revisions, and budget execution;
- Assist the PC in all project implementation activities;
- Provide assistance to partner agencies involved in pilot initiatives, performing and monitoring general administrative and financial aspects of pilots to ensure compliance with budgeted costs and in line with UNDP/GoC policies and procedures;
- Monitor project expenditures, ensuring that no expenditure is incurred before it has been authorized;

- Assist project team in drafting quarterly project progress reports concerning financial issues;
- Ensure that UNDP procurement rules are followed in procurement activities carried out by the project and bear the responsibility for the inventory of the project assets;
- Perform preparatory work for mandatory and general budget revisions, annual physical inventory and auditing, and assist external evaluators in fulfilling their mission;
- Provide assistance in all logistic arrangements concerning project implementation.

*Administrative management:*

- Make logistical arrangements for the organization of meetings and round tables;
- When necessary, provide secretarial support for the project staff;
- Draft contracts for international/local consultants and entities;
- Draft correspondence related to assigned project areas; clarifies, follows up, responds to requests for information;
- Assume overall responsibility for administrative matters of a more general nature, such as registry and maintenance of project files;
- Perform all other administrative and financial related duties, upon request;
- Provides support to the PC in coordination and arrangement of planned activities and their timely implementation;
- Assist the PC in liaising with key stakeholders from the GoC counterpart, donor community, civil society, and NGOs as required.

## ANNEX H

### Letters of Endorsement and Support



Ministry of Environment and Sustainable Development  
Office of International Affairs  
Colombia

Prosperidad  
para todos

#### Letter of Endorsement by Government

December 19<sup>th</sup>, 2011

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

**Subject:** Endorsement for the project: Reducing risk and vulnerability to climate change in the region of La Depresión Momposina in Colombia, "Reducción del Riesgo y la Vulnerabilidad al Cambio Climático de la Región de la Depresión Momposina en Colombia".

In my capacity as designated authority for the Adaptation Fund in Colombia, I confirm that the above national project 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 of "La Depresión Momposina" in Colombia.

Accordingly, I am pleased to endorse the above project/programme proposal with support from the Adaptation Fund. If approved, the project will be implemented by UNDP and executed by Ministry of Environment and Sustainable Development (MADS).

Sincerely,

**Carmen Silva Pinzón**  
Head  
Office of International Affairs  
Ministry of Environment and Sustainable  
Development



**Ministerio de Relaciones Exteriores**  
República de Colombia



DVAM/DIESA/GAA No.60575

Bogotá, D.C. 29 de septiembre de 2011

Señor  
**BRUNO MORO**  
Representante Residente del Programa de las Naciones Unidas para el Desarrollo  
Oficina del PNUD en Colombia  
Ciudad

Asunto: Remisión de la Nota de apoyo al proyecto de Colombia para el Fondo de Adaptación del Protocolo de Kioto

Señor Representante:

De la manera más atenta me permito hacer referencia al proyecto "Reducción del riesgo y la vulnerabilidad al cambio climático en la región de La Mojana", que el Gobierno Colombiano ha avalado, a través de su autoridad designada, el Ministerio de Ambiente, Vivienda y Desarrollo Territorial, para ser presentado al Fondo de Adaptación del Protocolo de Kioto.

A este respecto, muy comedidamente le envío, adjunto a esta comunicación, la Nota Verbal de la Cancillería para el Consejo del Fondo de Adaptación, expresando su apoyo al proyecto de referencia, con el propósito de que sea incluida dentro del paquete de presentación del proyecto que será enviado al Fondo.

