DATE OF RECEIPT:
ADAPTATION FUND PROJECT ID:
(For Adaptation Fund Board Secretariat Use Only)

PROJECT PROPOSAL

Climate Change Adaptation Proposal to Adaptation Fund

PART I: PROGRAMME INFORMATION

PROGRAMME: **Regular**

COUNTRY: **Ecuador**

TITLE OF PROJECT: **Enhancing resilience of communities to the adverse effects of climate change on food security, in Pichincha Province and the Jubones River basin.**

TYPE OF IMPLEMENTING AGENCY: **Multilateral Implementing Agency**

IMPLEMENTING ENTITY: **World Food Programme**

EXECUTING ENTITIES: **Ministry of Environment in coordination with Ministry of Agriculture, Livestock, Aquaculture and Fisheries, Commonwealth of the River Jubones Basin and Provincial Government of Pichincha**

AMOUNT OF FINANCING REQUESTED: **US$ 7,449,468.**

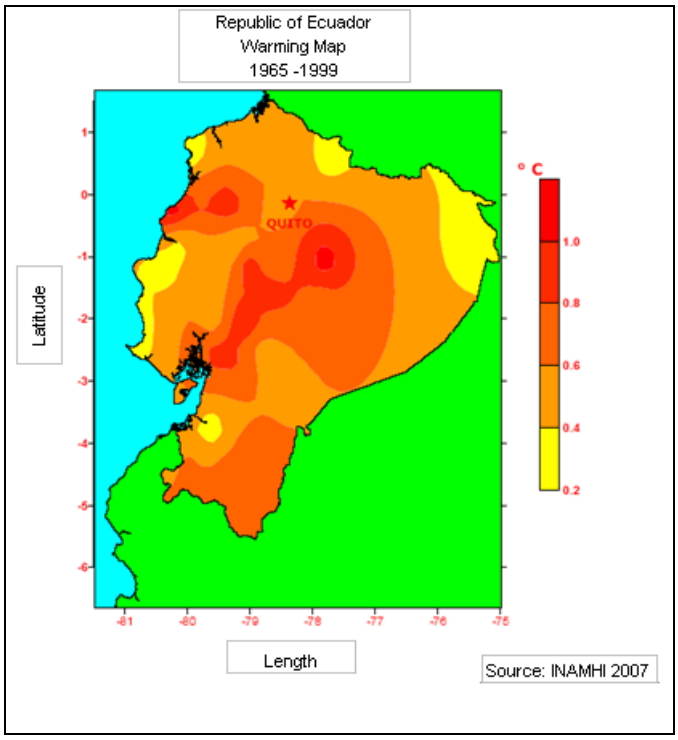
PROJECT BACKGROUND AND CONTEXT

Introduction

Ecuador is highly vulnerable to the impacts of climate change, due to its geographical location and rugged topography (United Nations Framework Convention Climate Change (UNFCC) First National Communication, Quito, 2000). Located on the equator with the Andes dividing the country, Ecuador has a land area of 256,370 square kilometers, divided into four regions: the Highlands - with 72 volcanoes, the Pacific coast, the Amazon and the Galapagos Islands Archipelago.

These regions display an extraordinary array of geographical extremes, from high altitude glaciers, to tropical rain forests in the Amazon region, to dry tropical forests on the Pacific Coast, to the Galapagos Islands, a mega-biodiversity World Heritage Site. Some of these systems show a greater sensitivity to climate change, or at least are considered more likely to undergo rapid changes as a result of climate change, including variability. (See Map 1.) The natural fragility of these ecosystems, with vast biodiversity, makes them highly susceptible to small changes in temperature and water availability. In the river basins of Ecuador, environmental degradation also compounds the affects of climate variability, in particular the over-exploitation of forests, crops planted on lands with high erosion rates and over grazing in high altitude areas.[1]

MAP 1
Warming in Ecuador



Studies on the impact of climate change in Ecuador show threats related to the increase in average temperature (1C° increase), the retreat of glaciers (30 percent loss of mass in the last

[1] See Annex IV: Multi-threats Map, source ECHO.

30 years), moorland degeneration and desertification, forest loss, and an increase in the frequency of extreme events. [2]

Direct impacts on local communities include a reduction in water flows, decreased crop yields and increased fragility of ecosystems, resulting in a reduction in ecosystem service provision. Rapid demographic growth and increased population density leave more people exposed to the above mentioned threats and dangers. As well poverty forces people to occupy unsafe land; the poor use the cheapest and disaster prone plots and are hit hardest by disasters. Lack of strategy and capacity to minimize the impact of intense events has resulted in increased exposure and greater economic losses from more frequent events.

A major contributing factor to community vulnerability to climate threats is the lack of awareness of these threats and of mitigation measures; houses built on fragile land; inadequate quality of infrastructure and construction materials; and ongoing environmental damage. Lack of regional policies for the preservation and conservation of natural resources, absence of planning and adequate building codes and standards, and poor application of early warning models compound the negative impacts of recurring events. Specifically, community early warning systems have not been developed. There have been few advances in terms of exploiting existing social organizations and local knowledge to identify climate related threats or solutions. In sum there is little understanding of climate change threats or adaptation measures at community level.

Increasingly Ecuador suffers from a range of natural disasters, including floods, droughts, earthquakes and volcanic eruptions. (Refer to Table 1.) Reoccurring floods and droughts are also intensifying in severity. In the past decade Ecuador has incurred economic losses of more than $4 billion from droughts alone.[3] This high exposure has increased the vulnerability of key economic sectors such as agriculture, water resources, fisheries, infrastructure and tourism. Annual economic losses to these sectors highlights that Ecuador is a country particularly vulnerable to climate change. The effects of climate change, including the increased frequency and intensity of El Niño and La Niña, combined with deep pockets of food insecurity and poverty requires Ecuador to develop sound planning and replicable implementation models to address climate change threats.

Although Ecuador is oil exporting country, large disparities in living conditions and access to opportunities exist. Inequality and exclusion are related to ethnicity, place of residence (urban and rural), gender and age. Ecuador is ranked 80th out of 182 countries in the 2009 UNDP Human Development report. Chronic malnutrition affects 26 percent of children under five at the national level; however the rate reaches almost 45 percent in the highlands of Ecuador and 47 percent for indigenous populations (SIISE-MCDS 2006, WHO, 2005). Lack of access to food and consumption factors such as poor nutrition practices and health problems contribute to high malnutrition rates. The incidence of extreme poverty at national level is 13 percent, but is higher in rural areas, exceeding 49 percent. As highlighted in the Millennium Ecosystem Report, 21 percent of the land area in Ecuador is used for agriculture. According to the Survey of Living Conditions (SLC 2006), over 51 percent of heads of household who live in poverty with limited

[2] Vulnerability - Adaptation and Mitigation to Climate Change in Ecuador: compendium of actions, strategies and profiles of projects in the energy sectors, forestry, agriculture, coastal marine and water resources. National Committee for Climate, Ministry of Environment, Ecuador, June 2001.
Evidence of Climate Change in Ecuador – update. National Committee for Climate, - Ministry of the Environment (Project ECU/99/g31 Climate Change, Phase II, Ecuador, June 2002).
National Communication Republic of Ecuador for UNFCCC, Ministry of Environment, Ecuador, November 2000.
Notes for the discussion of the national human development strategy: contributions to an alternative environmental strategy, sustainability indicators and environmental policies. SENPLADES, FLACSO Ecuador, UNDP Ecuador, CISMIL2015, 2009.
[3] See Annex V: VAM Ecuador: food insecurity, erosion, frost and desertification maps, WFP Ecuador, 2010.

purchasing power, earn their living through agricultural, livestock or fishing activities and are dependent on stable water supplies.

Food insecurity is high in the country's disaster prone areas, mainly in the rural sector populated by indigenous and Afro-Ecuadorian populations. These groups are adversely affected by ongoing floods, volcanic eruptions and droughts, and are least able to cope with individual events or changing climatic patterns.

TABLE 1

Numbers of affected population and estimated economic cost of disasters in selected South American countries 2000 – 2010

	Drought		Earthquakes/ Volcanic Eruptions		Floods / Rains		TOTAL	TOTAL US$'000
Countries	Affected	Economic Cost	Affected	Economic Cost	Affected	Economic Cost	**Total Affected**	**Economic Cost**
Argentina		120,000	727,000		729,713	2,133,210	**730,440**	**2,253,210**
Bolivia	102,500				1,459,770	847,000	**1,562,270**	**847,000**
Brazil	2,000,000	1,650,000	286,000		4,506,375	2,444,840	**6,506,661**	**4,094,840**
Colombia			149,248	10,000	4,540,868	10,000	**4,690,116**	**20,000**
Ecuador	107,500	4,000,000	497,683	160,975	430,699	1,018,800	**1,035,882**	**5,179,775**
Paraguay	310,990				75,655	820,000	**386,645**	**820,000**
Peru	21,500		1,017,934	900,050	749,923		**1,789,357**	**900,050**
Uruguay		250,000			156,312	70,000	**156,312**	**320,000**
Venezuela					136,192	54,000	**136,192**	**54,000**

Source: "EM-DAT: The OFDA/CRED International Disaster Database. Created on: Mar-18-2010. - Data version: v12.07 www.emdat.be - Université Catholique de Louvain - Brussels - Belgium".

The Proposed Project

The Government of Ecuador, as well as provincial governments recognize that it is essential to take action to: 1) increase awareness of climate change threats; 2) generate more information and knowledge so that local communities can adapt to climate change threats; 3) create local plans that identify community priorities and support the implementation of adaptation measures to increase capacity to mitigate the impact of these threats; and 4) ensure that the poorest communities have the capacity to adapt to climate change impacts without further eroding their food security.

The proposed project supports these strategic directions, is in line with the new Constitution of Ecuador, and is in conformity with the National Development Plan 2009-2013 which is the basis for the UNDAF 2010 - 2014. In particular the project supports Ecuador's efforts to reach MDG 1: to reduce under nutrition and hunger in half by the year 2015; and MDG 7: to ensure environment sustainability.

The proposed project strongly supports the policies and strategies of the 4 targeted provinces: Pichincha, Azuay, Loja and El Oro. The proposed project contains two important watersheds and covers 12 cantons, approximately 120 communities and 15,000 families. The Pichincha Provincial Government (GPP) and the Commonwealth of the River Jubones basin (MCRJ) have identified as priority, the implementation of adaptation measures, in order to support local communities to respond to climate change threats, to reduce their vulnerability to climate change and build ecosystem resilience, in particular of moorlands and forests. MCRJ is an

organization comprised of 15 decentralized autonomous governments (GAD) and 12 cantons in 3 provinces (Azuay, Loja and El Oro). MCJR aims to ensure a coordinated effort, including the participation of local actors in the management and protection of natural resources in the River Jubones watershed.

The project is in line with WFP's overall strategy in Ecuador; one of supporting government priorities through a focused effort to: 1) improve food and nutrition security in integrated cross-sectoral strategies; 2) support preparedness and mitigation of risks caused by natural disasters and climate variability; and 3) assist Colombian refugees and host populations directly affected by the conflict in the Northern part of Ecuador. These areas, in addition to emergency response comprise WFP's strategy in Ecuador. As well, the proposed project supports WFP's global mandate and the following strategic objectives: S02 which prevents acute hunger through investments in disaster preparation and risk reduction; and SO5 which builds capacities to reduce hunger through support for government implementation of hunger related solutions.

Country Eligibility

Ecuador ratified the UNFCCC through a Congressional Resolution dated January 6th 1993, which was published as Executive Decree No. 565 in the Official Journal No. 148, March 16th 1993. The Kyoto Protocol was also signed and ratified by Ecuador in December 1999 (Official Journal No. 342, December 20th, 1999). The technical focal point for the UNFCCC and the Kyoto Protocol is the Under-Secretary of Environmental Quality, currently Climate Change Under-Secretary in the Ministry of Environment (MAE) of the Republic of Ecuador.

Climate Policy in Ecuador

Policy Context

Climate policy in Ecuador dates back to the early 1990s, when it became clear that the country was particularly vulnerable to the effects of climate change. Following the UNFCCC ratification in 1993, the Meteorological and Hydrological Institute (INAMHI) led the Climate Change Process Project in Ecuador (PCCE). This initiative brought, for the first time, the issue of climate change to the attention of public policy makers in Ecuador. This initiative generated a number of other actions including:

- The Ecuador Climate Change Country Study (EPA);
- A Dutch funded project on the impact of Climate Change on the coastal region;
- A Climate Change Training Program - Ecuador (CC Train);
- Program for Offsetting of GHG emissions in Ecuador (UNEP-RISO); and
- Technical support for Stages I and II of Ecuador's National Communication to the UNFCCC (UNDP-GEF).

The First National Communication (FCN) provides an overview of Ecuador's climate change policy (2001). The Second National Communications provides important data on the sectors

that emit green house gases (GHG) in Ecuador, especially actions related to deforestation, land use change, mitigation actions and energy use.

The FCN produced the first benchmark on GHG emissions and emphasized adaptation to climate change as a national priority. It identifies priority systems in terms of their sensitivity to climate change and defines a series of policy options to improve Ecuador's management of climate risks, highlighting water governance as a national priority. According to the FCN, Ecuador contributes 0.001 percent to global greenhouse gas emissions.

Climate warming affects temperature and rainfall patterns and has a direct impact on local communities, affecting economic production and increasing the fragility of ecosystems. The Second National Communication states that the threats to ecosystems will have long ranging affects. In the project areas, due to the increase in average temperatures and the severity of rainfalls, a retreat of Cayambe glacier is in progress. The degradation of the watersheds, lack of sustainable management of moorlands and water resources and the patterns of agricultural exploitation has contributed to the progressive degradation or transformation of the area's ecosystems. Many villages may face water scarcity in the future. According to the Second National Communication "All patterns indicate an unequivocal warming of the climate system in all regions of the country. The foreseen climate change is consistent with world-wide patterns, although Harrison & Carson (2007) foresee areas of cold weather in South American Pacific Coast".

In spite of the low contribution to global emissions, the commitment of the Government of Ecuador to climate change is evident. The 414th article of the Constitution of Ecuador establishes that the "State shall take appropriate and transversal measures for the mitigation of climate change through the limitation of emissions of greenhouse, deforestation and air pollution; shall take measures for the conservation of forests and vegetation, and will protect the population at risk".

Ecuador has recognized adaptation and mitigation to climate change in national policy. (See Annex I, Executive Decree 1815, July 1, 2009) The fourth article of the Executive Decree 1815 grants all the powers, functions and performances previously assumed by the National Climate Committee, to the National Division of Climate Change, Production and Sustainable Consumption under the Ministry of Environment. The post of Under-Secretary of Climate Change in MAE was created in December 2009. This Under-Secretary is responsible for the management of climate change in coordination with other State entities and civil society.

Adaptation and mitigation to climate change are well defined as priorities in the National Environmental Policy (Policy 3, MAE 2010). The policy outlines management practices for the adaptation of ecosystems and populations to climate change, and prioritizes plans, measures and actions to:

- Mitigate the impacts of climate change and other natural events on populations and ecosystems;
- Manage the inherent risk associated with extreme events linked to climate change; and
- Reduce emissions of GHGs in the productive and social sectors.

With Executive Decree 1815 (mentioned above), MAE has assumed responsibility for formulating and implementing the National Strategy on Climate Change. It includes initiatives for awareness raising, measures for adaptation, mitigation and climate risk management, and

threat and risk information generation. In addition, the strategy promotes inter-institutional coordination of climate change initiatives at all levels of the State. The National Climate Change Strategy identifies the following priorities:

- Strengthen national scientific capacity for research on the climate system, GHG emissions and the vulnerability of the country to climate change;
- Monitor climate variability, temperature and precipitation and analyzing vulnerabilities to climate change and GHG emissions;
- Mitigate GHG emissions and promote Adaptation to climate change; and
- Build institutional capacities and generate awareness of climate change.

As well, the fourth objective of the National Development Plan (NDP) is to: "Ensure the rights of nature and promote a healthy and sustainable environment". The plan identifies “promoting the adaptation and mitigation to climate change with emphasis on the process of climate change adaptation" as a priority (SENPLADES 2009). This policy promotes the implementation of adaptation programs, with particular attention to vulnerable and fragile ecosystems, food sovereignty, and inter-institutional coordination among different relevant partners.

Given the high priority of sustainably managing water resources, the National Secretariat of Water (SENAGUA) was created through Executive Decree No. 1088, on May 15, 2008. It is responsible for managing water in a sustainable and integrated way through watershed management strategies. One of its main objectives is to promote policies for the protection of watersheds with emphasis on the conservation of native forests and preservation of water quality at the source.

Implementation Context

Directly linked to the National strategy, MAE is implementing two adaptation projects funded by the Global Environment Facility (GEF). The first project is Ada*ptation to Climate Change through Effective Water Governance in Ecuador* (PACC). Its main objective is to reduce Ecuador’s vulnerability to climate change by promoting efficient water management and improved access to timely and accurate climate data. This project focuses on mainstreaming adaptation measures in the water management sector in Ecuador and includes three basins (Azuay, Loja, Los Ríos). The other project is, *Reduce the Impact of Rapid Glaciers Retreat in the Tropical Andes of Peru, Bolivia and Ecuador countries* (PRAA). The main objective is to contribute to strengthen the resilience of local ecosystems and economies to the impacts of glacier retreat in the Tropical Andes. In the case of Ecuador, the PRAA emphasizes sustainable management and conservation of micro-watersheds and moorlands surrounding the Antisana volcano.

In support of the national policy framework, Ecuador is implementing several strategic measures to reduce GHG emissions, including with Partner Forest and Partner Moorland. These initiatives provide economic incentives for the conservation of forests and moorlands in support of ecosystem management and the reduction of deforestation. The aim is to reduce GHG emissions and support adaptation measures which build ecosystem resilience through the

conservation of biodiversity, provision of environmental services and the improvement of social conditions. These initiatives have contributed to the conservation of 260,000 hectares of forests.

Since 2001,CAMAREN (Consorcio de Capacitación en el Manejo de los Recursos Naturales Renovables), a consortium comprised of state agencies (MAE, CREA) and of representatives from a dozen national universities and NGOs, has brought together a series of stakeholders interested in water governance in Ecuador. This forum offers a unique framework through which climate change concerns are mainstreamed into the emerging water agenda in Ecuador. The Sixth Forum on Water Resources was held in June 2010.

The Ministry of Energy is also promoting initiatives for the promotion of energy efficiency. Ecuador also implements projects with the Clean Development Mechanism (CDM), (a total of 25 projects registered and/or validated in areas such as hydropower and energy efficiency). In addition, MAE is also sponsoring an awareness campaign on the importance of energy efficiency in the fight against climate change.

Climate Vulnerability at National Level

The final report of the Intergovernmental Panel on Climate Change (IPCC), confirmed that the warming of the climate system is unequivocal. With regard to water, the report notes, among other impacts, an acceleration in the reduction of glacial mass and snow cover. The immediate affects are a reduction in water availability for human consumption, a decrease in hydroelectric potential, and a disruption in seasonal water flows. Among the most affected areas are the Hindu-Kush, Himalayas, and the Andes.

In Latin America, the report cited that: a) tropical forests in the Amazon would be gradually replaced by savannas; b) semi-arid, vegetation would be replaced by arid land vegetation; c) there would be a loss of biodiversity, with extinctions of species; and d) reductions in agricultural and livestock productivity would occur with adverse consequences for food and nutrition security. With respect to water, changes in precipitation patterns and the disappearance of glaciers would significantly affect the availability of water for hydroelectric, agricultural, and human consumption.

According to the Ecuador National Environment Policy (MAE,2010), the country has experienced sustained increases in temperature, changes in frequency and intensity of extreme events (droughts, floods), changes in the hydrological regime, and the retreat of glaciers. Crucial is the variation recorded in the last ten years with intense precipitation in very short periods followed by periods of significant decrease in precipitation. As well, the retreat of glaciers in recent years is significant, 20 to 30 percent loss of ice mass in the last 30 years. For example, recent studies show that the surface covered by glacial ice on the mountain Cotopaxi has decreased by 30 percent since 1976 (Cáceres, B. *et al* 2005).

High mountain agro-ecosystems in Ecuador are exposed to cyclical drought, thus glacier runoff is critical for providing mountain communities with reliable water sources and sustaining livelihoods. Likewise, coastal and estuarine ecosystems along the Pacific Coast and the Guayas River estuary are particularly exposed to rising sea levels and settlements in the low-lying coastal areas. These zones are affected by increased coastal erosion, tidal surges and flooding. They are particularly prone to salt water intrusion, and aquifers are especially vulnerable to changes in groundwater quality.

There is currently no updated assessment of the state of water resources in Ecuador. The last available study dates back to 1989, and was commissioned by the former Instituto Ecuatoriano de Recursos Hidráulicos (INERHI) and the Centro de Estudios y Experimentación de Obras Públicas de España (CEDEX). This assessment serves as a basis for the formulation of the National Plan for Water Resources (PNRHE), which inventoried surface water and compared supply and demand for consumptive and non consumptive uses of water. Few studies exist regarding the state of groundwater supplies in Ecuador. However at this time, SENAGUA is carrying out a study to analyze the water supply and its balance.

The total surface water availability in Ecuador amounts to 146,798 hm3/year, of which 90 percent is found in the Eastern Lowlands which are part of the Upper Amazon Basin. As these figures have not been updated, projections of supply have not estimated the impact of climate variability and climate change on water supplies in Ecuador. This reinforces the importance of addressing the lack of reliable climate data and integrating adaptation measures with livelihood strategies at community level, as proposed in this project.

Over the past few years, increasing social conflicts surrounding water resources and watershed management in Ecuador have led to a growing public debate surrounding the need for policy reform in the water resources sector. The current baseline in Ecuador is characterized by:

- A dispersed water governance arrangement which leads to increased competition and conflict over scarce resources;

- Lack of coherence between national climate information and local/regional end users, as most water use permits are given regardless of the state of water resources;

- Lack of resources (both financial and technical) for community-based users to improve their adaptive capacities or implement innovative water management approaches; and

- Insufficient knowledge generation and dissemination of climate related risks or threats.

Climate Vulnerability in the Project Area

Two watersheds covering the four provinces have been selected for the proposed climate change adaptation project. They are characterized by different ecological systems, cultural traditions, ethnic composition, and differing reliance's on natural resources to sustain livelihoods. The targeted areas predominately experience high to very high level of food insecurity. As well, in both watersheds communities are affected by climate threats, reoccurring natural disasters and lack of preparedness at local level to deal with climate threats. In the highlands, populations are characterized by ethnic groups of the Quichua nationality. Specifically the population group is Cayambis in Pichincha, Salasacas in Loja and Cañaris in Azuay.

Hunting, deforestation, water harvesting activities, mining at small and medium scale, all have contributed to the degradation of ecosystems and the reduction of the species in Ecuador. Land use changes and the excessive use of chemicals in agricultural and mining have affected the quality of water in the proposed project area. In the Jubones River Basin, the increase in temperature has caused severe droughts, particularly in the upper zones, affecting the hydrographical basins. Agriculture is the main economic activity in the Jubones River Basin. In the middle and high altitude areas agriculture mainly supports the daily subsistence of small

farmers. More than 50 percent of the farming households in the high basins are small, with a high exposure to droughts (provinces of Azuay and Loja). In the districts of the lower part of the basin (El Oro province), there are less farm families due to high exposure to floods.

The districts of Pedro Moncayo and Cayambe in the province of Pichincha have the highest rates of malnutrition and basic needs not met and are the districts more vulnerable to climate change. The average temperature in Cayambe is 12ªC and relative humidity of nearly 80 percent. Community livelihoods are based on agro-forestry and floriculture activities for about 50 percent of the population. In district Pedro Moncayo there is a shortage of irrigation water; over-exploitation of soils and excessive use of chemicals. Due to the erosion and severity of rainfall, there has been an increase of landslides. (See Annex XI for more details on climate change scenarios.)

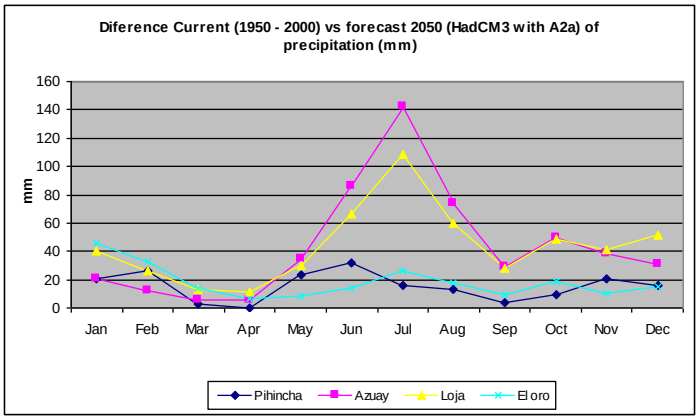
Several studies have been carried out by the MCRJ to observe climate threats in the River Jubones watershed. The main finding is that extreme climate events are affecting the natural water systems of the watershed. In the central zone, long periods of drought occur, lasting up to 16.8 months. In the higher elevations studies show an increase in the frequency of landslides and heavy flooding. A priority for the provincial governments of the MCRJ is to conserve and promote the recovery of natural resources, with the participation of local communities and local organizations. (See Annex II Main risks in the basin of the river Jubones.)

Forecasts made up to the year 2050 (A2a HadCM3 Climate World), which are based on statistics recorded between 1950 and 2000, show significant changes in precipitation in the four project provinces (Pichincha, Azuay, Loja and El Oro). The variation highs are observed in July and in June. In the case of El Oro province, these variations are more significant in the month of December. In addition, variations in temperature exceeded 2 C° (see Graphs 1 and 2, and Annex III Forecast 2050: Precipitation and Temperature). These changes have a direct impact on food security.

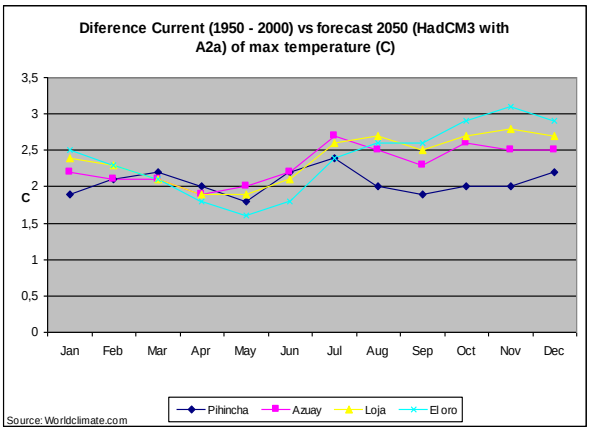
The Second National Communication identifies three climate change scenarios at national level for Ecuador. These scenarios are derived from the application of PRECIS, TL959 and ETA models and were validated in October 2010. The analysis concludes that an increase in rainfall in the Highlands is foreseen; while a decrease of rainfalls is foreseen in the Pacific Coast and the Amazon. A decrease of rainfall is expected for the lower part of the Jubones River Basin. A systematic climate warming is expected for all the regions in the country.

According to the historic climate indexes and applying FCLINDEX, the increase of consecutive non-rainy days is evident in the project area: the number of consecutive non-rainy days in 1971 was 3-6 days; and the number increased to between 15-18 days in 1981. Changes in temperature directly affect rainfall patterns. If the temperature for the period 1991 – 2010 is compared with the scenario for 2010 – 2020 (using the PRECIS), an increase in the average temperature of approximately 0.9 and 1º C is foreseen for the project areas. Furthermore, a ten percent decrease of the rainfalls is foreseen, mainly for the lower region of the Jubones River Basin while there is a ten percent increase in rainfall in the districts of Cayambe and Pedro Moncayo in the Province of Pichincha, during the period. (See Annex XI, Analysis of Climate Change Scenarios.)

