.

ADAPTATION FUND

CONCEPT NOTE PROPOSAL

PART I: PROJECT INFORMATION

Name of the Project/Programme: Integrated and Integrated Management of Water Resources in the watersheds prioritized by the National Adaptation Plan of Ecuador.

Country: Ecuador

Thematic Focal Area: Water Management, Food Security, Ecosystem based Adaptation.

Type of Implementing Entity: Multilateral Implementing Entity

Implementing Entity: World Food Programme (WFP-Ecuador)

Executing Entities: Local NGOs and UN Agencies

Designated Authority: Ministry of the Environment, Water and Ecological Transition (MAATE)

Financing Requested: $ 10,000,000.00 United States dollars

Project Formulation Grant Request: Yes ☐ No ☒
Amount of Requested financing for PFG: 10,000,000.00 (in U.S Dollars Equivalent)
Letters of Endorsement (LOE) signed for all countries: Yes ☒ No ☐
NOTE: LOEs should be signed by the Designated Authority (DA). The signatory DA must be on file with the Adaptation Fund. To find the DA currently on file check this page:
Stage of Submission:
☐This proposal has been submitted before including at a different stage (pre-concept, concept)
☒ This is the first submission ever of the proposal at any stage
In case of a resubmission, please indicate the last submission date: Click or tap to enter a date.

A. PART I: PROJECT / PROGRAMME BACKGROUND AND CONTEXT

NATIONAL CONTEXT

1. Ecuador is an Andean country, located in the northwest of South America, whose 256,370 km² of territory include the continental region, which is divided into Coast, Highlands and Amazon, and the Insular region, composed mainly of the Galapagos Islands. It is organized into 24 provinces, 221 cantons, and 1,499 parishes, which correspond to the different levels of territorial organization (MAATE NDC, 2022).

2. According to the 2022 population census, Ecuador has 17.7 million inhabitants and a population density of 52 people per square kilometer. Culturally, it is a country recognized as an intercultural and plurinational state, where mestizo, Afro-descendant, Montubia and 14 nationalities and 18 indigenous peoples coexist and whose ancestral languages are interculturally related. The country's Constitution guarantees collective rights to these communities, promoting the strengthening of their identity, and the protection of ancestral knowledge and respect for their territorial and customary rights.

3. Due to its geography, the country hosts a wide range of climates. The mountain valleys have a year-round temperate climate, and a humid subtropical climate exists in coastal areas and rainforest in lowlands.

4. Ecuador is one of the countries with the highest biodiversity and water resources, with an annual average total water resources of 376 km3 or 1,514 mm of contribution to the runoff sheet. They are located on two main watersheds: the Pacific Ocean with 72 watersheds and the Eastern or Amazonian watershed with 7 watersheds. However, the water potential between the watersheds is very heterogeneous, since the Eastern Slope has 3/4 of the country's water resources, while the highest concentration of the population is in the Pacific Ocean Slope with 87% of the 17.7 million inhabitants, which leads to greater pressures and demands on the natural resources of this CNRH region. 2002; 2006 to; 2006 b).

5. As for the soil, in Ecuador it varies from sandy soils on the coast to clay and silty soils in the Sierra and Amazon. This diversity in texture affects water holding capacity, aeration, and ease of working the soil. Ecuadorian soils may contain a mixture of sand, silt, and clay, with significant variations in organic and mineral content (MAATE-ENB, 2012).

6. The soils in the coastal region are generally alluvial, fertile, and suitable for agriculture. In the Andean region, soils vary from volcanic (highly fertile and mineral-rich) to clay. In higher areas, soils may be shallower and more erodible. Amazonian soils are mainly lateritic, acidic and with low levels of nutrients due to the intense leaching caused by high annual rainfall on average of 3,000 mm of rainfall (Calvache, 2017).

7. Soil fertility varies considerably between regions. coastal and highland soils, especially those of volcanic origin, tend to be more fertile and suitable for a wide range of crops. In contrast, the soils of the Amazon, although initially fertile, can lose nutrients quickly if not properly managed.

8. Agricultural practices in Ecuador are adapted to the characteristics of the soil. On the coast, products such as rice, bananas and cocoa are grown, taking advantage of the alluvial fertility. In the highlands, agriculture includes crops such as corn, potatoes, and quinoa, taking advantage of volcanic soils. In the Amazon, products such as cassava and plantain are grown, although intensive agriculture can be challenging due to soil conditions (Espinosa, 2024).

9. Despite the rich biodiversity and cultural legacy that characterizes Ecuador, the country faces a high vulnerability to climate change due to its geographical location, climatic diversity, socioeconomic structure, and dependence on sectors such as agriculture, fishing, and tourism, which are particularly sensitive to environmental alterations. Currently, Ecuador faces serious challenges such as extreme weather events, rising sea levels, and the degradation of ecosystems. This threatens both its environmental balance and the economic and social well-being of its population.

10. To address these problems, in 2023 Ecuador published its National Climate Change Adaptation Plan (NAP) to improve resilience and safeguard vulnerable communities and ecosystems. The Plan identifies medium-term adaptation needs, based on biophysical climate risk results (MAATE-PNA, 2023).

Water Management

11. The sustainable management of water assets in the country is key for water security, environmental sustainability, and the well-being of communities. The largest tributaries of this vital resource are glaciers and moorlands that encompass rivers, lakes, wetlands, and aquifers, and benefit rural and urban populations. In the last 50 years, glaciers have decreased by 33%, and the surface of the Paramos, which act as natural flow regulators, has decreased by at least 25% (MAATE-RAS, 2024).

12. Water resources are vital for the development of daily life, agricultural production, livestock, and the generation of hydroelectric energy. Ecuador water resources are currently at risk due to climate variability and changes in precipitation patterns that affect the availability and quality of water for human consumption and irrigation. The region faces problems from soil erosion and sedimentation in reservoirs due to deforestation and inappropriate land use in sub-basins, which compromises biodiversity and essential ecosystem services.

13. Ecuador has a considerable average availability of fresh water per capita, reaching 4,863.41 m^3 per inhabitant per year on the coastal slope and 172,786.36 m^3 per inhabitant per year on the Amazon slope. However, it faces significant challenges related to the territorial and temporal distribution of this resource (CNRH, 2002; 2006a; 2006 b).

14. There are regions with a high risk of water deficit, a situation that could worsen in the future. The need for water is not only based on its total availability, but also on its geographical distribution throughout the territory. Rising temperatures and intense rainfall over short periods will lead to an increase in the frequency and duration of extreme events, such as heavy rainfall and droughts. This, in turn, will accentuate inequity in access to water, generating drastic changes in the distribution of water resources (MAATE-RAS, 2024).

15. Another problem is the lack of hydrological and climate information, since it is the fundamental pillar to apply methodologies for measurement, monitoring, and evaluation, prioritize and zone action to adapt to climate change with a focus on water security.

16. In this way, safeguarding ecosystemic, economic, cultural, environmental, and social services in the face of the effects of climate change, through adaptation mechanisms, prioritizing the most vulnerable sectors (MAE, 2019a). "*Climate information makes it possible to determine how the climate system responds to the interaction between human influence, natural drivers, and internal variability*" (IPCC, 2021a, p. 21).

17. According to National Water Plan, in 2010, water consumption in Ecuador was 15.80 km^3, including 13.05 km^3 for agricultural use. By 2025, it is estimated that total water demand will rise to 20.32 km^3, of which 16.80 km^3 will correspond to water for agricultural use. In contrast, according to projections in the national plan of water resources, by 2025 there will be a deficit of 8.28 km^3 to cover all sectors. This demonstrates a realistic constraint in water availability harshened by a climate change scenario.

18. Based on information from the NDC, it is mentioned that 88% of the Ecuadorian population lives in the Pacific basin, but in this area water availability is limited and only 31% of water resources are found there. Similarly, nationally, 80% of the population has water access and 64.5% has some type of sanitation; however, in rural areas, these figures decrease to less than 40% coverage in communities of less than 200 families. Climate change is expected to exacerbate these conditions, worsening the population's access to water, especially in the most vulnerable areas.

19. According to WRI Aqueduct (2019), water stress in Ecuador is in the west of country, especially in the coast region and the southwest of the sierra region. This indicator shows competition for water resources and is defined informally as the ratio of demand for water by human society divided by available water. It measures the ratio of total water withdrawals to available renewable surface and groundwater supplies.

Food Security

20. In 2022, the agricultural sector was responsible for 40% of the foreign currency that entered the country from exports of goods, excluding oil. This is equivalent to a total of USD 27,235.9 million in exports, of which USD 18,085.9 million correspond to non-oil exports and USD 7,438 million to agricultural exports not including aquaculture and fisheries. This significant contribution highlights the importance of the agricultural sector in the country's trade balance and job creation (ECB, 2023).

21. In the last two decades, at the national level, the average percentage of agricultural area lost due to changes in temperatures and rainfall regimes was 5.4% of the national planted area. Permanent crops have a percentage of lost area of 5.4% and transitory crops a percentage of 5.9% (INEC, 2022).

22. As for the area lost due to different causes, due to climatic events it represents 60% of the national total in the period 2002-2021, with drought being the event that causes the greatest impact on agricultural crops with a percentage of 37%, followed by floods with 15% and frost with 8% (MAATE-RAS, 2024). The adverse effects of climate change will significantly affect crop and livestock production, which, in turn, will have an impact on food security.

23. Labor indicators in the agricultural sector reveal a complex panorama. In rural areas, the unemployment rate was 1.8% and the underemployment rate was 28.5%, while in urban areas, unemployment reached 5.2% and underemployment 20.4%. The agricultural sector employs 32% of the country's working population. This means that three out of ten employed people work in this sector, which highlights its importance as a source of employment and livelihood for a large part of the Ecuadorian population (INEC, 2022).

24. The Ministry of Environment, Water and Ecological Transition is coordinating intersectoral actions within the framework of the National Adaptation Plan (NAP), focusing on transforming diagnostics into concrete projects that not only mitigate the impacts of climate change, but also strengthen the resilience of farmers and rural communities with technified irrigation systems, promotion of technological innovation, sustainable water and soil management, income diversification, capacity building, governance and sustainable production (MAATE-RAS, 2024).

Ecosystem conservation

25. Ecuador is one of the 17 most biodiverse countries in the world (García et al., 2014), a country with a plurinational and intercultural cultural richness. Its territory has been inhabited by 14 Nationalities and 18 Indigenous Peoples, Afro-Ecuadorian, Montubio and mestizo. Ancestral languages are interculturally related, and their ancestral knowledge is the gateway to the development of science and technology (Fourth National Communication, 2022).

26. Being a relatively small country in terms of area, it has the largest number of species per square kilometer. According to the Undersecretary of Natural Heritage of MAATE, as of 2018, a total of 87 ecosystems have been mapped, covering 61.58% (15,385,843 ha) of the national territory, of which 30% (7,465,637 ha) are within protected areas (MAE, 2013).

27. As of December 2023, 10.2% (2,527,000 ha) of the continental terrestrial territory is conserved through protected areas and BVP[1] (MAATE, 2023), and some 18,500 species of vascular plants are recorded, 98% (MAATE, 2023), in addition to birds, amphibians, mammals (marine and freshwater).

28. One of the threats currently faced by megadiverse countries such as Ecuador is the loss of biodiversity in terms of flora, fauna and ecosystems caused by the effects of climate change. This in turn affects the well-being of vulnerable populations for whom access is limited: (a) supplies (meat, skins and natural medicines); (b) regulation and support (water purification, soil fertility, decomposition, pollination and biological control), and (c) cultural services (aesthetic value and recreational activities) (MAE, 2015b).

[1] "Forests and Vegetation Protectors (BVP)". Ministry of the Environment, Water and Ecological Transition (MAAE), 2020

29. In Ecuador, the rich diversity of ecosystems not only provides habitats for a wide range of species, but also plays a crucial role in the hydrological cycle. Forests and wetlands act as natural water regulators, facilitating the infiltration and recharge of aquifers, as well as the regulation of flows in rivers and streams (MAATE-RAS, 2024. In process of publication). Therefore, the conservation and sustainable use of biodiversity are essential to guarantee the quality of life of present and future generations (MAE, 2015b).

Impacts of climate change on other economic sectors

30. Energy security in Ecuador faces major challenges, mainly due to its high dependence on hydroelectric generation. Currently, 92% of the country's energy generation comes from hydroelectric power plants, 7% from thermal plants, and 1% from non-conventional sources (photovoltaic, wind, biomass, biogas, geothermal, among others) (Ministry of Energy and Mines, 2023).

31. This dependence on water resources makes it vulnerable to severe droughts, such as the one that has affected the country since 2023, with notable impacts on electricity production. During the dry season, reservoirs drop in level, which limits the operation of hydroelectric power plants, directly affecting energy supply.

32. The main hydroelectric complex located in the Paute River Basin and other power plants[2] do not generate energy, due to their low flow rate or the fact that their reservoirs are kept at a minimum. Consequently, they do not contribute to the National Interconnected Energy System.

33. However, significant challenges remain to diversify the energy matrix and expand non-hydro renewable sources. As of 2023, wind and solar energy account for less than 1% of total electricity generation in Ecuador, despite the country's high potential in both areas due to its geographical location.

34. The government has announced plans to expand this capacity through auctions for renewable energy projects to reach its target of 90% renewable generation by 2025. In addition, investment in renewables is expected to contribute to improving electricity coverage, which in rural areas is close to 90%, but with remote areas still without adequate access to the grid.

35. In recent years, there have been efforts to diversify the energy matrix. By 2023, on average, 68.01% of renewable energy, 21.00% of non-renewable energy, and 10.9% of imports were generated per dry season (CELEC, 2023).

36. Electricity service that is provided by public and private companies, and as of 2020, 139 power generation plants are registered, of which 80 belong to public companies and 59 to private companies (CENACE, 2020).

37. The dependence of the country's Food Security on a constant, stable, and reliable supply of energy is critical. Limited access to stable energy affects the ability to transform agricultural products, which increases post-harvest loss and affects both smallholder farmers and the national food supply (United Nations, 2022)

38. The water reserves of rivers and reservoirs in the Andean and Amazon regions are important to produce clean and renewable energy. Despite this, climate change is wreaking serious havoc on this subsector due to

[2] **Coca Codo Sinclair Hydroelectric Power Plant:** Located in the province of Napo, it is the largest hydroelectric power plant in Ecuador, with an installed capacity of 1,500 MW. It generates around 8,800 GWh annually, supplying an important part of the country's electricity demand. **Sopladora Hydroelectric Power Plant**: This project is located in the province of Azuay and has an installed capacity of 487 MW. It is part of the Paute Integral Hydroelectric Complex and harnesses the flow of the Paute River, contributing an average annual generation of 2,770 GWh. **Paute Molino Hydroelectric Power Plant:** Also located on the Paute River in Azuay, this plant has an installed capacity of 1,075 MW and was one of the first large-scale hydroelectric projects in Ecuador. Its construction dates back to the 1980s and 1990s, and its average generation is approximately 5,000 GWh per year. **Manduriacu Hydroelectric Power Plant:** Located on the border between the provinces of Imbabura and Pichincha, it has a capacity of 60 MW and generates around 370 GWh annually. **Minas-San Francisco Hydroelectric Power Plant:** Located between the provinces of Azuay and El Oro, it has an installed capacity of 270 MW. This plant helps to take advantage of the hydroelectric potential in the south of the country and generates around 1,290 GWh annually. **Toachi-Pilatón Hydroelectric Power Plant**: This complex is located between the provinces of Santo Domingo de los Tsáchilas and Cotopaxi, with a capacity of 254 MW. Although it has had delays and challenges in its construction, it is expected to contribute significantly to hydroelectric power generation in the central region of the country.

alterations in precipitation patterns and river flow, as well as climate variation causing prolonged droughts, and the reduction in the flow of water available to hydroelectric plants, which directly affects power generation capacity and puts the stability of the electricity supply at risk (PNA, 2023).