Cordialmente,

**PATTI LONDOÑO JARAMILLO**  
Viceministra de Asuntos Multilaterales

Anexos: 1 folio

Calle 10 No 5 – 51 Palacio de San Carlos  
Dirección correspondencia Carrera 5 No 9 – 03 Edificio Marco Fidel Suárez  
PBX 3814000 – Fax 3814747 [www.cancilleria.gov.co](http://www.cancilleria.gov.co)  
Bogotá D.C., Colombia sur América

**Prosperidad  
para todos**



REPÚBLICA DE COLOMBIA  
MINISTERIO DE RELACIONES EXTERIORES

**DVAM/DIESA/GAA No.60004**

El Ministerio de Relaciones Exteriores - Viceministerio de Asuntos Multilaterales - saluda muy atentamente al Honorable Consejo del Fondo de Adaptación del Protocolo de Kioto, con ocasión de la presentación del proyecto: "*Reducción del riesgo y la vulnerabilidad al cambio climático en la región de La Mojana*", por parte del Gobierno de Colombia.

A este respecto, esta Cancillería informa muy comedidamente al Consejo del Fondo de Adaptación que el proyecto de referencia cuenta con todo el apoyo del Gobierno de Colombia, incluyendo al Ministerio de Relaciones Exteriores. Para Colombia, como país altamente vulnerable al cambio climático, la adaptación es una prioridad nacional.

Colombia es un país altamente comprometido con los esfuerzos por enfrentar la problemática global del cambio climático. Adicionalmente, el Gobierno colombiano está disponiendo de toda su capacidad institucional para apoyar el proyecto de referencia, y para garantizar el éxito de su ejecución.

El Ministerio de Relaciones Exteriores – Viceministerio de Asuntos Multilaterales – se vale de esta oportunidad para reiterar al Honorable Consejo del Fondo de Adaptación del Protocolo de Kioto las seguridades de su más alta consideración.

Bogotá, D. C., 27 de septiembre de 2011

Al Honorable  
Consejo del Fondo de Adaptación del Protocolo de Kioto

## ANNEX I

### Co-Financing Letters



Departamento Nacional de Planeación  
República de Colombia

**Prosperidad  
para todos**

SDAS - 20112100554651

Bogotá D.C., Jueves, 06 de Octubre de 2011

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

Asunto: Apoyo y contrapartida al proyecto "Reducción del Riesgo y la Vulnerabilidad al cambio climático de las comunidades asentadas en la región de la Depresión Momposina en Colombia".

Apreciados Señores:

Por la presente confirmamos nuestro interés en participar en el proyecto que por medio del Proyecto de las Naciones Unidas para el Desarrollo (PNUD) presenta Colombia al Fondo de Adaptación para la región de La Mojana: Apoyo y contrapartida al proyecto "Reducción del Riesgo y la Vulnerabilidad al cambio climático de las comunidades asentadas en la región de la Depresión Momposina en Colombia".

En el marco de esta iniciativa el Departamento Nacional de Planeación, se compromete a aportar una contrapartida en especie que incluye el desarrollo de estudios, alquiler de oficinas y desarrollo de materiales (alquiler de oficinas, materiales, computadores y productos) la suma de **\$1.459.886.687 COP, alrededor de \$740,000 USD**

A continuación se relacionan los recursos aportados por las distintas áreas Dirección de Desarrollo Territorial del Departamento Nacional de Planeación para el Proyecto Formulación del Plan Integral de la Mojana, (vigencia agosto 2010-diciembre 2011):

DESCRIPCIÓN	COP	USD**
Apoyo Directivo Proyecto Mojana (Vigencia 2011)	\$ 99.859.040	US\$ 50.638
Apoyo Coordinación Técnica Proyecto Mojana (Vigencia 2011)	\$ 89.023.760	US\$ 45.144
Apoyo Gerencial Proyecto Mojana (vigencia 2010)	\$ 33.543.992	US\$ 17.010
Convenio entre la Universidad Nacional de Colombia y el Departamento Nacional de Planeación para la realización de estudios sobre las obras de infraestructura necesarias y prioritarias para el ordenamiento ambiental y el desarrollo territorial de la Región de la Mojana	\$ 916.206.275	US\$ 464.608
Apoyo Gerencial Proyecto Mojana (Vigencia 2011)	\$ 159.813.190	US\$ 81.041
Apoyo Consultoría Proyecto Mojana (Vigencia 2011)	\$ 109.632.030	US\$ 55.594
Apoyo Técnico Proyecto Mojana (Vigencia 2011)	\$ 51.808.400	US\$ 26.272
<b>Total</b>	<b>\$ 1.459.886.687</b>	<b>US\$ 740.308</b>