GRAPH 1
Projected Differences in Precipitation in Targeted Provinces



GRAPH 2
Projected Changes in Temperature in Targeted Provinces



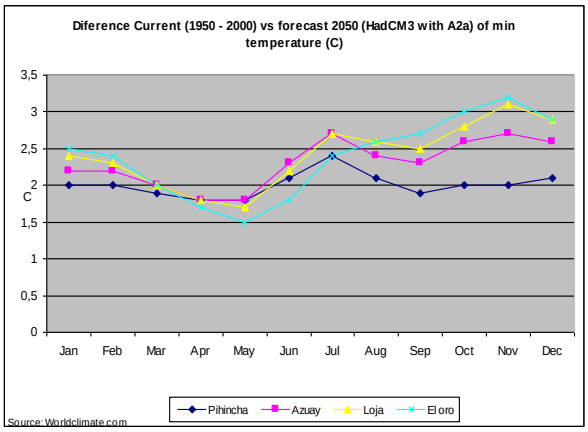


Table 2 shows the level of food insecurity and climate risk in the targeted areas of the project by province and canton. Each province and most cantons face a very high level of undernutrition and food vulnerability. As well, all targeted areas experience reoccurring severe droughts. In Cayambe, glacial melt is a climate change risk that impacts water flows, food production, food availability, and thus the food and nutrition security of communities and families. As well, in the highland regions, the number of edible plants is affected by drought. As these plants have a long growing period, with one harvest per year, a drought results in no harvest for the year. The reduction of water in the high altitude zones is affecting food production, and in some areas (in Cayambe, Saraguro, Pucará) edible plant varieties are no longer viable in their traditional ecological zones.

A result is a high incidence of consumption poverty and food security vulnerability. Nutritional status is also affected as are traditional dietary practices and food habits. Dietary preferences are naturally being modified to fit with coping or mitigation strategies. From a nutritional point of

view, these strategies are inadequate and mothers and children are most affected by the changes in diets related to climate risks.

TABLE 2
Food Security and Climate Risks

Province	Canton	Range of malnutrition	Consumption Poverty	Climate & Food Vulnerability	Climate Risk
Total País		**25,80**	**38,2**		
Pichincha			22,40		Increased in number and severity of droughts
	Cayambe	22,3 - 29,1	23,00	High	
	Pedro Moncayo	29,1 - 35,9	26,00	High	Ice reduction (Cayambe).
Azuay			26,70		Sustained water shortages and droughts that can last up to 16.78 months
	Nabon	63,3 - 70,8	32,00	High	
	Oña	48,3 - 55,8	0,27	High	
	Santa Isabel	40,8 - 48,3	16,00	Very high	
	Pucara	55,8 - 63,3	29,00	High	
	Giron	40,8 - 48,3	12,00	High	
	San Fernando	40,8 - 48,3	16,00	High	
Loja			47,10	High	Extreme events including flooding droughts and. landslides.
	Saraguro	61,6 - 73,3	42,00		
El Oro			28,00	Moderate to high	In the lower river basin sustained and recurring flooding.
	Zaruma	23,3 - 34,1	13,00		
	Chilla	12,6 - 23,3	16,00		
	Pasaje	12,6 - 23,3	5,00		

1- Undernutrition - Encuesta de condiciones de vida (INEC) 2006/ Referencia WHO 2005 // WFP VAM, 2009.
2,- Poverty by Consumption - Encuesta de condiciones de vida (INEC) 2006 // VAM, WFP, 2009.
3- VAM, WFP 2009.
4- Climate Risk and Vulnerability assessment Jubones River.
Notes: Very High Regions that have a higher level of threat and a higher level of food vulnerability. High Regions with a greater risk to climate impacts and food vulnerability./ Moderate. Regions at risk of food vulnerability.
Source: SIISE 2010 // VAM, WFP Ecuador, 2009.
Annex IV, Multi-threats Map; Annex V WFP VAM Ecuador: food insecurity, erosion, frost and desertification maps.
Annex VI, Table of Social Indicators.

PROJECT / PROGRAMME OBJECTIVES:

The **overall goal** of the proposed project is to:

> *Reduce vulnerability and food insecurity of communities and ecosystems, related to the adverse effects of climate change, in the most vulnerable cantons of Pichincha Province and the basin of the river Jubones.*

The proposed project includes two components with the following objectives:

Component 1: Develop awareness and knowledge capacity at the community level on climate change and food insecurity related risks.

Objective: Increase knowledge to manage climate change risks affecting food security in targeted cantons in Pichincha Province and in the basin of river Jubones.

Component 2: Increase adaptive capacity and reduce recurrent risks of climate variability at the community level.

Objective: Strengthen adaptive capacity of highly food insecure communities to respond to the impacts of climate change, including variability in targeted cantons in the Pichincha Province and MCRJ.

These components will be implemented at community level under the leadership of MAE and in coordination with MAGAP, through two management authorities: under direct management of the MCRJ and the Pichincha Provincial Government.

PROJECT / PROGRAMME COMPONENTS AND FINANCING

A detailed budget is presented in Annex X A. A disbursement schedule is provided in Annex X B. Table 3 summarizes expected results at the outcome level, with an associated indicative funding level.

TABLE 3
Expected Results

Component 1-Objective	EXPECTED OUTPUTS[4]	EXPECTED OUTCOMES	AMOUNT (USD)
Increased knowledge to manage climate change risks affecting food security in targeted cantons in Pichincha Province and River Jubones basin	1.1.1. Communities in targeted cantons trained in climate change threats and adaptation measures which reduce vulnerability, in particular related to food insecurity 1.1.2. Targeted communities participate in adaptation and risk reduction awareness activities 1.1.3. Food security and gender considerations integrated in all adaptation training programs	1.1.Increased awareness of communities on climate change risks and food security related risks	141,600.00
	1.2.1. Canton and community adaptation plans developed to reduce vulnerabilities to climate change induced food insecurity in targeted areas 1.2.2. Community participation in processes to develop adaptation plans in targeted cantons 1.2.3. Agreements developed and signed among targeted cantons, GPP or MCRJ, MAE and WFP to implement adaptation actions 1.2.4. Women participated in processes and decision making to develop adaptation plans	1.2 Secured ownership of adaptation measures in communities in targeted cantons	523,200.00
	1.3.1. Community early warning system designed, implemented and maintained 1.3.2. Monitoring system in place to track climate events in targeted cantons	1.3 Increased knowledge to manage climate change and risk, including climate variability affecting food security	740,200.00

[4] Based on the community adaptation plans concrete outputs and targets will be developed and included into the M&E plan.

	1.3.3. Monitoring system to track project results and lessons learned		
Component 2-Objective	**EXPECTED OUTPUTS**	**EXPECTED OUTCOMES**	**AMOUNT (USD)**
Strengthen adaptive capacity to respond to the impacts of climate change, including variability in targeted cantons in Pichincha Province and MCRJ	2.1.1 Concrete adaptation measures based on community adaptation plans and designed 2.1.2. Physical assets created, improved or maintained. For example: a. Water harvesting and storage measures; b. Irrigation and drainage systems; c. Flood defences and climate proofed infrastructure (check dams, etc.) 2.1.3. Natural resources assets created, improved or maintained. For example: a. Land reforested, original vegetation in moorland and grasslands, b. Improved Seed distribution 2.1.4 Identification of adaptation technology requirements and transfer of technologies through concrete actions. For example agricultural production systems in transition and measures to increase crop yields 2.1.5. Implementation strategy includes approach for use of incentives and PES	2.1Increased adaptive capacity and ecosystem resilience in targeted rural communities	4,695,000.00
	2.2.1. Community participation, in particular participation of women, guide decision making processes for project execution 2.2.2. Communities share success stories and lessons learned	2.2Increased capacity at communities and institutional level to manage climate change risk in targeted cantons	229,200.00

		6,329,200.00
5. Project Execution cost	**(10 percent)**	**632,920.00**
6.Total Project Cost		**6,962,120.00**
7.Indirect Support Cost	**(7 percent)**	**487,348.40**
Amount of Financing requested	**US $**	**7,449,468.**

PROJECTED CALENDAR:

Milestones	Expected Dates
Start of project	July 2011
Midterm review	December 2013
Project Closing	July 2016
Terminal Evaluation	August 2016

PART II: PROJECT / PROGRAMME JUSTIFICATION

A. Project Elements

Project Strategy

Given the climate threats faced by the targeted provinces and cantons, including glacial melt reduced precipitation and more frequent droughts, and the anticipated effects on food security, the project will adopt a two pronged strategy: community based adaptation (CbA)[5] and ecosystem-based adaptation (EbA). The Project will help to reduce vulnerability to climate change induced risks and vulnerabilities in four provinces and 50 parishes of Ecuador. The strategy supports the aim of reducing vulnerabilities to climate change threats, in particular food insecurity, and increasing climate change resilience in order to maintain: the water provisioning services of moorlands and forests, and the productive capacity of agricultural lands. These three landscapes, in two watersheds, are the focus of the project. A unique feature of the project is the integration of adaptation measures in food security strategies.

The targeting of these two major watershed areas will help to maintain resilience over extensive areas and provide a stronger buffer against climate induced stresses. A community based approach is typically lacking in most projects in Ecuador, however it is a key element of the projects implementation strategy. The project will support the execution of two national strategies (the strategy for climate change and the strategy for food security), by coordinating actions at the territorial level (provincial government) and watershed level. The implementation structure includes a direct link with and coordination among local entities (MCRJ, GPP) that

[5] Community-based adaptation (CBA) recognizes that communities already possess much of the knowledge and skills required to cope with the expected impacts of climate change. Communities can often increase their resilience to climate stresses by building on their own knowledge and skills. This strategy recognizes that environmental knowledge, vulnerability and resilience to climate impacts are embedded in societies and cultures. This means the focus is on empowering communities to themselves take action based on their own decision-making processes. (The 4th International Conference on Community Based Adaptation (CBA) to Climate Change, Dar Es Salaam, Tanzania, 21-27 February 2010.)

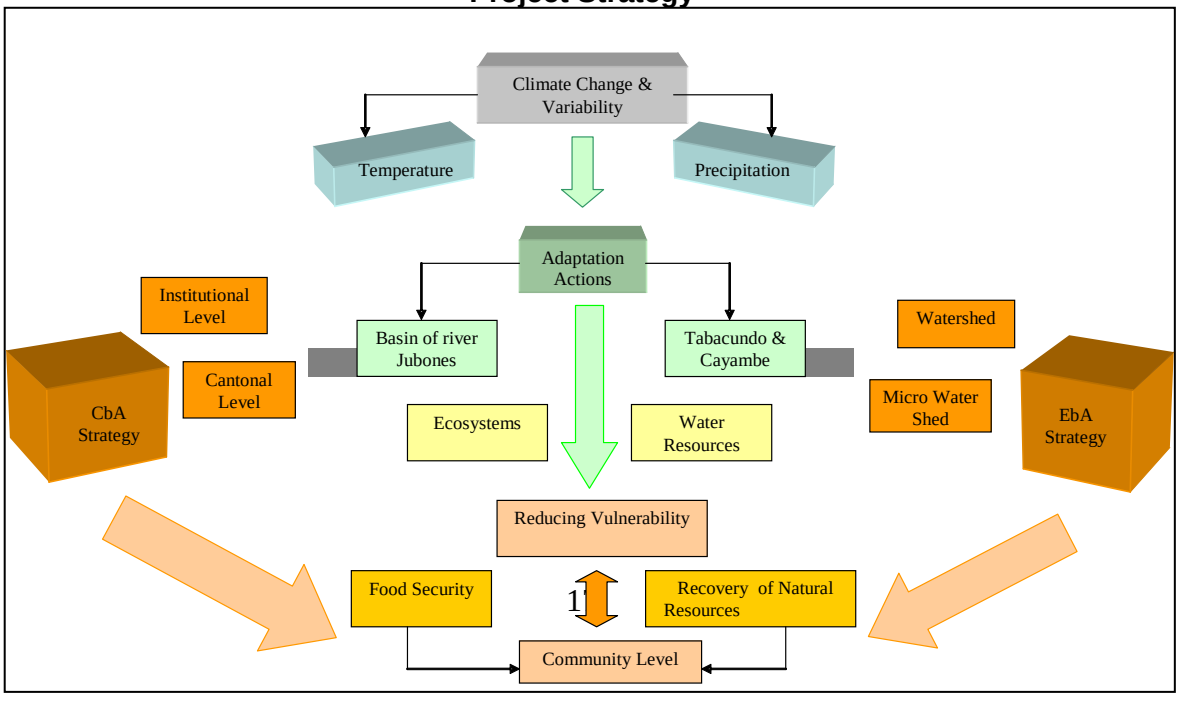
work with communities and directly execute community adaptation plans; and with MAE and MAGAP at the central level.

The project will identify and implement a range of landscape based activities (agricultural, moorland and forest) that support improved water management. Activities will be selected through a participatory process that considers the ecological zone and community priorities. The strategy is grounded in Ecuadorian experience demonstrating that community-level adaptation requires awareness raising, increased knowledge, improved capacities and the stable provision of ecosystem services. By maintaining large-scale resilience, the flow of ecosystem services will be maintained, without irreversible ecosystem regime shifts.

A main element of the strategy is to monitor and evaluate the effectiveness of the diverse community plans that will be implemented. MAE has a strong interest to review which activities are effective in helping communities adapt to climate change and which build ecosystem resilience. MAGAP is concerned about food security, considering production, access, utilization and stability at the local level in the face of climate change. The intention is that the Government will scale up community models that are effective in meeting these two aims. The process of updating the national climate change strategy is an opportunity for the Government, in collaboration with WFP, to test implementation models that support community level adaptation to climate change across different sectors.

The proposed approach recognizes the importance of critical ecosystems and agricultural production systems in support of food security and the most vulnerable segments of the population. The project targets those cantons with high levels of chronic malnutrition and high risk of precipitation fluctuations and water availability due to climate variability and change. It also targets communities that will be most severely affected by climate related events and are least able to cope with increased climate variability. The focus on communities allows the project to target vulnerable households, in particular those headed by women and those with high levels of consumption poverty. In addition, the assessment of incentives for environmental works or the payment for ecosystem services (PES) will be assessed. A strategy to use incentives or PES will be an important part of the implementation plan, and developed in line with GoE practices.

GRAPH 3
Project Strategy



Project components and activities will be implemented on the basis of a community strategies and plans, with special attention to the priorities of women and indigenous populations. With this focus, the project aims to have a greater impact at the local level, empowering communities to cope with climate change threats. The participatory process will foster the participation of at least 50 percent women in all planned activities, including decision making processes.

Project Targeting

The project will be implemented in four provinces: Pichincha, Azuay, Loja and El Oro and 12 cantons. Within these provinces adaptation plans and activities will be carried out in approximately 500 communities in 50 parishes. Community selection will be based on indicators to measure climate, food security vulnerability and community organization. (See Annex VI and IX, E.)

Vulnerability criteria for the selected communities included:

1. Increase in frequency and severity of floods, droughts and landslides
2. Glaciers retreat affecting water supply
3. Forests and humid soil degradation
4. Degradation and contamination of water resources
5. Agricultural activities for daily subsistence and land tenure
6. Agricultural over exploitation

A census survey will be conducted in all selected parishes and communities with the aim of distinguishing vulnerable groups, using the following targeting criteria:

1. Households affected by chronic malnutrition, anemia, poor dietary diversity and insufficient food consumption
2. Household with livelihoods dependent on agricultural and ecosystem services
3. Households headed by women
4. High concentration of Indigenous populations
5. Households with more than six members.

Reducing Vulnerabilities

The proposed project will address the following climate threats and reduce vulnerabilities posed by these threats, in particular to household food security: increase in average temperature, the retreat of glaciers, moorland degeneration and desertification, forest loss, and an increase in the frequency of extreme events. The project will support an integrated set of community based adaptation interventions that aim to reduce vulnerability and strengthen resiliency.

Activities will contribute to reducing the direct impacts of these threats on local food security, strengthening community resilience to cope with climate change threats, and to reducing economic and human losses at local level. Project activities will develop awareness of climate change threats, disseminate information and transfer knowledge so that local communities can adapt to specific climate change threats. Specific activities include training, awareness raising, adaptation plan development, implementation of early warning systems and implementation of

specific physical and natural resources assets, as tangible measures to reduce local vulnerabilities.

Community adaptation plans will identify community priorities which support the implementation of adaptation measures to increase capacity to mitigate the impact of localized climate threats. Specific adaptation measures will be in identified, in a participatory process with the selected communities, to response to local climate threats. Concrete actions may include water conservation and storage measures, reforestation and protection of vulnerable landscapes and preparedness measures to mitigate the impacts of extreme events including measures to reduce soil erosion and control runoff. These adaptation measures will help ensure that the poorest communities have the capacity to adapt to climate change impacts without further eroding their food security.

Project Components

As part of the project baseline, an in-depth vulnerability assessment to identify local climate threats will be undertaken using WFP's 2010 VAM. The assessment will also inform canton level planning and guide the development of community level adaptation plans. The assessment will be carried by GPP and MCRJ, in coordination with WFP, MAE, MAGAP and the National Institute for Meteorology and Hydrology of Ecuador (INAMHI). (See Table 4 for consultation arrangements.) The assessment will consider the following: climate change risk indicators, socioeconomic indicators, and food security indicators including food consumption habits, constraint to accessing food, and agricultural practices. All indicators will be assessed by gender, and data will be disaggregated by gender and socio-economic groups. Secondary data sources will include: climate risk maps, watershed and micro-watershed inventories, and food and nutrition data from health centers, INAMHI metro- logic data, and other local monitoring systems.

The project will be implemented through two components and capacity development, monitoring and knowledge management will be important elements of both components.

Component 1: Develop awareness, knowledge and capacity at the community level on climate change and food insecurity related risks.

Objective: *Increase knowledge and capacity to manage climate change risks affecting food security in targeted cantons in Pichincha Province and in the river basin of Jubones.*

This component will support the national strategy for climate change by addressing local exposure to climate change risks and high vulnerability, in particular to food insecurity. This component will raise awareness and understanding of climate change threats, adaptation solutions, and the need for action at community level. This component will also work to ensure that MAE and MAGAP mainstream climate change adaptation into provincial sector develop strategies and adaptation strategies. The project will work at three levels, provincial, canton and parish/community, with particular focus on the community level. However, coordination will be strengthened among all levels with specific coordination mechanisms and through the execution of project activities.

This component includes three outcomes and ten outputs aligned to activities which aim to develop awareness, knowledge, capacity and commitment among key stakeholders to respond

to climate change threats. The component will help to address challenges related to integrating adaptation to climate change in development planning, in particular as it relates to improving food and nutrition security. Participatory methodologies, tools and planning approaches will be developed as part of the project, with the aim of broader application in other watersheds of Ecuador.

Output 1.1.1, 1.1.2, and 1.1.3: will focus on vulnerable communities in targeted cantons and special efforts will be made to ensure the participation of women and vulnerable groups. Working through GPP and MCRJ officials in coordination with MAGAP and MAE, local staff will develop and implement an awareness campaign to inform local officials and communities of the threats to climate change and potential adaptation solutions. In addition a training module will be developed to help officials and communities assess local threats. These activities will give particular attention to the threats that climate change posses to production systems, water management and food and nutrition security. A gender approach will be integrated in all training modules and awareness campaigns. Capacity will be built to assess changing threats and incorporate threat information into local planning and sector projects.

The Project Management Team will work with local communities to ensure that community plans support priorities at the canton level. Plans will be supported by implementation schedules, including the technical inputs to be provided by MAE, MAGAP or others. Agreements will be signed by relevant stakeholders, including with communities, targeted cantons, Pichincha Government or MCRJ, MAE, MAGAP and WFP for the implementation of adaptation plans*.* Coordination among the various stakeholders will be a crucial role of the project management team.

Output 1.2.1, 1.2.2, 1.2.3, and 1.2.4: In support of the national climate change strategy, canton level adaption priorities will be assessed and presented in an adaptation plan. In accordance with priorities to reduce vulnerabilities to climate change, in particular vulnerabilities related to food insecurity, a participatory process will be developed to engage all members of the community. (See Annex VII.) Participatory workshops will be carried out by GPP and MCRJ, under the guidance of MAE and in coordination with the MAGAP. The institutional framework for community based planning will be strengthened in line with the Government of Ecuador's National Development Plan. Workshops will be conducted, with a focus on two main themes: the context of climate change risks, mitigation and adaptation solutions with consideration of both community livelihoods and ecosystem integrity and the services these ecosystems do or can provide. In addition, workshops will integrate topics on food sovereignty and food security. These workshops will result in increased participation of communities, in particular women, in finding solutions to climate change threats and concrete plans which will be implemented through Component 2 of the proposed project.

Critical technical information is required to support decision making at local and national level. Through ***Outputs, (1.3.1, 1.3.2, and 1.3.3)*** tools will be developed to assist officials and communities to better understand climate threats. *C*ommunity early warning systems will be designed, implemented and maintained. This tool will be especially important for deciding on context specific adaptation investments based on local risks and hazards. Early warning systems will also help in updating climate related risk maps (hazards, vulnerabilities and impacts) and in refining socio-economic and food insecurity indicators.

Developing a system for knowledge management and evidence- based decision making is key to the government's intention to draw lessons and replicate adaptation models that generate results in different contexts ***(Output 1.3.2).*** A monitoring system will be developed to track

climate events and trends in targeted cantons. In particular systems will be developed with INAMHI (and be aligned with the systems of SNGR) to support weather monitoring and forecasting systems. These systems will be installed at the local level and be linked with national systems.

As part of the project monitoring plan, GIS tools will be used to track changes in the Jubones river basin and the targeted watershed in Pichincha. Spatial presentation of the project will allow the Government of Ecuador to map investments by project types and other relevant parameters at local and provincial level. Another aim is ***Output 1.3.3*** which will disseminate planning and results information, including the tracking of selected outputs and outcomes, as outlined in the project log frame. A further aim of the monitoring system to support the development of a common knowledge repository for climate change adaptation results. The use of GIS, combined with early warning information, will allow the project to track project results related to food and nutrition security and the reduction of climate risks.

TABLE 4
Consultation and Participation

Areas of Consultation	Level of community participation
Institutional level: • Conceptualization of climate change, food sovereignty, food security linkages • Situation and threat analysis • Identifying of priorities at the provincial/watershed level • Methodologies developed	MAE Without community involvement
Canton level: • Identifying of priorities at the provincial/watershed level • Priorities guide community consultations • Analysis and prioritization of adaptation measures • Canton adaptation plan approved	GPP and MAE MCRJ and MAE Involvement of community leaders
Community level: • Community awareness raising and consultations • Community plan prepared • Consensus reached on plans • Consensus reached on implementation schedules and agreements signed at appropriate levels	GPP, Mayor, MAE MCRJ and MAE Full community participation

Component 2: Increase adaptive capacity and reduce recurrent risks of climate variability at the community level.

Over half of project resources will be used to implement concrete adaptation actions at the community level. Natural and physical assets will help reduce vulnerabilities, mitigate the impact of climate variability and strengthen food security and livelihoods.

An incentive strategy will be developed, considering payment for ecosystem services and incentives such as cash and/or vouchers for participation in community related asset creation,

An analysis will be made in each community to identify the best mechanism, considering lessons learned from WFP´s past experiences and community preferences and needs.

Objective: *Strengthen adaptive capacity of highly food insecure communities to respond to the impacts of climate change, including variability in targeted cantons in the Pichincha Province and MCRJ.*

Component 2 focuses on the implementation of concrete adaptation actions. In line with the priorities of cantons, communities will select from a menu of feasible concrete adaptation activities. These activities will be designed with support from MAGAP and local sector experts to ensure high technical standards ***(Output 2.1.1).*** These activities will increase adaptive capacity and ecosystem resilience in targeted rural communities and can be grouped into two categories: the construction and maintenance of physical assets ***(Output 2.1.2)*** and the creation and enhancement of nature resources and ecosystem integrity (***Output 2.1.3***). Physical assets and infrastructure may include for example water harvesting and storage measures, irrigation and drainage systems, flood defense and other climate proofing of infrastructure, such as check dams and storage tanks. These actions will help to maintain water supplies and provisioning services, partially through the reduction in the wastage of water and the promotion of sustainable practices. As well, provisioning services will be supported by efforts to manage water demand based on climate change scenarios and the expected precipitation decreases. Local strategies will give particular attention to securing access to water for the most vulnerable populations. However the strategy must also consider vulnerabilities to natural events, for example floods and landslides, that may be exacerbated by climate change. (See Table 5.)

These outputs include community organization, trainings and workshops in each of the 50 targeted 50 parishes. Specific actions include the preparation of all training materials, and the implementation of training sessions. Topics to be covered include natural resource management, improved agriculture practices, improved water management practices, food security and climate change themes. This component is crucial for ensuring that assets created have technically solid designs, are well constructed, meet specified technical standards, and are maintained according to well established practices.

Biological measure and natural resource conservation will also be part of the menu of options that would be implemented as part of the watershed approach; based on the community adaptation plans. For example, actions will stabilize hill slopes vulnerable to landslides, restore forest and vegetative cover to conserve water and reduce erosion in moorlands and forest areas, and improve agricultural practices to conserve water and maintain or increase yields on a sustainable basis to respond to climate threats. All activities will be part of a comprehensive community package of interventions that will serve as models with high replication potential in other water stressed areas of Ecuador.

Output 2.1.4 is a priority of GPP and MCRJ to fill existing gaps in adaptation related technology and the transfer of appropriate technologies to address specific climate threats. Through this activity the project will work with local experts to identify adaptation technology requirements. For example agricultural production systems in transition require new technologies to ensure adequate seed sources, drought resistant varieties and other measures to increase crop yields.
All adaptation measures will be executed by GPP and MCRJ, in coordination with local government programs, including sector (forest, water and agriculture) and social programs. Specifically activities will be implemented in coordination with MAE programs, Forest Partner

and Moorland Partner. Both programs include payment strategies for environmental services, in particular for the restoration of forest and vegetation cover.

As compensation for natural resource management is a practice in Ecuador, an assessment of incentives and the strategy to use incentives is an important part of the implementation strategy. If it is established that incentives are an appropriate and useful tools in the targeted watersheds, the use of cash or vouchers will then be assessed based on criteria such as the availability of financial institutions, markets and security considerations. Using WFP's experience of working with cash and vouchers to involve vulnerable groups ***(Outputs 2.1.5)***, an assessment will be undertaken to determine how cash or vouchers can be used to compensate or

Table 5
Examples of Project Activities

Sector	Land Protection	Natural Resources Restoration
Land Rehabilitation	Land protection with community organization	Reforestation with native species
	Live fencing with native species	Drainage systems
	Watershed management	Environmental management plans
	Reintroduction of native species	Soil protection and recuperation
	Early warning systems	Introduction of native species
Agriculture	Training on species with low water consumption, organic production	Reforestation training programs
	Water management and storage structures	
	Establishment of greenhouses	
Livestock	Pasture management programs	Implement certified seeds for pastures
	Water storage	Live fencing with native species
Moorlands	Moorlands management and conservation	Training programs
	Water storage and capture systems	Management plans development for natives species recovery
Water Management	Water storage and capture systems	Reforestation and protection of sources
	Community water storage systems	
	Check dams and capture infrastructure	
	Drip irrigation systems	
	Canal infrastructure improvement	

motivate community members for their participation in community based natural resource activities. The analysis will consider if there is a need to encourage communities to participate to build or restore physical infrastructure, to reforest or vegetate forests and moorlands respectively, or using biological conservation measures to protect the water resources of Cayambe. Considerations of sustainability, social benefits to be derived and the level of community vulnerability will also be factored into the decision to include an incentive strategy in the project.

Because the project will target the poorest and most vulnerable communities incentives or PES may be integrated in community plans to ensure participation in the creation of assets or the protection of natural resources. The GoE currently employs two models: incentives for natural resource management and PES through the program, Socio-Bosque.

From the creation of the Socio-Bosque in 2008 the program has benefited a total of 40.273 personas (9.314 families), through 43 conservation agreements covering community lands involving indigenous and Afro-Ecuadorian communities. Also, 388 agreements were established with private land holders, protecting 416.508 hectares of native tree species and other priority ecosystems. The proposed project will draw on lessons from Socio-Bosque and ensure coordination and compatibility in strategy and approach, in particular as related to the use of incentives and PES.

