



PROJECT CONCEPT NOTE TO THE ADAPTATION FUND

PART I: PROJECT INFORMATION

Project Category: Regular project

Country: Côte d'Ivoire

Title of Project/Programme: Strengthen the resilience of smallholder farmers to the effects of climate change through the adoption of proven innovative technologies and practices.

Type of Implementing Entity: National Implementing Entity

Implementing Entity: Fonds Interprofessionnel pour la recherche et le conseil agricoles (FIRCA)

Executing Entity: Agence Nationale d'Appui au Développement Rural (ANADER)

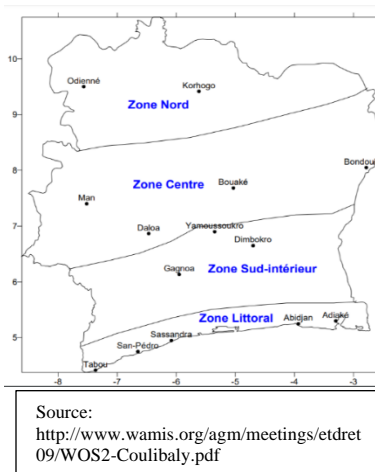
Amount of Financing Requested: US \$ 4,000,000

Project Background and Context:

General overview

Côte d'Ivoire is a country in West Africa that lies along the Gulf of Guinea. It has a total area of 322,462 square kilometers. Mali and Burkina Faso border the country to the north, the Atlantic Ocean to the south, Ghana to the east, and Guinea and Liberia to the west. Plains in the south, highlands in the center, and mountains in the north and west make up the generally uneven landscape, with Mount Nimba serving as the highest point (1,753 meters). The climate is generally hot and humid, ranging from equatorial in the south to tropical in the center of the country and semiarid in the north. Based on biophysical and socioeconomic characteristics, Côte d'Ivoire is split into four major agro-climatic/agro-ecological zones. Zone Nord, Zone Centre, Zone Sud-Intérieur, and Zone Littoral constitute all the zones. The Zone Nord region is characterized by a single rainy season that lasts between 1,000 and 1,400 mm per year and is focused between July and September. The Zone Centre shows a rainfall range of 1,000 to 1,600 mm, allowing for two agricultural cycles per year. Rainfall in the Zone Sud-Intérieur ranges from 1,200 to 1,600 mm, with two rainy seasons (the main one beginning in December and the minor one from August to October) and two dry seasons. Finally, the Zone Littoral has a rainfall of more than 1,600 mm, with two rainy and two dry seasons. Warm and dry (November to March), hot and dry (March to May), and hot and wet (June to October) are the three seasons in total; however, seasons are increasingly shifting due to climate change.

Figure 1. Agro-ecological zones in Côte d'Ivoire



Deforestation is a major problem in the country, with an estimated loss of 200,000 hectares each year¹. Côte d'Ivoire's forest cover has decreased from 16 million hectares to 2 million hectares since the early 1960s. Côte d'Ivoire is on track to lose the entirety of its national forest by 2034 if present deforestation trends continue. The exploitation of the forest for agricultural development, mining, timber and firewood energy (e.g., charcoal used by about 47 percent of the urban population)², as well as bush fires, are the main causes of deforestation. The administrative system in Côte d'Ivoire is comprised of 31 regions divided into 12 districts, as well as two autonomous districts, Abidjan and Yamoussoukro, the capital. Districts are decentralized territorial bodies tasked with leading large projects, superregional planning,

¹ Zero hunger strategic review for Cote d'Ivoire (2018).

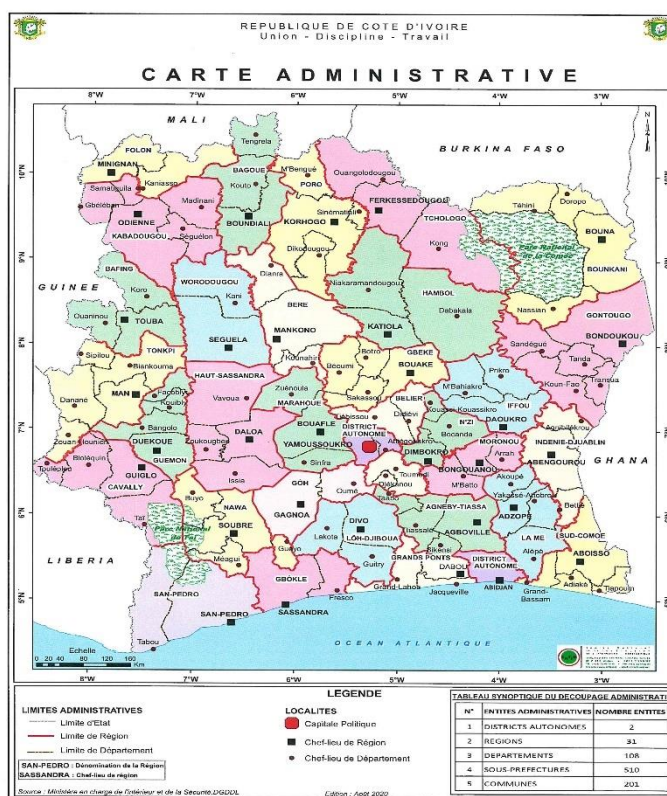
² BNEEDT. 2015. Gestion durable des ressources forestières. Rapport pour les Etats généraux de la forêt, de la faune et des ressources en eau, 31 Juillet 2015 ; 89p

and maximizing the economic potential of their respective regions. The following table lists the several districts and their respective territories.