FUENTE: DDTs-DNP

\*\* : Tasa de Cambio 1US\$ = \$1.972 (octubre 5 de 2011)



Departamento Nacional de Planeación  
República de Colombia

**Prosperidad  
para todos**

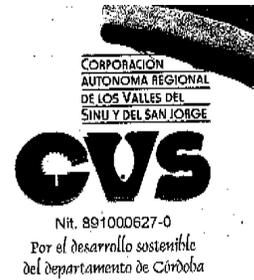
Consideramos que el proyecto es de primera importancia para Colombia: la región se clasifica como prioritaria dentro del Plan Nacional de Desarrollo 2010-2014 y tenemos el firme compromiso de dedicar recursos humanos y financieros a la adaptación de la región durante las vigencias 2012-2014.

Quedamos a su disposición para éste y cualquier otro tema.

Cordial saludo,

CAROLINA URRUTIA VÁSQUEZ  
Subdirectora Desarrollo Ambiental Sostenible

Preparó: Paola Ricaurte Ayala  
Revisó: Carolina Urrutia Vásquez



040. 5270 \*  
Montería, 07 OCT. 2011

**Señores**  
**THE ADAPTION FUND BOARD**  
c/o Adaption Fund Board Secretariat  
Email: [secretariat@adaptation-fund.org](mailto:secretariat@adaptation-fund.org)  
Fax: 202 522 3240/5

Referencia: Carta de aportes en contrapartida al proyecto "Reducción del riesgo y la vulnerabilidad al cambio climático en la Región de la Depresión Momposina en Colombia"

Apreciados Señores:

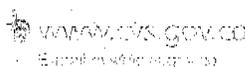
Por medio de la presente, confirmamos nuestro interés de participar en el proceso de la referencia presentado por Colombia ante el fondo de adaptación al cambio climático de la UNFCCC a través del programa de las Naciones Unidas para el Desarrollo (PNUD), para la región de la Depresión Momposina.

En el marco de esta importante iniciativa, la Corporación Autónoma Regional de los Valles del Sinú y del San Jorge – CVS, como autoridad ambiental regional del Departamento de Córdoba, se compromete a aportar una contrapartida en especie y por medio de los proyectos a desarrollar durante los años 2012 a 2014 que estén aprobados en nuestro plan anual de inversiones - POAI, para la implementación del Distrito de Manejo Integrado de Ayapel y la cuenca del San Jorge, que históricamente ha oscilado entre los 200 a 300 millones de pesos anuales.

Los aportes anteriormente señalados, apoyarán la implementación del proyecto "Reducción del riesgo y la vulnerabilidad al cambio climático en la Región de la Depresión Momposina en Colombia", en el área de nuestra jurisdicción en el Municipio de Ayapel, durante el período de ejecución establecido en el documento del mismo, en el marco de la suscripción del convenio a que haya lugar de acuerdo a los lineamientos de la normatividad aplicable y especialmente al artículo 213 de la ley 1450 de 2011, por la cual se expide el Plan Nacional de Desarrollo 2010 – 2014.

Consideramos que este proyecto es de gran importancia para la región y esperamos que sus resultados nos permitan mejorar la gestión ambiental y del riesgo asociados al cambio climático en una de las regiones de Colombia más impactadas por este fenómeno en los últimos años que las comunidades afectadas encuentren en esta

Calle 29 No. 2 - 43 Ed. Morindó  
Pisos 3, 6, 7 y 8 PBX: 7829950 - 7821817  
Fax. 7814743 Montería - Colombia  
Línea verde 018000914808





CORPORACIÓN PARA EL DESARROLLO SOSTENIBLE  
DE LA MOJANA Y EL SAN JORGE  
"CORPOMOJANA"  
NIT: 823000077-2

D.G.C. 01- 0133

San Marcos, 7 de octubre de 2011

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

Referencia: carta de endoso y aportes de contrapartida al proyecto "Reducción del riesgo y la vulnerabilidad al cambio climático en la Región de La Depresión Momposina en Colombia".