39. Currently, food transformation and storage systems depend almost entirely on this resource (Ministry of Agriculture and Livestock, 2022), so the suspension of supply could lead to food decomposition and waste, due to the latent inability to continue with the production chain of processed products, particularly in rural areas of the country (World Bank, 2023).

SUBNATIONAL CONTEXT IN THE AREAS OF INTERVENTION

40. For the development of this proposal, the Ministry of the Environment, Water and Ecological Transition (MAATE) in its capacity as focal point for the Adaptation Fund, has selected three key areas for its intervention:

    1) the upper basin of the Carrizal River in the canton of Bolívar - Manabí;

    2) the Pacoche River in San Lorenzo - Manabí;

    3) and the Machangara and Gualaceo rivers in the main basin of the Paute River, in the province of Azuay

41. Intervention areas were defined through a prioritization process carried out by the National Environmental Authority of Ecuador. The areas are affected by reduced precipitation (prolonged droughts), which results in reduced food production, imbalance in natural ecosystems and sedimentation problems in the reservoirs of hydroelectric plants.

42. Social vulnerability is determined by factors such as poverty, inequality, lack of access to resources and demographic fragility, which is intensified by the effects of climate change, generating greater exposure and sensitivity to climate risk.

43. These factors, such as the lack of recognition of rights, gender inequality, forced migration, and the loss of cultural identity, contribute to the fragility of communities in the face of extreme weather events (MAATE-RAS, 2024).

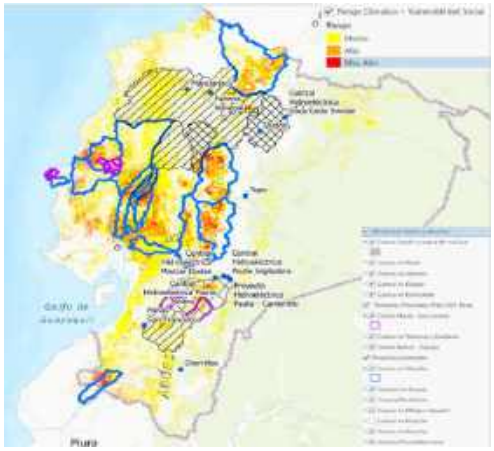

Figure 1. Priority areas for intervention (MAATE - RAS, 2024)
Note: *Priority areas of Manta Canton, Bolívar Canton, Paute River Basin (Machangara and Gualaceo Rivers.*
Source: *PNA 2023; Own calculations based on climate information from the Ministry of Environment, Water and Ecological Transition*
Prepared by: *MAATE-RAS, 2024*

Prioritized Zone 1: *Paute River Basin, Machangara River Sub-Basins and San Francisco and Santa Barbara Rivers (Gualaceo)*

44. The Paute River basin, located in the provinces of Azuay, Cañar and Morona Santiago, which includes the sub-basins of the Machangara, San Francisco and Santa Barbara rivers, is essential for hydroelectric generation in Ecuador, agricultural irrigation and human consumption. The availability and quality of water in this watershed are essential for agricultural activities, where farmers depend on irrigation to grow their products the average flow varies significantly according to climatic conditions (MAATE-RAS, 2024).

45. The synergies and exchange of information and knowledge that could be coordinated in these areas would allow the spaces for multi-stakeholder articulation, the strategies for the implementation of measures and cooperation actions with local partners, the tools, and methodologies of citizen participation, to be more efficient and allow to reduce the response to the local needs of the Highland and Coastal regions of Ecuador.

Prioritized Zone 2: *Pacoche River Basin, Local goverment San Lorenzo – Marianitas. Province Manabi.*

46. The Pacoche River Basin, located in the San Lorenzo parish of the Manta canton, Manabí, is distinguished by its rich biodiversity and its protected natural environment. This ecosystem is home to the Pacoche Forest, a Coastal Marine Wildlife Refuge that preserves endemic flora and fauna species. Covering an area of 306 km², the basin features a variety of landscapes including cliffs and mountains covered in lush vegetation.

47. The Pacoche River Basin has a mountainous relief and rich vegetation. Its economy is based on agriculture and livestock. With a population of around 2647 inhabitants, the local culture is diverse, but it faces challenges such as deforestation, water pollution, loss of natural sources and springs that fed these ecosystems, which has contributed to the reduction of the flow of the adjacent estuaries and rivers.

48. The climate of the basin is tropical mega thermal, characterized by average annual temperatures of around 24 ºC. Highs rarely exceed 32 °C, while lows are around 16 °C. Annual rainfall is less than 500 mm, concentrated in a single rainy season that runs from January to April, with significant variations due to phenomena such as El Niño

49. The population that lives in the basin includes communities such as San Lorenzo, Pacoche, Ligüiqui, Las Piñas and Santa Rosa, which represent approximately 3.94% of the rural population of the Manta canton. These communities rely heavily on the natural resources offered by the Pacoche forest, which acts as a climate regulator and source of drinking water.

Prioritized Zone 3: *Upper hydrographic basin of the Carrizal River; Local Government of Quiroga,Province Manabi.*

50. The Upper Hydrographic Basin of the Carrizal River is located in a region of humid tropical climate, where high temperatures and generous rainfall throughout the year are distinctive characteristics, with an average annual temperature of 24.2°C and an average annual rainfall of 2,650mm.

51. This precipitation is unevenly distributed throughout the year, mainly concentrated in the rainy season from December to April, with a monthly average of 420 mm in January and February, while the dry season, from May to November, experiences a monthly average of 110 mm, with July being the driest month with 55 mm. In addition, the average annual relative humidity is 87%, with higher values during the night (INAMHI, 2024).

52. As for the relief, the basin exhibits a mountainous topography, with altitudes that reach up to 1,520 meters above sea level in the Chongón-Colonche Mountain Range, according to updated data from the Military Geographic Institute (IGM).

53. This topography includes steep slopes, with 42% of the basin presenting slopes greater than 30%, which poses challenges for agricultural activities and infrastructure.

54. This configuration also increases vulnerability to natural disasters, with landslides and floods being exacerbated by climate change impacts, with an average erosion rate estimated at 22 t/ha/year (MAATE, 2022).

Climate Rationale

Priority Zone 1

Climate Threats

55. Biophysical models[3] carried out with climate change scenarios suggest that the prioritized sites could experience a significant reduction in water resources which will in turn alter ecosystems, decrease flows and increase erosion and sediment in the dams of the hydroelectric plants of the Paute river basin and the Carrizal river basin. (MAATE-RAS, 2024).

56. To effectively address the intervention in the three prioritized areas and counteract the impacts of the climate risks associated with them (floods and prolonged droughts) (NAP, 2023), MAATE has opted for a watershed-based approach. This comprehensive approach considers the interactions between water resources, agriculture, health, ecosystems, and human activities, allowing for a holistic assessment of present and future climate risks (MAATE-RAS, 2024).

57. In the last twenty years in the provinces of Manabí (Coast region) and Azuay (Sierra region), floods and droughts have affected a total of 227,704 people and 99,970 hectares of crops. This is due to an absence of prevention plans in the face of climate threats that increase their intensity (Desinventar, 2024).

58. The flow of the Paute River can reach up to 161 m^3/s (rainfall surplus), which allows an adequate supply for the hydroelectric power plants it feeds, such as Sopladora, Paute-Molino and Mazar, which together generate approximately 1,756 megawatts, making it the largest power generator in the country and other uses.

59. However, during periods of drought, such as those experienced in 2024, the flow has decreased, reaching critical levels of 25.21 m^3/s to 11.40 m^3/s, which caused the government blackouts of up to 14 hours a day, affecting the productive, commercial and residential sectors (MAATE-RAS,2024).

[3] Biophysical Climate Risk Analysis is the interaction between the parameters of a biophysical model, which represent the sensitivity and adaptive capacity (vulnerability) of the exposed elements, and the climate threats they face. In the agricultural field, models were used to evaluate crop yields, while for water resources and hydroelectric generation, flow variations in the basins are analyzed. In the case of natural heritage, the suitability of species is assessed based on changing climatic conditions. For public health, the speed of spread of climate-sensitive vectors is studied. Likewise, in human settlements and strategic productive sectors, risks such as floods and landslides are analyzed. This analysis is complemented by the Sectoral Routes to implement the National Adaptation Plan, allowing a climate risk analysis to be carried out through statistical models that help overcome the barrier of lack of information in various regions of the country.

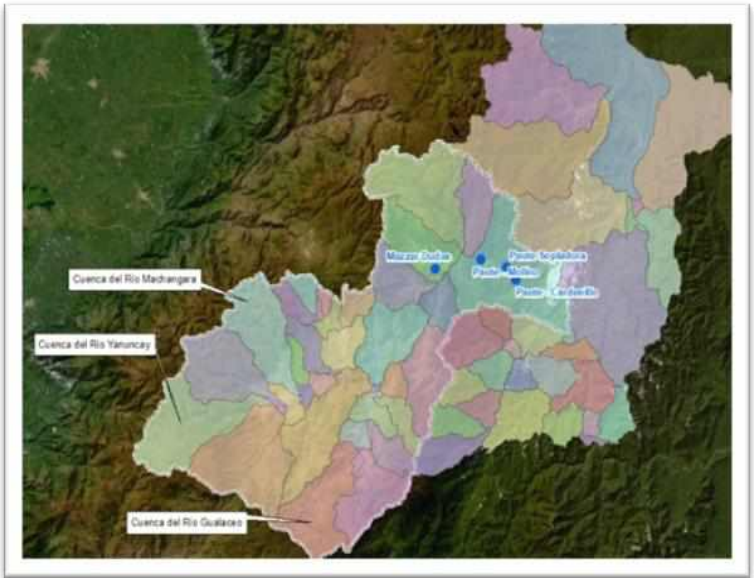

Figure 2. Location of the sub-basins of the Machangara and Gualaceo rivers in the upper area of the Paute Basin
Prepared by: MAATE-RAS, 2024
Note: The location of hydroelectric power plants is included on the map.

60. In the most representative localities of the Paute basin, the average daily rainfall has remained at 2.4 millimeters during the historical period. However, a decrease of 5% is projected for the future period.

61. This reduction is most evident during the months of May to September, where a significant decrease is expected, with a seasonal rate of variation of at least 15%.

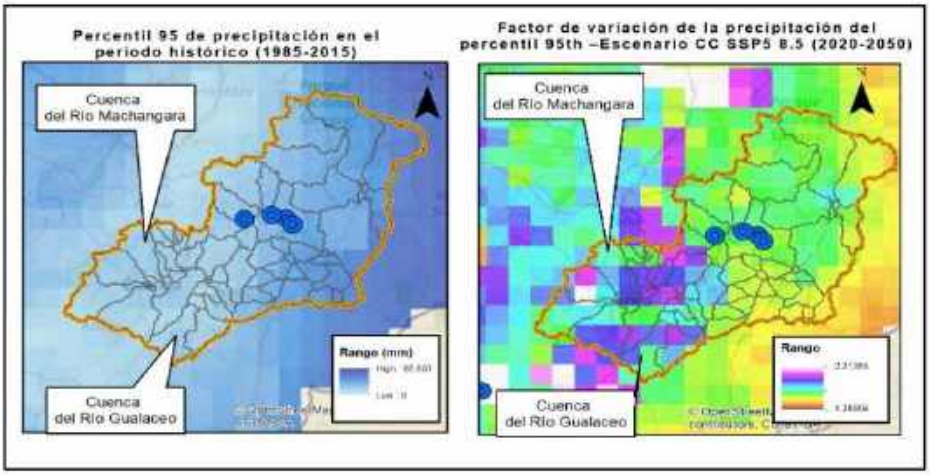

Figure 3. Province of Azuay, cantons of Cuenca and Gualaceo: climatic threat due to precipitation variation, scenario SSP5 8.5
Prepared by: *MAATE-RAS, 2024*

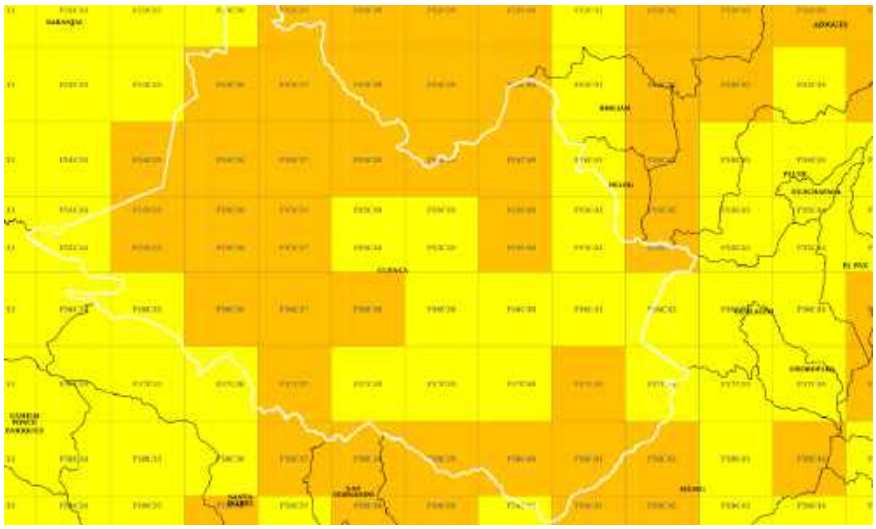

Figure 4. Province of Azuay, cantons of Cuenca and Gualaceo: climatic threat due to high temperatures, RCP 8.5 scenario

Prepared by: *WFP. 2024*

62. As for the temperature, the historical maximum has been 19.6 degrees, but an increase of 9% is anticipated in the future. During the months of June to August, an increase of more than 10% will be observed compared to the previous period.
63. In contrast, the minimum temperature will increase by 15%, exceeding the growth of the maximum temperature by 6 percentage points. The months of June and July stand out as the months with the most pronounced growth in the minimum temperature, with a seasonal growth rate of at least 17%.
64. Although climatic conditions offer a solid basis for understanding the climatic context, it is important to enrich this analysis with the description of events that, historically, have had a low probability of occurrence.
65. Strategies to cope with droughts, manage water resources more efficiently, and prepare for extreme weather events, together with long-term planning and cross-sector collaboration are crucial to mitigating the negative impacts of climate change and building resilient communities.