Table 1. Districts and regions in Côte d'Ivoire

Districts and regions in Côte d'Ivoire	
Districts	Regions
Lacs	Bélier, Iffou, N'zi, Moronou
Comoé	Indenie-Djuablin, Sud-Comoé
Denguélé	Folon, Kabadougou
Gôh-Djiboua	Gôh, Lôh-Djiboua
Lagunes	Agnéby-Tiassa, Mé, Grands ponts
Montagnes	Tonkpi, Cavally
Sassandra-Marahoué	Haut-Sassandra, Marahoué
Savanes	Poros, Tchologo, Bagoue
Bas-Sassandra	Nawa, San-Pedro, Gbôklè
Vallée du Bandaman	Hambol, Gbèkè
Woroba	Béré, Worodougou, Bafing,
Zanzan	Bounkani
Abidjan	Abidjan
Yamoussoukro	Yamoussoukro

Figure 2. Administrative map of Côte d'Ivoire



Source: Third National Communication to the UNFCCC, 2017

Socio-economic context

Côte d'Ivoire is a lower middle-income country with a Gross Domestic Product (GDP) per capita, PPP (current international \$) of USD 17,109.451 in 2020 and plays a key role in transit trade for neighboring, landlocked countries. The country is the largest economy in the West African Economic and Monetary Union, constituting 40% of the monetary union's total GDP. The country is the world's largest exporter of cocoa beans, and the fourth-largest exporter of goods, in general, in sub-Saharan Africa (following South Africa, Nigeria, and Angola). With GDP growth estimated at 6.9% in 2019 (or 4.2% in per capita terms), Côte d'Ivoire continued to be one of the best performing economies in Sub-Saharan Africa, driven in particular by the expansion of the middle class, which supported demand in all sectors. Prior to the COVID-19 health situation, the outlook for 2020 remained favorable, with projected growth of about 7%. This figure has been revised downwards, following the slowdown in exports and the introduction of COVID-19 containment measures, which put a brake on economic activity in the first half of 2020. GDP growth is now expected to be around 1.8%. The agricultural sector is a major pillar of the Ivorian economy and accounts for 19.8% of GDP and more than 75% of exports in 2019. In addition, agriculture is the main means of subsistence for 2/3 of households in Côte d'Ivoire and employs 65.8% of the active population³. Food crops, mainly rainfed, are the most common component throughout the country. It plays a dual role in food security, the fight against malnutrition and as a source of revenue for the population.

Despite its importance to the economy, however, the sector has had only a minor impact on rural income development and poverty reduction. Women account for about half of the population in Cote d'Ivoire. Despite recent attempts, Côte d'Ivoire remains one of the world's countries with the greatest rates of

³ Plan National de Développement 2021-2025, Tome 1

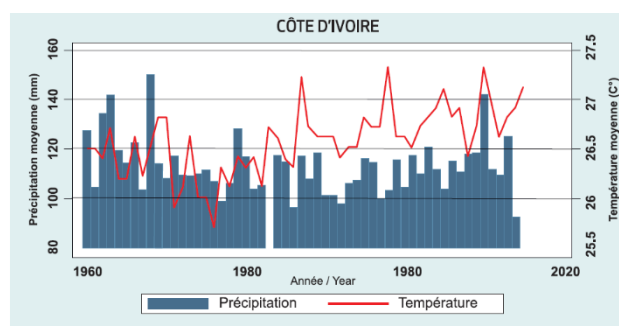
gender inequality, ranking 157th out of 162 countries on the 2018 Gender Inequality Index (GII)⁴. Women account for 90% of the active population in agriculture. Cassava, maize, bananas, and vegetables are commonly grown by women for self-sufficiency. Men who own enough property can grow commercial crops such as cocoa, coffee, palm oil, and rubber. Women do not own land or resources, and they do not have the financial means to purchase agricultural processing equipment. Furthermore, because women have a lower literacy rate than men, they have trouble obtaining micro-credits or small loans.⁵ Agriculture, particularly primary commodities, is highly susceptible to swings in international pricing, which have a negative and variable influence on rural household revenues. Despite accounting for only 0.9 percent of GDP in 2014, fishing generated 100,000 jobs directly.