Apreciados Señores:

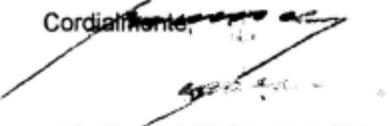
Por medio de la presente confirmamos nuestro interés en participar en el proyecto de la referencia presentado por Colombia ante el Fondo de Adaptación al Cambio Climático de la UNFCCC a través del Programa de las Naciones Unidas para el Desarrollo (PNUD), para la región de La Depresión Momposina.

En el marco de esta iniciativa la Corporación para el Desarrollo Sostenible de La Mojana y el San Jorge – CORPOMOJANA, como una de las autoridades ambientales regionales del Departamento de Sucre, se compromete a aportar una contrapartida en especie e inversiones de **Veinte millones de pesos colombianos (\$ 20.000.000.00)**, para la implementación del proyecto "Reducción del riesgo y la vulnerabilidad al cambio climático en la Región de La Depresión Momposina en Colombia", en el área de su jurisdicción en el municipio de San Marcos durante el período de ejecución establecido.

Consideramos que este proyecto es de gran importancia para la región y esperamos que sus resultados nos permitan mejorar la gestión ambiental y del riesgo asociados al cambio climático en una de las regiones de Colombia más impactadas por este fenómeno en los últimos años y que las comunidades afectadas encuentren en esta iniciativa las herramientas e instrumentos que les permitan adaptarse al entorno mientras mejoran su calidad de vida.

Quedamos a su disposición para atender cualquier requerimiento adicional.

Cordialmente,

  
**MIGUEL PALENCIA VILLAMIL**  
Director General

Copia: Archivo



Instituto de Hidrología,  
Meteorología y  
Estudios Ambientales



**IDEAM**  
Garantizado con el premio

IDEAM 12-10-2011 02:15:06: Colombiano Ejemplar

Al Comisionado Cite Este No.: 2011EE4835-0-1-Fol: 1-Anex: 0

Origen: Sd: 20 - OFICINA ASESORA DE PLANEACION/MALAMBO MARTIN

Destino: PNUD/JIMENA PUYANA

Asunto: APOYO Y CONTRAPARTIDA AL PROYECTO DE ADAPTACION

Obs.:

Bogotá 12 de Octubre de 2011

Doctora

**JIMENA PUYANA E.**

Oficial de Medio Ambiente y Energía  
Área de Pobreza y Desarrollo Sostenible  
PNUD Colombia  
Av. 82 # 10 – 62  
Bogotá - Colombia

**Asunto:** Apoyo y contrapartida al proyecto de adaptación.

Señora Oficial de Medio Ambiente y Energía:

De manera atenta me dirijo a usted con el propósito de certificar la contrapartida que aportara el Instituto de Hidrología, Meteorología y Estudios Ambientales –IDEAM - , para el desarrollo del proyecto de adaptación cuyo objetivo es: *Reducir la vulnerabilidad de las Comunidades y Ecosistemas en la región de la Mojana frente al riesgo de inundación y sequía asociados a la variabilidad y al cambio climático.*

El IDEAM aportará la suma de 864'238.064 (Ochocientos sesenta y cuatro millones, doscientos treinta y ocho mil, sesenta y cuatro pesos COP), en especie durante los 5 años de duración del Proyecto representada en: a) Personal Directivo, técnico y Administrativo y b) Información técnica de soporte para la realización de las actividades del Proyecto y uso de equipos.

Cordialmente

**MARTHA NATHALIA SILVA ULLOA**

Jefe Oficina Asesora de Planeación (E)

Instituto de Hidrología, Meteorología y Estudios Ambientales – IDEAM.