Biophysical Climate Risk Analysis

66. Under unfavorable climatic conditions, it is expected in climate change scenarios (2020-2050) intense precipitation in short periods of time at the national level, which would result in greater sedimentation and erosion of the hydrographic basin, which would cause wear and tear on the electromechanical elements of the plants and a higher production cost in the medium term (MAATE-PNA, 2023).
67. Soil erosion occurs in the upper and middle sub-basins of the Machangara and Gualaceo rivers due to the decrease in vegetation cover, increased rainfall, and inappropriate land use, especially on steep slopes, which exacerbates its impact with unfavorable climatic conditions (MAATE-RAS, 2024).
68. As more (degraded) tracts of land are overused, the amount of sediment that reaches reservoirs increases, which has a direct impact on hydroelectric plants. This can lead to problems such as increased sedimentation, which reduces the storage capacity of reservoirs, loss of power generation, increased water treatment costs, and an increase in the operation and maintenance costs of hydroelectric plants (MAATE-RAS, 2024).
69. In addition, there are non-climatic exacerbating factors such as the expansion of the agricultural frontier in the hydrographic sub-basins of the upper zone, on the high scrub and paramo. The inappropriate use of land in the Andean landscape, which translates into a severe overuse of soil resources, with an increase in erosion rates, runoff and a decrease in infiltration, are processes that affect the destabilization of slopes,

sedimentation in riverbeds (downstream) and low crop production and degradation of pastures. Changes in rainfall and temperature of the environment and soils will directly affect water recharge, irrigation, and human consumption, among other uses (MAATE-RAS, 2024).

70. In this context, soft maize cultivation is expected to experience a decrease in yield of 40% per hectare in the future. For the historical scenario, soft corn crop areas have a yield of 4 tons per hectare per year (MAATE-PNA, 2023).

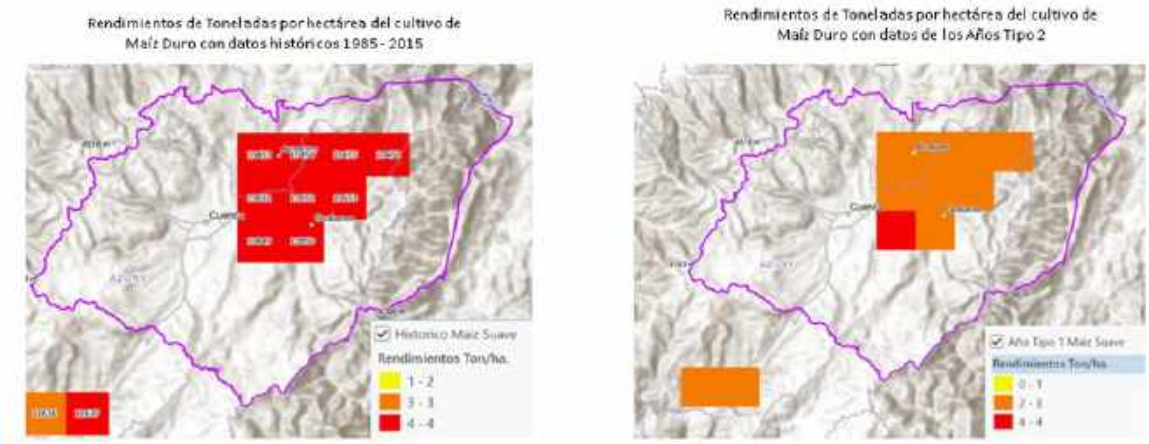

Figure 5. Priority Area 1: Climate Risk Food Security, Agriculture and Livestock
Source: PNA. MAATE. 2023

71. In addition, the availability of water for irrigation, crucial for the success of soft maize cultivation in the region, could be compromised by the decrease in available water resources due to climate change. The combination of these factors presents significant challenges for farmers in the Paute River basin and in the prioritized sub-basins, who are forced to adapt to an increasingly uncertain and volatile agricultural environment.

72. On the other hand, in the Paute river basin, the increase in soil erosion is not only related to the intensity of rainfall, but also to the decrease in the natural cover of forests, shrubs and moorlands, which has weakened the soil's ability to retain moisture and resist erosion.

73. According to the climate risk for the water sector in the Machangara river sub-basin as part of the Paute river basin, the maximum flow values according to the RCP 4.5 climate change scenario for the 2031–2035-time window is 63.99m3/s and for 2036-2040 it is 67.49 m3/s (MAATE/AICCA, 2021).

74. While for the RCP 8.5 scenario for the temporary 2024 window of 2031-2035 it is 101.38m3/s and for 2036-2040 it is 61.98 m3/s. The variation in maximum flow in the basin is the direct impact of climate change, indicating a reduction in flows due to future climatic conditions represented in the modeled values (MAATE/AICCA, 2021).

75. This value is further reduced when, in addition to the impacts of climate change, non-climatic threats such as deforestation, land use changes and land overuse are considered.

76. The availability of water resources in basin climate change scenarios, increased soil erosion not only has environmental consequences but also significant socio-economic impacts, such as decreased agricultural productivity, the risk of mass movement and water processes that endanger local communities and infrastructure.

77. Facing this challenge requires soil conservation and vegetation cover restoration measures, as well as climate change adaptation strategies that strengthen the resilience of the upper basin (Machangara and Gualaceo sub-basins) of the Paute River to these risks.

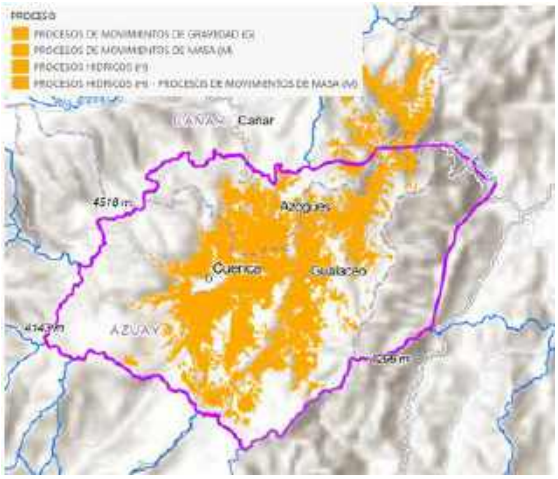

Figure 6. Prioritized Zone 1. Paute River Basin, Processes that increase Climate Risk Water sector
Source: PNA. MAATE. 2023
Prepared by: MAATE-RAS, 2024

78. The National Adaptation Plan has modeled 602 endemic species. Those found in the Paute River Basin are *Burmeistera sodiroana (hemiepiphytic grass or subshrub) and Bouteloua disticha (herbaceous plant*), revealing possible high to very high risk effects for these species in these territories (MAATE-PNA, 2023).

79. *Burmeistera sodiroana,* a species that is in the red book of endangered species with moderate risks, is located in a protective forest in the sub-basin of the Gualaceo River, named with the code BVP016. The availability and quality of water in this sub-basin could be affected by the impacts of climate change on endemic flora and fauna, altering the balance of the ecosystem (MAATE-RAS, 2024).

80. In the sub-basin of the Machangara River, the Cajas National Park is located as a protected area, surrounded by 15 forest areas within the Paute River basin. These forested ecosystems play a crucial role in water regulation, so their deterioration due to climate change could reduce the availability and quality of water in the basin (MAATE-RAS, 2024).

Vulnerability

81. In addition, extreme weather events such as prolonged droughts could displace local populations to urban areas in search of more stable conditions. The region faces problems from soil erosion and sedimentation in reservoirs due to deforestation and inappropriate land use in sub-basins, which compromises biodiversity and essential ecosystem services.

82. This environmental degradation affects local ecosystems to adapt and resist the impacts of climate change, this leads to negative effects for hydroelectric generation threatened by the reduction of river flows and sedimentation in reservoirs, which increases the operating and maintenance costs of hydroelectric plants.

83. Agriculture and livestock are facing significant challenges due to the decrease in agricultural productivity and the availability of water for irrigation, negatively affecting local incomes and increasing the economic vulnerability of producers.

Prioritized Zone 2

Climate Threats

84. In San Lorenzo, a significant reduction of 40% in average daily rainfall is anticipated.

85. The most affected months will be March, April and December, with a seasonal decline rate of at least 80%. As for the daily maximum temperature, which averages 27.4 degrees Celsius, an increase of 9% is expected.

86. In the towns around influence of San Lorenzo, the historical average daily rainfall has been 1 millimeter. However, a reduction of almost 40% is expected in a future projection.

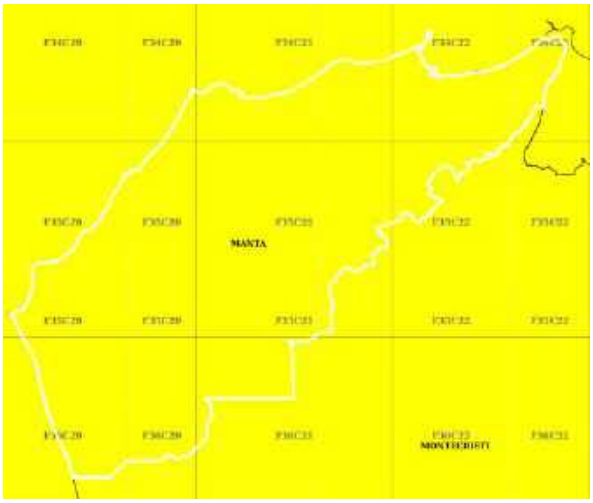

Figure 7 .Manabí Province, Manta Canton: Climate Threat from High Temperatures, RCP 8.5 Scenario
Prepared by: WFP 2024

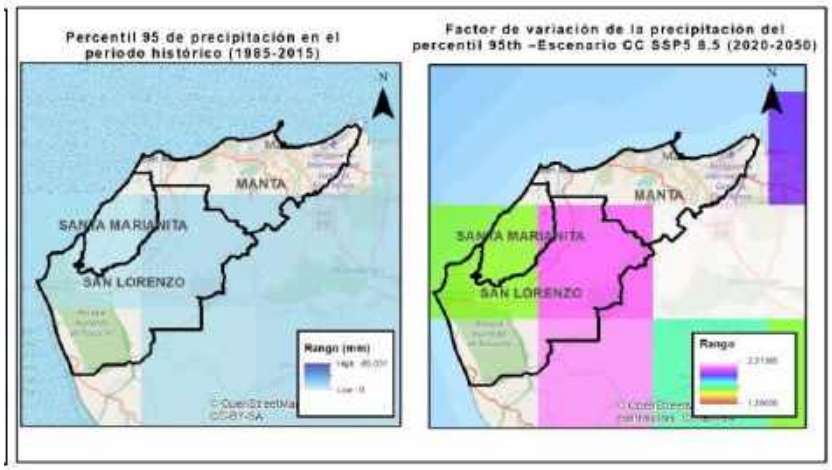

Figure 8. Manabí Province, Manta Canton: Climate Threat of Precipitation Variation, SSPS 8.5 Scenario
Prepared by: MAATE-RAS, 2024

87. This increase is evenly distributed across all months of the year. Regarding the daily minimum temperature, which has been 24.2 degrees historically, an increase of 8% is expected in the future. The months of July, August, October and November will experience a seasonal growth of at least 9%.

88. Similarly, a considerable increase in the frequency of rainy days is projected, with an increase in the number of days in which at least 2 millimeters of rain is recorded and a significant reduction in average daily precipitation is expected, which could lead to longer periods of drought, although an increase in temperatures is also anticipated.

89. This includes strategies to cope with droughts, manage water resources more efficiently, and prepare for extreme weather events. Long-term planning and cross-sector collaboration are crucial to adapt to the negative impacts of drought.

Biophysical Climate Risk

90. The dry season (May to November) registers a monthly average of 120 mm, with July being the driest month with 60 mm.

91. In addition, San Lorenzo de Manta faces a significant climate risk, due to its dependence on the supply of water for human consumption that comes mainly from the La Esperanza dam, located more than 135 km away.

92. The Pacoche River, the main watercourse of the basin, has an approximate length of 48 km and an average flow of 35 m^3/s. Its flow varies throughout the year, from a maximum of 70 m^3/s in the rainy season to a minimum of 20 m^3/s in the dry season. Although the presence of underground aquifers is estimated, their potential has not yet been fully evaluated. Water quality faces threats from pollution, such as agrochemicals and solid waste. Fecal coliform levels above the permitted limits were found in 58% of the water samples from the Pacoche River.

93. The water deficit in the area is a pressing challenge, especially considering the vital need for water for irrigation, which ranges from necessary to indispensable in certain areas where demand exceeds 1,000 mm of rainfall per year.

94. During the critical months of July to December, the need for irrigation peaks, significantly exposing the agricultural population to water shortages for their crops.

95. This situation highlights the urgent need to implement effective measures to ensure an adequate supply of water throughout the year, not only to ensure food security, but also to protect the livelihoods of vulnerable farming communities in the region.

96. The climatic risk of the sector is focused on the endemic vascular plants that are in danger of extinction in future conditions 2020 – 2050, which are very close to the study area are: *Bouteloua disticha and Cynophalla ecuadorica*.

97. As it is located nearby, the Pacoche forest is located in a low and deciduous shrub forest ecosystem of the lowlands of the jama-zapotillo and seasonal piedmont evergreen forest of the coastal mountain range of the equatorial Pacific; which according to the information of the MAATE has a [4]High and Medium fragility and a Very High Fragmentation[5] , with a connectivity[6] low, this helps us to sustain the climate risk of forest species much more (MAATE-PNA, 2023).

Vulnerability

98. The basin is home to about 5,000 inhabitants with a rich cultural diversity but faces significant challenges due to its dependence on agriculture and livestock, activities sensitive to climate fluctuations and water availability.

99. Existing water infrastructure, such as the La Esperanza dam, crosses several cantons to supply the population, but faces problems maintaining adequate flows, which puts the supply of drinking water at risk.

[4] Frailty can be defined as a physiological state of greater vulnerability to stressors, which result from the decrease in physiological reserves or the dysregulation of multiple physiological systems. MAE.2012. Ecosystem Classification System of Continental Ecuador Project Vegetation Map of Ecuador National Forestry Directorate Undersecretariat of Natural Heritage.

[5] Fragmentation: Fragmentation is the loss of continuity of an ecosystem, and produces important changes in the structure of populations and communities of plants and animals, both in the physical and ecological environment, which affects their functioning. MAE.2012. Ecosystem Classification System of Continental Ecuador Project Vegetation Map of Ecuador National Forestry Directorate Undersecretariat of Natural Heritage.

[6] Connectivity in biology refers to the ability of organisms, populations, or ecosystems to interact and communicate with each other within a system. MAE.2012. Ecosystem Classification System of Continental Ecuador Project Vegetation Map of Ecuador National Forestry Directorate Undersecretariat of Natural Heritage.

100. The basin due to its fragile and biodiverse ecosystems, so it presents problems of deforestation, water pollution and loss of natural habitats that threaten local biodiversity.

101. In addition, the high rate of soil erosion and landslide risks are exacerbated by mountainous topography and intense seasonal rainfall, compromising water quality and the stability of aquatic ecosystems.

102. The basin relies heavily on agriculture and livestock as the main economic drivers. However, these activities are vulnerable to climate changes that could reduce crop yields and affect the availability of pasture for livestock.

Prioritized Zone 3

Climate Threat

103. It has been evident in recent months, the drought has intensified on the Ecuadorian coast, due to the increase in the number of days without rainfall, in RCP 8.5 scenario in the period 2011 - 2040 an increase in both minimum and maximum temperatures is projected.

104. The maximum temperature will experience an increase of 6%, with a seasonal distribution similar to the last period, although with a slight notable increase in January, where an increase of 8% is expected.