Environment context and projected climate changes

According to the ND-GAIN Matrix, Côte d'Ivoire has one of the highest levels of climate change vulnerability in the world, ranking 142nd out of 182 countries (2019)⁶ and it is the 51st most susceptible and 31st least prepared country in the world. A third of the population lives within 100 kilometers of the coast. Rising temperatures and sea levels, rainfall variability, increased duration and severity of dry seasons, and increased floods and coastal erosion are all signs of climate change in Côte d'Ivoire. Between 1979 and 2015, climate parameters in Côte d'Ivoire were recorded. With the exception of the far north, the majority of Côte d'Ivoire receives relatively moderate inter-annual rainfall fluctuation. In the Komoe Headwaters Region, long-term historical trends reveal only a modest increase in temperatures with statistical significance. Long-term rainfall trends have been minimal in the past. On the other hand, all regions exhibit a statistically significant drop in rainfall frequency but an increase in the frequency of extreme rainfall events⁷.

Temperatures in West Africa increased by 0.5-0.8°C between 1970 and 2000, according to historical data. The last two decades of this period have seen the most significant changes. Temperature observations from 1990 to 2000 show that temperatures in Côte d'Ivoire are rising. Over the previous 30 years, the average annual temperature of Côte d'Ivoire has grown by 0.1°C every decade, with 2016 being the second warmest year on record since 1961. According to NMD studies, the average temperature increased by 0.5°C between 2001 and 2010, compared to the average temperature in the 1980s. Between 1970 and 2000, rainfall in Côte d'Ivoire's northeastern, central, and southern regions decreased⁸. During the major rainy season of June-October from 1951 to 2000, station data from all throughout the country show decreasing trends in precipitation⁹. Despite the abundance of surface water resources in Côte d'Ivoire, there has been a significant decline in precipitation and increased variability during the last 80 years. Between 1951 and 1980, rainfall decreased by 6% across Ivorian territory, with more significant declines of 13% in Sassandra and 11% in Adiaké, both in the coastal zone to the south-west and south-east, respectively. Rainfall patterns showed a distinct decline and fluctuation from the 1980s to the 1990s, as indicated in the national company of exploitation and development of an airport, aeronautics and meteorology (SODEXAM)'s data in Annex 1. According to the same study, the rainy season on the coast has been shortened by an average of 10 to 27 days, with a two-week start-up delay. The length of the season is reduced by

Figure 3. Evolution of annual temperature and rainfall in Côte d'Ivoire



Source : Auteurs à partir des données du Climatic Research Unit (CRU)

⁴ HDI 2019 Analysis for Côte d'Ivoire, UNDP 2019

⁵ Country Gender profile, JICA, 2013 and UNDP 2020

⁶ <https://gain.nd.edu/our-work/country-index/rankings/>

⁷ Côte d'Ivoire national climate change profile, AfDB, 2018

⁸ Climate Change National Strategy 2015-2020

⁹ Climate Knowledge Portal, World Bank 2020

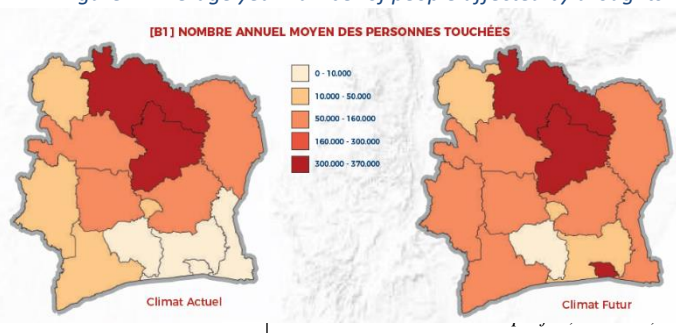
10 to 20 days in the Zone Nord, 20 to 30 days in the Zone Sud-Interieur, and 10 to 28 days in the Zone Centre inside the national territory.

For Representative Concentration Pathway (RCP) 4.5 and RCP8.5 (Coupled Model Intercomparison Project, Phase 5/CMIP5 included in the Intergovernmental Panel on Climate Change (IPCC)'s Fifth Assessment Report), mean annual temperatures over West Africa are expected to rise by 3°C to 6°C by the end of the twenty-first century. In 2050, the average mean annual temperature in Côte d'Ivoire will rise by 1.9°C (RCP 8.5, High Emission)¹⁰. By 2030, the estimated rise in annual mean temperature is expected to range from +0.9 to +1.5°C, +1.3 to +2.3°C by 2050, and +1.5 to +4.1°C by 2085. By 2030, the range is expected to be +0.8 to +1.7°C, +1.0 to +2.8°C by 2050, and 1.0 to +5.2°C by 2085, with the biggest rises in the country's northern regions, where malnutrition rates are already high. These statistics have a medium level of confidence, but all scenarios predict a rise in temperature. The yearly mean temperature has changed in a medium-strong way¹¹. Many CMIP5 models predict that mean precipitation in West Africa will increase during the rainy season by the end of the century, with a slight delay in the start of the rainy season. In 2050, mean annual precipitation in Côte d'Ivoire will decrease by -17.9 mm (RCP 8.5, High Emission), whereas the frequency of intense rain events may remain steady or increase¹². By 2100, the RCP 4.5 model (Low Emission) predicts an 8% reduction in daily precipitation between April and July rainy season¹³.