Payments and incentives would be provided to poor vulnerable people with the aim of enabling their participation in natural resource activities that produce social benefits. A strategy will be developed which includes an assessment of both modalities to determine how best to use these models and the criteria for their inclusion in the project. Incentives would only be provided during the start up phase and the project would seek continued participation through capacity development and awareness-raising activities, and benefits accruing from the project assets. It is not anticipated that payments would continue after project start up. Transfers would be made using the mechanisms WFP has established in country, using either cash or vouchers, consistent with Socio-Bosque mechanisms.

As the proposed project will implement targeted adaptation actions to reduce climate change variably risks, community participation in decision making processes for project execution is crucial (***Outputs 2.2.1)***. This output makes the distinction between carrying out activities or being compensated to participate in an activity, with a clear role in decision making in all aspects of planning and execution. The project aims to ensure that communities, in particular women and vulnerable groups within a community, contribute to defining and prioritizing adaptation measures.

As the project proposes a comprehensive set of adaptation measures with high replication potential, the project will systematically capture lessons and practices. Central to the generation of lessons and practices is the opinions and views of communities (***Output 2.2.2***). Communities also will share success stories and lessons through workshops as an input to the knowledge management component of the project. These lessons will also contribute to increased awareness, by bringing visibility, not only to the threats of climate change and variability, but also to the potential of adaptation response options in diverse contexts. (See Annex 9 F, Sustainable Project Outputs for more details.)

An aim of the project is to develop capacity at local level to ensure the technical quality of community project designs. An important sustainability element is the role of the community in

developing and implementing community plans. Establishing ownership is central to project sustainability.

The agriculture and forestry sectors are vital for economic and social development in the country and are linked to the promotion of other productive sectors. MAGAP is responsible for the implementation of agricultural policies, in line with the National Climate Change Strategy. The new Constitution of the Republic (2008), the National Development Plan of (2009-2013), Heritage Policy, Water Management Plan, and the Law for Land Tenure, among others regulate the sustainable use of agriculture, water and forest resources. The land tenure policy is in force and would be adhered to for the implementation of this project. The project will put particular attention to ensure that the poorest have secure ownership of project benefits and services.

MAGAP as a strategic partners will be responsible for ensuring that all policies are adhered to. Based on Instituto Nacional de Desarrollo Agrícola information, in the proposed project areas, approximately 1 percent of the properties are community held lands, 2 percent are public properties and 97 percent are private properties. The project will ensure that all works are carried out on lands with valid property documents. A project activity will include helping secure proper documentation as required.

B. Social, Economic and Environmental Benefits

Ecuador faces multiple hazards and presents a wide range of vulnerabilities to climate change. The effects of climate change are expected to intensify over the coming years and decades and the most vulnerable will be adversely affected. As the distribution and availability of water resources change over time, production systems and water use practices will need to be modified. Deliberate and planned adaptation to climate change requires an iterative and community based approach that enables the adoption of sound development choices in the face of uncertainty. It also involves different sectors and levels of society.

The project promotes full coordination and collaboration at all levels of territorial management to assure that project socio-economic and environmental benefits are embedded in plans and strategies. Capacity strengthening at all levels will contribute to the realization of benefits at national, provincial and local level. In the absence of this project, the baseline scenario would see continuing deterioration in ecosystem integrity, production systems, and household food security. Specifically the project addresses the effects of climate change and climate vulnerability on ecosystem services and water availability, production systems, and food access and consumption (considering quantity, quality and stability). Rising temperatures and water shortages are already affecting the production of major crops:

- Changes in rainfall patterns increase the likelihood of crop losses in the short term and reduction of long-term production; and

- Climate change will lead to an additional increase in the price of major crops such as rice, wheat, corn and soybeans. This also implies an increase in animal feed costs which will result in an increase in meat prices.

In addition, climate change may affect the physical availability of food due to temperature and precipitation change:

- Climate change may negatively influence people's access to food by reducing income from coastal fishing because of rising sea levels; and

- Climate change may influence the reduction of foreign exchange earnings by the destruction of export crops as a result of catastrophic events.

The approach considers how altered rainfall patterns require modifications to farming and natural resource practices, which require laying the foundation for household and community behavioural changes in order to improve food security. The project proposes an integrated set of community based interventions that aim to reduce vulnerability and strengthen resiliency, recognizing the in some cases incentives and PES would encourage and facilitate the participation of the most vulnerable. Communities can participate in adaptation activities, while investing in productive asset-building activities which strengthen long-term resilience.

Specific benefits of the project will include stabilized water use to support agriculture production and enhance the flow of ecosystem services. The main beneficiaries of the project will be local communities with a population of over 200,000 vulnerable members in the four provinces. In line with the Government's policy to reduce inequalities in Ecuador, between urban and rural and between various population groups, the project will benefit highly food insecure vulnerable rural communities. Specific **social** benefits of the project are:

- Participation of women in decision making process and asset creation activities;
- Community organization and social cohesion;
- Increased capacities at all levels of the project to protect and manage natural assets;
- Increased incomes for vulnerable families; and
- Improved food and nutrition security of rural communities.

Economic benefits of the intervention are related to improving family incomes through a:

- Reduction in production losses due to the negative effects of climate variability;
- Productivity and quality increases in the local production;
- Increase in environmental goods and services (timber and carbon);
- Increased capacity to cope with climate variability; and
- Reduction in local migration rates.

Environmental benefits are an instrumental part of the project concept and design. Improved access to quality and stable water supplies is a main anticipated benefit that will support livelihood and food security objectives both for direct participants and indirect downstream users. It is also anticipated that improved soil maintenance will enhance agricultural productivity as well as prevent soil erosion. Small-scale interventions, based on an adaptation plan made with the participation of the community and led by the local governments will help to mitigate negative environmental impacts. Specific environmental benefits include:

- Reduction of soil loss in areas sensitive to erosion;
- Improved water management systems and access to water;
- Protection and recovery of biodiversity with the use of native and adapted species; and
- Stabilized water use to support agriculture production, ecosystem services, and domestic uses.

C. Cost effectiveness of the purpose project

The Government of Ecuador's strong policy, strategy and planning platform offers the opportunity to incorporate climate change adaptation in community natural resource management, food and nutrition and disaster risk reduction strategies. As Ecuador already faces severe water problems in a number of sectors, this early attention to the links with food security, offers the opportunity to avoid or at least mitigate emergency situations. Prevention is a well documented cost effective strategy. Also, the emphasis on participatory decision making, landscape level interventions, and an integrated approach enhances the cost effectiveness of the project. The integrated approach of community based and ecosystem based approaches will promote an integrated package of measures that will build knowledge, awareness, tools and local capacities to address the threats of climate change. The project strategy emphasizes coordination between different organizations and full involvement of communities.

Initial discussions regarding project design focused more on an ecosystem based approach as the protection and sustainable management of natural resources must bring benefits to local communities It was decided, based upon wide stakeholder consultations to combine the EbA with a community approach that includes a concentrated effort on community mobilization, awareness raising and training. The project's CbA approach will involve local people in: managing natural resources, meeting social needs and sustaining outcomes over time (maintaining local cultures, increasing opportunities for income generation, and improving food security and well-being). Implementing concrete adaptation activities with community participation is cost effective when well executed and is the most cost-effective way to achieve large scale results in Ecuador.

To improve cost effectiveness, the project will specifically address the issue of ad-hoc and small scale adaptation efforts. The strategy considers that fragmented responses may address a local issue, however, without a combined community based and ecosystem based approach it is unlikely that context specific actions which meet the priorities of local populations will be implemented. The project will help address this concern of the government. The project approach specifically aims to reduce fragmentation by targeting watersheds, and promoting an ecosystem approach. Small add hoc activities also lead to externalities and are hard to bring to scale. The proposed project aims to achieve a large scale impact and avoid externalities as actions will be the priority of affected communities.

The project will emphasize cost effectiveness for all project activities. Detailed cost effectiveness analysis will be made for each community adaptation plan, using a methodology developed by WFP, comparing measurable outcomes with all feasible options and risk analysis. This community level analysis will help ensure that least cost options are selected during project design and implementation. The integrated focus on the management of natural resources, processes to recover ancestral knowledge to reduce and mitigate climate change related risks (maintaining local culture), and opportunities for income generation, improved food security and well-being will increase the cost effectiveness of the project. Baring this in mind, and because specific actions will be identified through a participatory action planning process, a planning model was developed to provide preliminary indications of cost effectiveness. In the model presented below, activities were selected based on local studies, technical feasibility analyses, and their potential to generate multiple social, economic and environmental benefits as described above.

Community Activity Cost Model

Sector	Cost Description	Cost US$
Land Rehabilitation/protection/regeneration/reforestation	**Reforestation/ land protection/ regeneration reforestation/ Total cost for 4 hectares**	4.160
Water management and storage structures	**Reservoir Tank /Connections and Pipes/ and other supplies -**	2.320
Early warning systems	**Equipment and installation for system – unit cost per one community shared among six communities**	2.000
Irrigation	**Irrigation system and other supplies- cost per community**	2.500
	Total cost per community	10.980

An indicative model includes land rehabilitation/regeneration/ protection, water management, irrigation and early warning actions. An average investment in a community would be around US$10,980. This initial investment is viewed as a seed investment within one community, catalyzing additional actions and cost sharing at community and parish level. To achieve the landscape coverage desired by the project, this investment would be made in 500 communities, within 50 parishes, 12 cantons and four provinces. The direct participants would be approximately 15,000 households. However the indirect beneficiaries of sound adaptation planning and water management could reach over 200,000 people in just the targeted watersheds. It is possible that twice as many downstream users would benefit from the positive externalities of the project. Thus, the project presents the least costly means of achieving rapid landscape benefits.

The proposed project will build on the lessons, linkages and synergy with other projects under implementation (mostly small scale and with an emphasis on capacity building) which are expected to generate benefits nationally. The effectiveness of the concrete adaptation measures implemented by the project will be tested and measured during the project. This will involve cost-benefit analyses to ascertain which activities provide economically viable options for up scaling to neighbouring communities, parishes and provinces.

The proposed project also has the potential to influence and support policy and strategy development at local level. As specified in the national adaptation strategy, territorial strategies will need to be developed. GPP has indicated that the planning and learning process for this project will provide valuable input to the Province of Pichincha's adaptation strategy. The project thus has the potential to bring together focused efforts aligned with watershed, water management, land tenure, food security and climate change adaptation under more coordinated policy and strategy frameworks.

D. Consistence with the national and sub-national sustainable development strategies

The project is well aligned with the defined priorities of the National Environmental Policy (Policy 3, MAE 2010). Specifically the proposed project will support the government's policy to manage the adaptation of ecosystems and community needs with respect to climate change. The project is aligned with two national priorities:

- Mitigate the impacts of climate change and other events natural on population and ecosystems.

- Manage the inherent risk associated with extreme events linked to climate change.

The Second National Communication which is being finalized defines as a priority adaptation measures and policies which support vulnerable communities and prioritizes watersheds. The project also supports the Government's national plan and the priority of developing national food sovereignty. With a focus on addressing threats to food production and access, the project will contribute to putting Ecuador on a more firm path towards food security. Specifically, the project supports the government's strategy of promoting the implementation of adaptation programs, with particular attention to vulnerable and fragile ecosystems, food sovereignty, and inter-institutional coordination among different key partners. At the regional level the project addresses critical natural resources and social development needs.

E. Meeting national technical standards

Project appraisal will consider quality programming standards based on Government of Ecuador norms and standards for different sectors. The necessary safeguards will be followed and incorporated into the project design. In addition, the proposed interventions will adhere to all national technical standards that are in force, particularly those relating to water harvesting and control structures. The project will also identify gaps in appropriate sector technologies aligned with adaptation needs and identify possible solutions including sources of technical assistance and transfer modalities.

F. Duplication

While Ecuador has a number of climate initiatives underway, they do not address community based adaptation needs and they do not address the effects of climate change on food security. Specifically, the targeted cantons are not part of any other climate change adaptation project, with the proposed approaches.

The project supports the government's priorities and is in line with the 2010-214 UNDAF for Ecuador which states:

> *WFP will work with the most vulnerable populations through food based assistance in support of literacy, climate change and other social development activities at the community level.*

A review of on-going projects shows that there is no duplication of the proposed project with other projects financed by bilateral or multilateral organizations, as this project would be the first

one to explicitly focus on improving the resilience of communities and ecosystems, as an adaptation strategy. This project expects to complement other initiatives that are already being implemented at territorial level. During design process, all stakeholders including donor funded projects were consulted, in order to avoid any potential duplication of efforts, resources or geographical coverage, and to ensure synergy between the ongoing initiatives and the proposed project. The project is expected to complement ongoing initiatives by bringing in the CbA and EbA approach to address climate change threats.

The project will also coordinate and learn from the GEF project Ada*ptation to Climate Change through Effective Water Governance in Ecuador*. While there is an overlap with two provinces (Azuay and Loja) the micro watersheds selected for this proposed project are different. However the proposed project will benefit from the institutional strengthening aspects of this project at both national and provincial level. These benefits will facilitate the implementation of concrete actions at community level. (See Table 6 A and B.)

The project will gain from other ongoing projects in Ecuador, for example FAO's work at watershed and micro basin level and its work on seed sources and seed dissemination. The Management of Adaptation to Climate Change Project (GACC), implemented at a national level, aims to strengthen adaptive capacity impacts through advocacy, awareness raising and communication. This project will provide valuable lessons in terms of developing effective communication strategies and community outreach.

Many of the initiatives under implementation or planned in the project area are small in scale and aim to increase awareness of climate change issues. The proposed project will use these experiences as a platform to bring concrete adaptation actions to scale.

TABLE 6 A
Complementary Projects Under Execution

PROJECTS	OUTCOMES	COMPLEMENTARY LEVEL	AVOIDANCE OF OVERLAP MECHANISM	
			COVERAGE	MECHANISM
Adaptation to Climate Change through Effective Water Governance in Ecuador - PACC Ecuador (MAE)	1. Strengthened Policy Environment and Governance Structure for Effective Water Management 2. Improved Information and Knowledge Management on Climate Risk in Ecuador 3. Application of Sustainable Water Management and Water-Related Risk Management Practices to Withstand the Effects of Climate Change	This project proposes a top down approach to improve the planning and policy formulation of water resources. This project addresses a key policy dimension of implementing an adaptation strategy. It focuses its intervention at the political level. .	Chone Portoviejo Babahoyo Paute Jubones Catamayo	Jubones is same area targeted by the proposed project. Therefore the proposed project will ensure coordination at all levels. As the watershed includes three provinces, the proposed project will avoid overlap in data collection and institutional capacity building activities in the Jubones watershed. As the proposed project will be implemented at local level with full community participation, with MAE and MAGAP and a focus on food security the concept of the projects are very different. However the project will ensure information sharing and complementarities.
Adaptation to the impact of rapid glacier retreat in the tropical Andes Project - PRRA Peru, Bolivia and Ecuador (MAE)	Integration of the issue of glacier retreat in regional/local planning.	This project is focused on strengthening the resilience of local ecosystems and economies threatened by the impacts of glacial retreat.	Antisana glacier	No overlap in area. The project will ensure coordination and draw on the experiences and lessons of the regional project.
Partner Forest and Partner Moorland (MAE)	Delivering an annual economic incentive per hectare to indigenous communities that voluntarily commit to the conservation and protection of native forests, moorland, or another native vegetation	This is a national initiative supported by MAE. The proposed AF project will draw lessons from the national initiative and will ensure to complement other incentive actions	Country wide	MAE and WFP will ensure coordination and complementarities.

Investment Project-Management of Adaptation to Climate Change GACC 2010-2014 (MAE)	Strengthen the capacity of social systems, natural and economic resources to respond to climate change impacts	The project generates information tools on the causes and effects of climate change in the country.	Country wide	Develop several consultancies, including Design "National Communication and Awareness on Climate Change" Participation of social communicators. Focus on information and knowledge management.
Green Pichincha (GPP)	1. Agricultural frontier controlled in order to protect the moorlands 2. Communitarian nursery built and maintenance with the Community participation 3. Activities coordinated with others institutions such as Colegio de Ingenieros Forestales, FONACC, INAMHI, PUCE	The main objective of this project is to reforest big areas of the province in order to preserve sensitive areas and to protect water resources.	Pichincha	This project responds to the priorities establishes in the Development General Plan 2002. For the execution of the project, GPP coordinates with the communities through the parish authorities. Pichincha is same area targeted by the proposed project. Therefore the proposed project will ensure coordination at all levels. In addition, GPP is and will be local executing institution of both projects.
Hydro-meteorological Stations Project (GPP)	Semiautomatic technology installed in the Hydro-meteorological stations of the province. This project will be executed during 2011.	In Pichincha, there exists an hydro-meteorological stations network, but it is poorly equipped. he purpose of this project is to provide these stations with a semi-automatic technology to generate climate information and weather forecasts	Pichincha	This project is executed in coordination with INAMHI. Pichincha is same area targeted by the proposed project. Therefore the proposed project will ensure coordination at all levels. In addition, GPP will be local executing institution of both projects.
Support to the Natural Risk Management System in the province of Pichincha (GPP)	SGR-P will be constructed to share important information for planning activities. This project has 2 components: Diagnose of risk management at local and provincial level. And, support to the formulation of SGR-P	The objective of this project is to support the strengthening of Natural Risk Management System (SGR-P), in order to improve prevention, mitigation and preparation capacities.	Pichincha	There are some interesting studies of local risk management in Pichincha, however, they are just focused on Quito. Based on those investigations, GPP tried to evaluate risks and hazards in Pichincha but it was not possible. For this reason, GPP identified the information needs as a priority. The proposed project will ensure coordination at all levels and GPP will be local executing institution of both projects.

TABLE 6 B
COMPLEMENTARY PROJECTS

	PROJECTS	INSTITUTIONS	TOTAL AMOUNT US$	ACTIVITIES RELATED TO AGRICULTURE AND WATER	STATUS
JUBONES BASIN COMMONWEALTH	Technical Assistance Agreement – Financial support for: European organization counterparts (ZT Fund), DED National Professionals in the area of Strategic Development Plan for Jubones Basin implementation	DED -MCRJ	150,000.00	• Advisory Management in the areas of: water, environment, and communication. • Advocacy to strengthen discussions about the environmental and economical development of Jubones Basin	In execution – closing date June 2011
	Advocacy to institutional strengthen of autonomous and decentralized local governments of Jubones Basin (MCRJ)	FONS-VALENCIA, ART-PNUD, MCRJ, AME	410,000.00	• Educational support in masters programs (41 students) • Regional event "Water Law" Awareness campaign to promote environmental education	In execution - closing date December 2011
	Ensure access to production guarantying food sovereignty and promoting food alternatives among the households of Leon River Sub-Basin (Oña, Nabón, Saraguro).	MIES_IEPS, FONS VALENCIA, J.P. COCHAPATA, MUNICIPIOS DE NABON, OÑA, SARAGURO. MCRJ	215,000.00	• Production and productivity increase with food sovereignty purposes • Protect and recover Rio Leon Sub-Basin water resources • Promote awareness in the utilization of natural resources through training	In Execution - closing date March 2011

	Protection to water sources and food security in Sub-Basins of the Rivers Rircay, Minas, and San Francisco, through local participation of the community of Jubones Basin	PRODER, CREA, MCRJ	309,000.00	• Protect water sources / deposits through the establishment of Infrastructure • Strengthened human capacities for integral management of water resources in the sub-basins • Promote food security and clean production activities among the population near water sources	Close – up - February 2011
	MCRJ - PROTOS CEDIR Agreement, for the inventory of drinking water systems and irrigation systems in the parishes of Saraguro Celen, Llushapa, Selva Alegre (Rio Leon sub-basin) and Manu, Yuluc, Sumypamba (sub-basin Rio Chucay).	UNION EUROPEA COOPERACION BELGA(Protos-Cedir), MCRJ, MUNICIPIO SARAGURO	20.000	• Arrange the SENAGUA information on water concessions, both for human consumption and irrigation as the basis for the proposed water inventory. • Drinking water systems inventory.	In execution - closing date March 2011
	WATER AND GOVERNANCE: Support for the development of the MCRJ municipalities	FONS VALENCIA, MCRJ, SENAGUA	665.000 Euros	• Formation and strengthening of 30 micro-watershed committees in MCRJ. • Water irrigation systems and environmental sanitation in the MCRJ cantons.	Starting March 2011
Province Government of Pichincha	2. Rural development program in northern Ecuador: Pedro Moncayo and Cayambe counties	Republic of Ecuador and Kingdom of Belgium	800.000	• Improve the living conditions of the population in quintiles 1 and 2 that live in the rural areas of five intervention provinces (Pichincha, Imbabura, Carchi, Esmeraldas and Manabí), through the enhancement of productive activities. • Support the institutional strengthening of national public bodies, at sectorial and territorial levels.	In execution - closing date 2013

G. Learning and Knowledge Management

The project gives high priority to monitoring and knowledge management and both local and national governments attach high priority to generating lessons, avoiding duplication and replicating best practices. The proposed project will build on the experiences and lessons of on-going initiatives in Ecuador, in particular those related to community based development and specific sectoral lessons. The Government of Ecuador views this project as a learning model that will allow national and local governments the opportunity to review context specific approaches, establish best practice and scale up successful activities to achieve a landscape-scale resilience approach (watershed or river basin). The project will emphasize the capture, analysis and dissemination of lessons and best practices, featuring which adaptation responses are most appropriate for specific ecological and social contexts.

WFP Ecuador has included knowledge management and evidenced based programming as part of its country strategy. Thus WFP will take the lead in all activities related to monitoring, evaluation and knowledge management, in line with its corporate procedures.

Before project start up, and as part of the formulation of the monitoring and evaluation plan, an evaluation strategy will be developed and aligned to the expected outcomes of the project. Evaluation, in addition to monitoring, will provide the basis for the evidence-based approach proposed in this project. Also, the need for special studies based on the overall objectives of the project will be assessed.

The emphasis on knowledge management is in line with Government of Ecuador priorities and will fill a gap in MAE's current implementation capacity. The knowledge management activities in the project will draw upon national actors and capabilities, and include community based monitoring and evaluation.

H. Consultative process

WFP and MAE have worked, from the beginning, in close coordination on the formulation of this project. Therefore, this is a joint project and it is formulated to support government policies. MAE and WFP held a joint workshop to identify priorities and explore how the two entities could work to jointly address adaptation need in Ecuador. As a result of this first workshop MAE officially asked WFP to join in its climate change efforts and a letter of agreement was signed. (See Annex IX for details on stakeholder roles and consultation events.) MAE has officially coordinated with MAGAP.

Future consultations organized through MAE brought together experts to discuss and identify the major climate threats in Ecuador and the geographical areas most at risk. From these discussions watersheds and river basins with ongoing activities were eliminated and a final selection of the geographic areas was made. WFP and MAE worked together in the analysis of data and available information to ensure the targeting of cantons with high levels of food insecurity and climate risks.

Local consultations were also held with Provincial officials. Important in these discussions were the agreement to develop a community based approach and the identification of provinces and cantons based on WFP vulnerability assessment and local level climate

threat information. A meeting was held with national and provincial stakeholders to review this document and views were incorporated accordingly.

I. Justification for funding requested and focusing on the adaptation

Component 1- Baseline without Adaptation Fund Support

The Government of Ecuador has established a solid policy framework to address climate change threats, culminating in the Second National Communication to the UNFCC. Most measures to address adaptation have been at the institutional level and concrete actions have been ad hoc. Disaster risk reduction is a priority for the government and WFP is working closely with SNGR, however actions have not moved passed the planning stage except for emergency response where concrete measures are in place. Further the water sector has been a priority since the First National Communication. However, climate change and variability risk factors have not bee fully recognized at provincial, canton or community level.

It is recognized that emergency response and short term measures do not lay the foundation for addressing the longer term climate change threats that are very real in Ecuador. MAE recognizes the gaps in tools, capacities and information needed to assess climate change threats and the importance of involving communities in developing adaptation actions and models that will help buffer communities from the exposure to natural hazards. Without this project, adaptation planning in Ecuador will be much slower to address the threats to food security.

Adaptation Alternative

Adaptation Fund resources would support the transition from a focus on planning and strategy at the central to level to the implementation of concrete actions at the local level. While sector specific projects are under implementation, they do not promote an adaptation focus. They do not consider the impact on food security which is a government priority. The proposed project would help make this transition by bringing together the two main ministries which deal with these two areas – MAE and MAGAP. Further it would step up coordination mechanisms with provincial and canton government officials, with the aim of integrating climate change threats into local planning and the implementation of sector activities. In addition, the project aims to involve the private sector, whose presence is limited in climate change actions.

The project will promote the incorporation of recognized cultural knowledge to address climate change risks and develop community plans to solve problems locally. It will help raise awareness of risks related to variations in temperature and precipitation, and the risks associated with glacial melt. Communities and in particular women, will be involved in planning and designing local solutions. Through a participatory planning process local people will gain knowledge and understanding and be empowered to drive local solutions to respond to climate threats.

The project will promote the generation and use of climate information in an institutionally coordinated manner, through the linking of local early warning systems with regional and national systems. Information from local levels will also inform contingency plans, which at the moment are developed and in force only at the national level. The generation and

dissemination of climate information will not only fill stated gaps but also contribute to the government's emergency preparedness measures. Appropriate tools for climate change monitoring and planning at local level are important elements of Ecuador's national climate change strategy.

WFP will assist the government in strengthening its threat, risk and vulnerability analysis capabilities by expanding its current Vulnerability and Analysis methodologies to overlay climate threats and monitoring changes in landscapes using GIS technologies. WFP has agreed to provide a small amount of funding to develop this capacity but the government still seeks additional funds. This project would provide the additional support required to develop vulnerability and analysis capabilities.

As result of linking central level planning with local level plans and community monitoring, the Government of Ecuador will have a wider evidence base upon which to strengthen its own institutional capacities to address climate change threats and promote local level adaptation to climate change.

Component 2 - Baseline without Adaptation Fund Support

Without concrete adaptation actions, the baseline scenario would see continuing deterioration in ecosystems, production systems, household food security, and livelihood security. The targeted cantons are highly vulnerable to climate threats and food security. Water scarcity is the predominate threat; however in some cantons intense flooding destroys crops and forces temporary location. At the moment concrete adaptation measures are ad hoc, do not receive adequate funding, and do not involve local communities in planning. Unless concrete adaptation measures are planned and implemented locally, vulnerability to threats and food insecurity will only increase.

Across Ecuador there remains a large gap in awareness regarding appropriate adaptation measures. Rather a sector by sector approach continues, without considering the adverse affects of climate change and possible solutions in sectoral actions. As noted above, vulnerabilities are only increasing and without support from the Adaptation Fund, the targeted vulnerable areas and communities would receive no adaptation to climate change support. In particular local adaptation measures to address food insecurity, while embedded in national policies and strategies, would not be translated into concrete actions at the local level where these vulnerabilities are most deeply, rooted.

Adaptation Alternative

With a combined strategy that integrates community based adaptation with an ecosystem approach, demand driven adaptation actions will be implemented, based on the priorities of cantons and communities. The targeted water sheds are critical for local populations for food production and income generation. Presently there are no clear mechanisms in place to protect forests and moorlands. In addition there are no incentives in place for poor food insecure local communities to protect, conserve or enhance these resources.

The project will indentify, design and implement through a consultative process involving stakeholders at provincial, canton and community level, adaptation mechanisms. Payment for environmental services or incentives for actions to protect forest and moorlands will also be introduced as appropriate. Based on sound analysis and planning, these actions will expand and enhance resources in the targeted watersheds, and promote sustainable land

and water management. These actions will include reforestation, water storage, moorland protection and regeneration, and improved agriculture practices.

It is anticipated that Adaptation Fund resources will help to leverage additional resources from government authorities, and that documented successes, combined with awareness raising, will promote local spontaneous adaptation responses to climate change threats. As well MAE, will be able to assess which adaptation actions generate the highest return, in specific contexts. With adaptation plans in approximately 500 communities, linked to 12 canton level plans in 4 provinces in two distinct ecological zones, MAE and MAGAP will have the elements of a data base for evidenced based decision making. The aim is that with these initial findings the two ministries will be able to replicate and scale up context specific local adaptation measures that specifically address food and nutrition security.