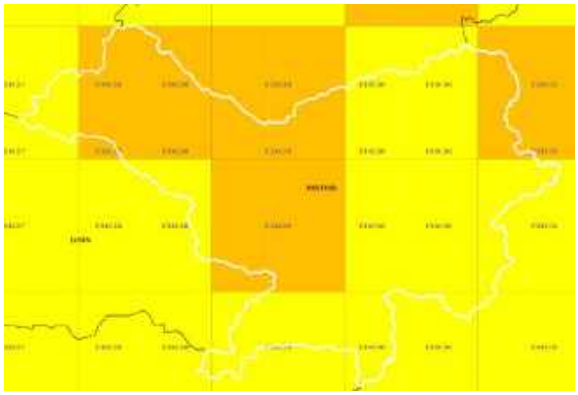

Figure 9. Manabí Province, Bolívar Canton: Climate Threat from High Temperatures, RCP 8.5 Scenario
Prepared by: WFP 2024

Figure 10. Manabí Province, Bolívar Canton: Drought climate threat map., SSP5 8.5 Scenario
Source: Ministry of Agriculture. National Agricultural Information System. Prepared by: WFP, 2024

Figure 11. Manabí Province, Bolívar Canton: Climate Threat Due to Precipitation Variation, SSP5 8.5 Scenario
Prepared by: MAATE-RAS, 2024

105. On the other hand, the minimum temperature will also rise by 7%, highlighting an increase of 8% in the months of June and July. Regarding precipitation in Bolívar, during the historical period an average of 3.9 millimeters per day was recorded, a figure that is expected to remain similar in the future period.

106. However, a small modification in its temporal distribution is projected, with a pronounced decrease during the months of February to July, offset by an increase during the months of September to December, where a seasonal increase of 20% is expected.

107. These findings highlight the need to understand regional climate dynamics and adapt management and planning strategies to address the challenges posed by climate change in each specific area.

108. In the case of temperatures, during the past period, 10% of the days had a maximum temperature of at least 32 degrees on average. This percentage is expected to rise to 45% in the future, which means hotter days for longer.

Biophysical Climate Risk Analysis

109. Yields of hard maize, the main source of income for the population and livelihood for livestock, could be reduced, and would directly affect food security in the region.

110. According to data from the PNA 2023, the historical yields of tons of hard corn cultivation are 7 Tm/ha. Under the climate change scenario, yields per tons would drop to 5 Tm/ha.

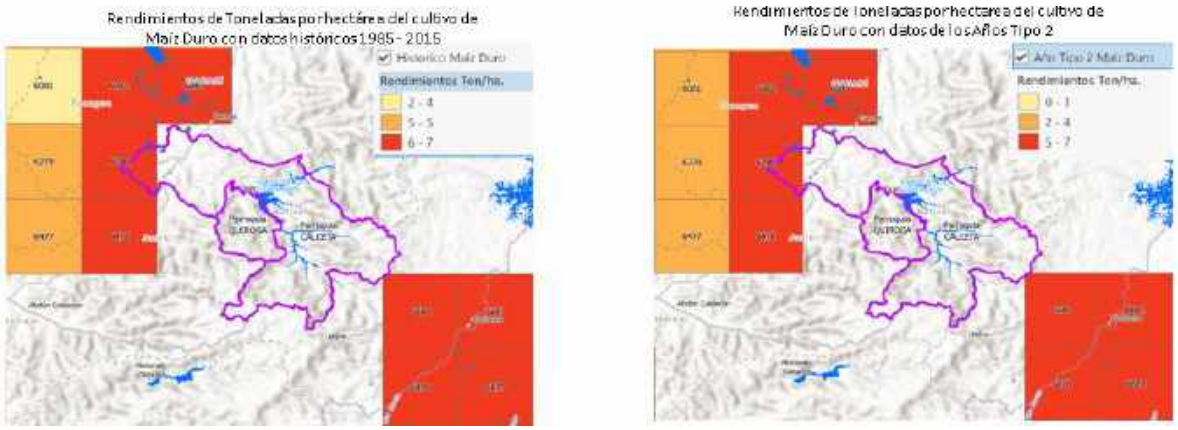

Figure 12. Yield in tons of hard maize under climate change scenarios in the study area
Source: NAP 2023
Prepared by: *WFP 2024*

111. In climate change scenarios, the importance of irrigation in areas with water deficit becomes even more evident and crucial. In areas where annual rainfall is not sufficient to meet the water needs of crops, irrigation becomes an indispensable element to maintain agricultural production and guarantee food security for the population.

112. This is especially relevant in regions where the water deficit exceeds 700 mm of precipitation per year, which means that the amount of water naturally available is insufficient to sustain crops throughout the year (INAMHI, 2024).

113. By investing in efficient and sustainable irrigation systems, farmers' vulnerability to climate uncertainty can be reduced and agricultural production continues to be ensured under adverse conditions.

Vulnerability

114. The region is home to a population that depends on agriculture as its main source of income and food security. Biophysical models indicate that climate change could significantly reduce crop yields, especially hard maize, which is critical for the local economy and household livelihoods.

115. This would not only threaten the food security of the population, but would also directly affect their livelihoods and social stability in the region.

116. However, climate change is projected to alter these patterns, with a decrease in rainfall during a few key months and an increase in temperature, which could intensify soil erosion and increase the risk of landslides.

117. Thus, there is a great risk in the territory: dependence on agricultural activities sensitive to climatic variations. In addition to durum maize, livestock and other agricultural activities would be affected by the increase in the number of days without rainfall, i.e. an increase in the period of drought. This reduces the sowing periods of the population (2 to 3 sowings/year and with prolonged droughts to 1 sowing/year).

118. This could lead to a decrease in farmers' household incomes and subsistence capacity, exacerbating rural poverty and limiting economic opportunities in the area.

BENEFICIARY POPULATION

119. The three prioritized areas correspond to the cantons of Cuenca and Gualaceo in the province of Azuay and the cantons of Manta and Bolívar in the province of Manabí, according to the population and housing census a total of 90,177 people[7], while the area of the population benefited will be approximately 36,071.

BARRIERS

120. The populations that settle in the areas of intervention face barriers and gaps that have been exacerbated by climatic threats in recent years, which influence biophysical dynamics such as environmental degradation and vulnerability to floods and droughts, as well as deep social gaps such as limited access to basic services such as drinking water, health, free mobility that deepen poverty rates and inequality.

121. These complex conditions are aggravated by institutional limitations, such as the lack of coordination of public policies, regulations and resources, limited participation of communities in decision-making, planning and generation and use of hydrometeorological information.

[7] National Institute of Statistics and Census – INEC. Population and Housing Census. 2022.

Barrier 1: Absence of the climate approach in planning instruments and few effective measures to increase the adaptive capacity of the population.

122. Subnational governments do not have the necessary capacities to incorporate climate change criteria into their local planning instruments. In addition, these land use and land use plans do not have measures to adapt to climate change.

123. High rate of degradation of ecosystems, loss of biodiversity and pollution of water sources, which are sources for human consumption and irrigation for crops.

124. Absence of adequate infrastructure for the collection, storage and distribution of water resources and inefficient management of irrigation water that puts productivity and food security at risk in a context of climate variability.

125. Most agricultural techniques do not respond to the climatic conditions of the sector, altering the balance of the ecosystem and degrading soil conditions.

Barrier 2: Weakening of information exchange between national and local hydrometeorological systems and networks.

126. The lack of adequate technology and interoperable protocols for the generation, follow-up, monitoring, transmission and interpretation of climate and hydrological information prevents the evaluation and decision-making to define adaptive strategies to reduce the impacts of disasters such as floods or prolonged droughts.

127. Lack of coordination and articulation between national government institutions and subnational governments, to strengthen a single robust hydrometeorological network, which reduces the loss of information from climatic and hydrological stations.

128. Weakening of the water quality monitoring network prevents up-to-date data for efficient decision-making.

Barrier 3: Low participation and lack of coordination among local actors in implementation and cooperation strategies for climate change adaptation measures

129. The lack of coordination between local and national actors hinders the processes to make effective decisions to increase the resilience of the most vulnerable territories to climate threats such as droughts and floods.

130. Weakness in the spaces and processes of articulation and coordination between local and national institutions that have the planning, environmental and productive competence to make decisions in the face of climate threats.

131. The measures implemented have not followed a participatory design process and do not have technical and financial sustainability strategies. This has generated a low level of credibility and legitimacy of local authorities and international cooperation agencies.

132. Although subnational governments have local development plans, they do not have the funding to include climate change variables and cross-cutting approaches such as gender and environmental and social safeguards.

133. The absence of local technical capacities, the lack of participation of government decision-makers, and the weakness of a legal status of the technical committees for community and watershed management limit the capacity for articulation, the joint implementation of adaptation measures, and the local climate finance strategy.

134. Populations in the intervention areas face various barriers to adaptation and resilience to climate change, including biophysical dynamics such as environmental degradation and vulnerability to extreme weather events, as well as deep social gaps that encompass poverty and inequality. These complex conditions are compounded by institutional and governance constraints, such as lack of coordination and resources, limited

community participation in decision-making, planning, and generation and use of hydrometeorological information.

B. OBJECTIVES OF THE PROJECT / PROGRAM

135. The goal of the proposal is "Strengthen the resilience and adaptive capacity of the three intervention zones (Machangara and Gualaceo basins; San Lorenzo; Bolívar) and populations vulnerable to climate change through the integration of climate adaptation approaches into local management policies and plans, the implementation of innovative and sustainable measures focused on Water Management, Food Security, Ecosystem based Adaptation, the development of effective hydrometeorological monitoring systems, and the creation of coordination spaces with an inclusive and culturally relevant approach, promoting the participation of all sectors and decision-making based on robust climate data."

136. **Outcome 1:** Promote and encourage local governments to incorporate the climate change approach into management and planning instruments and implement innovative adaptation measures focused on Water Management, Food Security, Ecosystem based Adaptation, increasing the adaptive capacity of the most vulnerable populations.

137. **Outcome 2:** Strengthen and connect local and national hydrometeorological networks, ensuring a robust climate and hydrological information system (stations and monitoring points for water quality and quantity).

Outcome 3: Strengthen spaces for territorial and sectoral articulation and coordination at the local and national levels, as a strategy for the development of public policies, regulations and other management instruments that increase the adaptive capacity of the territories. In addition, encourage these decision-making spaces to have a gender and cultural relevance approach.

C. PROJECT/PROGRAMME COMPONENTS AND FUNDING

COMPONENTS	OUTCOME	OUTPUT	VALUE (USD $)
COMPONENT 1: Planning and management instruments with a focus on climate change and comprehensive, multisectoral and effective adaptation measures for water, food and conservation security.	OC1. A comprehensive, multisectoral and effective process has been established that incorporates the climate change approach into management and planning instruments, along with a portfolio of adaptation measures implemented, which has increased adaptive capacity in the prioritized areas	OP1.1. Management and planning instruments of subnational governments that incorporate the climate change approach, strengthening their adaptive capacity	5,002,049
		OP1.2. Innovative measures implemented in the sectors of water management, food security and ecosystem-based adaptation, increasing adaptive capacity in the areas of intervention.	
COMPONENT 2: Local and national hydro-meteorological monitoring systems that transmit information in real time.	OC2. A strengthened hydro-meteorological monitoring system capable of transmitting climate and hydrological information to the National Network as a measure to increase resilience in the most vulnerable areas	OP2.1. Subnational and national hydrometeorological network strengthened and transmitting data for decision-making to local and national actors	1,793,682
		OP2.2. A system for monitoring the quantity and quality of water established and transmitting updated information to make climate decisions.	

COMPONENT 3. Strengthening of capacities and spaces for articulation and coordination as an adaptive capacity to climate threats such as rains and floods.	OC3. Spaces for articulation, coordination and local and national capacities strengthened, ensuring the implementation of adaptation measures in the areas prioritized by the sectoral adaptation plan.	OP3.1. Decision-making spaces at the local and national levels strengthened and/or created, with a focus on climate, gender, cultural and territorial relevance	1,621,245
		OP3.2. Intersectoral and multilevel technical training plan developed and implemented with considerations of gender equity and interculturality.	
		OP3.3. Strategies and mechanisms developed and executed that allow sustainability, visibility and monitoring of results through technological and economic solutions and communication tools	
Project Execution Cost (9.5%)			799,614
Total Project Cost			9,216,590
Project/program cycle management fee charged by the executing entity (if applicable) (8.5%)			783,410
Amount of funding requested			10,000,000

D. PROJECTED CALENDAR

Milestones	Expected Dates
Start of Project/Programme Implementation	December 2025
Mid-Project Review	June 2028
Project/Programme Closure	December 2030
End-of-Project Evaluation	September 2030

PART II: JUSTIFICATION OF THE PROJECT

A. PROJECT COMPONENTS

138. This proposal has three components, the first is the incorporation of the climate change approach in the management and planning instruments of local governments, encouraging the implementation of innovative adaptation measures focused on water management, food security and ecosystem-based adaptation, in order to increase the adaptive capacity of the most vulnerable populations. The second is to strengthen and connect hydrometeorological networks at the local and national levels, establishing a robust climate and hydrological information system that includes stations and monitoring points to assess water quality and quantity. Finally, the third proposes consolidating spaces for territorial and sectoral articulation and coordination at the local and national levels, as a strategy to develop public policies and regulations that increase the adaptive capacity of the territories, also promoting that these decision-making spaces integrate a gender and cultural relevance approach.

139. COMPONENT 1.- PLANNING AND MANAGEMENT INSTRUMENTS WITH A FOCUS ON CLIMATE CHANGE AND COMPREHENSIVE, MULTISECTORAL AND EFFECTIVE ADAPTATION MEASURES FOR WATER, FOOD AND CONSERVATION SECURITY.

140. Outcome 1 - A comprehensive, multisectoral and effective process has been established that incorporates the climate change approach into management and planning instruments, along with a portfolio of adaptation measures implemented, which has increased adaptive capacity in the prioritized areas.

141. Technical assistance will be provided, and technical processes will be developed to incorporate climate change variables, gender approach and cultural considerations into the territorial management and planning instruments of subnational governments. This would guarantee more resilient territorial planning with climate considerations and a gender approach.

142. To increase adaptive capacity in the face of climate change, innovative measures will be developed and implemented, such as the construction of green and blue infrastructure, including filtering galleries and barriers for the collection, storage, and distribution of water.

143. Collaboration with local communities will be essential to promote participation and knowledge on sustainable water management techniques, reducing vulnerability to droughts and extreme events.

144. Several measures focused on the conservation of natural resources and sustainable management of the territory will be implemented for the conservation of water recharge areas, such as conservation and restoration, including reforestation in the upper parts of “REPRESA la Esperanza and the Pacoche Forest and in the Paramo of the upper basin of the San Francisco Santa Barbara and Machangara rivers.

145. Training will be provided to farmers on efficient and sustainable irrigation techniques, increasing agricultural productivity and food security.

146. Various measures will be implemented to strengthen the local economy and community resilience. Agro-productive systems will be improved through the adoption of agroforestry and agrosilvopastoral practices, and a management plan for these systems will be developed, ensuring sustainable and efficient management of natural resources.