Climate vulnerability and risks

Climate change, through its effects on temperature and rainfall, contributes to increasing the vulnerability of agriculture in Côte d'Ivoire. Studies by SODEXAM show that the rainy season has shortened by an average of 10 to 27 days on the coast, with an average delay in the start-up of two weeks. In most parts of the country, the length of the season has been reduced by 10 to 20 days. In the north, the season length was reduced by 20 to 30 days and 10 to 28 days in the center part. Delays in the start of the season vary from one to two weeks depending on the locality.¹⁴ Extreme climate events such as floods, droughts, and bushfires have also resulted in crop losses as a result of the changes. Floods affect approximately 60 000 persons each year, or about 0.3 percent of the total population. Coastal zones are the hardest hit, with 80 percent of economic activity taking place there.

Figure 4: Average year number of people affected by droughts



The direct consequences on agriculture are a shortening of the average duration of vegetative growth periods (shifting of the beginning of the cropping season), weak growth of biomass and a reduction of the productive potential of ecosystems (reduction of arable land due to its degradation, increased exposure of plants to water stress and reduction of the volume of surface water in most regions). At the livestock level, it influences the availability of fodder and favors the appearance of pathogenic vectors for livestock. In addition, the production deficits observed and amplified by climatic changes, jeopardize the food security of the populations who depend directly on the production of their farms. The mismatch between weather calendars and crop seasons poses a real problem for agricultural production. In addition, there is the threat of famine, which is reflected in the extension of the hunger gap, the seasonal displacement of farmers in search of more hospitable areas, and the modification of farming habits. The impacts of these changes are also reflected in the loss of crops due to calamities such as floods, drought, and bush fires that are climatic in origin¹⁵. Drought affects 1.3

¹⁰ Climate Knowledge Portal, World Bank

¹¹ All projections are based on the results of the global model climate and sea level change projections, which are the base of the Fifth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC AR5 - www.ipcc.ch).

¹² Climate Knowledge Portal, World Bank

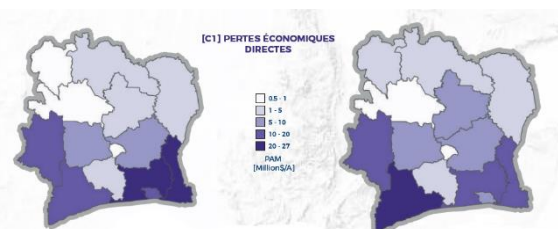
¹³ Climate Change National Strategy 2015 - 2020

¹⁴ DJE.K.B. 2007. Impact des phénomènes ENSO sur la pluviométrie et leurs incidences sur la production cacaoïère. Conférence Internationale pour la réduction de la vulnérabilité des systèmes naturels économiques et sociaux en Afrique de l'Ouest face aux changements climatiques. Ouagadougou du 24 au 27 janvier 2007.

¹⁵ Document de Stratégie Nationale de Lutte contre les Changements Climatiques

million people (5.4 percent) per year, especially in the northern region of the country, where water infrastructure is already a problem. If population growth is taken into account, the percentage will rise to 7.9%. (2,4 million people).

2Figure 5: Direct economic loss due to floods in present days (left) and projected (right)



Source: Côte d'Ivoire risk profile, UNDRR, 2018

The northern part of Côte d'Ivoire, which has only one rainy season, is extremely vulnerable to climate change's effects on natural resources and agricultural production systems. Climate change impacts can be seen in reduced rainfall, shorter rainy seasons, and changes in microclimates, increased temperature and heat winds, stream drying and groundwater volume reduction, the severity of dry seasons and a high-water deficit, soil degradation and loss of plant cover, and increased pest and disease incidence and alien species invasion. The Zone Centre is vulnerable to the same threats as the northern zone, but with a smaller fall in precipitation. Climate change effects in the Zone Sud-Intérieur include lower precipitation and shorter rainy seasons, reduced groundwater quantities and land degradation, loss of soil fertility, and loss of forest cover. Agricultural production in the southern half of the country is slightly less affected than in the northern section of the country. Finally, climate change impacts in Zone Littoral include shifting wet seasons, reduced river flow, intense rains and floods, and coastline erosion. Even yet, agricultural production in this portion of the country is less damaged than in the north¹⁶. The table below summarizes information from Côte d'Ivoire's Third National Communication to the United Nations Framework Convention on Climate Change on actual climate change impacts in different agro-ecological zones.

Table 2. Climate change impacts in the different agro-ecological zones in Côte d'Ivoire.