PART III: PROJECT MANANGEMENT MECHANISMS

IMPLEMENTATION ARRANGEMENTS

A. Arrangements for Project Implementation

The Government of Ecuador has prioritized the environment and specifically climate change mitigation and adaptation in its policies and strategies. The Ministry of Environment is responsible for formulating and implementing all adaptation to climate change measures. MAE, as the lead for the management of climate change in the country, invited the United Nations World Food Programme to work jointly to develop actions that will contribute to the implementation of its national policies and strategies.

In line with the National Environmental Policy and the National Strategy of Climate Change, this project will rely on a wide range of partners to enhance adaptation capacity and build resilience. Community participation will be essential to the success of the project. As well, partnerships and coordination among the key stakeholders is a key aspect of project implementation. Therefore, before project start up, a Cooperation Agreement between MAE, WFP, MCRJ, GPP, will be signed at national level. Local Cooperation Agreements between local executing agencies (MCRJ, GPP) and the parish councils will be signed in all targeted areas. These legal mechanisms will help foster institutional commitment, and consensus on roles and responsibilities for all institutions involved in the project.

To ensure coordination at all levels, the project has identified the main roles of national and local stakeholders. These roles have been agreed to during project design in specific stakeholder meetings. Despite such efforts, the project still must work to avoid overlap and poorly defined roles. To avoid conflict or misunderstanding at national or local level, precise roles have been developed. (See Annex IX for Implementation Details.)

The main actors involved in the project include:

- **Ministry of Environment or MAE** is the technical focal for the UNFCCC, located in the Under Secretary of Climate Change. This Ministry is the governing body responsible for the formulating and implementation of strategies of adaptation and mitigation to climate change as a State policy. This project will be under the responsibility of the Unit for

Climate Change Adaptation of the Under Secretary. MAE is WFP's main partner and responsible for the execution of the project. MAE is responsible for territorial coordination and is the representative of the Government of Ecuador for the presentation of this project. This project is developed jointly between WFP and MAE based on four main issues identified by MAE for the updating of the national strategy.

MAE is responsible for inter-agency coordination and implementation of actions related to climate change awareness and education. MAE is responsible for "the formulation and implementation of the national strategy and the plan that will allow to generate and implement actions and measures towards the awareness increase in the country on the importance to fight against this natural and anthropogenic process with the inclusion of coordination and articulation inter-institutional mechanisms "(Executive Decree No.1815, 2009). The legal framework enables the formulation and subsequent implementation of the National Program of Awareness and Communication on Climate Change. Thus, MAE through the Under Secretary of Climate Change is responsible for the inter-institutional and inter-agency coordination of climate change actions and measures.

In 2010, the Inter-institutional Committee on Climate Change which includes several national-level institutions was established: the Planning, Water, and Risk Management Secretaries; the Ministries of Heritage Coordination, Strategic Sectors, Production, Social Development; and the government ministries of Environment and Foreign Affairs. This Committee assumed the functions of the former National Climate Committee, with the Technical Secretary as the Climate Change Under-Secretary.

- **Ministry of Agriculture, Livestock, Aquaculture and Fisheries (MAGAP)** is responsible the country's agricultural policies, including the management, regulation and training of agriculture, agro-forestry and agro-industrial sector. MAGAP will work and coordinate with MAE to align adaptation measures with the food sovereignty policy and the agriculture sector.

  MAGAP will coordinate and works together to MAE at two levels: a) Central, as part of the management team for the implementation of the project, and; b) Local, from their provincial units as part of the operational team coordinating sector specialists. Under MAGAP, the entities that will be involved in the project are: National Institute of Agricultural Research (INIAP), Secretary National of Water (SENAGUA), National Institute of Irrigation (INAR), Forest Unit of Promotion and Development (PROFORESTAL), National Institute of Rural Training (INCCA). These entities have provincial units, which will facilitate the coordination and technical activities of the project team.

- **National Institute for Meteorology and Hydrology of Ecuador (INAMHI)** regulates the national hydro-meteorological sector. It has a key role in climate affairs in Ecuador, with a network of monitoring stations and overall supervision of official forecasting. It has the obligation to provide vital information on climate and water resources for the past, present and future. The director of INAMHI is the representative of Ecuador for the WMO (World Meteorological Society). In the national context, INAMHI is attached to SENAGUA, with technical staff and professional specialized in meteorology and hydrology, which contributes to the economic and social development of the country.

This entity is working together with MAE in studies to define the impacts on climate change and the forecasting to 2080.

- **National Secretary Risk Management (SNGR**) governs and regulates the national system of risk management in Ecuador, in order to strengthen capacities of the country to face emergencies or disasters. The SNGR and WFP collaborate to strengthen technical capacity for disaster preparation. For this project, MAE and WFP will coordinate with SNGR to support activities related to knowledge and awareness about climate change issues.

  Ecuador took a pioneering step to incorporate risk management as a right in the new Constitution. Also in the Good Living National Plan, both risk management and climate change are mentioned. The integrated management to reduce risks and manage emergencies and disasters is recognized and promoted as state policy. Risk management and climate change are interrelated, linking threats, vulnerabilities and risks; with adaptation to climate change which prepares people and ecosystems respond to the potential negative effects of climate change.

- **SETECI** and **CODENPE** are key actors because of their experience and possible contribution to the planning of the project. SETECI is responsible for the coordination of international cooperation. It is a decentralized public entity, attached to SENPLADES the national planning entity of the government. They work with territorial entities as well as communities, especially with indigenous populations.

  Commonwealth of the basin of the River Jubones or MCRJ is formed by local, provincial and municipal governments in the provinces of Azuay, Loja and El Oro. MCRJ is a voluntary and committed association of Autonomous Decentralized Governments (GAD) that works in coordination with the stakeholders within the watershed for the integrated management of natural resources and human needs (social, economic, production). MCRJ puts particular emphasis on water resources, so that water and the natural heritage is managed for present and future generations.

  In 2009, MCRJ and WFP formed a strategic relationship to optimize the resources available for the recovery and protection of food security in the Commonwealth.

- **Provincial Government of Pichincha or GPP** established programmatic priorities in the National Plan 2009-2014, including poverty reduction, food security and ensuring that families have access to food and improved quality of living through, inter alia, enhanced environmental quality. It also set goals related to integrated water management to ensure the availability and universal access to water. Since 2001, the GPP has maintained a strategic relationship with WFP to address hunger and malnutrition. The GPP has sought the cooperation of WFP to implement actions in the framework of its development plan.

- Water User Boards will be a main implementing partner. These boards are already organized in the communities where the project will intervene. The strengthening of local organizations is part of the project strategy and will be facilitated in those counties that have a department or office devoted to environmental issues.

Project Team

The Government of Ecuador will execute this 5 year project with the support of WFP. MAE will be the executing institution responsible for ensuring that the objectives and components of the project are delivered effectively as outlined in the project document.

To ensure coordination within the project, a **Project Management Team** will be established, and led by a **National Project Director** (NPD). MAE will prepare Letters of Agreement with MAGAP, GPP and MCRJ and designate the National Project Director. (See Annex IX B for the TOR of the NPD.) The NPD will be responsible for orienting the project and coordinating the actions of all actors at national and local level. The director will also be responsible for establishing and maintaining communications with all the relevant institutions in the water and agriculture sectors and with the planning arm of the government (SENPLADES). (See Graph 4)

The Project Management team will be composed of members from the central level, including MAE, MAGAP, WFP and the provincial executing entities (GPP and MCRJ) and will oversee project implementation. The team will ensure that the project strategy is integrated in all project activities, that the local monitoring systems comply with the requirements of the M&E plan, and that national and provincial linkages are maintained at all times. The committee will also be responsible for:

- Reviewing the M&E plan, annual workplans and all monitoring reports;
- Ensuring policy linkages between the project, local actors and national level;
- Developing coordinated and coherent approaches among the GPP and the MCRJ;
- Ensuring that technical standards are maintained for all assets developed; and
- Ensuring alignment between Adaptation Strategies developed at local level and findings, results and lessons from the project.

Local implementation of the project will carried out by GPP and MCRJ, under the guidance of the management team. MAE and MAGAP will create **Local Executing Teams** to coordinate and provide technical inputs in support of project execution. Technical delegates of MAE and MAGAP will work in support of provincial divisions.

WFP will provide support to the NPD and management team, and hire a Project Manager (PM) to work with the NPD and management team. WFP will coordinate the processes of monitoring, evaluation and knowledge management with local operation teams designated by MAE, MAGAP and the respective provinces. The project manager will be hired locally but not be a WFP staff member. WFP will assign two of its staff to work on the project on a part time basis (Vulnerability and Analysis Economist and a natural resource economist both working in the ECU Country Office Programme Unit).

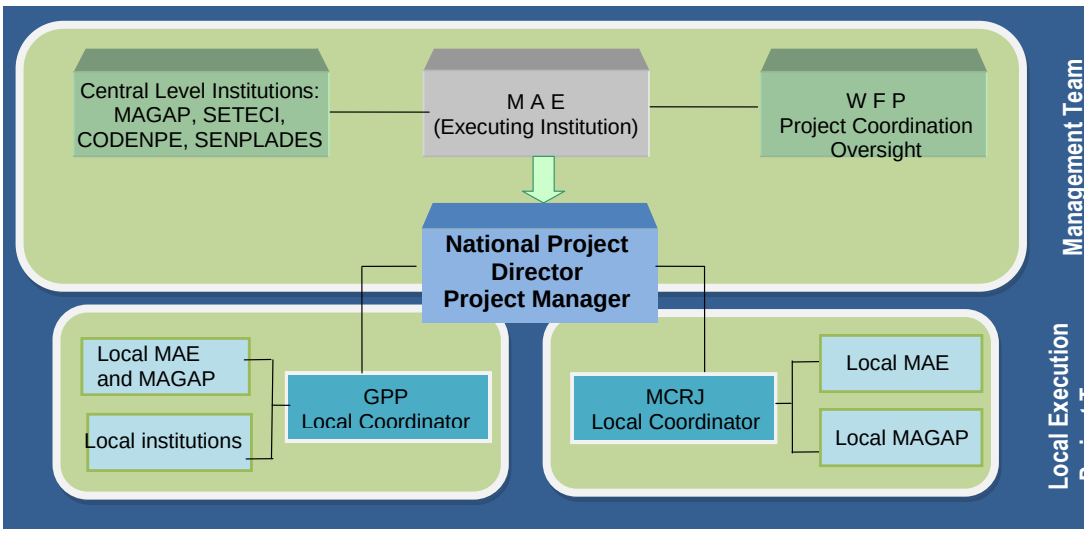
WFP will take the lead in overall project coordination, organizing stakeholder consultations, and overseeing the sourcing of technical inputs. WFP will assume financial oversight of the project and be accountable to the Adaptation Fund Board. WFP has responsibility to ensure that the project achieves and measures expected results, and fulfills all reporting functions. WFP will be responsible for reviewing the M&E plan and ensuring its implementation, including the organization of the independent midterm evaluation and the final evaluation.

In line with WFP corporate policy WFP, will develop a project risk register and monitor all risks as per its own internal processes. In line with current agreements with the MoE, WFP

will oversee procurement processes and ensure that certified financial statements are received on an annual basis. WFP will also coordinate an annual audit of the project, conducted by a legally recognized auditing firm. Project financial mechanisms will be established under the direction of WFP.

WFP as a recognized partner of the GoE in early warning and emergency response will provide technical support in areas related to food and nutrition security, early warning, vulnerability analysis and emergency preparedness. In areas specifically related to its mandate and current cooperation agreements with the GoE, WFP will provide technical support and backstopping. WFP will respond to information requests, arrange, support and participate in project visits and support the Management Team in assuring quality control.

GRAPH 4
PROJECT TEAM STRUCTURE



B. Financial and Risk Management

Financial and project risk management measures will be assessed as an ongoing process throughout the project as described in Table 7.

TABLE 7
Risks and Responses

Risk		Response Measure
Changes in responsible actors in the Ecuadorian Government may determine possible changes in the national strategy for climate change.	Low	This risk is minimized as the project will ensure coordination among a number of actors, including national and local actors (MAGAP, GPP, MCRJ, MAE, SENAGUA and INAMHI).
Climate change adaptation has not been incorporated in policies, strategies, and plans of local governments.	Low	Although, since 1990 climate change was included in the political agenda, it is only in recent years that local governments have become involved in climate change issues. To institutionally strengthen all levels MAE created a Sub-secretary for climate change with a strong coordination role. Also, GPP has incorporated environmental issues in the Governance Plan, Strategic Plan and Territorial planning, and has requested WFP cooperation to address the effects of climate change. MCRJ was formed among local governments with the objective to work in a coordinated way with all actors to manage its natural resources.
MCRJ is going through a re-organization process to become a local governmental consortium. During this period of change the leadership may redirect its priorities towards different objectives.	Low	The project will be implemented with a number of local governments in the selected areas. This strategy will pressure authorities to implement the project. MCRJ and WFP have signed a letter of understanding and coordination.
Scientific and technical information in relation to climate change in Ecuador is insufficient and incomplete, and uncertain.	Medium	During the design process of the national strategy for climate change, MAE identified this risk as one of four key problems. Given that MAE recognizes this deficiency it is working to address key information gaps. Also, the project includes information generation, including adaptation and participation plans, and prompt alert systems.
There is little local specialized management and technical capacity related to climate change, particularly in the entities that are responsible for the project. MAE identified among one of the major problems regarding adaptation to climate change, the lack of human technical resources.	High	The risk is minimized as MAE has the overall leadership role for execution of the project. GPP and MCRJ will coordinate local actions with the local governments and organizations, as well, as with MAGAP and MAE. The project includes measures to strengthen institutional capacities.

Regulatory setting is in discussion by Ecuador National Assembly, including a new law that regulates the use of hydro resources.	Medium	This risk is minimized as MAE is the project executor and coordinates environmental policy and among different levels of government.
Weak local organizational structures, which may raise conflicts within and among local communities or affect the ownership of communities over project benefits.	Low	Generally, relations between local governments and communities are good. The GPP has experience in community level work and coordinates with the Community Development Department. MCRJ has actively worked in communities and MCRJ technicians have the necessary experience. The strong emphasis on community organization, participation and social mobilization should help minimize this risk.
Risk of extreme climate events which could setback gains made by the project.	Medium	Ecuador experiences extreme events on a yearly basis. The project assets constructed will be designed to withstand severe flooding. The introduction of drought resilient species will help to reduce this threat. Also the introduction of early warning systems linked with the GoEs emergency response strategy will reduces damages.
MAE has pointed out the lack of local level information on many aspects of climate change.	Medium	To minimize this risk it is necessary to create a strong awareness at community level regarding the threats of climate change. The project foresees the need to start with awareness activities and strengthen climate change knowledge, before implementation adaptation actions.

C. Monitoring and Evaluation Arrangements

Project monitoring and evaluation (M&E) will be carried out in accordance with WFP procedures under the supervision of WFP. Monitoring and evaluation of project outcomes/results (both intermediate and end-of-project) will be coordinated by the PM. As well the KM system will be under the direction of WFP. WFP will assume financial oversight of the project and financial information on inputs, outputs, budgeting and accounting will be provided on a regular basis,

The following key M&E activities will be undertaken:

Project Inception Workshop (IW) will be held within the first 3 months of project start up with all stakeholders. The IW is crucial to building ownership for the project results and to plan the first year annual work plan.

Annual Progress Report: An Annual Progress Report (APR) shall be prepared by the Project Manager, and shared with all stakeholders. The APR will be include progress against set goals, objectives and targets, lessons learned, risk management and detailed financial disbursements.

Mid-term of the project cycle: The project will undergo an independent Mid-Term Evaluation (MTE) at the mid-point of project implementation (June 2013). The MTE will determine progress made toward the achievement of outcomes and will identify corrective actions if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. The findings of this review will be incorporated in a midterm report.

The M&E plan will be finalized, based on the Table 8 and the Results Framework in Table 9.

TABLE 8
M&E Plan

Type of M&E activity	**Responsible Parties**	**Budget US$*** *(does not include staff time)*	**Time frame**
Project Inception workshop (IW)	Project Coordinator WFP-CO	$3,800.00	Within first three months of project start up. (A meeting with each province: Pichincha, Azuay, Loja, El Oro)
Inception Report (workshop)	Project team WFP-CO	1,500.00	Immediately following IW
Quarterly reports	Project team	$ 30,000.00	At the end of each Quarter. (Visit to the communities to confirm progress for five years = 4x1,500x5)
Annual Progress Reports (APR)	Project Coordinator WFP-CO Project team	$ 7,500.00	At the end of each year (Requirement for year $ 1,500 x 5)
Meetings of the Project Coordination Committee	Project Coordinator WFP-CO	$2,400.00	After the inception workshop and thereafter at least once a year. (Meeting in two province 1.- Pichincha, 2.- Azuay, Loja, El Oro US$ 1,200 x 2)
Technical reports	Project team External consultants	None	To be determined by Project team and WFP-CO
Mid-term of the project cycle (MTE) external evaluation	Project team WFP-CO External consultants	$35,000.00	At the mid-point of project implementation
Final external evaluation	Project team WFP-CO External consultants	$ 45,000.00	At the end of project Implementation
Final Report	Project team WFP-CO	None	End of the project
Financial information Audit	WFP-CO Project team	$15,000.00	Yearly -(average $ 3,000 per year)
TOTAL INDICATIVE COST		**$ 140,200.00**	

Table 9
Results Framework

Project Strategy	Objectively Verifiable Indicators				
Goal	Reduce vulnerability and food insecurity of communities and ecosystems, related to the adverse effects of climate change, in the most vulnerable cantos of Pichincha Province and the Jubones River Basin.				
	Indicator	**Baseline**	**Target**	**Source of verification**	**Risks and assumptions**
Impact: To reduce food insecurity through effective adaptation to climate change measures	Threat level to ecosystems, related to climate change effects	Ecosystems rated as high vulnerability	By the end of the project the vulnerability level of ecosystems in the project area, are rated as medium	Ecosystem impact assessment at the end of the project Country Disaster Risk Management indicators	Climate change measures are long term and the project may not capture all change in ecosystem vulnerabilities Country policies do not support local adaptation with funds
	Household consumption score.	Food consumption less than 30 for 80% of population	Food consumption score improves (> 35/40) for all targeted participants	Social impact assessment at the end of the project Interviews with final participants	Climate change measures are long term and the project may not fully capture change in vulnerabilities and household food consumption within the next 5 years
Objective 1: Increased knowledge to manage climate change risks affecting food and nutrition security in targeted cantons in Pichincha Province and River Jubones basin.					
Outcome 1.1: Increased awareness of counties on climate change risks	Number of adaptation plans implemented at the community level, and incorporated in the district development plan	No community adaptation plans under development	50 parishes (39 parishes for the MCRJ and 11 for the GPP develop adaptation plans to climate change risk, in a participatory process	Community focus groups Workshops findings Adaptation plans include food security and gender approaches	Community structures need to be strengthened
Output 1.1.1: Parishes in targeted	Number of targeted	Limited knowledge by	By the end of the project	Interviews and	The disseminated information within the

cantons trained in climate change threats and adaptation measures which reduce vulnerability, in particular related to food security	population aware of climate change impacts and appropriate responses to threats	vulnerable parishes in the adaptation measures to reduce food insecurity	at least one family member out of 15,000 households have knowledge of climate threats and adaptation measures	surveys with community beneficiaries, related with monitoring and follow-up processes of the project implementation	parishes is not internalized well
Output 1.1.2: Targeted parishes participate in adaptation and risk reduction awareness activities	Awareness raised at community level of climate change threats	Limited awareness by parishes of climate threats and local responses	By the end of the project two 4 year awareness campaigns (one for the MCRJ and one for GPP) have been established and implemented	Surveys and interviews, related with monitoring and follow-up processes of the project implementation Field trips	Community support to implement activities is less than expected
Output 1.1.3: Food security and gender considerations integrated in all adaptation training programs	Food security training plan integrated within the adaptation training programs, with gender considerations.	Neither adaptation plans has integrated food security component, nor any development plans	By the end of the project all the developed adaptation plans, include a food security training plan. At least 40% of the participants in the training programs are women	Food security training programs. List of participants to the training programs	Community participation in the trainings is less than expected
Outcome 1.2: Secured ownership of adaptation measures in parishes in targeted cantons.	Number of planning frameworks at provincial and canton level include change adaptation considerations	Each of the targeted cantons has a development plan, that includes environmental issues, but it does not include adaptation measures	By the end of the project all the targeted cantons and provinces have incorporated climate change variability and adaptation considerations	District development plans	The process to include adaptation measures in the planning frameworks at the canton level takes longer than planned
	Number of parishes with adaptation plans aligned with local and provincial priorities	Each district by law must have a development plan developed by March 2011. These plans	By the end of the project 50 parishes have developed their adaptation plans, aligned with local and provincial	Community adaptation plan Interviews with decision makers at	The process to include adaptation measures in the planning frameworks at the canton level takes longer than planned

		include environmental issues	priorities, are used as a decision making tool	local level, related with monitoring and follow-up processes of the project implementation Final project evaluation	
	Number of adaptation plans, developed with community participation.	There are no climate change adaptation plans developed with active community participation	By the end of the project 50 parishes have participated in the adaptation plan development, with 50% of women in parishes participating	Surveys with the community leaders and women beneficiaries	Community leaders do not promote full participation of the community
Output 1.2.1: Canton and community adaptation plans developed to reduce vulnerabilities to climate change induced food insecurity in targeted areas	Number of adaptation plans with a vulnerability reduction and food security approach	There are no adaptation plans for targeted cantons and parishes with this focus	By the end of the project all targeted canton and community adaptation plans incorporate vulnerability reduction and food security solutions	Adaptation plans	Some of the technically required climate change adaptation measures are not community priorities
Output 1.2.2: Community participation in processes to develop adaptation plans in targeted cantons	Number of parishes and community leaders that participate in the process to develop adaptation plans	There are no adaptation plans developed with community participation.	By the end of the project, 50 parishes, including leaders and citizens have actively participated in the adaptation plans development	List of participants Interviews with community leaders	Communities have other priorities and face constraints to participate
Output 1.2.3: Agreements developed and signed among targeted cantons, GPP or MCRJ, MAE and WFP to implement adaptation actions	Number of institutions with increased capacity to manage adverse climate change events	No agreements in the targeted project area.	50 parishes sign agreements with required stakeholders	MOUs	
Output 1.2.4:	Number of women that	Limited participation	Women involved in	Focal groups.	Measures to overcome cultural barriers

Women participated in processes and decision making to develop adaptation plans.	are community leaders with an actively participation in adaptation plans development, and decision making processes.	of women and limited decision making roles	decision making in all parishes	Interviews with decision makers at local level, related with monitoring and follow-up processes of the project implementation	are not effective
Outcome 1.3: Increased knowledge to manage climate change and risk, including climate variability affecting food security and nutrition.	Disaster preparedness score.	Limited disaster preparedness knowledge in local governments of targeted parishes	Disaster preparedness score equal to or greater than 7, indicating local government capacity in disaster preparedness ad food security information with WFP support	Focus group discussions. Survey data. Final project evaluation.	Local governments have not enough technical capacity to manage climate change risks
	Percentage of early warning systems that meet national meteorological standards that are used on place	No early warning systems to cope with main disasters on place.	By the end of the project 50 systems in place and parishes able to take appropriate response actions following protocols	Surveys with the communities Site visits during the project implementation Final project evaluation	No technical community capacity to implement early warning systems tools and protocols
Output 1.3.1: Community early warning system designed, implemented and maintained	Number of vulnerable cantons with a designed early warning system and protocols	No early warning systems to cope with main disasters on place	By the end of the project 50 parishes have designed their early warning systems and protocols	Early warning systems Site visits during the project implementation	No technical capacity at the local level to support the development of the systems
Output 1.3.2: Monitoring system in place to track climate events in targeted cantons	A basic community based system for risk monitoring	No community monitoring system on place	By the end of the project 30 parishes have a monitoring system to track climate events	Community decision making tools for climate change Focal groups Interviews with	Community organization to implement and support the system is weak

				decision makers at local level, related with monitoring and follow-up processes of the project implementation.	
Output 1.3.3: Monitoring system to track project results and lessons learned	A project results and lessons learned monitoring system	No monitoring system	By the first six months of the project implementation, a monitoring system is designed and implemented Document with project lesson learned and validated models to be replicated.	Monitoring reports of project implementation twice a year	Stakeholders at local level require training to undertaken monitoring roles
Objective 2: Strengthen adaptive capacity of highly food insecure communities to respond to the impacts of climate change, including variability in targeted cantons in Pichincha Province and MCRJ.					
Outcome 2.1: Increased adaptive capacity and ecosystem resilience in targeted rural parishes	Community adaptation asset score (natural and physical)	No adaptative capacity is implemented in the targeted rural parishes	By the end of the project 50 parishes have reduced their risk and implemented adaptation measures Asset score threshold set to capture increase (created or restored) in community adaptation assets over base level communities	Focus group discussions Survey data Final project evaluation	MCRJ is going through a re-organization process to become a local governmental consortium. During this period of change the leadership team may redirect its priorities towards different objectives of those established in the project, especially for the selected focal zones
	Percentage of households in targeted parishes with increased capacity to manage climate risk desegregated by	Initial survey of targeted households	By the end of the project at least one member of each targeted household has received training and increased their understanding of climate	List of participants to the training programs. Focal groups and interviews	Community participation in the trainings is less than expected

	gender		risk and management 50% of the household participants are women		
Output 2.1.1: Concrete adaptation measures based on community adaptation plans are designed	Number of parishes that have implemented concrete adaptation measures	No community activities implemented in the targeted rural parishes	By the end of the project 50 parishes have implemented at least 3 concrete adaptation measures	Survey data Field visits Mid term and final project evaluations	There are limited economic and human resources to implement the activities in the parishes
Output 2.1.2: Physical assets created, improved or maintained	Physical assets implemented	Limited number of physical assets in place	Assets created according to community plans	Field visit Surveys	Community workforce available to support engineering measures requires incentives
Output 2.1.3: Natural resources assets created, improved or maintained	Natural resources assets implemented	Limited number of natural assets in place to withstand or adapt to climate change events	Activities implemented according to community plans	Field visit Surveys	Community workforce available to support natural resources measures requires incentives
Output 2.1.4: Identification of adaptation technology requirements	Number of technological instruments to address climate threats identified	No technologies related to adaptation to climate change in place	By the end of the project the GPP and the MCRJ have identified the adaptation technologies needed to address climate change on each of the targeted parishes	Interviews with local project coordinators and stakeholder staff	The costs to implement the identified technologies are higher than expected
Output 2.1.5: Implementation strategy includes approach for the use of incentives and PES	Number of parishes that receive incentives or PES	PES has not been implemented before in the targeted project area,but are part of GoE programmes in other areas.	To be determined based on strategy and community plans	Focal groups Surveys Lists of beneficiaries receiving payments by gender and community Lists of beneficiaries exchanging vouchers in shops, by gender, shop and community	Incentives or PES are not sufficient to encourage participation
Outcome 2.2: Increased capacity at	Coordination mechanisms among	Limited coordination among the main	By the end of the project there is a letter of	Letter of interest.	Some of the involved parties do not have political interest to sign the letters

parishes and institutional level to manage climate change risk in the targeted cantons	parishes, local governments, provincial governments in place	involved institutions to implement the adaptation measures	interest among all the involved entities to manage jointly climate change risks in the targeted cantons		
	Percentage of local governments and key stakeholders at national, provincial and local level that access to climate change relevant information	Climate change and variability information is insufficient and not up-dated Access is limited	Project stakeholders are able to access to up-dated information	Documents, resorts, evaluations, technologies	The information is not documented Scientific and technical information availability in relation to climate change in Ecuador is insufficient and incomplete
Output 2.2.1: Community participation, in particular of women, guide decision making processes for project execution	Parishes agree and support with decisions taken	Limited community participation on decision making processes	All of the proposed activities in the project have a participatory implementation strategy 50% of the participants are women.	Meetings records Interviews and surveys with parishes' leaders List of participants	Not enough time is given to nurturing the participatory process
Output 2.2.2: Parishes share success stories and lessons learned	Number of workshops to disseminate de information	No documented information available	Each of the targeted parishes has by the end of the project documented their experience	Documents, reports, evaluations referring the project	Most relevant information is not documented by stakeholders staff
	Number of visits to other parishes, not targeted in this project, to disseminate the information	No visits have been carried out	The most successful experiences, as well as the worst ones are documented	Documents, reports, evaluations pertaining to the project	Relevant information is not documented

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

A. RECORD OF ENDORSEMENT ON BEHALF OF THE GOVERNMENT

Dr. Marcela Aguiñaga Vallejo, Minister, Ministry of Environment (MAE)

Dr. Marcela Aguiñaga Vallejo *Minister of Environment*	Date: *(15th January, 2011)*

A. IMPLEMENTING ENTITY CERTIFICATION

Measures for financial and program/project risk management and for monitoring, reporting and evaluation will be detailed in the full program document.