147. It focuses on the implementation of a comprehensive and multisectoral action plan that includes efficient water and soil management practices that strengthen adaptive capacity in the prioritized areas, which allows reducing climate risk in the most vulnerable communities with a systemic approach to address the problems of water scarcity, food insecurity and ecosystem degradation.

148. The three areas of intervention share the impact of rainfall variability in climate change scenarios, which affects environmental, economic and social development. The Machangara and Gualaceo river basins are part of the Paute River basin, which provides a large percentage of the country's hydroelectricity generation. On

the other hand, San Lorenzo (Manta Canton) and Calceta (Bolívar Canton) depend mainly on these sources for their drinking water supply and irrigation. In addition, the La Esperanza dam regulates the Carrizal River, mitigating flooding and water shortages. To address these challenges, a comprehensive action plan is proposed.

149. **Output 1.1.-** Management and planning instruments of subnational governments that incorporate the climate change approach, strengthening their adaptive capacity.

150. **Output 1.2.-** Innovative measures implemented in the sectors of Water Management, Food Security, Ecosystem based Adaptation, increasing the adaptive capacity in the areas of intervention.

151. COMPONENT 2.- LOCAL AND NATIONAL HYDRO-METEOROLOGICAL MONITORING SYSTEMS THAT TRANSMIT INFORMATION IN REAL TIME.

152. Outcome 2.- A strengthened hydro-meteorological monitoring system capable of transmitting climatic and hydrological information to the National Network as a measure to increase resilience in the most vulnerable areas.

153. The monitoring system of local hydrometeorological stations will be strengthened through the implementation of new technologies and the optimization of data collection and analysis procedures, improving the capacity to respond to extreme weather events and facilitating informed decision-making for the management of water resources.

154. This network will include the installation of modern stations at strategic points, selected based on scientific and technical criteria to maximize the relevance and usefulness of the data collected, as well as the adoption of advanced remote monitoring technologies, ensuring wider coverage and high-quality data.

155. The repowering of the water quality and quantity monitoring points will be carried out, which will involve the updating and modernization of the equipment used for the collection of hydrological data.

156. This process will include replacing obsolete instruments with state-of-the-art technology, capable of providing more accurate and real-time data on water quality (parameters such as pH, turbidity, pollutants) and the amount of water (flow levels and volume).

157. Standardized protocols will be established for the collection, analysis, and reporting of data, thus facilitating greater coherence and reliability in the information obtained. This strengthening will allow for more thorough and continuous monitoring of water bodies, providing essential data for the conservation and sustainable management of water resources.

158. **Output 2.1.-** Subnational and national hydrometeorological network strengthened and transmitting data for decision-making to local and national actors.

159. **Output 2.2.-** A system for monitoring the quantity and quality of water established and transmitting updated information to make climate decisions.

160. COMPONENT 3.- STRENGTHENING OF CAPACITIES AND SPACES FOR ARTICULATION AND COORDINATION AS AN ADAPTIVE CAPACITY TO CLIMATE THREATS SUCH AS RAINS AND FLOODS

161. Outcome 3.- Spaces for articulation, coordination and local and national capacities strengthened, ensuring the implementation of adaptation measures in the areas prioritized by the sectoral adaptation plan.

162. It focuses on establishing and/or improving spaces where decisions are made in the face of climate threats, ensuring that these processes have a climate focus, are inclusive and consider gender, cultural and territorial perspectives.

163. This ensures that decisions reflect the needs and realities of different communities and groups, providing for the efficiency and relevance of climate change adaptation measures.

164. Strengthening local committees will facilitate coordination between communities in prioritized areas, ensuring that adaptation actions are effective and aligned with local needs.

165. A program will be developed to strengthen technical capacities in climate change covering various sectors and levels of government, integrating principles of gender equity, respect for cultural diversity and consideration of different generations.

166. An exhaustive diagnosis of the cost-benefit of the measures implemented to guarantee their sustainability will be carried out. This analysis will make it possible to assess the economic viability of the actions and ensure that the resources are used efficiently and effectively.

167. Edu-communication, environmental and gender plans will be designed and implemented to strengthen education and awareness in these areas, through educational materials that inform and sensitize the community, integrating the gender perspective and care for the environment in all communication and education activities to promote positive and sustainable changes.

168. A communication and visibility strategy of results with local, national and international scope will be executed, including participation in strategic events to multiply the reach, such as the Conferences of the Parties (COPs) so that the results achieved can be replicated and scaled.

169. A computer tool will be developed to facilitate the reporting, monitoring and systematization of the results of the project. This tool will be essential for monitoring progress, assessing impact, and ensuring transparency and accountability in all phases of the project.

170. **Output 3.1.-** Decision-making spaces at the local and national level strengthened and/or created, with a focus on climate, gender, cultural and territorial relevance.

171. **Output 3.2.-** Intersectoral and multilevel technical training plan developed and implemented with considerations of gender equity, interculturality.

172. Output 3.3.- Strategies and mechanisms developed and executed that allow sustainability, visibility and monitoring of results through technological and economic solutions and communication tools.

B. ECONOMIC, SOCIAL AND ENVIRONMENTAL BENEFITS

173. The project will contribute to the goal of the National Adaptation Plan to reduce the vulnerability of communities and reduce biophysical climate risk in the water basins of the Carrizal River, which includes the La Esperanza Dam in the canton of Bolívar and the Pacoche Protective Forest in the parish of San Lorenzo in the canton of Manta, province of Manabí, as well as the upper basin of the Paute River in the Gualaceo River basin (San Francisco and Sta. Barbara rivers) and the Machangara River sub-basin in the province of Azuay.

174. It is estimated that the proposal will directly benefit at least 36,071 people representing 12,000 families in the 3 intervention areas, of which 52.28% are rural women.

175. An articulated and coordinated process will ensure the participation of all stakeholders, promoting inclusive decisions that respect the rights and needs of local communities, thus strengthening the social fabric and fostering cohesion.

176. The monitoring system will allow for continuous assessment of the state of water resources and their use, facilitating the early identification of problems and the implementation of corrective measures, which contributes to environmental sustainability.

177. Adaptation actions, such as the implementation of sustainable agricultural practices and the improvement of watershed management and drinking water supply, not only will increase the resilience of communities to extreme weather events, but also protect ecosystems.

178. In addition, the promotion of the conservation of ecosystems, also is expected to generate income through ecotourism and sustainable agricultural production, creating economic opportunities that benefit local communities. Together, these elements create a virtuous cycle that enhances sustainable development, improves people's quality of life and protects the environment.

Economic Benefits

179. An integrated, comprehensive and sustainable watershed management will ensure a more consistent water supply during periods of drought where agriculture is highly dependent on rainfall, and is expected to increase agriculture productivity, resulting in higher incomes and economic stability for rural communities.

180. The management of the Paute River Basin reduces erosion, landslides and sedimentation, which guarantees the availability of the flow necessary for the generation of hydroelectric energy. This not only contributes to associated power purchase costs, but also minimizes the risk of damage to hydropower plant infrastructure and reduces turbine maintenance periods.

181. Forest restoration initiatives, agro-productive systems, green and blue infrastructure, greenhouses, irrigation systems, innovative measures for drinking water systems, watershed management model together can be leveraged as sustainable projects that would generate income and increase production and productivity. By integrating these elements, an integral model is created that benefits both the local community and the natural environment, promoting responsible, transparent and sustainable economic development.

182. Implementing sustainable agro-productive systems allows for reduced operating costs in terms of lower input use and labor savings. By improving soil health and increasing soil fertility through sustainable practices, the need for expensive fertilizers and pesticides is reduced. On the other hand, the implementation of techniques that require less manual labour, such as no-tillage, reduces the need for manual labour, which translates into significant savings.

183. Tree planting in the Bolivar project. Considering that within the area of influence of this project, half of the economically active population works as day labourers or labourers, the integration of this workforce into the new productive projects can have positive repercussions in increasing the livelihoods of the households of these workers and in the medium and long term overcome conditions of income poverty or consumption poverty.

184. Establish hydro-meteorological monitoring systems to regulate water flow according to rainfall, irrigation and human consumption needs. This will help to prevent floods and to optimize the use of water resources, directly related to saving economic resources from crop losses due to lack or excess of water.

Social Benefits

185. Improvements in the use and consumption of quality water have as subsequent benefits a series of avoided costs, including a decrease in public spending on health for acute diarrheal disease (ADD) care, and a decrease in health care costs in cases of malnutrition and malnutrition. These types of economic benefits are not only short-term, but their potential is also strengthened in the long term, especially in parameters related to school performance and the labour market in the case of children suffering from chronic malnutrition.

186. From a social perspective, the increase in drinking water coverage in the rural area of Manta that will occur with the San Lorenzo project and the provision of water for human consumption in Calceta improves the quality of life of the communities by guaranteeing equitable and sustainable access to drinking and irrigation water. These benefits respond to the fact of the low coverage of the drinking water network faced by the communities in the areas of influence of both projects.

187. In addition, the increase in the coverage of drinking water services immediately reduces the incidence of poverty due to unsatisfied basic needs; It should be noted that of the five components that allow the estimation of this type of poverty, the one related to drinking water coverage is the one that has the greatest preponderance in the poverty indicator; for example, with data from the 2010 census and performing a simulation of absolute coverage of drinking water services in Ecuador, the incidence of poverty by NBI would decrease from 60% to 35%.

188. The same axis, the experience of participatory local governance of the Machangara River Basin Conservation Committee has been highlighted for its effectiveness in the sustainable management of water resources

during the last 20 years, since its governance model is replicable for the sustainable management of other water basins.

189. The proposal to transfer this knowledge to the Paute, Carrizal and Pacoche river basins is a key component to replicate the success and promote sustainable practices throughout the country. This exchange of experiences strengthens local capacities and ensures that adaptation strategies are effective and adapted to the specific conditions of each region.

Environmental Benefits

190. Watershed protection and restoration are essential to maintaining the ecosystem services these regions provide, including the regulation of the hydrological cycle and the conservation of biodiversity.

191. Reforestation projects with native species and the rehabilitation of degraded ecosystems help mitigate climate change by absorbing carbon dioxide and improving the resilience of ecosystems. These efforts are particularly important in a country like Ecuador, where biodiversity is an invaluable resource and deforestation poses a significant threat.

192. Restoration conservation initiatives help restore degraded ecosystems and promote long-term sustainability.

193. The comprehensive approach to resilient infrastructure for communication and tourism will promote the conservation of ecosystems and biodiversity, educating visitors and residents about the importance of the environment, impacts and adaptation to climate change.

C. COST-EFFECTIVENESS OF THE PROPOSED PROJECT

194. The cost-effectiveness analysis of the adaptation measures proposed in each of the intervention areas incorporates a systemic approach that integrates reforestation, agroforestry, conservation, drinking water systems, irrigation, resilient infrastructure (where applicable), income diversification and enhance social, environmental and economic benefits.

195. In the context of the Bi-national project financed by the AF and implemented by the WFP, climate change adaptation measures have been implemented in the water management sector. The analysis of the cost of the investment made in the water systems, their operation and maintenance costs and projected benefits over 20 years discounted at the opportunity cost has a cost benefit ratio of 1.63, i.e. for every dollar invested, USD 1.63 is recovered, with a profit of 0.63 per dollar. Therefore, it was a profitable investment, which is explained by the well-being of the families by preparing their food with clean water, decreasing diseases and improving accessibility for food security.

The resilient integrated plots measure has had a significant impact in terms of savings on food purchases, strengthening the food security pillar of access. The projected benefits over 20 years have a cost-benefit ratio of 2.04, i.e. for every dollar invested, USD 2.04 is recovered with a profit of USD 1.04 per dollar, making it a profitable investment. This is explained by the well-being of the families by producing a variety of foods that have allowed them to diversify their diet, generating savings in the purchase of food, transport and time. An important improvement is perceived in households with a high dietary diversity, 84% of the total number of families, improving accessibility for food security.

COMPONENTS / OUTCOMES / OUTPUTS	JUSTIFICATION
COMPONENT 1: Planning and management instruments with a focus on climate change and comprehensive, multisectoral and effective adaptation measures for water, food and conservation security. OC1. A comprehensive, multisectoral and effective process has been established that incorporates the climate change approach into management and planning instruments, together with a portfolio of	It will develop and implement a Comprehensive and Integrated Action Plan to increase adaptive capacity in priority areas in the face of climate change. This component will focus on the implementation of innovative actions and measures in key sectors such as water, agriculture, and conservation. Restoration and reforestation with native species, as well as the rehabilitation of altered ecosystems, will contribute to

adaptation measures implemented, which has increased adaptive capacity in the prioritized areas. OP1.1. Management and planning instruments of subnational governments that incorporate the climate change approach, strengthening their adaptive capacity. OP1.2. Innovative measures implemented in the sectors of water management, food security and ecosystem-based adaptation, increasing adaptive capacity in the areas of intervention.	conserving forests, maintaining the hydrological cycle and controlling erosion in watersheds. These actions will not only improve water quality and protect against soil erosion but will also generate economic benefits such as ecotourism and the sale of sustainable forest products as well as the promotion of alternative marketing circuits. The comprehensive assessment of the feasibility and implementation of resilient infrastructure will ensure that adaptation measures are effective and sustainable in the long term. Conservation of sensitive areas will protect against natural disasters and reduce associated recovery costs, ensuring the resilience of local communities.
COMPONENT 2: Local and national hydro-meteorological monitoring systems that transmit information in real time. OC2. A strengthened hydro-meteorological monitoring system capable of transmitting climatic and hydrological information to the National Network as a measure to increase resilience in the most vulnerable areas OP2.1. Strengthened subnational and national hydrometeorological network and transmitting data for decision-making to local and national actors. OP2.2. A system for monitoring the quantity and quality of water established and transmitting updated information to make climate decisions.	A monitoring and visibility system for the results of the project will be implemented, which is crucial to ensure efficient and sustainable management of water resources. This component will include the strengthening of the national hydrometeorological network and the implementation of a water quality monitoring system. The infrastructure of monitoring the field capacity of the soil, using innovation and technological development, will optimize the utilization of water resources in irrigation, resulting in greater efficiency and cost reduction. The ability to monitor soil conditions and water quality in real time will allow informed and adaptive decisions to be made, reducing the vulnerability of communities to extreme weather events and minimizing related losses. In addition, this monitoring system will facilitate the visibility of the results, ensuring transparency and accountability in the management of water resources.
COMPONENT 3. Strengthening of capacities and spaces for articulation and coordination as an adaptive capacity to climate threats such as rains and floods. OC3. Spaces for articulation, coordination and local and national capacities strengthened, ensuring the implementation of adaptation measures in the areas prioritized by the sectoral adaptation plan. OP3.1. Decision-making spaces at the local and national levels strengthened and/or created, with a focus on climate, gender, cultural and territorial relevance. OP3.2. Intersectoral and multilevel technical training plan developed and implemented with considerations of gender equity and interculturality. OP3.3. Strategies and mechanisms developed and executed that allow sustainability, visibility and monitoring of results through technological and economic solutions and communication tools	Establishing effective implementation protocols and processes is essential to improve water resource management in watersheds. This component will focus on strengthening decision-making spaces at the local and national levels, ensuring a gender approach and cultural and territorial relevance. The creation of interdisciplinary committees in the identified priority areas will contribute to improving coordination between different actors involved in water management, promoting more inclusive and participatory governance. This will allow for more informed and efficient decision-making, reducing costs associated with inefficient water management and lack of coordination. The intersectoral and multi-level training plan will strengthen the capacities of all relevant actors, ensuring that climate change adaptation measures are effective and sustainable. The mechanisms for the sustainability of the initiatives implemented in the territory will guarantee that the actions undertaken are lasting and effective in the long term.