Zone	Main climate change impacts	Resulting vulnerability
Zone Nord	<ul style="list-style-type: none"> Decrease of precipitations, increased severity of droughts, alteration of microclimates Shortening of rainy seasons Increase of temperatures and heat waves Drying up of water streams and reduction of volumes of groundwater High water deficit Soil erosion and loss of vegetation Loss of households' production assets and migrations Increased desertification and land degradation 	<ul style="list-style-type: none"> High vulnerability of natural resources and agriculture production systems. Loss of soil fertility and land productivity Medium human vulnerability
Zone Centre	<ul style="list-style-type: none"> Decrease of precipitations, droughts, alteration of microclimates Shortening of rainy seasons Increase of temperatures and heat waves Drying up of water streams and reduction of volumes of groundwater From high to average water deficit Soil erosion and loss of vegetation Loss of households' production assets and migrations 	<ul style="list-style-type: none"> High vulnerability of natural resources and agriculture production systems. Loss of soil fertility and land productivity Medium to low human vulnerability
Zone Sud-Intérieur	<ul style="list-style-type: none"> Decrease of precipitations Shortening of rainy seasons Increase of temperatures and heat waves Drying up of water streams and reduction of volumes of groundwater From high to medium water deficit Degradation and loss of forest cover 	<ul style="list-style-type: none"> Medium vulnerability of natural resources and agriculture production systems. Low human vulnerability
Zone Littoral	<ul style="list-style-type: none"> Decrease of precipitations Shortening of rainy seasons 	<ul style="list-style-type: none"> Medium to low vulnerability of natural resources and

¹⁶ Zero hunger strategic review for Cote d'Ivoire (2018).

Zone	Main climate change impacts	Resulting vulnerability
Zone Littoral	<ul style="list-style-type: none"> • Unpredictable rainfall during the year • Drying of water streams • Longer dry periods • Low water deficit • Degradation and loss of forest cover • Floods • Sea level rise • Coastal erosion 	<p>agriculture production systems.</p> <ul style="list-style-type: none"> • Medium human vulnerability

Source: Côte d'Ivoire Third National Communication to the UNFCCC

Project scope

All the information above shows that the agricultural sector in Côte d'Ivoire is impacted and will continue to be affected by the consequences of climate change if nothing is done to support the vulnerable populations especially the farmers' communities, to build resilience and adapt to the future impacts. The current project is high lightening rice cultivation and vegetable farming. The food sector, particularly rice cultivation and vegetable farming, is highly dependent on climatic factors. Yields are low due to the limited capacity of rice farmers to implement appropriate agricultural practices, including climate-smart agriculture (CSA) technologies and practices, that can help mitigate greenhouse gas emissions in the rice farming system while increasing its productivity¹⁷. The water deficit also highly impacts the production of vegetables, which grow depend on an important amount of water. It has been stated that water availability is affected and will be impacted by future climate variations and changes.

Rapid urbanization in Côte d'Ivoire is accompanied by strong demand for food products, including rice, vegetables and aquaculture products. Unfortunately, the national production of most of these products is not sufficient to cover domestic demand, resulting in heavy dependence on imports. Like many countries, Côte d'Ivoire is subject to climate change with high variability in rainfall and thus greater risks for rainfed producers and more generally a latent risk in terms of food security for the population. However, the current mode of development of the lowlands in Côte d'Ivoire is essentially monocultural, whereas their assets should make them real poles of economic activity (rice growing, vegetable production, fish farming, tree farming on the slopes and overlooking the lowlands). A paradigm shift in cultivation practices is therefore needed to take into account the new context of climate change.

Two (2) innovative solutions related to "Solid Rain" and rice-fish farming were tested in the farming environment to provide sustainable solutions to the problem of water management in vegetable farming and rice cropping systems while improving crop productivity and producers' revenues. The tests have been made by selected farmers from the pilot project with the support of the executing entity, which is ANADER, but training was made prior to the field experimentation.

- The "Solid Rain", water retaining granules, bio-fractionable, non-toxic and able to absorb water and make it available to the root system of plants according to their needs, ensures a stable growth of plants and a loosening of the soil. This technology is well adapted to market gardening, especially in the off-season when water is more limited.

¹⁷ Contribution à l'atteinte des objectifs liés au changement climatique et à la sécurité alimentaire via l'agriculture intelligente face au climat en côte d'ivoire – cas de la filière riz

Figure 6: Solid rain technology used by vegetables farmers

- Rice-fish farming is a technology that plays on the mutualism of rice and fish ponds (the rice feeds the fish and the fish feeds the rice). Depending on the type, it can produce 3-5 tons of fish/hectare of a pond with a low-grade rice flour feed and improve rice production by 25-50% without the use of pesticides, herbicides or fertilizers.