I certify that this proposal has been prepared in accordance with guidelines provided by Adaptation Fund Board, and prevailing National Development Plan, National Environment Policy and National Climate Change Strategy subject to the approval by the Adaptation Fund Board, understand that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project.

Implementing Entity Coordinator: Deborah A. Hines Ecuador WFP Country Director	
Date: 15 January 2011	Tel: 593+2 2460-330 Email: Deborah.hines@wfp.org
Project Contact Person: Deborah Hines or Carmen Galarza	
Tel: 593+2 2460-330 Email: Deborah.hines@wfp.org / Carmen.galarza@wfp.org	

Annex One: Decree Executive 1815, July 1, 2009

Nº 1815

RAFAEL CORREA DELGADO

PRESIDENTE CONSTITUCIONAL DE LA REPÚBLICA

CONSIDERANDO:

Que el artículo 14 de la Constitución de la República del Ecuador, reconoce el derecho de la población a vivir en un ambiente sano y ecológicamente equilibrado, que garantice la sostenibilidad y el buen vivir, sumak kawsay; y declara de interés público la preservación del ambiente, la conservación de los ecosistemas, la biodiversidad y la recuperación de espacios naturales degradados;

Que el artículo 395 numeral 2 de la Carta Fundamental reconoce como uno de los principios ambientales que las políticas de gestión ambiental se apliquen de manera transversal y serán de obligatorio cumplimiento por parte del Estado en todos sus niveles y por todas las personas naturales o jurídicas en el territorio nacional;

Que el artículo 414 del texto constitucional dispone al Estado adoptar medidas adecuadas y transversales para la mitigación del cambio climático, mediante la limitación de las emisiones de gases de efecto invernadero, de la deforestación y de la contaminación atmosférica; tomará medidas para la conservación de los bosques y la vegetación, y protegerá a la población en riesgo;

Que mediante Decreto Ejecutivo No. 1101 publicado en el Registro Oficial No. 243 del 28 de julio de 1999, se creó el Comité Nacional del Clima (CNC), al que le correspondía proponer la definición y el establecimiento de las políticas y estrategias para la ejecución del Convenio Marco de las Naciones Unidas sobre el Cambio Climático;

Que mediante Decreto Ejecutivo No. 3516 publicado en el Registro Oficial de 31 de marzo de 2003 se expidió el Texto Unificado de Legislación Secundaria del Ministerio

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del Ambiente, el cual en su Libro VI Titulo VII incorpora lo estipulado en el Decreto Ejecutivo No. 1101 respecto a la creación del Comité Nacional del Clima;

Que el Comité Nacional del Clima no ha definido ni establecido las políticas y estrategias para la ejecución del Convenio Marco de las Naciones Unidas sobre el Cambio Climático lo cual no ha permitido que se concreten actividades concretas y de trascendental importancia para la adaptación al mismo;

Que mediante Oficio No. SENPLADES-SRDEGP-2009-123 de fecha 12 de junio de 2009, la Subsecretaría de Reforma Democrática del Estado e Innovación de la Gestión Pública emite informe favorable previo a la creación de la Subsecretaría de Cambio Climático así como del proyecto de Decreto Ejecutivo por el cual se declara política de Estado la adaptación y mitigación del cambio climático, la misma que estará a cargo del Ministerio del Ambiente;

En ejercicio de las facultades que le confiere los artículos 147 numerales 3, 5 y 6 de la Constitución de la República, y 11 letra f) del Estatuto del Régimen Jurídico y Administrativo de la Función Ejecutiva,

DECRETA:

Art. 1.- Declárese como política de Estado la adaptación y mitigación al cambio climático. El Ministerio del Ambiente estará a cargo de la formulación y ejecución de la

estrategia nacional y el plan que permita generar e implementar acciones y medidas tendientes a concienciar en el país la importancia de la lucha contra este proceso natural y antropogénico y que incluyan mecanismos de coordinación y articulación interinstitucional en todos los niveles del Estado.

Art. 2.- Todos los proyectos que ejecuten las entidades del sector público tendrán la obligación de contemplar en su ingeniería financiera una cláusula de adicionalidad, con la finalidad de acceder en lo posterior a mecanismos de desarrollo limpio (MDL).

Las máximas autoridades de las entidades e instituciones del Estado serán responsables del estricto cumplimiento de esta disposición.

Art. 3.- Déjese sin efecto el Título VII del Libro VI del Texto Unificado de Legislación Secundaria del Ministerio del Ambiente, expedido mediante Decreto Ejecutivo No. 3516 publicado en el Registro Oficial-Edición Especial de fecha 31 de marzo de 2003 y el Decreto Ejecutivo No. 2127 publicado en el Registro Oficial No. 436 del 6 de octubre de 2004.

Art. 4.- Todas las competencias, atribuciones, funciones, representaciones y delegaciones vinculadas con el Comité Nacional del Clima serán asumidas por la Dirección de Cambio Climático, Producción y Consumo Sustentable del Ministerio del Ambiente.

Nº 1815

RAFAEL CORREA DELGADO

PRESIDENTE CONSTITUCIONAL DE LA REPÚBLICA

Art. 5.- Deróguese el Decreto Ejecutivo No. 1101, publicado en el Registro Oficial No. 243 de julio 28 de 2009.

Art. Final.- De la ejecución de este Decreto Ejecutivo que entrará en vigencia a partir de esta fecha, sin perjuicio de su publicación en el Registro Oficial, encárguese a la Ministra del Ambiente.

Dado en el Palacio Nacional, en Quito, a 1 de julio de 2009

RAFAEL CORREA DELGADO

PRESIDENTE CONSTITUCIONAL DE LA REPÚBLICA

MARCELA AGUIÑAGA VALLEJO

MINISTRA DEL AMBIENTE

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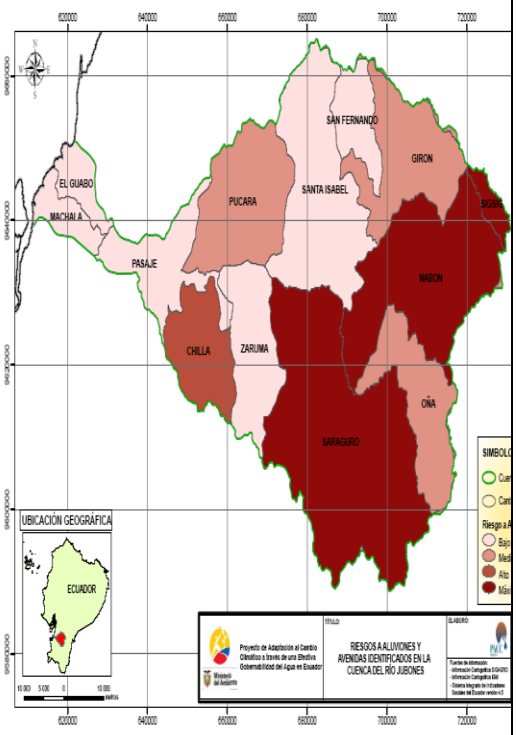
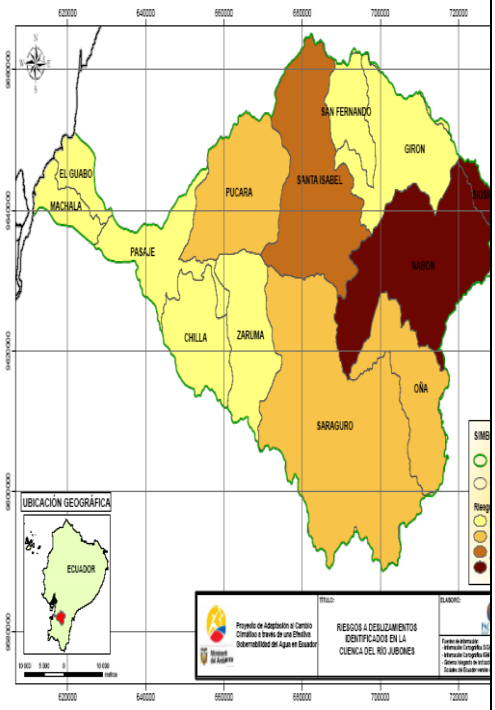
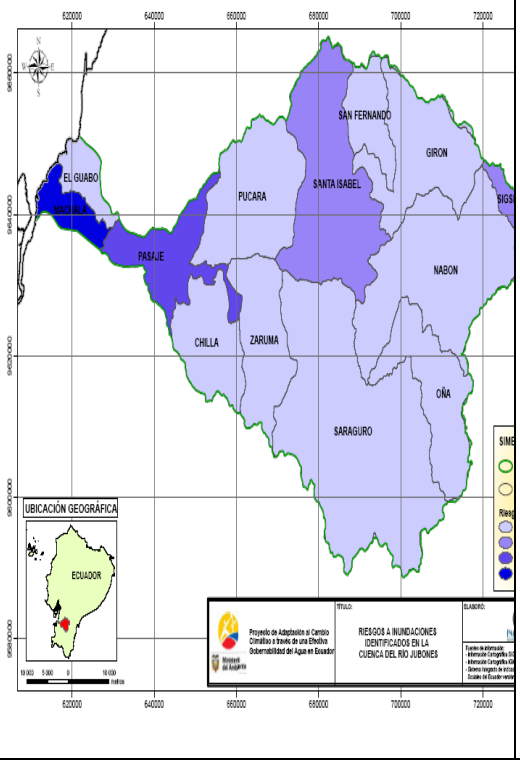
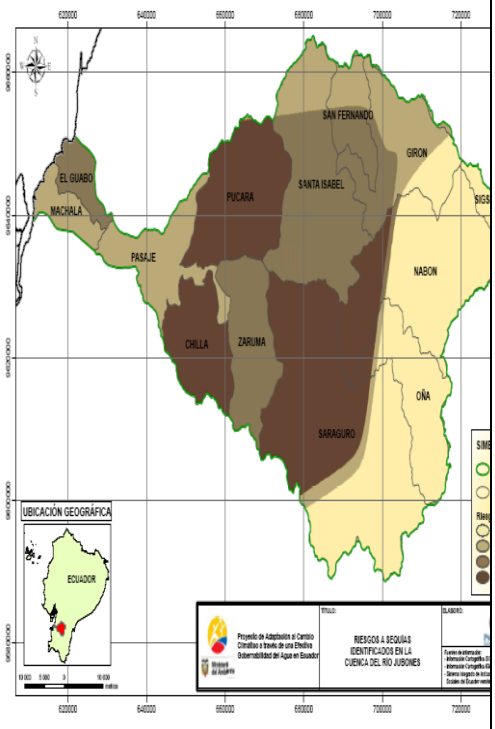
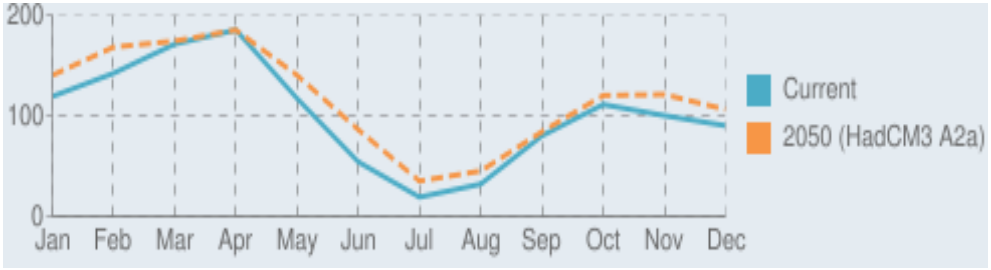
Annex Two: Main Risk in the basin of river Jubones

DOWNPOURS	SLIDINGS
	
FLOODINGS	**DROUGHT**
	

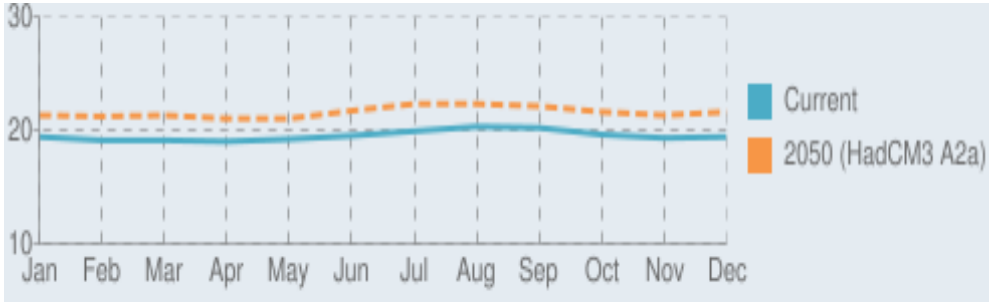
Annex Three: Forecast 2050: precipitation and temperature

Pichincha	Precipitation											
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Current (1950-2000)	119	142	171	185	117	54	19	32	80	111	100	90
2050 (HadCM3 with A2a)	140	168	174	185	140	86	35	45	84	120	121	106
Changes (mm)	21	26	3	0	23	32	16	13	4	9	21	16

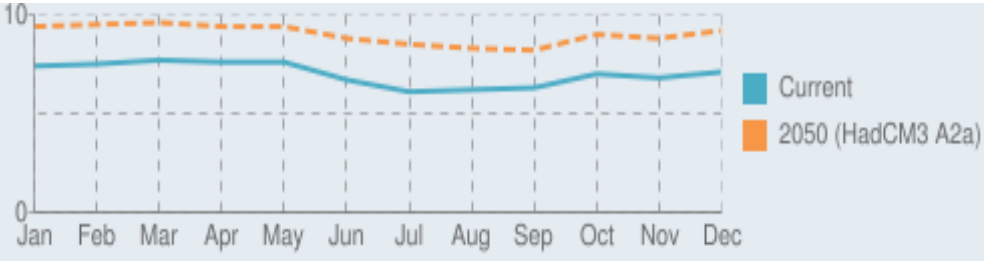


Pichincha	Maximum Temperature											
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Current (1950-2000)	19,4	19	19	19	19,2	20	20	20	20	20	19	19
2050	2	2	2	2	2	2	2	2	2	2	2	2

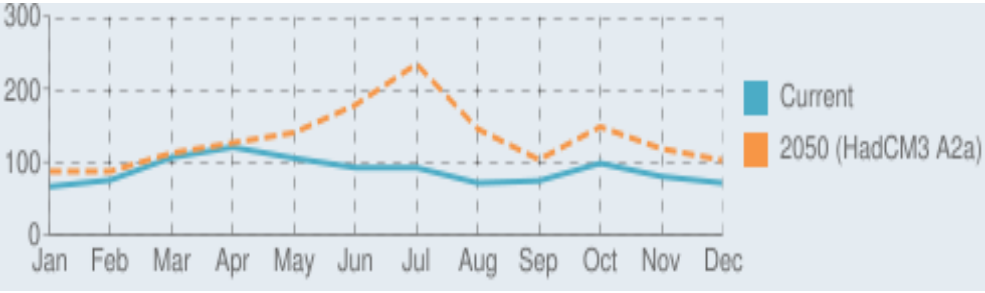
(HadCM3 with A2a)	1,3	1	1	1	1	2	2	2	2	2	1	2
Changes (C)	1,9	2,1	2,2	2	1,8	2,2	2	2	1,9	2	2	2,2



Pichincha	Minimum Temperature											
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Current (1950-2000)	7,4	7,5	7,7	7,6	7,6	6,7	6	6,2	6,3	7	6,8	7,1
2050 (HadCM3 with A2a)	9,4	9,5	9,6	9,4	9,4	8,8	9	8,3	8,2	9	8,8	9,2
Changes (C)	2	2	1,9	1,8	1,8	2,1	2	2,1	1,9	2	2	2,1

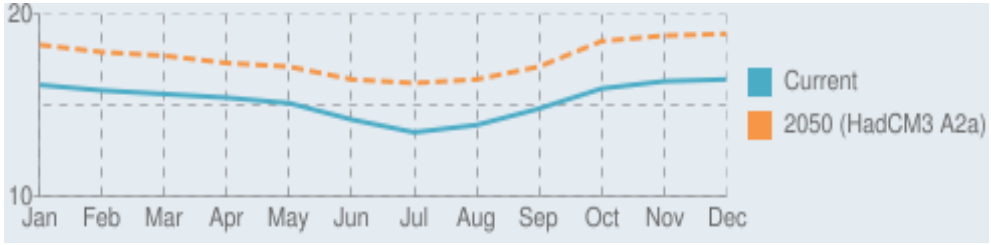


Azuay	Precipitation											
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Current (1950-2000)	66	75	106	120	105	92	92	71	74	98	80	71
2050 (HadCM3 with A2a)	87	87	112	126	140	178	234	145	103	148	118	102
Changes (mm)	21	12	6	6	35	86	142	74	29	50	38	31

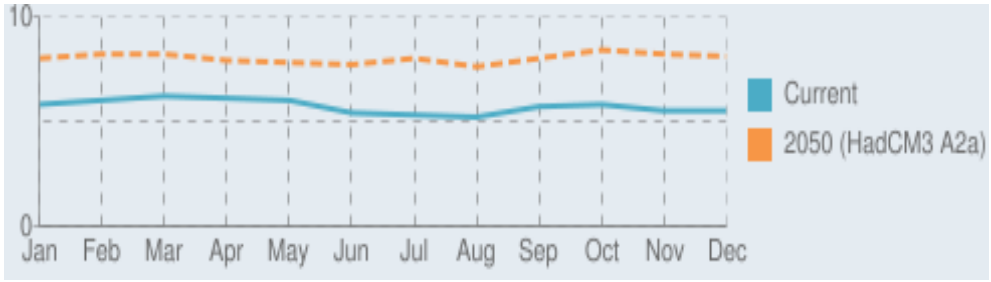


Azuay	Maximum Temperature											
	J	**F**	**M**	**A**	**M**	**J**	**J**	**A**	**S**	**O**	**N**	**D**

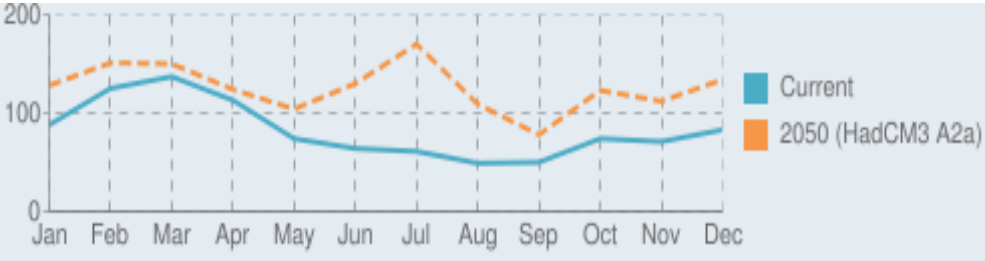
	an	eb	ar	pr	ay	un	ul	ug	ep	ct	ov	ec
Current (1950-2000)	16	16	16	15	15,1	14	14	14	15	16	16	16
2050 (HadCM3 with A2a)	18	18	18	17	17,1	16	16	16	17	19	19	19
Changes (C)	2,2	2,1	2,1	1,9	2	2,2	2,7	2,5	2,3	2,6	2,5	2,5



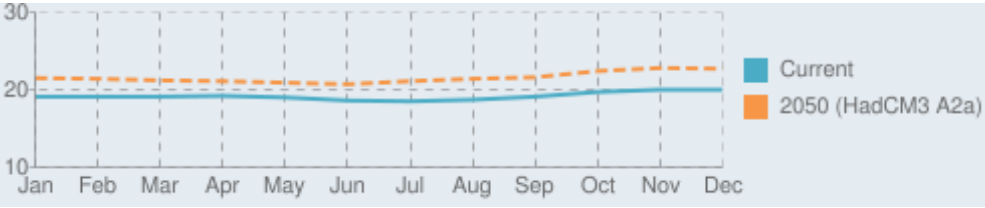
Azuay	**Min Temperature**											
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Current (1950-2000)	5,8	6	6,2	6,1	6	5,4	5,3	5,2	5,7	5,8	5,5	5,5
2050 (HadCM3 with A2a)	8	8,2	8,2	7,9	7,8	7,7	8	7,6	8	8,4	8,2	8,1
Changes (C)	2,2	2,2	2	1,8	1,8	2,3	2,7	2,4	2,3	2,6	2,7	2,6



Loja	Precipitation											
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Current (1950-2000)	88	125	137	113	74	64	61	49	50	74	71	83
2050 (HadCM3 with A2a)	128	151	150	124	104	130	170	109	78	123	112	134
Changes (mm)	40	26	13	11	30	66	109	60	28	49	41	51

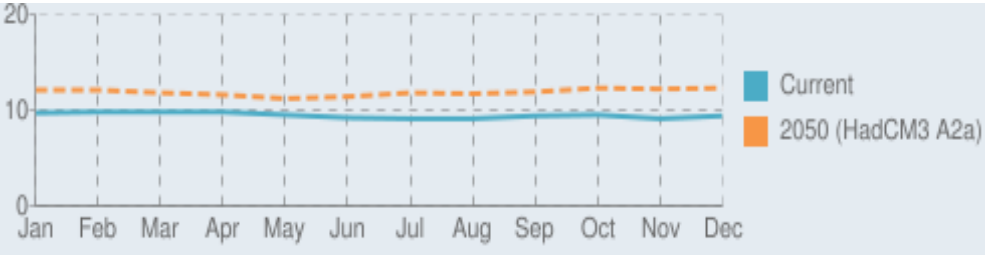


Loja	Max Temperature											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Current (1950-2000)	19,1	19	19	19	19	19	19	19	19	20	20	20
2050 (HadCM3 with A2a)	21,5	21	21	21	20,9	21	21	21	22	22	23	23
Changes (C)	2,4	2,3	2,1	1,9	1,9	2,1	2,6	2,7	2,5	2,7	2,8	2,7



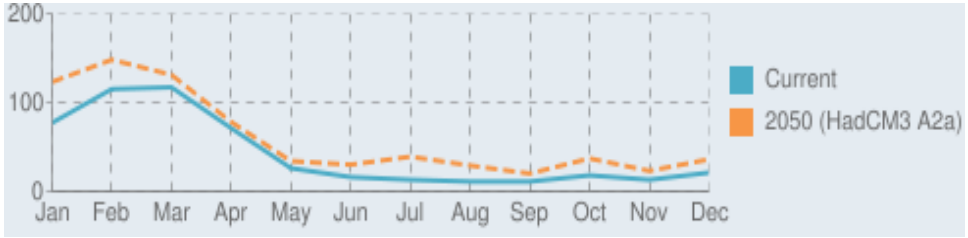
Loja	Min Temperature											
	Ja	Fe	Ma	Ap	Ma	Ju	Ju	Au	Se	Cc	No	De

	n	b	r	r	y	n	l	g	p	t	v	c
Current (1950-2000)	9,7	9,8	9,8	9,8	9,5	9,2	9,1	9,1	9,4	9,5	9,1	9,4
2050 (HadCM3 with A2a)	12,1	12	12	12	11,2	11	12	12	12	12	12	12
Changes (C)	2,4	2,3	2	1,8	1,7	2,2	2,7	2,6	2,5	2,8	3,1	2,9

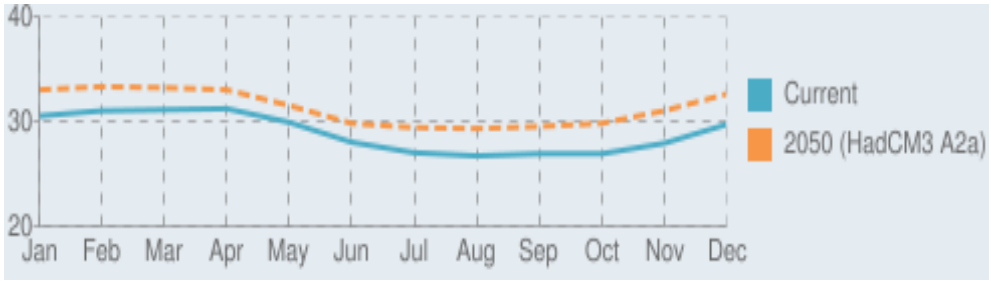


El Oro	Precipitation											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec

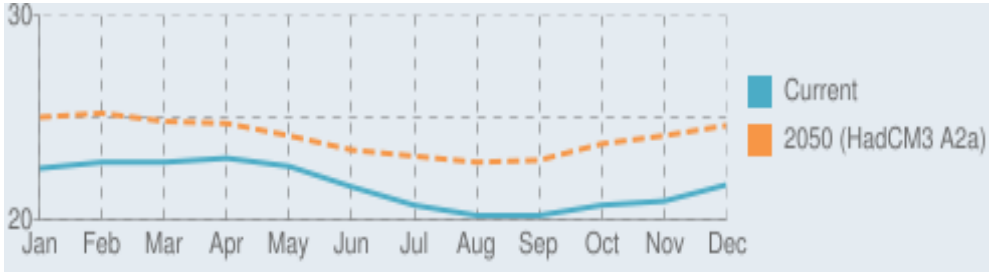
Current (1950-2000)	77	115	117	71	26	16	13	11	11	18	13	21
2050 (HadCM3 with A2a)	123	148	131	78	34	30	39	29	20	37	23	36
Changes (mm)	46	33	14	7	8	14	26	18	9	19	10	15



El Oro	**Max Temperature**											
	Jan	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**
Current (1950-2000)	30,5	31	31	31	29,9	28	27	27	27	27	28	30
2050 (HadCM3 with A2a)	33	33	33	33	31,5	30	29	29	30	30	31	33
Changes (C)	2,5	2,3	2,1	1,8	1,6	1,8	2,4	2,6	2,6	2,9	3,1	2,9