D. ALIGNMENT WITH NATIONAL AND SUBNATIONAL DEVELOPMENT STRATEGES

PLANS / STRATEGIES	ALIGNMENT	COMPONENT
Constitution of Ecuador	Article 414 establishes that the State must take appropriate and cross-cutting measures to mitigate climate change and protect the population at risk. Chapter Four sets out the rights of communities, peoples, and nations. Specifically, in Article 57, the Constitution	Comp. 3

	details the right of Afro and indigenous populations to freely maintain, develop and strengthen their identity, ancestral traditions and forms of social organization.	
Ecuador's National Climate Change Strategy	The National Climate Change Strategy (ENCC), through Ministerial Agreement 095, promotes the incorporation of climate change and risk management in different economic sectors to improve emergency preparedness, response and recovery capacities. The Decentralized Autonomous Governments (GADs) submit their climate change plans, programmes, and strategies to the national government for approval, in order to be incorporated into the national climate change plan.	Comp. 2
National Plan for Adaptation to Climate Change (NAP)	This Plan is the basis for the progressive strengthening of the technical, environmental, social, economic and political scenarios for the management of adaptation in the country, aspects that are fundamental for the updating of the following Plans, and the gradual scaling up of inputs such as climate risk analysis, adaptation measures and financing mechanisms to ensure the sustainability of multiscale and multi-stakeholder interventions.	Comp. 1
Gender and Climate Change Action Plan in Ecuador	It allows an opening to understand the impacts associated with and identified based on the climate threat, showing an approach to the gender perspective in the socioeconomic and climate change context.	Comp. 3
Nationally Determined Contribution	The goal of Ecuador's NDC is to implement policies, actions, and efforts to reduce greenhouse gases, and increase resilience to climate change in priority sectors, according to the National Climate Change Strategy. These measures will be based on the strategic lines and measures detailed in the document. Ecuador seeks to meet its obligations under the Paris Agreement	Comp. 1 Comp. 2
The Climate Finance Strategy.	The EFIC presents three strategic lines of action that outline its implementation: Clear and effective governance of climate finance. Consolidation of a financial system that integrates the climate approach across the board. Effective and efficient access, management, allocation and mobilization of climate finance. These include 83 actions to be implemented in the short term (until 2023), medium term (until 2026) and long term (until 2030) Actors and institutions from the public sector (national and subnational), private, financial, civil society, international cooperation, academia, and indigenous peoples and nationalities. The EFIC will strengthen and expand the formulation and execution of climate change mitigation and/or adaptation projects. Achieve climate-resilient development, low in emissions and without compromising national efforts.	Comp. 3
National Irrigation and Drainage Plan	The plan as a mechanism for adaptation to Climate Change establishes a fundamental relationship between water resources and agriculture. Its importance is highlighted in its ability to reduce economic losses and promote agro-productive development. Agriculture responds to climate challenges by optimizing water and adjusting agronomic practices. Strategies such as changes in planting dates and the technification of irrigation are essential to deal with the water deficit.	Comp. 1 Comp. 2

	In communities where it was not previously required, irrigation has taken on a fundamental role, evidencing its importance in agricultural sustainability and increasing farmers' incomes	
National Agricultural Plan	The strategic vision of the state policy for Ecuadorian agriculture 2020-2030 is to achieve within this period the prosperity of Ecuadorian agriculture under the focus of quality and sustainability.	Comp. 1 Comp. 2

E. COMPLIANCE WITH RELEVANT NATIONAL TECHNICAL STANDARDS

COMPONENTS / OUTCOMES / OUTPUTS	RELEVANT REGULATIONS, STANDARDS AND PROCESSES ALIGNED WITH AF PRINCIPLES	COMPLIANCE, AUTHORIZED PROCEDURES
COMPONENT 1: Planning and management instruments with a focus on climate change and comprehensive, multisectoral and effective adaptation measures for water, food, and conservation security. OC1. A comprehensive, multisectoral and effective process has been established that incorporates the climate change approach into management and planning instruments, together with a portfolio of adaptation measures implemented, which has increased adaptive capacity in the prioritized areas.	Organic Environmental Code (2017); Law on Agricultural Promotion and Development; Law on Water Resources, Water Uses and Exploitation (2014); Regulations to the Water Resources Law; Technical Regulations for Water Resources Management; Municipal Ordinances on Water Resources Management; National Watershed Plan; National Irrigation and Drainage Plan; Regulation of Studies and Projects of Water Resources; Regulations for the Protection and Conservation of Watersheds; Regulations for the Integrated Management of Water Resources; National Agricultural Strategy for Rural Women (2020); Forest Plantation Regulations; National Reforestation Plan (PNR); National Forest Restoration Policy; Forestry Law and Conservation of Natural Areas and Wildlife; National Plan of Protected Areas (PNAP); Regulations of the National System of Protected Areas; National Biodiversity Policy	The results and outputs are rigorously aligned with all national technical regulations, especially those related to practical adaptation measures, such as reforestation, restoration, forest conservation, watershed management, drinking water supply, sanitation and crop loss reduction.
COMPONENT 2: Local and national hydro-meteorological monitoring systems that transmit information in real time. OC2. A strengthened hydro-meteorological monitoring system capable of transmitting climatic and hydrological information to the National Network as a measure to increase resilience in the most vulnerable areas	Standards of the National Institute of Meteorology and Hydrology (INAMHI): Regulate the operation and maintenance of meteorological and hydrological stations in the country. Standards of the National Water Information System (SENAGUA): Regulate the collection, management and dissemination of information on water resources. Water Resources, Water Uses, and Exploitation Law (2014): Regulates the use, conservation, management, and administration of water resources, including the monitoring and control of water resources at the national and subnational levels. Organic Environmental Code (2017): Establishes provisions for the conservation and sustainable management of natural resources, including environmental and climate monitoring. Regulations to the Water Resources Law, Water Uses and Exploitation: Details the procedures and mechanisms for the implementation of the Water Resources Law, including monitoring and control aspects.	Ongoing consultations with relevant authorities will be carried out at all stages of programme design and implementation to ensure that all activities comply with applicable national technical regulations. WFP, through its current interventions, maintains agreements with INHAMI, an entity that has a mandate to monitor hydro-meteorological information.

	National Climate Change Policy: Establishes guidelines for climate change adaptation and mitigation, including hydro-meteorological monitoring. Ecuadorian Technical Standard INEN 1108: Drinking Water. Requirements (2014): Defines the quality parameters for drinking water, ensuring its suitability for human consumption. Ecuadorian Technical Standard INEN 2169: Water Quality. Guide to Water Quality Sampling (1998): Establishes procedures for water quality sampling, ensuring consistency and accuracy in analyses. Water Quality and Pollution Control Technical Standards Regulation (2015): Details water quality standards and procedures for controlling water pollution. Ministerial Agreement No. 097-A (2015): Establishes the permissible limits for the discharge of liquid effluents into bodies of water and public sewerage systems. National Water Quality Plan (2017): Provides a comprehensive strategy to improve and maintain water quality in the country.	
COMPONENT 3. Strengthening of capacities and spaces for articulation and coordination as an adaptive capacity to climate threats such as rains and floods. OC3. Spaces for articulation, coordination and local and national capacities strengthened, ensuring the implementation of adaptation measures in the areas prioritized by the sectoral adaptation plan.	National Plan for Adaptation to Climate Change Constitution of the Republic of Ecuador (2008): Articles 12, 313 and 318: Establish that water is a fundamental human right and a strategic heritage of the country, guaranteeing its participatory and sustainable management. Organic Law on Water Resources, Water Uses and Exploitation (2014): Articles 3, 4, 56 and 57: Promote citizen participation and social organization in the management of water resources, including the creation of water boards and user committees. Organic Law on Citizen Participation (2010): Articles 1, 6 and 7: Establish mechanisms for citizen participation in public management, including water management. Organic Environmental Code (2017): Articles 19 and 20: Promote the participation of communities in the conservation and management of natural resources, including water. Regulations to the Organic Law on Water Resources, Water Uses and Exploitation (2015): Articles 15 and 16: Detail the organization and functions of water boards and other forms of social organization for water management. Executive Decree 123 (2017): Establishes guidelines for community management of drinking water and sanitation. Organic Law on Territorial Planning, Land Use and Management (2016): Articles 31 and 32: Promote the comprehensive and participatory management of natural resources, including water, in the field of territorial planning	The project aligns with the priorities of the NAP, addressing biophysical climate risks and social vulnerability through a comprehensive approach that includes watershed management, ecosystem restoration, and the implementation of monitoring infrastructure. By integrating national technical regulations and ensuring continuous consultation with the relevant authorities, the project ensures compliance with environmental regulations and the effectiveness of adaptation measures.

F. DUPLICATION WITH OTHER FUNDING SOURCES

196. The Intergovernmental Panel on Climate Change (IPCC) Report highlights that the Andean region, where Ecuador is located, is particularly susceptible to changes in climate, exacerbating food insecurity and economic challenges for the most vulnerable populations (IPCC, 2019). The country faces serious threats related to rising temperatures, changes in precipitation patterns, increased frequency and intensity of extreme weather events such as; floods, droughts, and landslides (MAATE, 2021).

197. Ecuador should receive approximately 2,500 million dollars per year to effectively implement its climate change adaptation and mitigation policies. On the contrary, to date, it has only received around 200 million dollars per year, which shows a financing gap of 2,300 million dollars each year (MAATE, 2021).

198. Within the framework of the multi-criteria analysis carried out for the selection of the area of intervention, the existence of different projects and programs implemented in the municipalities prioritized for this proposal is an opportunity for the Government of Ecuador to scale up current investments and generate maximum impacts by establishing synergies between ongoing initiatives.

INSTITUTION	RELEVANT INITIATIVES	COMPLEMENTARITIES, EVIDENCE / LESSONS LEARNED, AND POTENTIAL PARTNERSHIPS (AVOIDANCE OF DUPLICATIONS)
Government of China/WFP	Sustainable, Resilient and Nutritious Agri-Food Systems with Equity Project "Rice – Duck".	The project was developed in five provinces of Ecuador (Guayas, Manabi, Los Rios, El Oro y Loja), with the aim of increasing productivity and diversifying crops to improve the food and nutritional security of families. Measures include phasing out fertilizers and herbicides, incorporating ducks into rice cultivation, implementing agroecological practices, and diversifying incomes. In addition, learning communities were formed on topics such as farm planning, agroecological production, marketing and food security. The project was supported by the Government of the People's Republic of China and the Ministry of Development and Rural Affairs of Ecuador.

Adaptation Fund	Building capacities for adaptation to climate change through food and nutrition security actions in vulnerable Afro-descendant and indigenous communities located in the border area between Colombia and Ecuador	The experiences of the Awa indigenous nationality and Afro-descendants provide remarkable lessons learned: 1. **Safe water systems**: Reduced water time by up to 26 hours per month for 10,500 residents in 42 communities. 1. **Women**'s participation: Women's leadership on water boards has increased to 45%, improving community management. 2. **Food security**: 2,700 people in 16 communities have improved their agricultural production, saving up to 55 hours and $38 per family, with a significant increase in food consumption and diversity. 3. **Environmental conservation**: 15,600 hectares of ecosystems are protected and 5,500 farmers receive climate bulletins. Lessons learned that would serve as an example for the intervention of the Adaptation Fund in the three prioritized areas: the upper basin of the Machangara River, the upper basins of the Santa Barbara and San Francisco rivers (Azuay), and the areas of San Lorenzo and Calceta-Bolívar (Manabí).
IKI-BMUV	Regional Programme Scaling Up Ecosystem-Based Adaptation Measures in Rural Latin America (Ecuador, Costa Rica, Guatemala)	Scaling up the EbA approach to increase the resilience to climate change of vulnerable communities and ecosystems in rural areas of the province of Manabí with the aim of: a) Strengthening local, subnational, national and regional governance to scale ecosystem-based adaptation measures in a social, conflict-sensitive and gender-transformative manner, b) Implementing effective and sustainable CCA-EbA measures in vulnerable communities and ecosystems and c) Strengthening the individual, organizational and institutional capacity of key actors for the implementation and scaling up of CBA-EbA considering the dimensions of d) Strengthen capacities in the flow of financial resources for CabE PCA measures and access to financing for indigenous and non-indigenous men and women. In the province of Manabí, synergies will be generated in relation to local governance and exchange experiences on capacities to implement effective and sustainable measures based on nature and vulnerable ecosystems. The project is supported by the Institute for International Cooperation on Biodiversity and the Environment (IKI) and the German Federal Ministry for the Environment, Nature Protection and Nuclear Safety (BMUV), implemented by GIZ and IUCN, which will run until August 2026.
Funding: IKI-BMU	Project: Implementation and Financing of Ecosystem-Based Adaptation (EbA) by the Agri-Food Sector to Reduce Climate Risk and Environmental	The project aims to transform conventional agriculture to regenerative agriculture, a transition that will support the achievement of key biodiversity and climate adaptation goals, and drive climate mitigation in agricultural systems. By ensuring that the value of ecosystem services and benefits to

	Impacts in Latin America-Future Landscapes	people are considered in the planning and implementation of viable agriculture-based economies, the resilience of rural communities to climate change will be strengthened. There is a clear co-dependency between EbA and agricultural production systems, and this project seeks to implement Regenerative Agriculture and Livestock (R2A) at scale that allows increasing agricultural production, restoring degraded soils, increasing water security and carbon sequestration, while developing climate change adaptation tools for communities. The project will be implemented until May 2028, in the provinces of Manabí, Pichincha, Guayas, and Los Ríos. Project with which synergies will be articulated in the province of Manabí. The project is supported by the Institute for International Cooperation on Biodiversity and the Environment (IKI) and the German Federal Ministry for the Environment, Nature Protection and Nuclear Safety (BMUV), implemented by**: THE NATURE CONSERVANCY - TNC**

G. KNOWLEDGE MANAGEMENT AND LEARNING TO CAPTURE AND DISSEMINATE LESSONS LEARNED

199. The project will develop a knowledge management, communication and visibility strategy as part of the capacity building component for water resource management, which is expected to support the fulfillment of the planned results per component, with the following objectives:

TYPE	TOOL	DESCRIPTION	LINK
VISIBILITY	Life stories	Stories and testimonies of project beneficiaries and the impact on their livelihoods	https://es.wfp.org/historias/el-manglar-produce-nuestra-comida-es-nuestra-vida
	Informational Videos	Audiovisual material that compiles progress and testimonies of the implementation of the project	https://www.youtube.com/watch?v=OS_b2Buy4dg
COMMUNICATION / Channels	IG-WFP Ecuador account publications	Official Instagram account of the World Food Programme Ecuador	https://www.instagram.com/wfp_ecuador/
	X-WFP Account Publications	Official account in X of the World Food Programme Ecuador	https://x.com/WFP_Ecuador
	Audiovisual material on YouTube WFP-Ecuador	WFP Ecuador's official account on YouTube	https://www.youtube.com/@wfpecuador2667

H. CONSULTATION PROCESS DURING THE PREPARATION OF THE CONCEPT NOTE

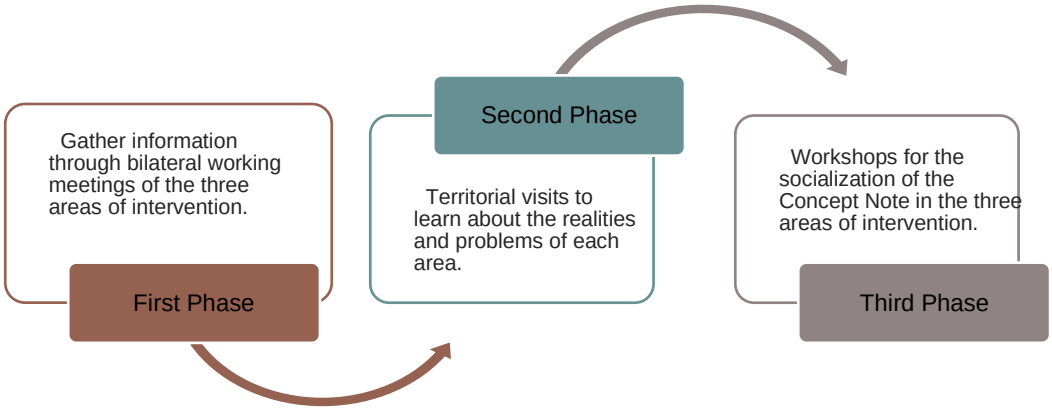

Figure 12. Phases of the socialization process and validation of the Concept Note of the three intervention areas

200. For the design of the Concept Note, three stages of consultation and validation were established led by the Ministry of Environment, Water and Ecological Transition (MAATE), with technical and financial support from the World Food Program (WFP) and the United Nations Program (UNDP).