Figure 7: Rice-Fish farming technology



Demonstrations of the two (2) technologies were carried out in the farming environment with results that were well appreciated by the farmers in the localities that hosted the pilot phase of the transfer of these technologies. The pilot project benefited 65 farmers for solid rain technology from January 29th, 2019, to June 2021, and 150 farmers for rice-fish farming technology from June 24th, 2019, to November 2021. It is therefore important to increase the dissemination of these technologies that are resilient to the effects of climate change in all the country's vegetable and rice production areas by strengthening the production capacities of farmers and sustaining the adoption of these technologies by creating a suitable financing system and strengthening national regulations for Climate Smart Agriculture technologies dissemination.

The main challenges related to the proposed technologies lie in the lack of access to water management. This problem is accentuated by the scarcity of water due to the impact of climate change and rainfall variability. Access to finance can also prevent farmers from adopting the tested technologies, and communication between farmers can also bias the scaling up of successful practices. The proposed project is designed to address the above challenges. It is also a direct response to National Adaptation Plan (NAP) priorities. It targets rural populations and aims to improve and diversify the agriculture production system and thus making it more climate-resilient. The proposed intervention with AF funding has been designed by Government, with the support of the Global Green Growth Institute (GGGI), along four main components: (1) sustain access to improved water management technologies to build resilience to climate change (2) Support farmers' activities diversification and climate-resilient rice farming system through rice-fish farming technology (3) Strengthen farmers' access to green finance for climate-resilient rice and vegetables farming enterprises development and, (4) Support knowledge sharing and policies/strategies development and the sustainability of the adaptation 'technologies adoption by farmers.

Project areas

This project will be implemented in locations based on agro-ecological zones and available conditions for the success of the chosen technologies. Particularly, the project areas have been selected taking into account the level of vegetables and rice production in the area and the level of water scarcity engendered by climate change. Solid rain will be used in vegetable production areas to improve water use efficiency throughout the growing season. The solid rain technology will be implemented in Korhogo (Poro region), Boundiali, Tengrela (Bagoue region), Ferkessédougou (tchologo region), Katiola, Dabakala (Hambol region), Odienné, Gbeleban, Madinani (Kabadougou region), Minignan, kaniasso (Folon region), Bondoukou (Gontougo region), Seguela (Worodougou region), Mankono (Béré region), Bouaké, Sakassou, Béoumi (Gbêkê region), Mbahiakro (Iffou region), Dimbokro, Bocanda (Nzi region), Touba

(Bafing region) Tiébissou (Belier region), Bouaflé (Marahoué region) and Abengourou; Agnibilekro (Indénié Djuablin region). The rice-fish farming will be implemented in Korhogo (Poro region), Boundiali (Bagoue region), Katiola (Hambol region), Yamoussoukro, (Belier region), Abengourou (Indénié Djuablin region), Soubré (Nawa region), Gagnoa (Gôh region), Danané (Tonkpi); Duekoué (Guemon) and Daloa, Vavoua, Issia (Hautassandra region).

The regions chosen for solid rain technology are justified mainly by the fact that those are the vegetable production regions in the country, where farmers are facing a lack of water due to the reduction and variability of rainfall. Therefore, solid rain technology is an adequate solution to the management of water resources and sources. Regarding rice-fish farming, the reason linked to the selection of the cited regions lies in the promotion of food and nutritional security among rice farmers who do not have resources that can allow them to access protein. Hence, the diversification of the income sources and types of agricultural production is a solution to this issue. The financial component of the project will be implemented in all the projects covering the region and the development of policies and strategies will be national. The sites were selected after consultations with the stakeholders in all the selected regions for their demand for the extension of the pilot project to a larger scale for more impact.

Project Objectives:

The main objective of the project is to ***strengthen the resilience of smallholder farmers to the effects of climate change through the adoption of proven innovative technologies and practices***. More specifically, the project will:

- Sustain access to improved water management technologies to build resilience to climate change.
- Support farmers' activities diversification and climate-resilient rice farming system through rice-fish farming technology.
- Strengthen farmers' access to green finance for climate-resilient rice and vegetable farming enterprises development.
- Support knowledge sharing and policies/strategies development and the sustainability of the adaptation technologies adoption by farmers.

Project Components and Financing:

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US\$)
1. Sustainable access to improved water management technologies to build resilience to climate change	1.1 Extension agents' capacities to disseminate adaptations technologies to farmers enhanced	<i>Capacities of rice and vegetables farmers communities to apply sustainable and improved water management technologies to build resilience to climate change developed</i>	72,381
	1.2 Vegetable farmers capacities to adopt climate adaptation technologies on Solid Rain built		1,559,400
2. Rice- fish farming to support diversification and climate-resilient rice cultivation system	2.1 Capacities of rice and fish farmers are enhanced through adoption of rice-fish farming	<i>Climate-resilient rice cultivation system developed, scaled-up and providing fish production</i>	526,440
	2.2 Rural planners on rice-fish farming diversification management system trained		10,000
	2.3 Application sites of the rice-fish farming technique developed		544,570
3. Access to finance strengthened for climate resilient rice and vegetables farming enterprises development	3.1. An adaptation-oriented micro-finance scheme that supports the uptake of resilient rice and vegetable farming technologies and practices through partnership with local microfinance and local management committed	<i>Credit schemes tailored to scale-up proven resilient rice and vegetable farming technologies</i>	50,000
	3.2. Existing cooperatives/professional		324,000