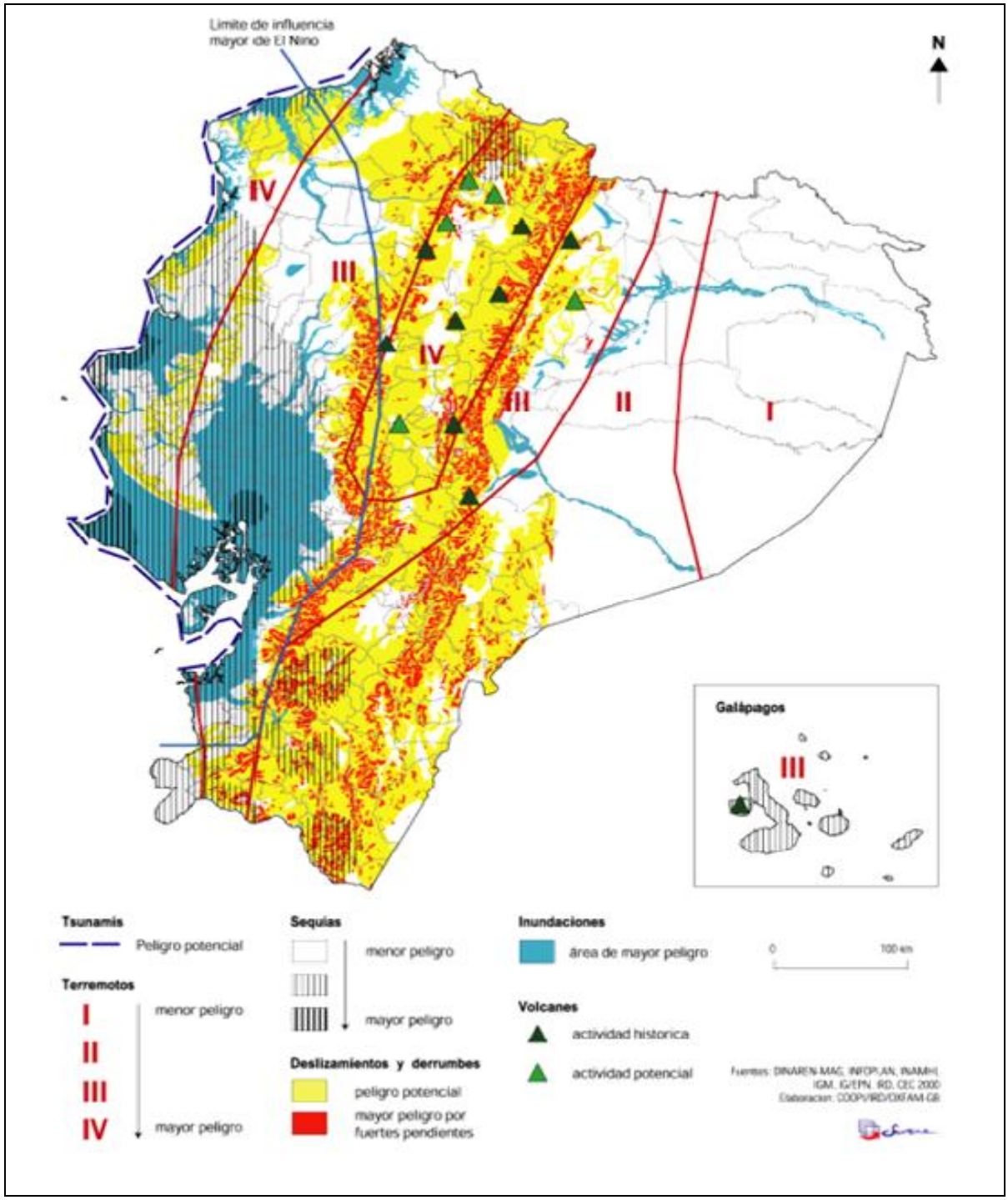


El Oro	Min Temperature											
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Current (1950-2000)	22,5	23	23	23	22,6	22	21	20	20	21	21	22
2050 (HadCM3 with A2a)	25	25	25	25	24,1	23	23	23	23	24	24	25
Changes (C)	2,5	2,4	2	1,7	1,5	1,8	2,4	2,6	2,7	3	3,2	2,9



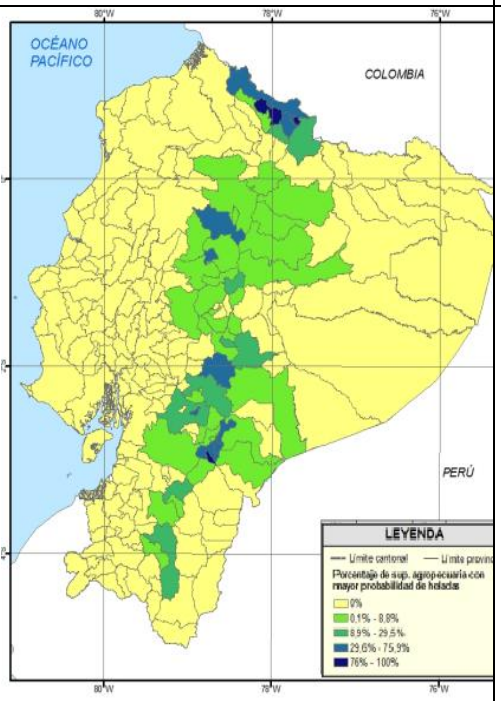
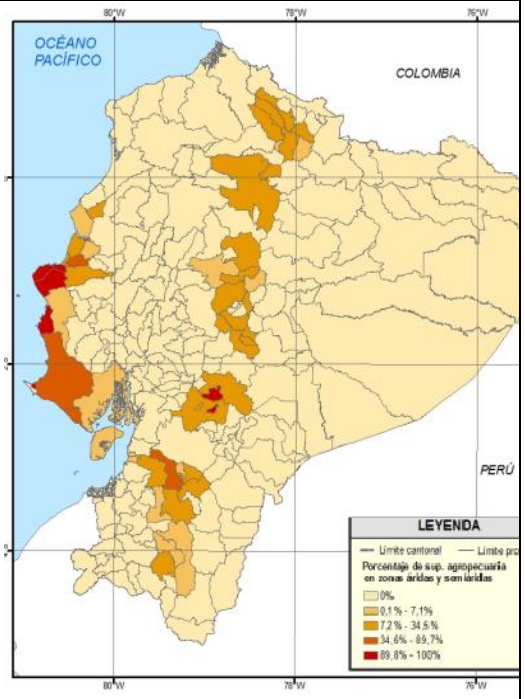
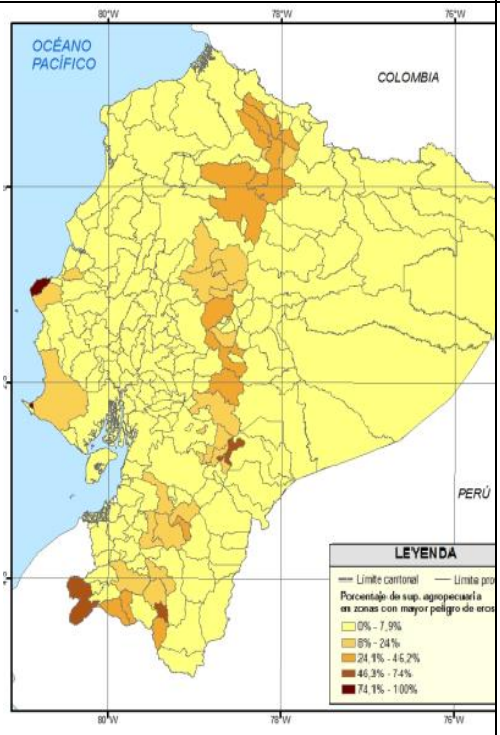
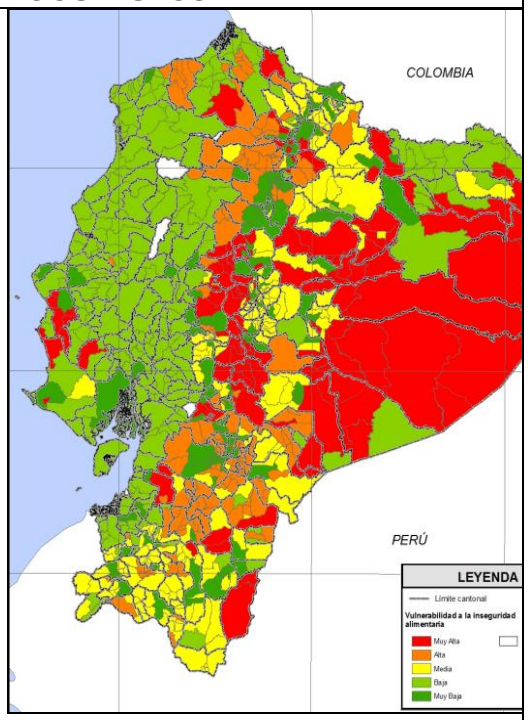
Source: WORLDCLIM CLIMATE SURFACES FOR GLOBAL LAND AREAS

Annex Four: Multi-threats Map



Mapa Multi-Amenazas del Ecuador
Robert D´ercole et al 2003
IRD / COOPI / OXFAM

Annex Five: VAM Ecuador: food insecurity, erosion, frost and desertification maps, source Ecuador Country Office WFP

FROST	DESERTIFICATION
	
EROSION	**FOOS INSECURITY**
	

Annex Six: Social Indicators

Social Indicators by Province								
			Population				Food	Climate
Province	Canton	Parish	#	% Rural Population	Undernutrion	Consumption Poverty	Vulnerability	Risk
Total País			**12.156.608**	**39%**	**25,8**	**38,2**		
Pichincha			2.388.817	28%	22,5	22,4		
	Cayambe		69.800	56%	34	23		
		Olmedo						Climate change affects droughts in this sector, reduction of running ice (Cayambe).
		Pesillo	6.439		41,5	32,03	Very high	
		Cangahua	13.508		46,5	42,6	High	
		Oton	2.125		42,1	36,33	Very high	
	Pedro Moncayo		25.594	76%	31	26		
		Tabacundo	11.699		31,8	17,23	Low	
		Tupigachi	5.120		38,5	38,52	Very high	
Azuay			599.546	47%	36,7	26,7		The central

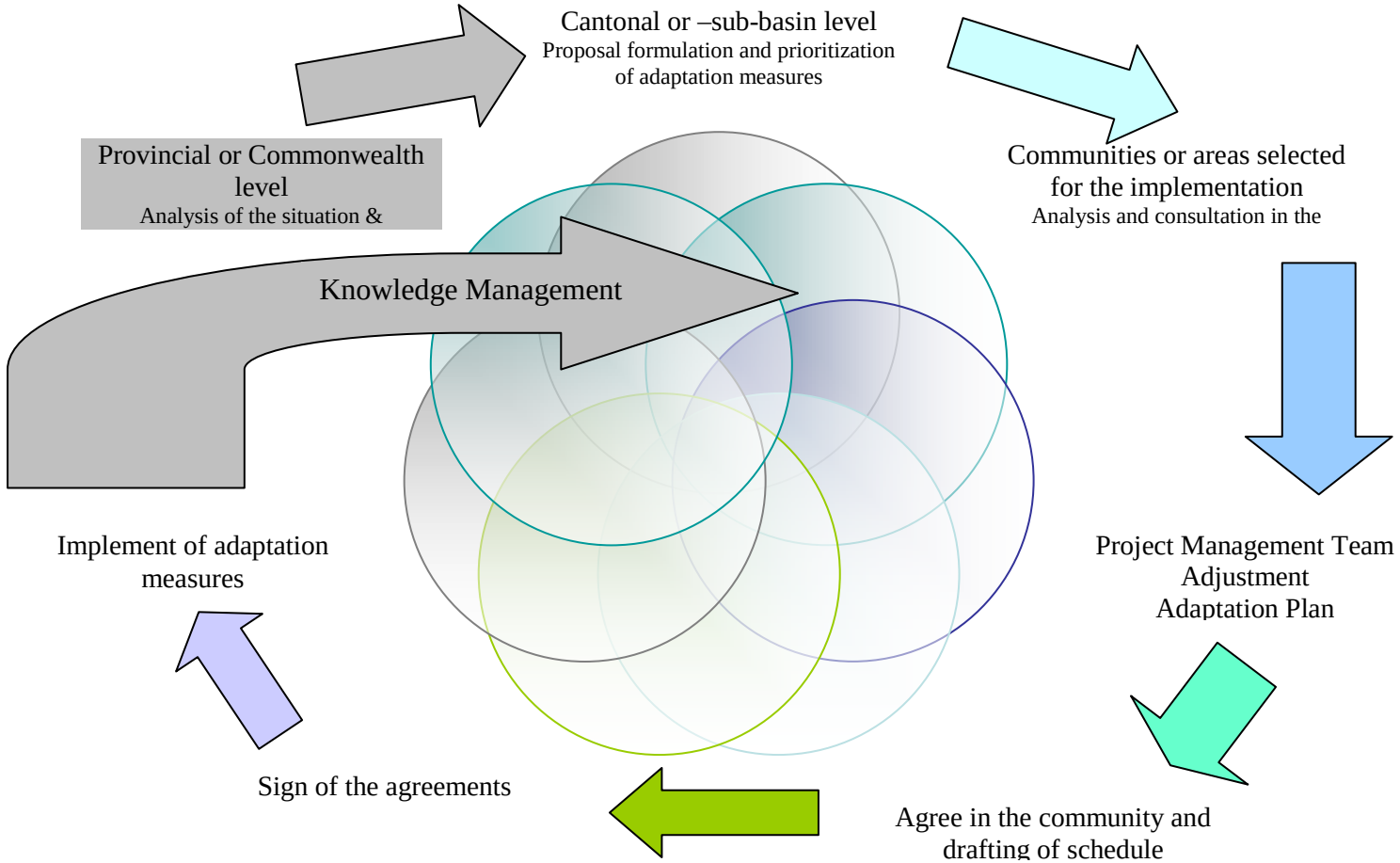
	Nabon		15.121	93%	64	32		area is estimated long periods of drought, them that can last up to 16.78 months.Pucara, Santa Isabel, Giron, San Fernando - High risk of drought. Nabon, Oña and Pucara,- Landslide risk
		El Progreso	2.252		66,6	41,74	High	
		Nabon	8.818		68,2	30,59	High	
		Cochapata	2.686		54,4	31,5	High	
	Oña		3.231	79%	49	0,27		
		Oña	3.231		51,6	27,7	High	
	Santa Isabel		18.015	77%	47	16		
		El Carmen	1.239		49	29,3	Very high	
		Zhagili	2.487		61,9	22,9	Very high	
	Pucara		20.382	95%	53	29		
		Pucará	9.838		59,5	38,05	Very high	
		San Rafael	1.663		60,9	39,17	High	
	Giron		12.583	72%	46	12		
		La Asunción	2.885		48,5	12,17	High	
	San Fern		3.961	65%	41	16		

	ando	San Fernando	3.195		42,7	18,11	High	
Loja	Saraguro		404.835	55%	34,7	47,1		Jubones River Basin have shown extreme climate changes. Landslides.
			28.029	89%	62	42		
		San Sebastian	1.046		52,2	28,98	High	
		Manu	4.740		49,4	39,83	High	
		Lluzhupa	1.758		68,7	42,7	High	
		Selva Alegre	2.068		67	60,35	High	
		El Paraiso	2.315		70,5	59,22	High	
		San Pablo	3.502		67,5	49,03	Middle	
		Saraguro	7.346		62,2	25,3	Middle	
		Urdaneta	3.142		71,8	47,57	High	
		El Tablon	880		55,4	54,86	High	
		San Antonio	1.232		53	51,34	High	

El Oro			525.763	24%	15,2	28		In the lower river basin Jubones have demonstrated long-term flooding.
	Zaruma		23.407	63%	23	13	Middle	
	Chilla		2.665	62%	19	16	Middle	
	Pasaje		62.959	28%	17	5	Middle	

1,- Population,- Censo de población y Vivienda INEC 2001
2,- Undernutrion - Encuesta de condiciones de vida (INEC) 2006/ Referencia WHO 2005 // VAM, WFP, 2009
3,- Consumption poverty- Encuesta de condiciones de vida (INEC) 2006 // VAM, WFP, 2009
3,- Vulnerability- VAM, WFP, 2009
4,- Climate Risk,- Vulnerability assessment Jubones River
Notes:Very High,- Regions that have a higher level of threat and a higher level of food vulnerability. / High,- Regions with a greater risk to climate impacts and vulnerability./ Middle,- Regions at risk of food vulnerability.
Source: SIISE 2010 // VAM, WFP, 2009

Annex Seven: Project Process



Annex Eight: Letter MAE

GOBIERNO NACIONAL DE LA REPÚBLICA DEL ECUADOR

Ministerio del Ambiente

Av. Eloy Alfaro y Amazonas, Edificio MAGAP
Quito - Ecuador
Teléfonos: (593 2) 2563429 - 2563430 - 2529845
RUC: 1760010460001
www.ambiente.gov.ec

Oficio No. MAE-D-2010-0421

Quito , 20 de Mayo de 2010

Señor
Riaz Lodhi
DIRECTOR ADJUNTO
PROGRAMA MUNDIAL DE ALIMENTOS
Presente.

Estimado señor Lodhi:

El Ministerio del Ambiente del Ecuador se encuentra actualmente liderando la gestión del Cambio Climático en el país. Para ese efecto, desde el 1 de Diciembre de 2009 ha creado la Subsecretaría de Cambio Climático, que está encargada de la gestión del cambio climático en coordinación con otras entidades del Estado y de la Sociedad Civil.

La Subsecretaría de Cambio Climático enfoca su gestión a través de dos ejes de trabajo principales, la mitigación y la adaptación al cambio climático. En el país se han generado herramientas de planificación y políticas que dan el direccionamiento para las acciones relacionadas con el cambio climático, desde la Constitución de la República, El Plan Nacional del Buen Vivir, hasta la Política Ambiental Nacional. Esos instrumentos han sido reforzados a través de distintos decretos ejecutivos y acuerdos ministeriales que afianzan la institucionalidad y buscan el tratamiento multisectorial para el manejo de un tema de tanta trascendencia como es el cambio climático. Unos de los objetivos que guía las acciones que el Ministerio ejecuta sobre el tema es la gestión de la adaptación y mitigación al cambio climático para disminuir la vulnerabilidad social, económica y ambiental en el país.

En el campo de trabajo relacionado con la adaptación al cambio climático se busca levantar la información necesaria para entender de mejor manera la vulnerabilidad de las poblaciones y ecosistemas al cambio climático. Ese es el punto de partida para en lo posterior identificar y priorizar medidas de adaptación. Uno de los sectores relevantes para la gestión de la adaptación al cambio climático es el sector agrícola por su estrecho vínculo con la seguridad alimentaria.

Conocedores de la labor del Programa Mundial de Alimentos de las Naciones Unidas, y sus esfuerzos por velar por la seguridad alimentaria de los grupos poblacionales más pobres y su reciente involucramiento en procesos de desarrollo orientados a enfrentar el hambre en el mundo, el Ministerio del Ambiente del Ecuador considera que dicho Programa ofrece grandes oportunidades de asocio para el trabajo conjunto en la gestión de la adaptación al cambio climático, entre otras cosas por la experiencia desarrollada a nivel local. Por esa razón, a través de esta carta, quiero invitar al Programa Mundial de Alimentos de las Naciones Unidas a trabajar con el Ministerio del Ambiente de forma conjunta para desarrollar acciones que contribuyan con nuestra gestión sobre la adaptación al cambio climático, sin perjuicio de encontrar acciones que también pueden contribuir a la mitigación del

2010 Año Internacional de la Diversidad Biológica

Bicentenario

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Oficio No. MAE-D-2010-0421

cambio climático.

El Ministerio del Ambiente está comprometido con la lucha contra los efectos adversos que plantea el cambio climático y se ha comprometido a liderar el tema en el país en coordinación con otras instituciones del Estado y Sociedad Civil.

Atentamente,

Marcela Aguiñaga Vallejo
Ministra del Ambiente

MA/mc

C.C.: Marco Chiu
SUBSECRETARIO DE CAMBIO CLIMÁTICO
MINISTERIO DEL AMBIENTE
María Victoria Chiriboga Nielsen
DIRECTORA NACIONAL DE MITIGACIÓN Y ADAPTACIÓN AL CAMBIO CLIMATICO
MINISTERIO DEL AMBIENTE
Diana Priscila Martucci Larrea
SUBSECRETARIA DE PLANIFICACIÓN AMBIENTAL
MINISTERIO DEL AMBIENTE
Doctora
Carmen Galarza
COORDINADORA NACIONAL
PROGRAMA MUNDIAL DE ALIMENTOS PMA

Annex Nine: Implementation Measures

A. Implementation Details

The Project will help to reduce vulnerability to climate change induced risks and vulnerabilities, including a food security, in four provinces of Ecuador, 50 parishes and about 500 communities, by encouraging community based adaptation measures for climate change, based on community climate change adaptation plans. The participatory process will seek the participation of at least 50 percent of women in all planned activities, as well as in decision making processes.

Component 1: Develop awareness, knowledge and capacity at the community level on climate change and food insecurity related risks.

The component will help to integrate adaptation measures in district development plans; in order to reduce and avoid human and material loses from climate change threats in the targeted vulnerable areas. The project aims to develop capabilities of local institutions and communities and to increase understanding of the causes and possible impacts of climate change risks in the MCRJ and the GPP. All adaptation measures will have direct or indirect effects on a food security. Component 1 will encompass the following outputs:

Output 1.1: Communities in targeted cantons trained in climate change threats and adaptation measures which reduce vulnerability, in particular related to food security

Indicative activities under Output 1.1.1will include:

- Develop one adaptation plan for each of the 500 targeted communities.
- Establish and implement a training program on climate change threats and adaptation measures related to food insecurity at community level. Ensure a gender focus in all trainings.
- Organize workshops and seminars for communities in the targeted cantons on climate change threats.
- Organize workshops and seminars for central, provincial and local authorities on climate change threats and provide inputs to provincial adaptation strategies.
- Indentify sources of climate risk information at local; disseminate information and ensure that vulnerable households and schools have access to relevant information.

Output 1.1.2: Targeted communities participate in adaptation and risk reduction awareness activities.

Indicative activities under Output 1.1.2 will include:

- Develop workshops to develop risk maps and registers. Use information to inform local official and communities of the climate change threats.
- Establish a community participatory process for developing adaptation plans, with at least 50 percent of women participation.
- Establish cooperative links between all involved parties on climate change adaptation in the targeted areas to support the implementation of project activities at the community level. (GPP, MAGAP, MAE, MCRJ, WFP).
- Organize awareness raising events – at least 2, 4 year awareness campaigns at provincial and district level to disseminate climate change risk information.

Output 1.1.3: Food security and gender considerations integrated in all adaptation training programs.

Indicative activities under Output 1.3 will include:

- Develop a food security/climate threat training program, with a strong gender focus.
- Organize workshops and seminar with at least 40 percent of participants women.

Output 1.2.1: Canton and community adaptation plans developed to reduce vulnerabilities to climate change induced food insecurity in targeted areas.

Indicative activities under Output 1.4 will include:

1.4.1 Develop 50 parish community adaptation plans, covering 500 communities through a participatory process, using a standardized methodology developed for the project.

Output 1.2.2: Community participation in processes to develop adaptation plans in targeted cantons.

Indicative activities under Output 1.5 will include:

- Design a participatory process to be included in all the project activities.

Output 1.2.3: Agreements developed and signed among targeted cantons, GPP or MCRJ, MAE and WFP to implement adaptation actions.

Indicative activities under Output 1.6 will include:

- Organize meetings among cantons and involved institutions/stakeholders dealing with climate change issues in the targeted project area to sign letters of cooperation.

Output 1.2.4: Identification of adaptation technology requirements and transfer of technologies through concrete actions

Output 1.3.1: Community early warning system designed, implemented and maintained.

- Design and implement early warning systems to enable the dissemination of the main threats for each of the targeted areas.
- Install at least 50 EWS at parish level with the necessary technical elements to make it fully functional.
- Training for all the necessary personnel to operate and maintain the EWS.

Output 1.3.2: Monitoring system in place to track climate events in targeted cantons

Indicative activities under Output 1.6 will include:

- Design a monitoring system to track main climate change events.
- Establish the monitoring system, assure regular collection of data and verify inputs and data sources.
- Train staff on monitoring techniques and data input.

Output 1.3.3: Monitoring system to track project results and lessons learned

Component 2: Increase adaptive capacity and reduce recurrent risks of climate variability at the community level.

The resources will be used to implement concrete adaptation actions at the community level, with the aim of reducing vulnerabilities to climate change threats. These actions will be focused on the construction or maintenance of physical and natural assets, as well as activities that will maintain, restore and protect ecosystems.

Component 2 will encompass the following outputs:

Output 2.1.1: Concrete adaptation measures based on community adaptation plans are designed

Indicative activities under output 2.1 will include:

- Identify feasible assets to mitigate the treats of climate change. Establish technical standards and means of verification.
- Organize a participatory process to identify community priorities, consensus building processes, and decision making mechanisms. Hold workshops and focus group discussions at community level.

Output 2.1.2 Physical assets created, improved or maintained.

Indicative activities under output 2.2 will include:

- Secure high quality technical expertise and inputs.
- Organize work groups.
- Construct appropriate physical assets.

Output 2.1.3 Natural resources assets created, improved or maintained.

Indicative activities under output 2.3 will include:

- Secure high quality technical expertise and inputs.
- Organize work groups.

- Construct appropriate physical assets.

Output 2.1.4 Identification of adaptation technology requirements and transfer of technologies through concrete actions.

Indicative activities under output 2.4 will include:

- Analyze priorities and link with technologies available in the region or at national level.
- Identify possible partners to work with local officials.
- Through focus groups understand the appropriateness of the technology.
- Develop transfer mechanisms and means of verification.
- Hold training sessions and workshop.

Output 2.1.5 Implementation strategy includes approach for the use of incentives and PES

Indicative activities under output 2.5 will include:

- Analyze how existing programs use incentives and PES.
- Develop a strategy for their use in this project to support the participation of poor vulnerable families.
- Identify the more appropriate delivery method for different parishes and communities based on criteria and past lessons.
- Deliver incentives and payments based on systems of control and accountability.

Output 2.2.1 Community participation, in particular of women, guide decision making processes for project execution

- Methodologies developed to ensure a gender focuses approach.
- Local facilitators trained to work with local groups to introduce methodologies.
- Feedback and verification is integrated into community monitoring.

Output 2.2.2Communities share success stories and lessons learned

Indicative activities under output 2.7 will include:

- Disseminate main lessons learned and findings from the project, through key stakeholders.
- Document success stories and lessons learned.
- Organize focus meetings and workshops to valid lessons.
- Establish linkages with existing knowledge management systems to share lessons.

B. Terms of Reference National Project Director

NATIONAL PROJECT DIRECTOR:

Enhancing resilience of communities to the adverse effects of climate change on food security, in Pichincha Province and the Jubones River basin

INTRODUCTION

Ministry of Environment in coordination with Ministry of Agriculture, Livestock, Aquaculture and Fisheries, Commonwealth of the River Jubones Basin, Provincial Government of Pichincha; with the Climate Change Adaptation Fund and WFP support will execute a project called — Enhancing resilience of communities to the adverse effects of climate change on food security, in Pichincha Province and the Jubones River basin. The targeted areas predominately experience high to very high level of food insecurity. As well, communities are affected by climate threats, reoccurring natural disasters and lack of preparedness at local level to deal with climate threats.

Given the climate threats faced by the targeted provinces and cantons, including glacial melt reduced precipitation and more frequent droughts, and the anticipated effects on food security, the project will adopt a two pronged strategy: community based adaptation (CbA) and ecosystem-based adaptation (EbA). The climate change adaptation project will concentrate its resources in two watersheds covering four provinces (Pichincha, Azuay, Loja and El Oro).

The **overall goal** of the proposed project is to *reduce vulnerability and food insecurity of communities and ecosystems, related to the adverse effects of climate change, in the most vulnerable cantons of Pichincha Province and the basin of the river Jubones.*

The proposed project includes two components: Develop awareness and knowledge capacity at the community level on climate change and food insecurity related risks; and increase adaptive capacity and reduce recurrent risks of climate variability at the community level. The objectives of the projects are to increase knowledge to manage climate change risks affecting food security in targeted cantons in Pichincha Province and in the basin of river Jubones; and to strengthen adaptive capacity of highly food insecure communities to respond to the impacts of climate change, including variability in targeted cantons in the Pichincha Province and MCRJ.

These components will be implemented at community level under the leadership of the MAE and in coordination with the MAGAP, through two management authorities. The first, under direct manage of the MCRJ and the second, under the Pichincha Provincial Government.

II. SERVICES REQUIRED

Guide and coordinate the implementation of the Project "Enhancing resilience of communities to the adverse effects of climate change on food security, in Pichincha Province and the Jubones River basin achieving the proposed outcomes and outputs,

reporting to the WFP Country Director and working under the guidance of the Head of Programme.

III. CONSULTING SERVICES' SCOPE AND DURATION

The consulting services will be undertaken in the project's area of influence, for a five year period, subject to the administrative reviews of the WFP.

IV. FUNCTIONS

The Project Coordinator will:

- Prepare annual work plans and budgets.
- Coordinate with local government and non-governmental institutions linked to project development.
- Coordinate and manage project implementation, including monitoring
- Supervise expert teams and direct the project technical team.
- Create coordination mechanisms in the different levels of work.
- Generate synergies among different participants as well as among diverse activities, products and results.
- Facilitate conflict resolution among stakeholders and resolve obstacles in the way of timely efficient implementation of activities and achievement of outcomes.
- Submit regular reports.