201. The first phase, from January to June 2024 had the technical support of UNDP, included 7 virtual meetings with local authorities of the four (4) Decentralized Autonomous Governments (GADs) of Cuenca, Gualaceo, Bolívar and Manta and community representatives of water committees and boards to collect accurate information and comply with national regulations on adaptation to climate change.

202. In the second phase, between May and June 2024, four territorial visits were carried out led by the Ministry of Environment, Water and Ecological Transition (MAATE), with support from WFP and the Decentralized Autonomous Governments (GADs). These visits allowed for a detailed understanding of the challenges and opportunities in each area, highlighting the equal participation of women and collaboration with local community leaders.

203. The territorial visits ensured gender equality, with a female participation of approximately 45%. They included decision-makers such as mayors, as well as technical teams from the mayor's offices of Manta, Bolívar, Gualaceo, and the Secretary of the Committee of the Machangara River sub-basin. Personnel from the Ministry of Environment, Water and Ecological Transition also participated.

204. The activity allowed MAATE and WFP to identify in situ the problems and potential solutions in the areas of intervention, as well as to obtain information on possible solutions to mitigate the effects of climate change. This ensured that the information collected in this phase would allow the Concept Note to be aligned with national mandates and plans on climate change.

205. The experiences of the Saucay Association in the Machangara River sub-basin underscored the effectiveness of community governance and sustainable management through women-led agroecological production. The 20-year experience of the Sub-Basin Committee will serve as a model to replicate in other basins, such as those of the Carrizal River, the La Esperanza Dam and the San Lorenzo-Pacoche Protected Forest.

206. During the third phase, a participatory process was carried out to disseminate and validate the Concept Note, led by the Ministry of Environment, Water and Ecological Transition (MAATE) with the technical and financial support of WFP. In coordination with the Decentralized Autonomous Governments (GADs) of Cuenca, Gualaceo, Manta and Bolívar, and following the policies of the Adaptation Fund, four validation workshops were held in the three areas of intervention.

207. WFP, in coordination with MAATE, designed and applied the Andragogical methodology (experiential, didactic, participatory and practical), through 4 workshops developed in situ in the 4 cantons of Cuenca and Gualaceo (Azuay), Bolívar and Manta (Manabí), for which key actors at the community level (water boards

and committees), public (technicians from MAATE and the Ministry of Agriculture MAG) were prioritized. Local Authorities and Technicians of the GADS, civil society organizations, prior to a mapping of actors, which was prepared with the 4 technical focal points (GADS) of each canton. The agenda of each of the workshops was focused on working on the Theory of Change using maps for each area, in which the main climatic and non-climatic threats, assumptions, barriers, and adaptation measures in the face of climate change were identified, and a group dynamic with cultural relevance was developed. all 4 workshops were facilitated by the WFP Team.

208. Each workshop ensured the participation of women, young people. The Committee of the Machangara River in Cuenca, with the participation of academia, agroecological associations, the Prefecture of Azuay, MAATE, MAG and ETAPA, stood out. Representatives of water boards of the San Francisco and Santa Barbara rivers, Fundación Maylas, and leaders of Gualaceo, in the area of Manta and Bolívar, participated Mayor Ledy Muñoz and her technical team, as well as authorities of MAATE.

209. The process of validation ensures that key stakeholders and strategic partners in each area of intervention are actively engaged in the decisions related to adaptation measures to counteract the effects of climate change and strengthen food security and their livelihoods.

210. It should be noted that this participatory process made it possible to listen to the voice of women, to value the knowledge and experience of women leaders, and community leaders. These contributions allowed to identify the main needs and specific concerns that are reflected in the concept note. The process allowed to build a relationship of trust, laying the foundations for an equitable, inclusive, and effective process of implementation.

211. As a result of the process, 110 key local actors, including representatives of water boards and committees, GADs, academia, civil society and central government, participated in the consultation process and validation of the concept note. Among them, 29 women from community associations and GADs highlighted their concerns about climate change, food security, access to clean water, soil deterioration for agriculture and livestock, and the loss of biodiversity in moorlands, riverbanks and marine-coastal areas.

I. JUSTIFICATION OF THE REQUESTED FINANCING

212. Prolonged droughts and floods, especially in the arid and semi-arid agricultural areas of the Paute and Carrizal river basins, will become more severe due to climate change. This will have a significant impact on existing crops, leading to losses or reductions in production and productivity.

213. Soil degradation can lead to the abandonment of agricultural areas, displacement of farmers and unsustainable agricultural practices, such as the destruction of the Paramo to establish new agricultural areas.

214. Therefore, climate variability is a key driver of unsustainable land use, which decreases water quantity and quality, degrades soil, pollutes, and reduces forest cover and other ecosystem services.

215. In this context, it is crucial to adopt an approach that promotes a sustainable combination of techniques and technologies to effectively manage water resources and rehabilitate the soil, thereby improving farmers' resilience and increasing their yields and incomes.

216. The project proposes to implement climate change adaptation measures in four watersheds, guaranteeing access to and sustainability of water resources for agriculture and domestic uses, as well as the rehabilitation of degraded lands, especially in the Paramo area.

217. This strategy offers opportunities to ensure a sustained supply of water resources to watershed dwellers through the implementation of hydro-agricultural infrastructures. It also seeks to conserve and restore affected ecosystems, mainly in the Paramo, through restoration-conservation and reforestation programs, using native species that are resilient to climate change.

218. The project will help beneficiaries better plan their daily and economic activities by strengthening weather and water information, implementing a community-based hydrometeorological information management system, and fostering learning at local, national, and regional levels. This will be achieved through capacity building, partnerships, knowledge sharing, and lessons learned.

Components / Outcomes / Outputs	**Baseline scenario without AF**	**Additionality with AF**
COMPONENT 1: Planning and management instruments with a focus on climate change and comprehensive, multisectoral and effective adaptation measures for water, food and conservation security. OC1. A comprehensive, multisectoral and effective process has been established that incorporates the climate change approach into management and planning instruments, together with a portfolio of adaptation measures implemented, which has increased adaptive capacity in the prioritized areas. OP1.1. Management and planning instruments of subnational governments that incorporate the climate change approach, strengthening their adaptive capacity. OP1.2. Innovative measures implemented in the sectors of water management, food security and ecosystem-based adaptation, increasing adaptive capacity in the areas of intervention.	The increase in temperature causes a reduction in the productivity and production of agri-food systems, which are self-consuming. Sub-national governments do not have management and planning instruments with a climate change focus, so their measures and projects do not consider the climate variable, generating bad decisions and losses in investments. National climate finance is limited, although there is political will and ownership by national and local decision-makers. Beneficiaries ensure the maintenance and sustainability of measures that could be implemented. The absence of preventive measures for the management of riverbanks and the increase of the extensive agricultural frontier causes the accumulation of sediments in the lower basins, affecting the flow for the generation of energy in the Paute hydroelectric complex, which has	Through the financing of the project by the Adaptation Fund, adaptation measures will be implemented in the sectors of water security, food security and conservation of natural resources. For water security, management actions will be implemented for the storage and distribution of water resources, such as barriers, irrigation systems and groundwater extraction. For the conservation of natural resources, reforestation, restoration, sustainable management of the moors and tropical humid forest will be implemented to ensure water quantity and quality. For food security, measures will be implemented to increase crop production,

	generated economic losses in Ecuador.	resilient seed management and water supply through parcel irrigation systems.
COMPONENT 2: Local and national hydro-meteorological monitoring systems that transmit information in real time. OC2. A strengthened hydro-meteorological monitoring system capable of transmitting climatic and hydrological information to the National Network as a measure to increase resilience in the most vulnerable areas OP2.1. Strengthened subnational and national hydrometeorological network and transmitting data for decision-making to local and national actors OP2.2. A system for monitoring the quantity and quality of water established and transmitting updated information to make climate decisions	The generation, processing and transmission of hydrometeorological information is essential for preventive decision-making for identified climate threats. In the absence of climate finance, there is no hydrometeorological network and satellite information is used as a reference. This implies that there is no information on the quantity and quality of water in the prioritized watersheds.	Through the financing received from the adaptation fund, existing local hydrometeorological networks will be implemented and maintained. In some identified areas, technical advice will be provided for the transfer of hydrometeorological stations in order to increase the coverage of the local network.
COMPONENT 3. Strengthening of capacities and spaces for articulation and coordination as an adaptive capacity to climate threats such as rains and floods. OC3. Spaces for articulation, coordination and local and national capacities strengthened, ensuring the implementation of adaptation measures in the areas prioritized by the sectoral adaptation plan. OP3.1. Decision-making spaces at the local and national levels strengthened and/or created, with a focus on climate, gender, cultural and territorial relevance. OP3.2. Intersectoral and multilevel technical training plan developed and implemented with considerations of gender equity and interculturality. OP3.3. Strategies and mechanisms developed and executed that allow sustainability, visibility and monitoring of results through technological and economic solutions and communication tools	In the prioritized areas, spaces for intersectoral and multi-scale articulation have been identified, which articulate and coordinate actions for the management of the watershed. Under the baseline scenario, these coordination spaces will lose the information generated, the capacities acquired will be reduced and strengthened inter-institutional relations will be weakened.	The intervention areas will have transparent and efficient decision-making spaces to improve the investments that are implemented in the territory. The investment of the Adaptation Fund will be focused on a capacity-building program, with modules that technicians demand at the local and national levels. Through the financing of the Adaptation Fund, there will be a communication strategy that allows the results and efficiency of investment to be made visible in different national and international spaces such as the COP on climate change, biodiversity and desertification summit.

J. SUSTAINABILITY OF THE PROJECT

219. The project contemplates coordinated and consensual actions with various actors in 4 water basins where spaces for leadership and coordination will be formed or strengthened for the good use of water resources, management of hydrometeorological information and implementation of adaptation measures.

220. In this sense, the project will promote concerted work agendas with agreed elements and under the responsibility of the actors involved in such a way that the commitments can last over time and are fulfilled.

221. The promotion of a hydrometeorological monitoring system in the 4 water basins, and the proper management of the information generated will allow for a permanent alert system that will also facilitate the detection of

possible water deficits and immediate actions. The timely use of the information generated will allow the actors involved to act in time, so that its use can be extended over time.

222. The process of designing the adaptation measures will contemplate an analysis and specific agreements for their sustainability, so all the mechanisms and prior consensus will be sought to ensure that these measures last over time. The participating actors will be encouraged to contribute at all stages of the measures, aiming to ensure that these actors take ownership of the processes.

K. OVERVIEW OF THE ENVIRONMENTAL AND SOCIAL IMPACTS AND RISKS IDENTIFIED AS RELEVANT TO THE PROGRAM

223. The proposal is designed to achieve significant environmental, social and economic benefits. To achieve these ends, one of the strengths is the high degree of empowerment of local and national authorities as well as civil society organizations.

224. The proposed adaptation measures will be determined in conjunction with local authorities of sub-national governments, water committees and representatives of civil society organizations (foundations), national and sectional authorities, beneficiary family farming associations and participating institutions, ensuring that they are culturally relevant and attuned to the local needs of each of the prioritized areas.

225. In the design stage of the concept note, environmental and social risks were preliminary assessed under the 15 principles established in the Environmental and Social Policy of the Adaptation Fund. During the full proposal preparation, a full environmental and social risk assessment will be performed, and risk mitigation measures will be designed for the risks identified, in line with the Adaptation Fund's and WFP's social and environmental standards. Potential risks were preliminarily identified along with the need for further assessment.

226. A preliminary assessment conducted at the concept note stage has classified the project in Category B.

Environmental and Social Principles Checklist	No additional assessment required for compliance	Potential impacts and risks: additional assessment and management is required to meet requirements
Law Enforcement	x	During the process of developing the proposal in consultation with the relevant national, regional and territorial authorities, it becomes evident that the proposal complies with all national and international legal standards, as well as policies and plans as described in section E. Compliance procedures will be described in greater detail in the full proposal.
Access and Equity	x	The proposal will include transparent processes to ensure that economic, social and environmental benefits are distributed fairly and equitably, excluding no one. Gender, age and ethnicity quotas will be taken into account when selecting the beneficiary population. For an adequate implementation of the adaptive measures, coordinated work with the four local GADs will be key, thus guaranteeing equitable access to the benefits of the project. In addition, adequate dissemination will be ensured through various communication channels. Compliance processes will be further detailed in the full proposal.
Marginalized and Vulnerable Groups	x	Vulnerable populations such as women, youth, migrants, elders and representatives of local communities in the three areas will be consulted during the process of developing the full proposal, to ensure that their needs and threats are included, and to make joint decisions on concrete adaptation actions, valuing their traditional and local knowledge, and that mitigation measures are culturally relevant and responsive to local realities. The proposal will respect property and land use rights, as well as the Land Use and Management Plan (PUGs) and other customary laws.
Human rights	x	The project does not violate human rights standards, nor does it violate rights against nature.