Project/Programme Components	Expected Concrete Outputs	Expected Outcomes	Amount (US\$)
	organizations strengthened to improve climate resilient rice and vegetable farming practices with increased productivity and household income through microfinance facility.		
	3.3. Comprehensive climate adaptation plans developed for each value chain with identified public and private sources of funding.		50,000
	3.4. Market access strategy developed to facilitate the commercialization of the products		50,000
4. Knowledge sharing and policies/strategies development	4.1. Capacity building and knowledge sharing system established based on strengthened extension services/Lead farmers program (ToT Model) with consolidated modules and training guidelines (MRV training...)	<i>Enabling policies, strategies and legal frameworks are developed and adopted, and knowledge for the project sustainability shared.</i>	130,000
	4.2. Policies/strategies and institutions gaps assessed and adapted to ensure and facilitate the participation of the private sector, including the creation of incentive mechanisms.		50,000
1. Project execution cost (9,5%)			319,845
2. Total project cost			3,366,791
3. Project cycle Management Fee charged by the Implementing Entity (8.5%)			313,364
4. Amount of financing required			4,000,000

Projected Calendar:

Milestones	Expected Dates
Start of Project/Programme Implementation	January 2023
Mid-term Review (if planned)	June 2024
Project/Programme Closing	December 2025
Terminal Evaluation	June 2026

PART II: PROJECT JUSTIFICATION

A. Describe the project / programme components, particularly focusing on the concrete adaptation activities of the project, and how these activities contribute to climate resilience. For the case of a programme, show how the combination of individual projects will contribute to the overall increase in resilience.

To be able to effectively implement concrete adaptation actions that will benefit farmers and the country's food security and contribute to climate resilience, the project has been designed to be implemented under four key components:

Component 1: Sustainable access to improved water management technologies to build resilience to climate change.

Component 2: Rice-fish farming to support diversification and climate-resilient rice cultivation system.

Component 3: Access to finance strengthened for climate-resilient rice and vegetable farming enterprises development.

Component 4: Knowledge sharing and policies/strategies development.

Component 1: Sustainable access to improved water management technologies to build resilience to climate change

The proper management of water resources is critical for the socio-economic development of Côte d'Ivoire's populations, particularly those who live in rural areas and rely on agriculture for a living. This component will help communities in water-stressed areas where climate change is exacerbating their vulnerability. Unreliable water sources have an impact on their social well-being since they are unable to keep a sufficient amount of revenue to support their families. Many poor households are at risk of not having enough harvest to secure the food due to erratic and irregular rains. The proposed technologies/practices will provide long-term access to enhanced water management technology in order to increase their climate change resilience.

Output 1.1: Extension agents' capacities to disseminate adaptations technologies to farmers enhanced

The pilot projects for the demonstration of proven "Solid Rainfall" and rice-fish farming technologies covered five (5) and five (5) zones respectively. During these pilot phases, thirteen (13) and thirty (30) extension agents got their technical capacities strengthened in order to ensure the training of farmers on the aforementioned technologies and the monitoring of their application. With a view to extending the areas of application of the innovations, it is necessary to ensure capacity building for agents in the new intervention areas. Thus, 151 new agents will be trained to increase the number of trained agents for the technologies' dissemination; 138 agents will be trained in solid rain technology, while 13 agents will be trained in rice-fish farming. This capacity-building activities will be carried out through a series of training workshops jointly conducted by the executing entity trainers and experts from partner structures in technology dissemination. Practical field activities will be carried out during these workshops to enable them to quickly acquire the skills needed to follow up on-field activities. In addition, the Farmers' Field Days activities will be focused on the Training of Trainers (lead farmers).

Output 1.2: Vegetable farmers capacities to adopt climate adaptation technologies on Solid Rain built

In a context marked by frequent variations in rainfall and irrigation water management, the "Solid Rain", an innovative product developed by Sergio Rico, a Mexican chemist, offers a credible alternative for the sustainable production of food crops, especially market gardening. Indeed, acting as a sponge that restores 95% to 99% of the stored water, the "Solid Rain" is a water retainer in granular form, bio-fractionable, non-toxic and capable of absorbing water and making it available to the root system of plants according to their needs. It ensures stable plant growth and soil loosening while increasing agricultural productivity and reducing water losses despite disturbances.

The promotion of this product among farmers producing vegetables will take the form of (i) the creation of sales outlets for the "Solid Rain" product, (ii) the setting up of demonstration plots for the training of farmers

on the use of the product in vegetable crops, (iii) the training of farmers producing vegetables through the demonstration plots (iv) post-training follow-up of vegetable producers in the use of the product on their individual plots, (v) support for the structuring of producer groups and (vi) organization of exchange visits for the benefit of farmers who have not benefited from training on the demonstration plots.