VI. CONSULTANT'S PROFILE

University graduate in Natural Resource Management or Agronomy with experience in watershed management, participatory approaches and climate change adaptation. Work in community organization, gender approaches and project management essential.

Demonstrated experience in promoting processes of social and organizational change in Ecuadorian preferred. Knowledge of public administration at the national, and particularly, at the municipal level in Ecuador is essential.

The following will experience is required:

- Knowledge and/or experience in projects with a watershed approach
- Experience managing budgets and staff
- Experience in adaptive agro-ecological practices
- Knowledge of municipal management and territorial organization
- Experience in preparing and implementing educational programs

The person must meet the following requirements:

- Fluency in Spanish and English
- Social skills and ease in dealing with people
- High motivation and a proactive personality
- Willingness and flexibility to work with few resources and under pressure
- Awareness of development cooperation issues

- A team player with strengths in coordination, consensus building and establishing inter-personal and inter-institutional relations
- Integrity and respect for human rights

C. Role Stakeholders and Consultation Process

1. Stake Holder Roles

Stakeholder	Main Responsibility Area	Specific Role
Ministry of Environment (MAE)	It is the governing body responsible for formulating and implementing strategies related to adaptation and mitigation to climate change. MAE is responsible for inter-agency coordination and implementation of actions and measures, including awareness raising and education for climate change issues.	Management Team Leader and National Executing Institution. In addition, local execution team support through a Local Office in each targeted area.
Ministry of Agriculture, Livestock, Aquaculture and Fisheries (MAGAP)	It is responsible for the country's agricultural policies, including the management, regulation and training of agriculture, agro-forestry and agro-industrial sector.	Management Team Support and Local Execution Team Support through a local office in each targeted area
National Institute of Agricultural Research (INIAP)	INIAP generates technological information to increase national agricultural productivity. The Institute has a strong link with food security and competitive agricultural production.	Technical Assistance for Management and Local Teams
Secretary National of Water (SENAGUA)	It is responsible for comprehensive and integrated watershed management through policies, standards, and evaluation activities. Promotes efficient decentralized management of water.	Advisory for Management Team
National Institute for Meteorology and Hydrology of Ecuador (INAMHI)	It regulates the national hydro-meteorological sector. It has a key role in climate affairs in Ecuador, with a network of monitoring stations and overall supervision of official forecasting. It has the obligation to provide vital information on climate and water resources for the past, present and future.	Management Team Support
National Secretary Risk	It governs and regulates the national system of risk management	Advisory for Management Team

Management (SNGR)	in Ecuador, in order to strengthen capacities of the country to face emergencies or disasters.	
Technical Secretariat for International Cooperation (SETECI)	SETECI is responsible for international cooperation and belongs to the International Cooperation Ecuadorian System (SECI). It is a decentralized public entity, attached to SENPLADES. It coordinates international cooperation between governments.	Management Team member
Development Council for nationalities of Ecuador (CODENPE)	It is a technical institution that aims to establish effective democratization process through permanent and responsible community participation.	Management Team Support
Commonwealth of the basin of the River Jubones (MCRJ)	It is formed by local, provincial and municipal governments in the provinces of Azuay, Loja and El Oro. This Commonwealth is responsible for management of water resources for present and future generations.	Local Executing Institution
Provincial Government of Pichincha (GPP)	It established programmatic priorities in the National Plan 2009-2014, including poverty reduction, food security and ensuring that families have access to food and improved quality of living through, inter alia, enhanced environmental quality. It also set goals related to integrated water management to ensure availability and universal access to water.	Local Executing Institution
Planning and Development National Secretary (SENPLADES)	It is responsible for the management and coordination of the National Participatory Planning System. It establishes strategic objectives and policies, grounded in research, training, monitoring and evaluation to guide public investment.	Advisor for Management Team

2. Stakeholder Consultation Process

CONSULTATION	DATE	PLACE	PARTICIPANTS	Objective/Purpose	Achievement
Meeting	Jan/2009	Quito	MCRJ – WFP	Know likely WFP cooperation in issues relation to climate change	Two entities agreed to work jointly to reduce the impact of climate change and variability
Field visit to Azuay and Loja provinces	18 to 21 May/2009	Cuenca, Oña, Nabón, Saraguro	WFP MCRJ PRODER-MIES Saraguro Mayor and their technical staff Technical staff of Oña and Nabon Municipalities Community Leaders	Hold meetings with MCRJ and PRODER - MIES in relation to their proposed project and field visit to the area of influence in the provinces of Azuay and Loja to identify likely WFP cooperation	MCRJ and WFP agreed to prepare a project for Leon sub-basin that is part of Jubones basin
Workshop MCRJ	12/Feb/2010	San Fernando - Azuay	MCRJ Mayors and technical staff of Municipalities Provincial Directors of MAE, MAGAP, MIES, INIAP, SENAGUA	Participate in the presentation of Operation Work Plan of MCRJ 2010	MCRJ requested cooperation from WFP
Workshop MCRJ – WFP	20 to 22 Apr/2010	San Fernando - Azuay	MCRJ Government provincials of Loja and Azuay Mayors and technical staff of Municipalities Provincial Directors and delegates of MAE, MAGAP, MIES, INIAP, SENAGUA, Delegates of main universities in Loja and Azuay, Technical staff of PACC,	Discuss idea project to reduce impacts of climate change with a food security approach	Participation of local key actors and agreement to continue with developed a project idea
Meeting	May/2010	Quito	MAE – WFP Participation of MAE Minister and WFP Country Director	Discuss cooperation agreement and develop plan to formulate a join project	Minister agrees to lead formulation process MAE-WFP
Meeting	Jun/2010	Quito	GPP – WFP	Request for the support of WFP in climate change as part of the MAE-WFP project	Pichincha was included in the project

Workshop MAE-PMA	28/Jun/2010	Quito	MAE – WFP MAGAP GPP MCRJ MCDS	Prioritize the lines of the project MAE	Agreed to the elaboration of the project of adaptation to climate change, which will cover two areas of intervention: Jubones Basin and Pichincha province
Project Planning Meetings	Sep-Oct – Nov /2010	Quito	MAE - WFP	Define the lines of the project	Joint Development of Project Concept MAE – WFP Prepared the first draft and delivered to MAE, MAGAP, GPP and MCRJ
Workshop Prior Consultation Process at the central level	Jan/2011	Quito	MAE – WFP MCRJ, GPP SENPLADES, SNGR, INAMHI, MAGAP, SENAGUA	Finalize project document submitted AF	Analyze climate risks for Jubones and Pichincha. Agreement of project document
Workshop Prior Consultation Process at the local level (Provincial Government of Pichincha GPP)	Jan/2011	Cayambe - Pichincha	MAE – WF – GPP Social organizations' representatives from the cantons of Cayambe and Pedro Moncayo, and its respective parishes. Farmers' unions and other local bodies	Present the project document note submitted to AF	Analyze climate risks and measures at the local level. Agreement of project document
Workshop Prior Consultation Process at the local level Jubones Basin	Feb/2011	Santa Isabel – Azuay	MAE – WF – MCRJ Municipalities Social organizations' representatives from the nine selected cantons of the Jubones River basin, and its respective parishes. Farmers' unions and other local bodies.	Socialize the concept note submitted AF and national strategy of climate change	Analyze climate risks and measures at the local level. Agreement of project document

D. Planning and Legal Land Use Framework of Ecuador

The Ecuadorian Government promotes under its legal framework proper land use and management through environmentally friendly agricultural practices, resources and water conservation, biodiversity, thus improving food security for Ecuadorians. The proposed project will adhere to the articles of the frameworks presented below and ensure that the project promotes the provisions and rights guaranteed as described below:

1. Regarding land use planning activities, the Ecuadorian framework states as follows:

Section Three of the Constitution refers to Natural Heritage and Ecosystems, the following articles described the commitment by the state to protect and conserve soil.

> *Article 405. - The Protected Areas National System will ensure biodiversity conservation and maintenance of ecological functions. The system will be integrated by the state subsystems, autonomous decentralized, community and private, and its governance and regulation will be exercised by the state. The State shall provide financial resources necessary for the financial sustainability of the system and encourage participation of communities, peoples and nations who have ancestrally inhabited protected areas administration and management. Natural persons or legal foreign entities may not acquire land titles or concessions in the areas of national security or in protected areas, in accordance with the law.*
>
> *Article 406 .- The State shall regulate the conservation, management and sustainable use, recovery, and domain constraints of fragile and threatened ecosystems, among others, the moors, swamps, cloud forests, wet and dry tropical forests and mangroves, marine and coastal ecosystems.*
>
> *Article 409 .- It is of public interest and national priority , the conservation of soil, specially its fertile topsoil. State will establish a regulatory framework for protection and sustainable use to prevent their degradation, specially caused by pollution, desertification and erosion.*
>
> *In areas affected by land degradation and desertification, State shall develop and encourage forestation, reforestation and re vegetation to avoid monoculture and preferably use, preferably native species adapted to the area.*
>
> *Article 410 .- The State shall provide to farmers and communities rural support for conservation and restoration of soils as well as development of agricultural practices that protect and promote food sovereignty.*

Article 414 .- The State shall take appropriate and crossbars mitigation of climate change by limiting greenhouse emissions gases, deforestation and Atmospheric pollution, it will take measures for the conservation of forests and vegetation, and protect the population at risk.

Chapter II of the **Agricultural Development Law**, states that the responsibility that the Ministry of Agriculture has on soil management and agricultural practices, determines the relationship between agriculture and ecosystem conservation to achieve sustainability, thus ensuring quality food for the population.

Art. 17. - USE OF LAND. - The Ministry of Agriculture formulated a plan of use, management and zoning of the land. The State shall encourage the implementation of these plans and ensure compliance.

Art. 18 .- ECOLOGICAL MEASURES .- The Ministry of Agriculture, through its specialized agencies, shall adopt the measures recommended by environmental considerations to ensure rational land use and require that individuals or legal entities engaged in agricultural activities , livestock, forestry or infrastructure that adversely affect soil, to adopt conservation measures and recovery, with appropriate technical and scientific basis, determined by the competent authorities.

Water resources management legal framework

Article 20 .- In order to ensure the best availability of water, The National Water Resources Council will prevent, to the degree possible, the decline of these resources by protecting and developing watersheds and conducting relevant research studies. Concessions and management plans of watershed sources must also consider indigenous and local population use of these resources.

Article 41 .- The water for irrigation may be extracted from the ground, glaciers,
springs, natural and artificial channels where there is such a need and to the extent technically determined by the National Water Resources Council.

2. Regarding land tenure conditions, Ecuadorian framework states as follow:

The **Constitution of Ecuador** in chapter IV refers to Community rights, indigenous peoples and nationalities. This chapter discusses the collective rights of indigenous organization forms

Article 57 .- It is recognized and guaranteed to communities, towns and indigenous nationalities, in accordance with the Constitution and the

agreements, declarations and other international human rights instruments, the following collective rights:

4. *Imprescriptible retain ownership of their communal lands, which shall be inalienable, indefeasible and indivisible. These lands are exempt from taxes and fees.*

5. *Maintain possession of land and ancestral territories and obtain free award.*

6. *Participate in the use, management and conservation of renewable natural resources found on their lands.*

Chapter IV of the **Agricultural Development Law** states that land tenure is responsibility of the Ministry of Agriculture

Art. 24. - WARRANTY OF PROPERTY. - The State guarantees the ownership of land as stipulated in Articles 267 and 269 of the Constitution. The use of land and labor can be done individually, family, cooperative, associative, communal or corporate self-management, while meeting its social function.

Art. 25 .- SOCIAL FUNCTION .- The land fulfills its social function when it is in production and operation, properly maintained renewable natural resources and protects the ecosystem, ensuring food for all Ecuadorians and generate surpluses for export. The social function should result in elevation and redistribution of income to enable all people share the benefits of wealth and development.

E. Targeted Cantons and Parishes

	Province	Cantons	Hectares	*Population 2001	**Annual Rate 20.77	**Total population 2010
GPP	Pichincha	Cayambe				47469
		Pedro Moncayo				22868
MCRJ	Azuay	Nabón	67318.80	14969	3109.06	18078.06
		Oña	29201.60	3210	666.72	3876.72
		Santa Isabel	52793.70	17911	3720.11	21631.11
		Pucará	38398.60	11188	2323.75	13511.75
		Girón	38101.20	12543	2605.18	15148.18
		San Fernando	13691.20	3932	816.68	4748.68
	Loja	Saraguro	104586.30	27793	5772.61	33565.61
	El Oro	Zaruma	26588.00	23026	4782.50	27808.50
		Chilla	22000.20	2652	550.82	3202.82
		Pasaje	24168.60	61885	12853.51	74738.51
	Total		**416848.20**	**179109**	**37200.94**	**286646.94**

***siise ver. 4.5**
***inec, 1990 - 2001**
Ecuador Official birth rate (20.77)

Pichincha Province	
Cantons	**Total Parishes**
Cayambe	Cangagua
	Olmedo
	Ascázubi
	Cusubamba
	Otón
	Ayora
Pedro Moncayo	La Esperanza
	Malchinguí
	Tocachi
	Naigachi
	Tabacundo

MCRJ	
Cantons	**Total Parishes**
Nabón	Nabón
	El Progreso
	Cochapata
Oña	Oña
	Susudel
Santa Isabel	Santa Isabel (Chaguarurco)
	Shaglli
	Abdón Calderón
Pucara	Pucará
	San Rafael
	Zharug
Girón	Girón
	Asunción
	San Gerardo
San Fernando	San Fernando
	Chumblin
Saraguro	Saraguro
	Manú
	San Pablo de Tenta
	San Sebastián de Yuluc
	Urdaneta
	San Antonio de Cumbe
	Selva Alegre
	Lluzhapa
	El Paraiso de Celén
	El Tablón
	Sumaypamba
	Cabildo Indígena de Tuncarta
Zaruma	Zaruma
	Guanazán
	Abañín
	Sinsao
Chilla	Chilla
Pasaje	Pasaje
	Progreso
	Casacay
	Ushcurrumi
	Caña Quemada
	La Peña

F. Sustainable Project Outputs

EXPECTED OUTCOMES	EXPECTED OUTPUTS	Sustainability Mechanisms	Responsible
1.1 Increased awareness of communities on climate change risks and food security related risks	1.1.1. Communities in targeted cantons trained in climate change threats and adaptation measures which reduce vulnerability, in particular related to food insecurity 1.1.2. Targeted communities participate in adaptation and risk reduction awareness activities 1.1.3. Food security and gender considerations integrated in all adaptation training programs	GPP and MCRJ will coordinate local actions of training and awareness with the local governments and organizations, as well, as with MAGAP and MAE. The project includes measures to strengthen institutional capacities through training for trainers and skill development at local and central government level. In addition, project takes in community participation for all activities. The project develops a complementary relationship between communities and government.	MAE MAGAP GPP MCRJ Communities
1.2 Secured ownership of adaptation measures in communities in targeted cantons	1.2.1. Canton and community adaptation plans developed to reduce vulnerabilities to climate change induced food insecurity in targeted areas 1.2.2. Community participation in processes to develop adaptation plans in targeted cantons 1.2.3. Agreements developed and signed among targeted cantons, GPP or MCRJ, MAE and WFP to implement adaptation actions 1.2.4. Women participated in processes and decision making to develop adaptation plans	Adaptation plans will be prepared by communities and agreements will be signed by communities and local and central governments. These plans will be developed as part of communities. The complementary relationship between communities and government will be tangible through signed agreements which secure ownership of adaptation measures. In addition, project promotes women participation and they will be constituted a strong that makes safe implementation of adaptation measures.	GPP MCRJ Communities
1.3 Increased knowledge to manage climate	1.3.1. Community early warning system designed, implemented and maintained	These tools will be implemented at the local level and the local governments take for them	GPP MCRJ

change and risk, including climate variability affecting food security	1.3.2. Monitoring system in place to track climate events in targeted cantons 1.3.3. Monitoring system to track project results and lessons learned	the maintenance as part of their climate change strategies. GPP and MCRJ have incorporated in their policies to climate change as a priority. These tools are a part of local capacity building. Project results and lessons learned will be appropriated by government to be implemented for other areas with similar conditions.	
2.1Increased adaptive capacity and ecosystem resilience in targeted rural communities	2.1.1 Concrete adaptation measures based on community adaptation plans and designed 2.1.2. Physical assets created, improved or maintained. For example: a. Water harvesting and storage measures; b. Irrigation and drainage systems; c. Flood defences and climate proofed infrastructure (check dams, etc.) 2.1.3. Natural resources assets created, improved or maintained. For example: a. Land reforested, original vegetation in moorland and grasslands, b. Improved Seed distribution 2.1.4 Identification of adaptation technology requirements. For example agricultural production systems in transition and measures to increase crop yields 2.1.5. Implementation strategy includes approach for use of incentives	The project envisages two intervention strategies (Eba and Cba) for adaptation climate change. Both require a dynamic between nature and communities to adapt the climate change conditions. The first (Eba) is approached at the conservation and restoration of ecosystems to provide ecosystem services such as water. The second (Cba) creates conditions to develop human potential to strengthen integrity and diversity of the ecosystems and to avoid community practices contribute to the degradation of ecosystems. These strategies are implemented from communities and with the participation of their population. Therefore, project promotes appropriating the communities of small infrastructure works at the same time new agricultural practices assume ownership. In addition, a project use incentive to ensure community participation as a payment for ecosystem services when the services are restoring the pay is not necessary.	Communities

2.2 Increased capacity at communities and institutional level to manage climate change risk in targeted cantons	2.2.1. Community participation, in particular participation of women, guide decision making processes for project execution 2.2.2. Communities share success stories and lessons learned	The project results will be systematized and shared between all stakeholders in order to develop models of intervention can be replicated in areas with similar conditions. The project always promotes empower women especially to participate in decision-making.	MAE MAGAP GPP MCRJ Communities

Annex X A: Full Project Budget

Full Project Budget				
Award ID:				
Project ID:				
Business unit				
Project title: Enhancing resilience of communities to the adverse effects of climate change on food security, in Pichincha Province and the Jubones River basin.				
Implementing partner				
Outcome Project/Activity	Responsible party / Implementing agent	Donor Name	Budget Description	Total (USD)
Objective 1:				
Increased knowledge to manage climate change risks affecting food and nutrition security in targeted cantons in Pichincha Province and River Jubones basin.				
Outcome 1: Increased awareness of communities on climate change risks and food security related risks				
Output 1.1.1: Communities in targeted cantons trained in climate change threats and adaptation measures which reduce vulnerability, in particular related to food security	MCRJ/GPP	Adaptation Fund	Training Modules Developed and Printed	17.300
			Stakeholder Consultations and Community Mobilization Workshops	35.000
Output 1.1.2: Targeted communities participate in adaptation and risk reduction awareness activities.			Community Organization and Training	35.000
			Risk Reduction and other Experts	20.000
Output 1.1.3: Food security and gender considerations integrated in all adaptation training programs			Materials Developed and Printed	17.300
			Gender and other Technical Support	17.000
			SubTotal AF	**141.600**
Outcome 1.2:				

Secured ownership of adaptation measures in communities in targeted cantons.				
Output 1.2.1: Canton and community adaptation plans developed to reduce vulnerabilities to climate change induced food insecurity in targeted areas	MCRJ/GPP	Adaptation Fund	Technical Assistance to Develop Adaptation Plan Methodology	50.000
			Material Development and Printing	35.000
			Community Meetings and Workshops in each Community Including Travel	178.000
Output 1.2.2: Community participation in processes to develop adaptation plan in targeted cantons			Community Facilitators	75.200
Output 1.2.3 Agreements developed and signed among targeted cantons, GPP or MCRJ, MAE and WFP to implement adaptation actions			Agreements Developed with Input from Legal Advisors, printing	25.000
			Stakeholder Consultations	55.000
			Travel and Support	70.000
Output 1.2.4 Women participated in process and decision making to develop adaptation plans			Gender Facilitators	20.000
			Materials	15.000
			SubTotal AF	**523.200**
Outcome 1.3: **Increased knowledge to manage climate change and risk, including climate variability affecting food security**				
Output 1.3.1: Community early warning system designed, implemented and maintained	MCRJ/GPP	Adaptation Fund	Equipment	200.000
			Contractual Services	25.200
Output 1.3.2: Monitoring system in place to track climate events in targeted cantons			Equipment	300.000
			Technical Assistance	50.000
			Travel	24.800
Output 1.3.3. Monitoring system to track project results and lessons learned			Monitoring system in place and monitoring plan carried out according to plan	140.200
			Subtotal Outcome 1	**740.200**
Objective 2:				
Strengthen adaptive capacity of highly food insecure communities to respond the impacts of climate change, including variability in targeted cantons in				

Pichincha Province and MCRJ.				
Outcome 2.1: **Increased adaptive capacity and ecosystem resilience in targeted rural communities**				
Output 2.1.1: Concrete adaptation measures based on community adaptation plans are designed	MCRJ/GPP	Adaptation Fund	Technical Assistance	200.000
			Travel	69.000
			Technical Specifications Developed for all project activities	50.000
Output 2.1.2: Physical assets created, improved or maintained.			Technical Assistance	200.000
			Materials and inputs to create assets	1.250.000
			Travel	70.000
			Community Training and Workshops	75.000
Output 2.1.3: Natural resources assets created, improved or maintained.			Technical Assistance	150.000
			Materials and inputs to create assets	1.250.000
			Travel	50.000
			Community Trainings and Workshops	75.000
Output 2.1.4: Identification of adaptation technology requirements and transfer of technologies through concrete actions.			Assessment and Technical Assistance to identify possible technologies	165.000
			Materials and inputs for technology transfer	462.000
			Travel	50.000
Output 2.1.5a: Implementation strategy includes approach for the use of incentives.			Strategy Developed	79.000
Output 2.1.5b: Direct incentives and PES providers.			Direct Incentives - Voucher or Cash	500.000
			Subtotal outcome 2.1	**4.695.000**
Outcome 2.2: Increased capacity at communities and institutional level to manage climate change risk in the targeted cantons				
Output 2.2.1:	WFP	Adaptation Fund	Feed Back Process Implemented	69.000

Community participation, in particular of women, guide decision making processes for project execution			Facilitators	35.000
Output 2.2.2:			Methodology Developed	25.000
Communities share success stories and lessons learned			Community Feed Back Meetings Organized, including Facilitators	75.200
			Development Printing and publication of Lessons	25.000
			Subtotal Outcome 2.2	**229.200**
			Sub Total AF	**6.329.200**
			CR 5 Project Execution Costs	
			Project Manager – External Consultant	260.500
			WFP support staff	244.165
			Equipment	10.000
			Recurring Costs – including vehicle running costs, office supplies, security costs,	64.255
			Travel	54.000
			Total Project Execution Costs	**632.920**
			Indirect Support Cost	487.348
			Total Project Budget	**7.449.468**

Annex XB- Disbursements and Milestones

Outputs	PAYMENTS US$										
	1st Year GA signature	Milestone	Year 2	Milestone	Year 3	Milestone	Year 4	Milestone	Year 5	Milestone	Budget ($ US)
Output 1.1.1: Communities in targeted cantons trained in climate change threats and adaptation measures which reduce vulnerability, in particular related to food security	52.300	All communities participated in initiated training sessions.									52.300
Output 1.1.2: Targeted communities participate in adaptation and risk reduction awareness activities.	55.000										55.000
Output 1.1.3: Food security and gender considerations integrated in all adaptation training programs	34.300										34.300
Output 1.2.1: Canton and community adaptation plans developed to reduce vulnerabilities to climate change induced food insecurity in targeted areas	131.500		131.500	Community adaptation plans prepared							263.000
Output 1.2.2: Community participation in processes to develop adaptation plan in targeted cantons	37.600	50% of cantons reached	37.600	All cantons reached							75.200
Output 1.2.3 Agreements developed and signed among targeted cantons, GPP or MCRJ, MAE and WFP to implement adaptation actions Output 1.2.4 Women participated in process and decision making to develop adaptation plans	92.500	50% of agreements reached to implement adaptation plans	92.500	All agreements reached to implement adaptation plans							185.000
Output 1.3.1: Community early warning system designed, implemented and maintained	78.780	15% or early warning systems in place.	315.120	60% of systems in place	131.300	All early warning system in place					525.200
Output 1.3.2: Monitoring system in place to track climate events in targeted cantons	74.800	Monitoring systems in place									74.800

Output 1.3.3. Monitoring system to track project results and lessons learned	45.200	Monitoring systems in place							95.000	Monitoring systems in place	140.200
Output 2.1.1: Concrete adaptation measures based on community adaptation plans are designed	127.600	40% of adaptation measures planned	191.400	60% of adaptation measures planned							319.000
Output 2.1.2: Physical assets created, improved or maintained.			239.250	15% of assets created	558.250	35% of assets created	638.000	40% of assets created	159.500	100% of assets created	1.595.000
Output 2.1.3: Natural resources assets created, improved or maintained.			228.750	15% of natural resources assets created.	533.750	35% of natural resources assets created.	610.000	40% of natural resources assets created.	152.500	10% of natural resources assets created.	1.525.000
Output 2.1.4: Identification of adaptation technology requirements and transfer of technologies through concrete actions.			101.550	15% of adaptation technology requirements & transfer of technologies identified.	236.950	35% of adaptation technology requirements & transfer of technologies identified.	270.800	40% of adaptation technology requirements & transfer of technologies identified.	67.700	100% of adaptation technology requirements & transfer of technologies identified.	677.000
Output 2.1.5a: Implementation strategy includes approach for the use of incentives.	79.000	Strategy developed									79.000
Output 2.1.5b: Direct incentives and PES providers.			75.000	15% of payments are disbursed	175.000		200.000		50.000		500.000
Output 2.2.1: Community participation, in particular of women, guide decision making processes for project execution					52.000	Feedback process implemented	52.000	Feedback process implemented			104.000
Output 2.2.2: Communities share success stories and lessons					62.600		62.600				125.200

learned											
Subtotal	808.580		1.412.670		1.749.850		1.833.400		524.700		6.329.200
Execution costs	127.266	Support Costs in Staff, recurring costs. .	125.343	Support Costs in Staff and recurring costs	125.948	Support Costs in Staff and recurring costs	126.710	Support Costs in Staff and recurring costs	127.653	Support Costs in Staff and recurring costs	632.920
Subtotal	935.846		1.538.013		1.875.798		1.960.110		652.353		6.962.120
MIE fee	65.509		107.661		131.306		137.208		45.664		487.348
Total	**1.001.355**		**1.645.674**		**2.007.104**		**2.097.318**		**698.018**		**7.449.468**

Annex XI: Climate Change Scenarios

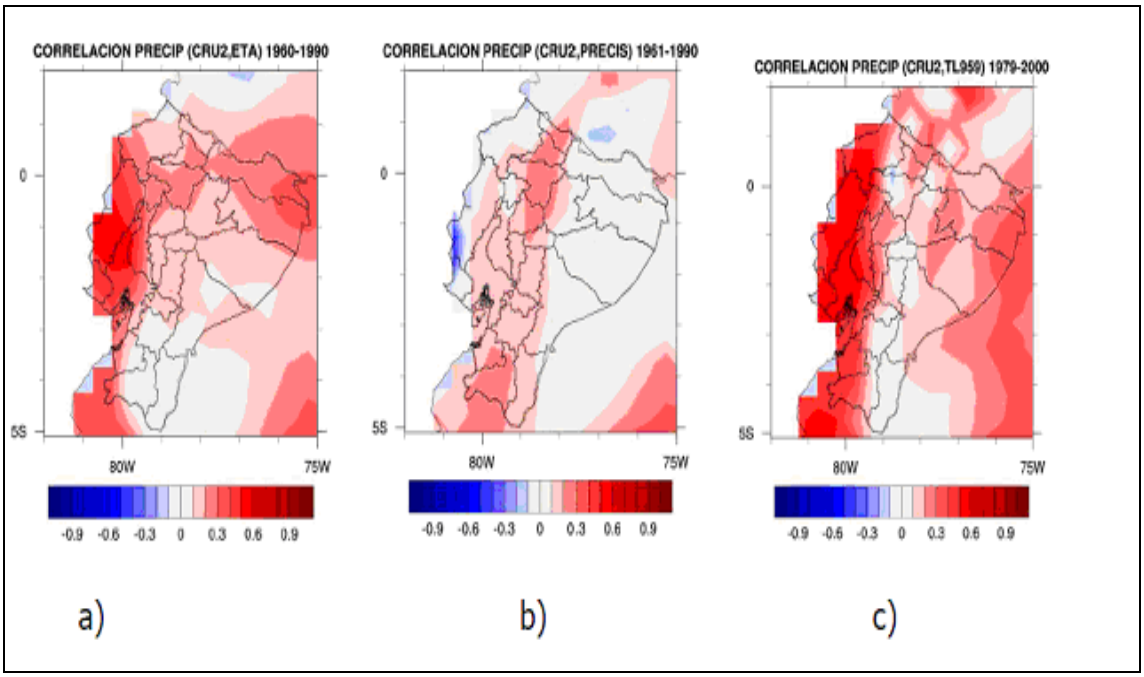
1. SCENARIOS OF CLIMATE CHANGE – SECOND NATIONAL COMMUNICATION

Rainfall:

Maps 9 (a, b and c) show the relationship between present and future status. The red colour indicates positive analogies, blue colour negative ones and white close to zero.