Environmental and Social Principles Checklist	No additional assessment required for compliance	Potential impacts and risks: additional assessment and management is required to meet requirements
		On the contrary, the project seeks to guarantee access to water resources for the inhabitants who are in the delimitation of the watersheds. The proposal will seek to redress disparities in livelihoods, particularly the rights of women and local communities; compliance processes will be further detailed in the full proposal.
Gender Equality and Women's Empowerment		The project will promote women's empowerment through training and capacity building, integrating the gender perspective in all its activities, especially in components 1, 2 and 3, using WFP's "Communication Strategy for Social and Behavioural Change" (SBCC) methodology. It will also promote female leadership in decision-making related to climate change and sustainable governance, strengthening food and nutrition security. Women representatives at the national, Decentralized Autonomous Governments (GADs) and community levels will be consulted, and an initial gender assessment will be conducted to identify the risks of ESP 5 on Gender Equality and Women's Empowerment.
Fundamental Labor Rights		Ecuador has been a member of the ILO since 1934. The country has ratified 62 Conventions (55 in force), including 8 of the 10 fundamental Conventions. The programme will comply with national, international and WFP standards in relation to fundamental labour rights.
Indigenous Peoples		The watersheds that constitute the objective of the project do not have significant indices of indigenous population, information that has been corroborated during the territorial visits, as well as the 4 workshops where it was evidenced that 100% of the population in the 3 areas of intervention self-identifies as a mestizo population. Compliance with this principle will be further detailed in the full proposal, which will make it possible to identify whether there are Afro-descendants, indigenous or Montubios. Should that be the case, a full FPIC process will be carried out.
Involuntary Resettlement	x	No resettlement is envisaged in the implementation of any of the project activities. In the event that a situation of resettlement or economic displacement will arise during the implementation of the project that was not anticipated during the design, WFP will ensure that a consultation and negotiation process is carried out with the potentially affected people, in accordance with the principles of FPIC and national legislation and do not cause harm.
Protection of Natural Habitats		By implementing ecosystem-based adaptation activities, such as restoration - reforestation, water conservation efforts, land rehabilitation for the provision of ecosystem services, the project will ensure the protection of water resources in the upper basins of the Carrizal, Machangara, San Francisco and Santa Barbara rivers. In the same way, it will not have any negative impact on legally protected natural habitats such as the Pacoche Protected Forest. However, during the design of the full proposal, an appropriate Environmental and Social Management Plan (ESMP) will be developed in accordance with the Adaptation Fund ESP guidelines.
Conservation of Biological Diversity		The proposal will carry out consultations with local experts from the GADs, representatives of water boards and committees, and MAATE, to identify areas to be restored with native species. Community management mechanisms will be created to develop soil conservation and recovery plans through reforestation and agroforestry. Interventions will be carried out in compliance with the local PUG, in consultation with the four GADs. During the design of the full proposal, an Environmental and Social Management Plan (ESMP) will be

Environmental and Social Principles Checklist	No additional assessment required for compliance	Potential impacts and risks: additional assessment and management is required to meet requirements
		developed in accordance with the Adaptation Fund ESP guidelines to mitigate conservation risks.
Climate change	x	All components and activities of the project contribute to increasing local capacities to face climate change in the long term and climate variability in the short and medium term. Through the components 1. Strengthened local and national capacities / Governance, 2. Strengthened hydro-meteorological monitoring system and 3. A comprehensive, multisectoral and effective action plan implemented by each intervention area.
Pollution Prevention and Resource Efficiency	x	The components and adaptive measures of the proposal do not involve significant risks of contamination, so no further assessments will be required. An additional evaluation will be carried out at the full design stage of the project to ensure that no risk is generated.
Public health	x	The proposal does not involve risks to public health. Considering that the strengthening of livelihoods such as: the conservation of upper watersheds, the restoration of riverbanks, the recovery of groundwater galleries, the restoration of forest landscapes will contribute to improving livelihoods through climate-resilient agroecological practices will contribute to the strengthening of food and nutrition security in the three areas of intervention.
Physical and Cultural Heritage		Ecuador accepted the Convention on the Protection of the Cultural and Natural Heritage of Humanity in 1975. During the initial design of the proposal, no areas of physical and cultural heritage were identified. However, further assessment will be carried out during full project preparation when specific project activities and sites will be identified. The analysis will guarantee that there are no effects on any physical and cultural site due to the activities of the program.
Land and Soil Conservation		Through the adaptation measures of component 1, this proposal will seek to contribute to the development of the Action Plan for the conservation of paramos in the upper basin of the San Francisco and Santa Barbara rivers, natural regeneration through native forest species. This proposal will give priority to degraded areas affected by climate change, particularly in the upper basins and riverbanks to guarantee water resources for parcel irrigation and the development of activities such as agroforestry, agrosilvopastoral and the development of community agrotourism.

PART III: IMPLEMENTATION ARRANGEMENTS

A. Alignment with the Results Framework of the Adaptation Fund

Project Objective(s)[1]	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Strengthen the resilience and adaptive capacity of the three intervention areas (Machangara and Gualaceo basins; San Lorenzo; Bolívar) and populations vulnerable to climate change through the integration of climate	Number of beneficiary families that have increased their adaptive capacity in the face of identified climate hazards (droughts and floods)	Outcome 7: Improved policies and regulations	7. Climate change priorities are integrated into national development strategy	5,002,049
		Outcome 5: Increasing ecosystem resilience to climate change and	5. Ecosystem services and natural assets maintained or enhanced under climate	

adaptation approaches into local management policies and plans, the implementation of innovative and sustainable measures focused on Water Management, Food Security, Ecosystem based Adaptation, the development of effective hydrometeorological monitoring systems, and the creation of coordination spaces with an inclusive and culturally relevant approach, promoting the participation of all sectors and decision-making based on robust climate data.		environmental stress	change and variability-induced stress	
		Outcome 1: Reduced national exposure to climate-related hazards and threats	1. Relevant threat and hazard information generated and disseminated to stakeholders in a timely manner.	1,793,682
		Outcome 2: Strengthened institutional capacity to reduce risks associated with climate-induced socioeconomic and environmental losses	2.1. Capacity of staff to respond to, and mitigate impacts of, climate-related events from targeted institutions increased	1,621,245
Project Outcome(s)	**Project Outcome Indicator(s)**	**Fund Output**	**Fund Output Indicator**	**Grant Amount (USD)**
OC1. A comprehensive, multisectoral and effective process has been established that incorporates the climate change approach into management and planning instruments, along with a portfolio of adaptation measures implemented, which has increased adaptive capacity in the prioritized areas	Percentage progress in the process of including the climate change approach in management and planning instruments.	Output 7: Improved integration of climate-resilience strategies into country development plans	7.2. No. or targeted development strategies with incorporated climate change priorities enforced	5,002,049
	Percentage of progress in the implementation of climate change adaptation measures	Output 5: Vulnerable ecosystem services and natural resource assets strengthened in response to climate change impacts, including variability	5.1. No. of natural resource assets created, maintained or improved to withstand conditions resulting from climate variability and change (by type and scale)	
OC2. A strengthened hydro-meteorological monitoring system capable of transmitting climate and hydrological information to the National Network as a measure to increase resilience in the most vulnerable areas	Percentage of climate information generated that is used by institutions and individuals for climate change adaptation	Output 1.1: Risk and vulnerability assessments conducted and updated	1.2 No. of early warning systems (by scale) and no. of beneficiaries covered	1,793,682
OC3. Strengthened spaces for articulation, coordination and local and national capacities, ensuring the implementation of adaptation measures in the areas prioritized by the sectoral adaptation plan	Number of spaces for articulation and coordination strengthened for decision-making focused on adaptation to climate change and variability	Output 2.1: Strengthened capacity of national and sub-national centers and networks to respond rapidly to extreme weather events	2.1.1. No. of staff trained to respond to, and mitigate impacts of, climate-related events (by gender)	1,621,245

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

A. Record of endorsement on behalf of the government[2]

Mr. Angel Sandoval *Undersecretary for Climate Change* *Ministry of Environment, Water and Ecological Transition* *angel.sandoval@ambiente.gob.ec;*	Date: *2th September 2024*

B. Implementing Entity certification

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans and subject to the approval by the Adaptation Fund Board, commit to implementing the project/programme in compliance with the Environmental and Social Policy and the Gender Policy of the Adaptation Fund and on the understanding that the Implementing Entity will be fully (legally and financially) responsible for the implementation of this project/programme.

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

<table>
<tr><td colspan="2"> 
Matteo Perrone - Country Director and Representative Ecuador
Implementing Entity Coordinator</td></tr>
<tr><td>Date: 2th September 2024</td><td>Tel. and email:
+593 986006375
matteo.perrone@wfp.org</td></tr>
<tr><td colspan="2">Project Contact Person:
Chiara Pili – Programe Policy Officer
Diego Guzmán - Programme Policy Officer
Carolina Díaz – Partnership Officer</td></tr>
<tr><td colspan="2">Tel. And Email:
+393463414549
chiara.pili@wfp.org
+593 998291681
diego.guzman@wfp.org
+593 996435515
carolina.diaz@wfp.org</td></tr>
</table>

REPÚBLICA DEL ECUADOR

ADAPTATION FUND

Ministerio del Ambiente, Agua y Transición Ecológica

Letter of Endorsement by Government of Ecuador

[2nd September 2024]

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

Subject: **Endorsement for: Integrated and Integrated Management of Water Resources in the watersheds prioritized by the National Adaptation Plan of Ecuador.**

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

Accordingly, I am pleased to endorse the above project proposal with support from the Adaptation Fund. If approved, the project will be implemented by World Food Programme.

Sincerely,

Mr. Angel Sandoval
Undersecretary for Climate Change
Ministry of Environment, Water and Ecological Transition

Dirección: Calle Madrid 1159 y Andalucía
Código postal: 170525 / Quito-Ecuador
Teléfono: +593-2 398 7600
www.ambiente.gob.ec

EL NUEVO ECUADOR

APPENDIX 2. GENDER ASSESSMENT

1. 51.3% of the population of Ecuador are women (8,686,463), of which 35.4% live in rural areas and 64% of rural women live in conditions of poverty with an overall workload 22% greater than that of men and only 27% have access to land ownership. (INEC, 2022 and 2018). Rural women in Ecuador are especially vulnerable to the impacts of climate change due to their dependence on natural resources, as they are the main providers of 60% of subsistence agricultural production. They tend to be more confined to their homes and have less mobility and are unlikely to be able to migrate from areas prone to floods and droughts. In addition, they have low access to information channels and are unlikely to handle climate information to make decisions (ENAMR, 2020).

2. According to the World Economic Forum's 2023 Global Gender Gap Report, Ecuador is ranked 81st out of 153 countries, indicating insufficient progress in reducing the gender gap. In terms of economic participation, Ecuador ranks 94th, reflecting a low representation of women in leadership roles and high levels of female labor informality, women earn on average 21% less than men and at the national level 65 out of every 100 women have suffered some type of gender-based violence at some time in their lives (INEC-Envigmu, 2019).

3. All these gaps limit women's ability to adapt to climate change and affect their well-being and that of their families. Despite being more vulnerable, they can play a crucial role in mitigation and adaptation. The National Plan for Gender and Climate Change seeks to address these inequalities by promoting the equal participation of women and men in decision-making and the implementation of climate actions. This includes climate leadership education and training (MAATE-PAGCC, 2023).

4. The project will seek to offer women and men equal opportunities to create resilience capacity, address their differentiated vulnerabilities and increase their capacity to adapt to the effects of climate change in the prioritized areas of Azuay and Manabí.

5. In the province of Azuay, 72% of women in rural areas work in the informal sector, which implies low income and lack of job security (INEC-ENEMDU, 2022). Male migration to urban areas or abroad exacerbates the situation, leaving women overworked, as they must take on both unpaid household care work (domestic work) and agricultural work. In addition, Azuay shows the highest rates of gender-based violence in Ecuador, about 80 out of every 100 women have experienced some violent event in their lives and 46.2% in the last year. The combination of these factors creates an environment of economic and social precariousness that negatively affects the well-being and development opportunities of rural women in this region.

6. In the approaches maintained, it is observed that there are female figures who stand out, officials of local government institutions whose technical knowledge and leadership are recognized by men and women, however, it should be noted that the majority of representatives of the irrigation boards and other water management committees or producers in rural areas are men, and if there are women, they present themselves as "delegates" of a man who could not attend.

7. In the province of Manabí, the rates of gender-based violence are the lowest in the country, however, there are studies (Fundación Equidad, 2020) that indicate that violence and discrimination are normalized and women do not recognize them as such. The sexual division of labor is normalized, where women are almost exclusively in charge of household care work and are not linked to the labor market, and if they work for an income, they do so in precarious conditions, more than 68% of rural women in Manabí work in the informal sector (INEC-ENEMDU, 2022).

8. In the two prioritized localities of Manabí to implement adaptation measures, the municipal authorities are women, women are also observed in positions of representation of parish governments. Women with expertise in climate change, water supply or production are not seen to participate in decision-making tables, where men are mainly present, so enhancing deliberate actions to train women in technical aspects of climate change will be key.

9. For Azuay and Manabí it will be important to carry out an Analysis of Gender Social Norms that show the root causes of inequalities and provide information to promote gender equality, as contemplated in the planned measures, from the strengthening of capacities for the management of resources, to the planned educational-communication campaigns, as well as those that increase resilience to the effects of climate change.

10. To this end, WFP Ecuador has specialized personnel in the subject (gender focal point) and project personnel specialized and experienced in incorporating the gender approach in previous climate change projects, which is aligned with the Gender Policy of the Adaptation Fund.

11. WFP will provide technical support and gender capacity building to executing entities and local communities and stakeholders. To this end, the full proposal will plan investments from comprehensive models to empower adult and young women to make decisions to adapt to climate change, overcoming gender violence and the sexual division of labor.

APPENDIX 3. Initial Assessment of indigenous people

12. After the territorial visits and the 4 workshops of socialization and validation of the concept note in the three areas of intervention, it was evident that the majority population is mestizo in 92% while the population that self-identifies as indigenous, Afro-Ecuadorian or Montubio is 2% and 6% of the population belongs to another ethnic group.

13. However, according to Ecuadorian legislation, the mestizo ethnic group is also classified as a people with their own and particular practices, customs, and ways of life in each locality. Thus, this rural population is dedicated to agriculture, livestock and community tourism. A population that has also used traditional techniques for decades that have contributed to face the effects of climate change.

14. As for the community or organizational structure, it is based on cooperation, mutual support and often with strong family ties, as has been evidenced in the sub-basin of the Machangara River with the Saucay Association (agroecological producers) and the water boards of the San Francisco River in Gualaceo.

15. In addition, the integration of local knowledge with modern practices is a distinctive feature that can be key to the success of climate change adaptation initiatives. The mestizo people, at the center of this cultural convergence, possess in-depth knowledge of the natural environment and sustainable management techniques that can contribute to implementing effective strategies to address climate challenges in the three prioritized areas.

16. The 2% of the population that self-identified as indigenous or montubio will also be considered for the implementation of adaptive measures with cultural relevance, particularly in the San Lorenzo Parish considering that the main activity is artisanal fishing population that self-identifies as montubio, in the same way the community of El Aromo dedicated mostly to producing the best quality of toquilla straw at the country level and around 60 families represented mostly women are dedicated to this activity, which is marketed to Montecristi and Picoaza to make toquilla straw hats (Panama hats), for whom the bioeconomy is considered an adaptive measure for the empowerment of women as well as a sustainable activity through the sustainable use of biodiversity.

    Following the guidelines of environmental and social safeguards to protect the human and collective rights of indigenous peoples and local communities, the adaptive measures will contribute to mitigating the effects of climate change, respecting their customary rights with cultural and territorial relevance in the three areas of interevent.