PNUD ASUNTO: PRY 02

Radicado: 201105520 2011/10/13 3:44 PM

Proc: ENT00016- INSTITUTO DE HIDROLOGÍA, METEOROLOGÍA

Dest: JMP-PUYANA JIMENA

Asun: APOYO Y CONTRAPARTIDA AL PROYECTO DE ADAP

Adjunto: Detalle de contrapartida

Revisó: Margarita Gutiérrez

Elaboró: [Signature]

PNUD, COLOMBIA  
13 OCT 2011 10:11:15  
RECIBIDO OF. REGISTRO

## ANNEX J

### List of Acronyms

AF	Adaptation Fund
APR	Annual Project Report
AWP	Annual Work Plan
CAR	Regional Autonomous Corporation
CBO	Community Based Organization
CLOPAD	Local Committee for the Prevention and Aid of Emergencies and Disasters
CNWP	Colombian-Netherlands Water Partnership
CONPES	National Council of Economic and Social Policy
CORPOICA	Agriculture Research Corporation
CORPOMOJANA	Corporation for the Sustainable Development of La Mojana and San Jorge
CPAP	Country Programme Action Plan
CREPAD	Regional Committee for the Prevention and Aid of Emergencies and Disasters
CVS	Regional Autonomous Corporation of the Sinú and San Jorge Valleys
DANE	National Administrative Department of Statistics
DGPAD	Office for Disaster Attention and Prevention
DGR	Department of Risk Management
DNP	National Planning Department
EbA	Ecosystem-based Approach
EIA	Environmental Impact Assessment
ENSO	El Niño-Southern Oscillation
FAO	Food and Agriculture Organization (United Nations)
GDP	Gross Domestic Product
GEF	Global Environment Facility
GIS	Geographic Information System
GoC	Government of Colombia
HEIS	Hydroclimatological and Environmental Information System
H-H models	Hydrological and hydraulic modeling
IAvH	Alexander von Humboldt Research Institute
IADB	Inter-American Development Bank
ICANH	Colombian Institute of Anthropology and History
IDEAM	Institute of Hydrology, Meteorology, and Environmental Studies
INAP	Integrated National Adaptation Project
INCODER	Colombian Institute for Rural Development
IPCC	Intergovernmental Panel on Climate Change
IPCZ	Intertropical Convergence Zone
LoA	Letter of Agreement
M&E	Monitoring and Evaluation
MADR	Ministry of Agriculture and Rural Development
MADS	Ministry of Environment and Sustainable Development
MDG-F	Millennium Development Goals Achievement Fund
MEI	Multivariate ENSO Index
MOU	Memorandum of Understanding
NBI	Unsatisfied Basic Needs Index
NCCP	National Climate Change Portal
NDP	National Development Plan
NGO	Non-Governmental Organization
NIM	National Implementation Modality

NOAA	Meteorological and Oceanographic Authority of the United States
NPD	National Project Director
OCHA	United Nations Office for the Coordination of Humanitarian Affairs
ONI	Oceanic Niño Index
OSSO	Seismic and Geophysical Observatory of Southwestern Colombia
PAC	4-Year Action Plan
PAHO/WHO	Pan American Health Organization/World Health Organization
PC	Project Coordinator
PDD	Departmental Development Plan
PDM	Municipal Development Plans
PDSM	Sustainable Development Programme for the La Mojana Region
PIU	Project Implementation Unit
PNACC	National Plan for Adaptation to Climate Change
POT	Land Zoning Plan
PSC	Project Steering Committee
SBAA	Standard Basic Assistance Agreement
SCCF	Special Climate Change Fund
SIAC	Environmental Information System of Colombia
SINA	National Environmental System
SINAP	National System of Protected Areas
SIRAP	Caribbean Subsystem of PAs
SNPAD	National System of Prevention and Attention to Disasters
SOI	Southern Oscillation Index
ToRs	Terms of Reference
UAESPNN	Administrative Unit of the Protected Areas System of Colombia
UNC	National University of Colombia
UNDAF	United Nations Development Assistance Framework
UNDP	United Nations Development Programme
UNDP CO	United Nations Development Programme Country Office
UNDP-ALM	United Nations Development Programme Adaptation Learning Mechanism
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UNICEF	The United Nations Children's Fund
WB	World Bank