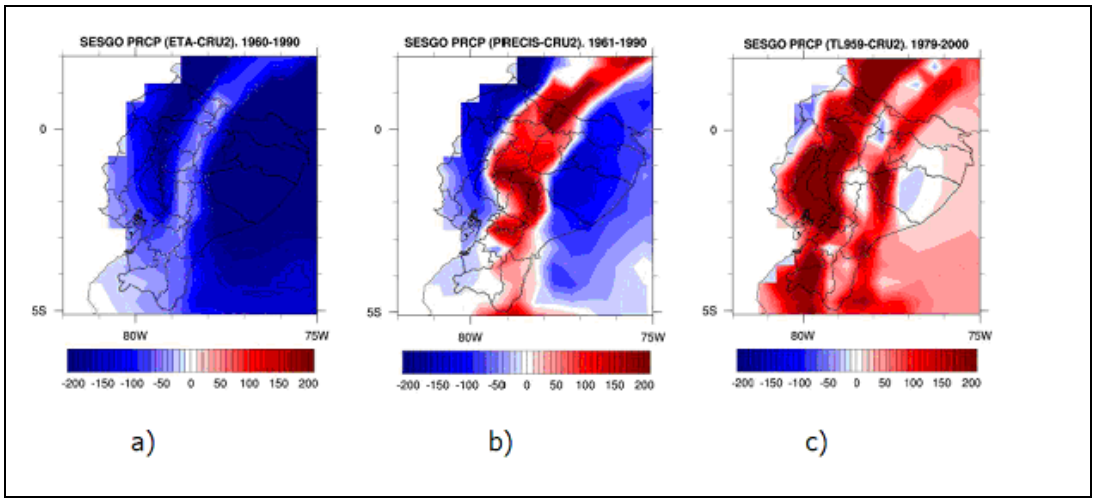
The higher analogies at national level have been obtained with ETA pattern and the lower with PRECIS. The patterns ETA and TL959 show important positive analogies, mainly in the Pacific Coast and some areas of the Amazon.

Map. 9 Correlation Between Future Time vs. Present Time



Maps 10 (a, b and c) show the deviation by calculating the difference between the rainfalls at present and the foreseen rainfalls in the future. The areas in red show the increase and those in blue show the decrease of rainfalls. With exception of the Highlands, the ETA pattern underestimates the rainfalls in the Pacific coast and the Amazon. The PRECIS pattern over values the rainfall in the Highlands and South of the Amazon and underestimates the rainfall in the rest of the country. The pattern TL959 overestimates the rainfalls in the continental area of the Pacific Coast and the West and East hillside of the Andes; while in the Northern central areas of the Pacific coast the values are neutral or underestimated.

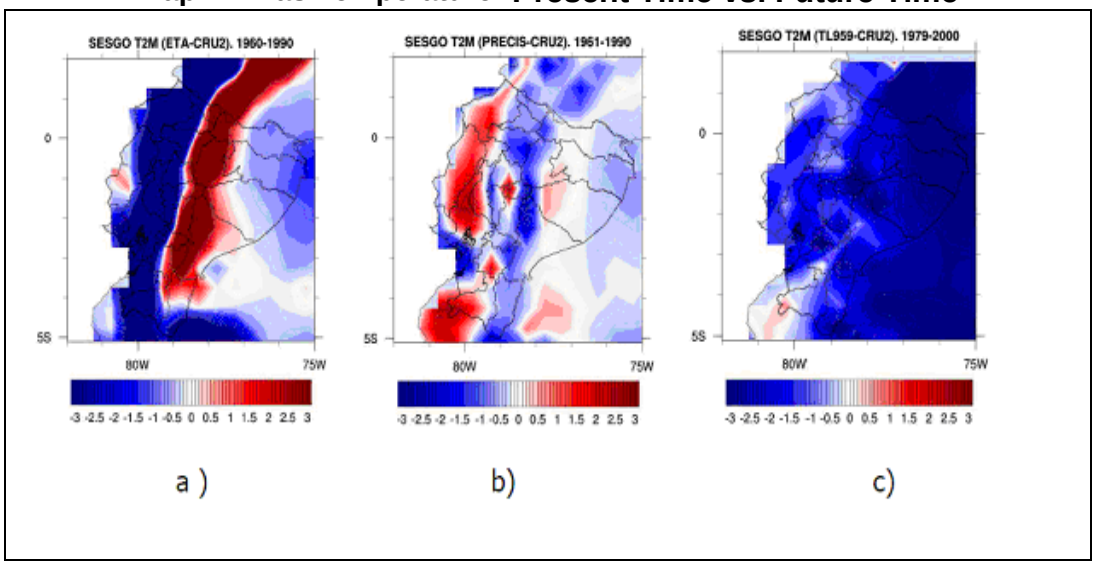
Map 10 Bias Present Time vs. Future Time



Temperature:

In the case of temperature "… the best analogies are provided by TL959, which foresees a cold deviation for the majority of the country. ETA pattern indicates a cold deviation for the Pacific Coast and the Western Andean watersheds (Pacific) (equal to or higher than 3 Centigrade degrees) while there is a warm deviation (equal to or higher than 3 Centigrade degrees) for the Amazonian areas close to the hillsides and the Easter Andean watershed (Amazon). For the rest of the Amazon it has been foreseen a lower cold deviation, approximately 1.5°C). The PRECIS pattern show high analogies for temperature, with the exception of certain areas in the Province of Loja, in the South of Ecuador. On the other hand, show a warm deviation for most of the Pacific Coast and cold deviations for the Highlands. In general terms, the temperature in the Amazonian is well described, with the exception of the regions in the Eastern side. Maps 11 (a, b and c) show the over and under estimations of future temperature in comparison with present temperature.

Map 11 Bias Temperature: Present Time vs. Future Time



General Consent Analysis:

In accordance with the climate change scenarios described above, “The results of the general consent analysis suggest, at a long term, an increase in the rainfalls, mainly for the Highlands, while it is foreseen a decrease of rainfalls for the Amazonian region (particularly the Eastern region of the Amazon) and for the Pacific Coast (Santa Elena, Manabí and Esmeraldas) particularly for Esmeraldas”.

“In the short term, TL959 pattern foresee an increase of the rainfalls for the Pacific Coast, particularly for some areas of Province El Oro, Southern region of province of Guayas and the majority of Manabí. In the Highlands it is foreseen both, increase and decrease of rainfalls, depending on the area. In the Amazon, in the areas close to the Andean hillsides, there are many zones that show an increase of the rainfalls, while in the Eastern region, a decrease or minimum increase of rainfalls is foreseen”.

“All the patterns indicate an unequivocal warming of the climate system in all the regions of the country. The foreseen climate change is consistent with world-wide patterns, although Harrison & Carson (2007) foresee areas of cold weather in South American Pacific Coast”.

2. ANALYSIS OF HISTORIC EVIDENCE AND SCENARIOS OF CLIMATE CHANGE

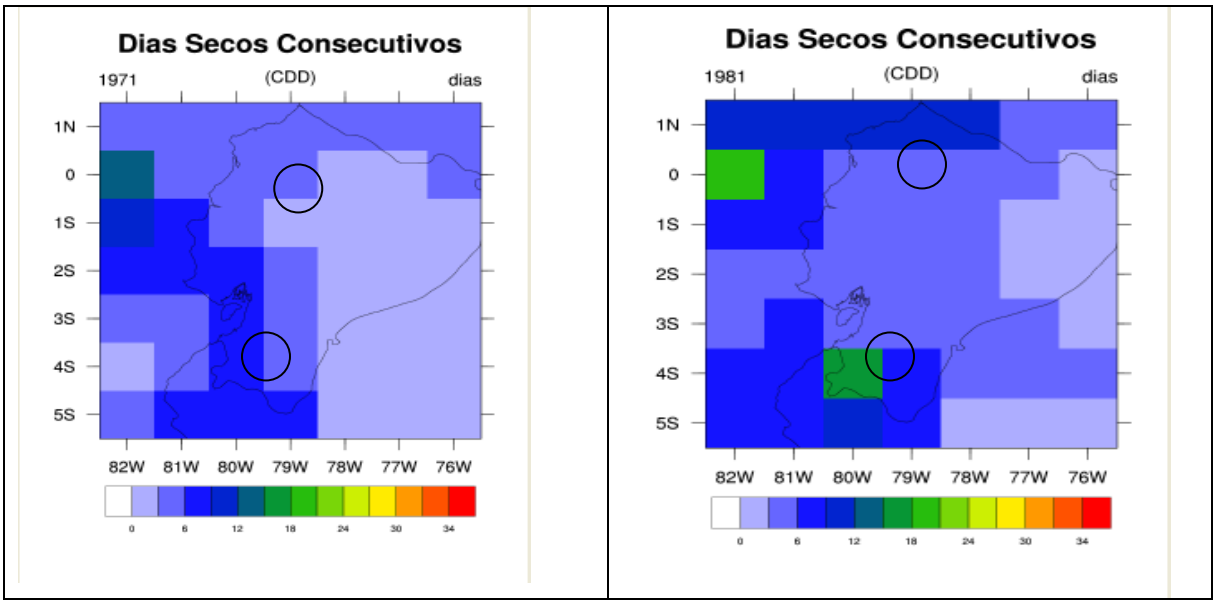
Following is an analysis based on the historical evidence and application of PRECIS pattern for 2010-2020:

- Historical climate changes in the period 1971 – 2009 based on statistical and historical information in Ecuador (source INAMIH)
- Estimation of future climate change elements 2010 – 2020, as per information provided by programme PRECIS-Echam, which allows forecasting climate change in certain periods.

Historic Evidence of Climate Change:

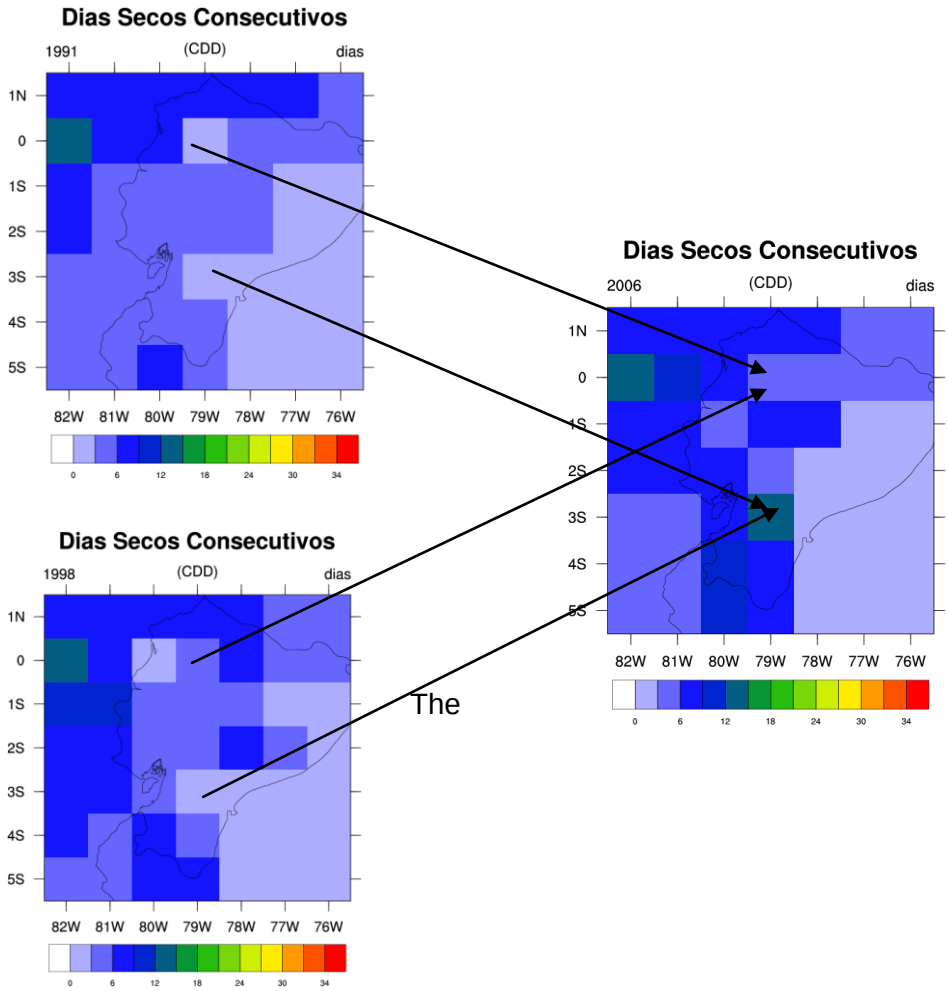
The analysis on climate index, applying FCLINDEX (numeric - historic data – 1971 – 2009) give clear evidence of the climate change. For instance, if the index of consecutive non-rainy days (CND) for the period 1971 – 1981, the increase of non-rainy days is clear. This index is higher in the areas of the project (Pichincha-Cayambe and Jubones River Basin), where the number of non-rainy consecutive days has increased from 3-6 to 15-18.

Consecutive Dry Days



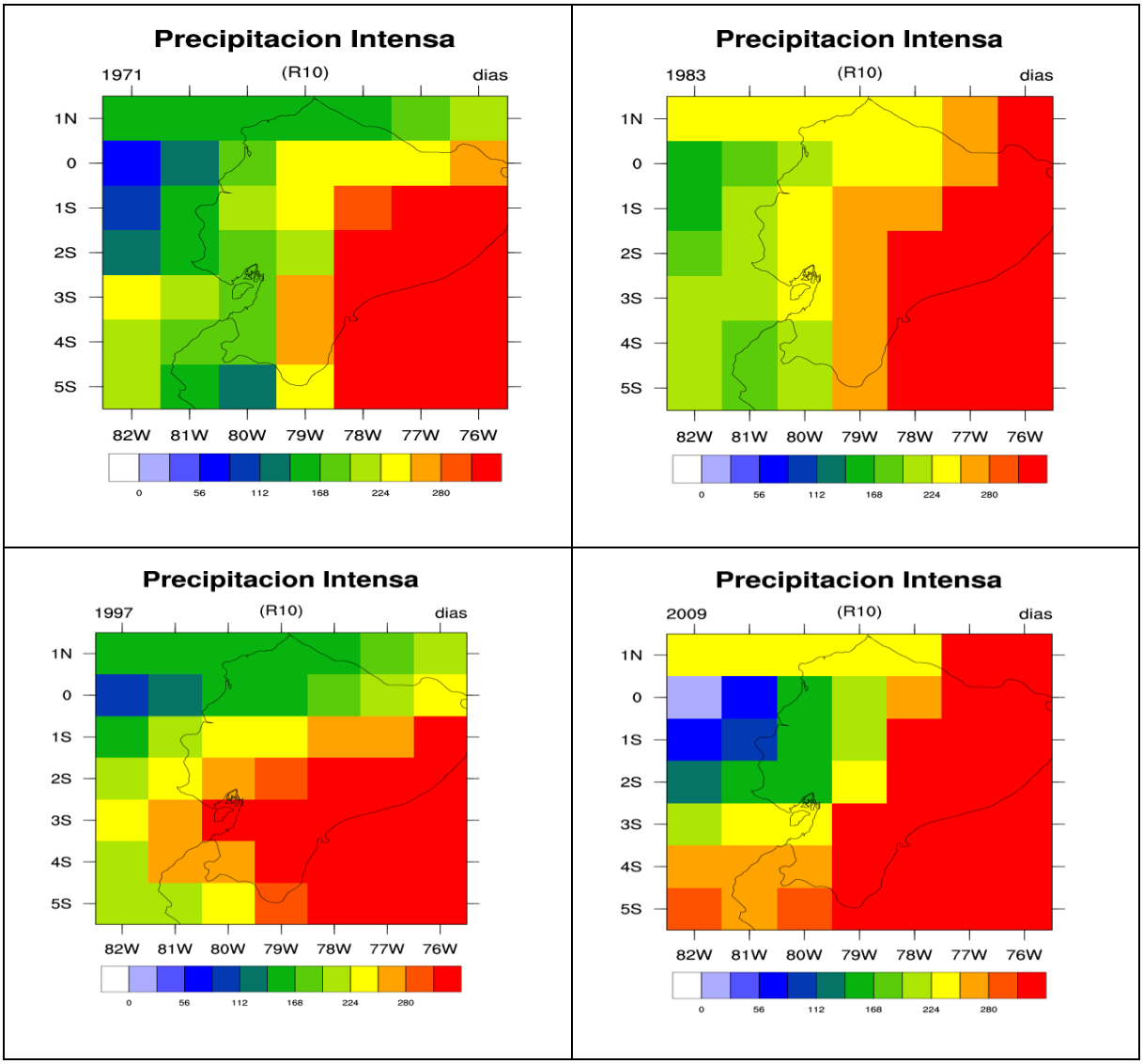
These scenarios are shown in the following graphics. The number of consecutive non-rainy days has increased in 1, 5 consecutive non-rainy days for the period 2001- 2006.

Example: 1991 – 2006 / 1998 -2006: increase of consecutive non-rainy days in the area of Jubones Basin for the period 1991 - 2006, is 12 days.



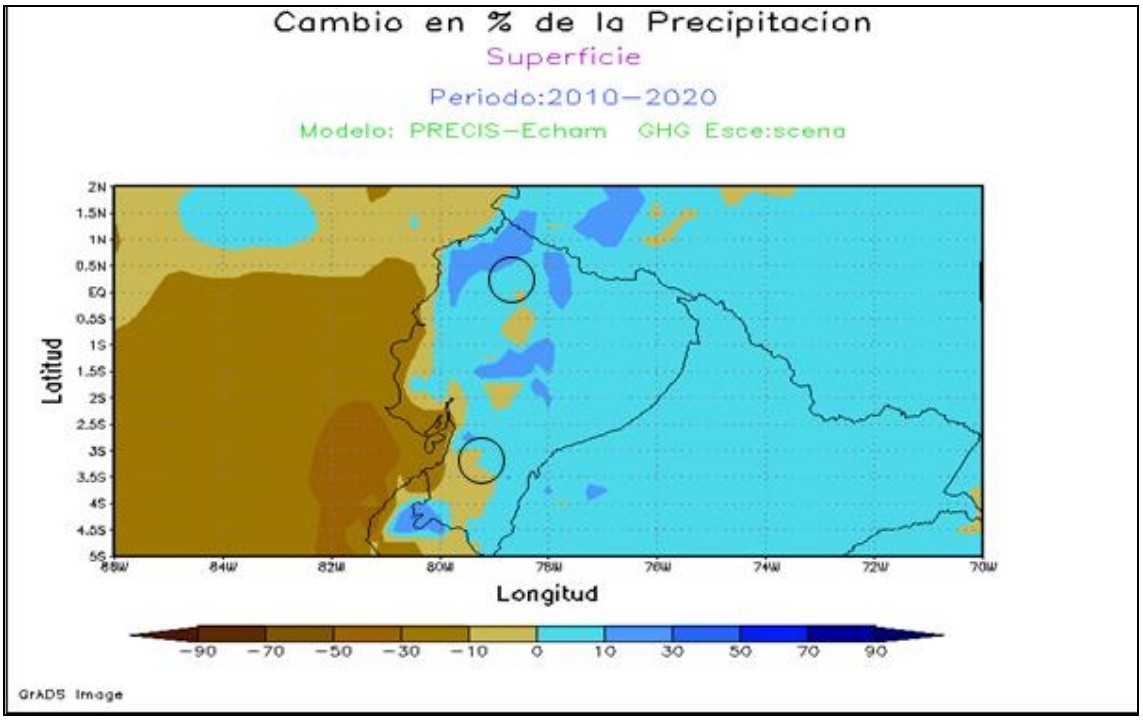
The

Number of days with heavy precipitation (R10)



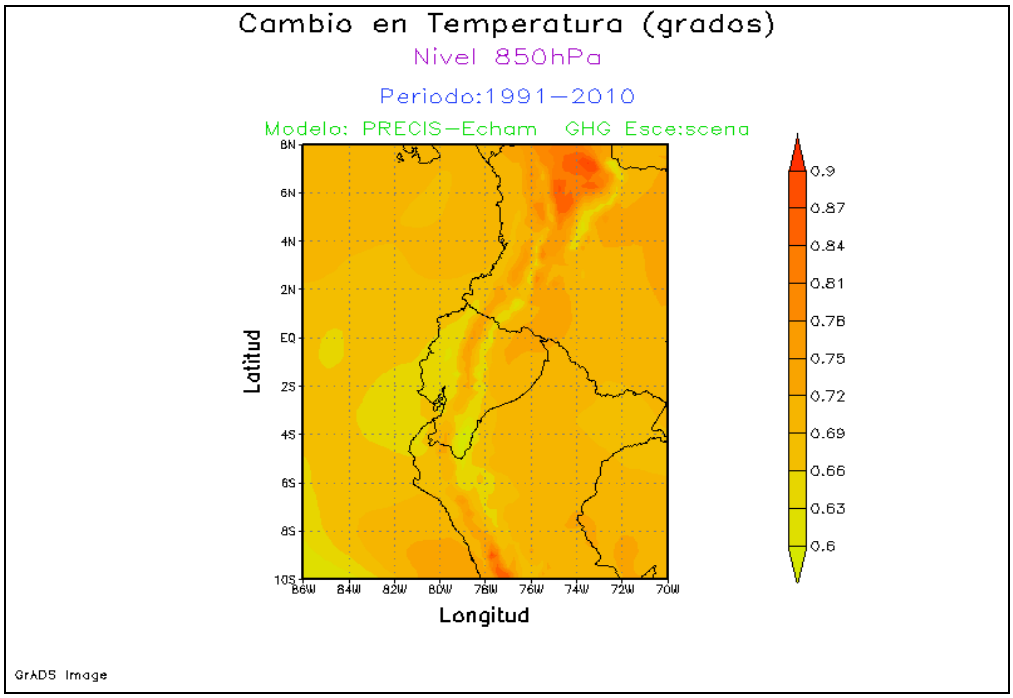
The change in temperature directly affects rainfall patterns. As it can be seen in the following graphics, there are intense rainfalls in short periods of time. If the climate change scenario foreseen for 2010 – 2020 is analyzed, 10% decrease of the rainfalls is foreseen, mainly for the lower region of Jubones River Basin while there is 10% increase of the rainfalls in the districts of Cayambe and Pedro Moncayo in the Province of Prichincha, during this period.

Precipitation Change in%

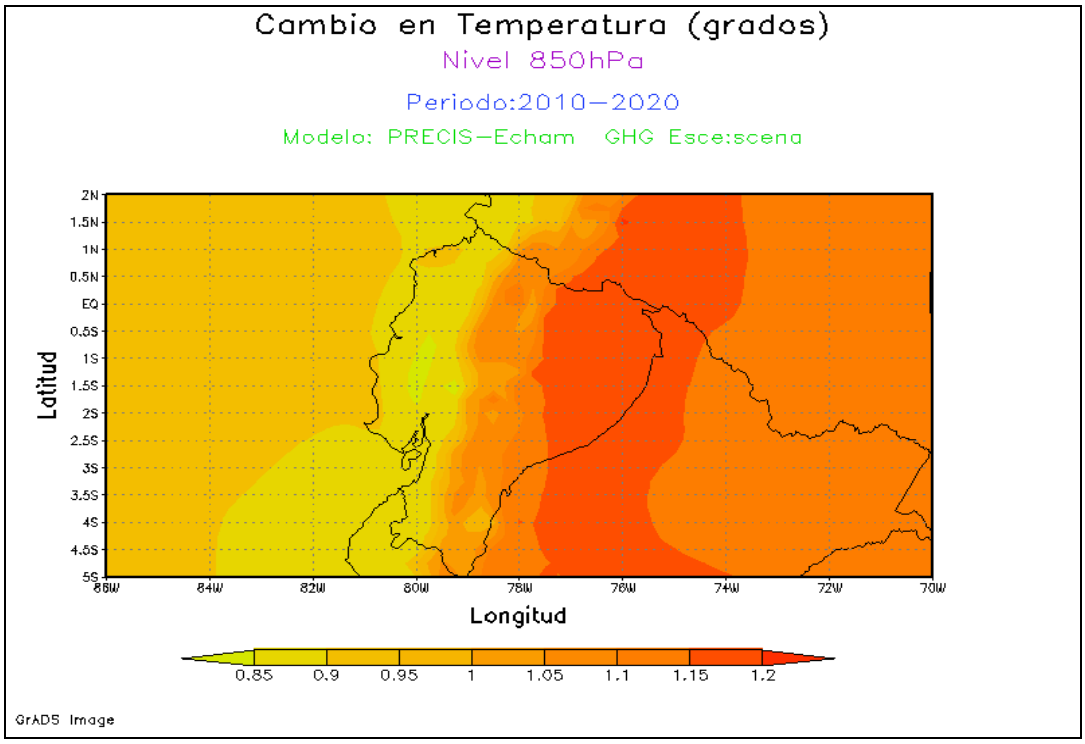


The change of temperature is clear. If the information obtained for the period 1991 – 2010 is compared with the scenario 2010 – 2020, an increase in the average temperature of approximately 0.9 and 1º C is foreseen for the areas of the project.

% Change in Temperature 1991-2010



% Change in Temperature 2010-2020



LETTER OF ENDORSEMENT

GOBIERNO NACIONAL DE LA REPÚBLICA DEL ECUADOR

Ministerio del Ambiente

Calle Madrid y Andalucía
Quito– Ecuador
Teléfonos: (593 2) 3987600
www.ambiente.gob.ec

Oficio No. MAE-D-2011-0061

Quito, 26 de enero de 2011

The Adaptation Fund Board
ADAPTATION FUND BOARD SECRETARIAT
Presente.

In my rol as Minister of Environment of Ecuador, and the National Authority on Climate Change, I hereby endorse the attached Full Project Proposal titled: "Enhancing resilience of communities in Ecuador to the adverse effects of climate change on food security, in Pichincha Province and the Jubones River Basin", presented to the consideration of the Adaptation Fund Board under the United Nations Framework Convention on Climate Change.

This project fits within the climate change national priorities and policy objectives of the Government of Ecuador, which prioritize and mandate the implementation of climate change adaptation actions and initiatives that contribute to reduce the adverse effects of climate change in the most vulnerable communities. It is in the view of the Government that there is a need to design and support the development of projects that help to build capacities and generate knowledge at the local level so that our citizens are able to implement adaptation measures to effectively respond to current food security threats, and contribute to build resilience in the most vulnerable populations, and sensitive ecosystems, affected by extreme weather events. This is the first project of its kind that is being implemented in Ecuador that will address issues related to national food security.

The project proposal has been prepared jointly by the Ministry of Environment of Ecuador and the United Nations World Food Programme, entities that will be leading its implementation once it is approved, in coordination with the local authorities of the Government of the Province of Pichincha and the Commonwealth of the Jubones River Basin.

Atentamente,

Sra. Marcela Aguiñaga Vallejo
MINISTRA