The implementation of all these activities will contribute to strengthening the technical and organizational capacities of producers and increase their resilience in the face of worsening climatic variability manifested by increasingly unfavorable pedoclimatic conditions such as the drastic decline in rainfall, poor distribution of rainfall, declining soil fertility, etc. The data recorded during the pilot phase show that: for an elementary plot of 1 hectare (ha), in vegetable farming, it takes 10 Kg of solid rain at the cost of USD 50/Kg, or USD 500 per ha of tomatoes and 10 kg of solid rain at the cost of USD 50/Kg, or USD 500 per ha of cabbages. Per crop cycle in a manual irrigation system, the use of solid rainfall results in a 30% increase in average yield and a 50% reduction in watering time, for tomatoes and a 30% increase in average yield and a 50% reduction in watering time for cabbage. The added value of the increased production and reduced irrigation load induced by the use of solid rain is USD 1,540/ha per cycle for tomatoes and USD 1134/ha per cycle for cabbages. As a result, the use of solid rain in vegetable crops is more profitable for the producer. (see table in annexes). This makes it possible to bear the additional cost of introducing solid rain. In addition, the time saved by reducing watering could be used by the farmers to carry out other activities.

Component 2: Rice-fish farming to support diversification and climate-resilient rice cultivation system

Diversification is crucial for risk reduction, particularly for those who live in rural areas and rely on agriculture for a living. This component will build rice farmers and fish farmers' capacities to adopt climate adaptation technologies in the rice-fish farming diversification system. Diversification can have a positive impact on farmers' social well-being and level of income. Many poor households are at risk of relying on only one speculation or agricultural activity. Diversification by rice-fish farming technology and a climate-resilient rice growing system will be supported by the proposed initiative. The concrete activities related to this technology lie in (i) creation of one demonstration pond per locality (11 demonstration ponds), (ii) support for the maintenance of 55 water reservoirs of rice growing facilities, (iii) stocking of 165 fishponds with fingerlings, (iv) provision of fish feed, (v) providing rice-fish farmers with small equipment for the exploitation of ponds (nets, buckets, scales, etc.) and (vi) monitoring and support of rice-fish farmers.

Output 2.1 Capacities of rice and fish farmers are enhanced through adoption of rice-fish farming

Rice-fish farming is a technology that plays on the mutualism of rice and fishponds (the rice feeds the fish, and the fish feeds the rice). The rice-fish culture technique of juxtaposing fish ponds and rice ponds allows for the production of 3-5 tons of fish/hectare of a pond with a feed based on low-grade rice flour, and improves rice production by 25-50% without the use of pesticides, herbicides or fertilizers. In a context marked, on the one hand, by the aggravation of climatic variability (manifested by the drastic regression of rainfall) and the increasing decrease in arable land for food crops (due to rapid and uncontrolled urbanization and the expansion of the area under perennial and export crops) and water reserves, on the other hand, rice-fish farming appears to be a very credible opportunity for the development of resilience on the part of the rice farmers. The pond water, which is rich in nutrients due to the deposition of farmed fish and the degradation of food scraps, is used to irrigate the rice fields, saving the rice farmer the expense of fertilizers, pesticides and herbicides.

Demonstrations on rice-fish farming using the technique of juxtaposing fish ponds and rice pits carried out through training units for rice farmers in Abengourou, Oumé, San Pedro, Soubré and Yamoussoukro, with an adoption rate of 60% by the beneficiaries. This performance could have been better if substantial support had been provided for the development of water mobilization infrastructure and fishponds as proposed in this project. The capacity enhancement will primarily take place through applied training sessions. The training will be carried out through the Pedagogical Units. This training will be both theoretical and practical. The trainings provided through this site will aim at offering attendees the possibility to acquire new knowledge in order to favor the sustainability of their farms. A total of nine (09) practical training sessions will be organized over the duration of the rice and fish production cycle according to the following schedule:

- implementation of rice nursery

- Ploughing and planting of the rice paddy
- tilapia production system in ponds, conditioning and transfer of fry
- rice transplanting, irrigation with water from the fish pond
- water management, biosecurity measures and maintenance of rice ponds
- pathology, predator control, feeding and water management
- rice harvesting, growth control fishing economic management of a rice-fish farm, marketing of marketable fish

Output 2.2 Rural planners on rice-fish farming diversification management system trained

Rural planners' capacity to develop and install the rice-fish farming system will be required for proper diversification operations. This will aid in the adoption of the proposed technology by the communities. The project's goal is to increase human and technical ability to integrate adaptation concerns into planning processes, which is critical for long-term development. During the pilot phase, it was difficult to find capacities to help in the implementation of the fish plot, so for the project implementation to be more effective in the technology dissemination, rural planners' training is needed. The fish ponds will be built by specialists in fish pond management. They will receive applied training from the management specialists on fishpond construction and rice and fish pond joint use. The training module for rural planners will cover the following sequences (i) prospecting the site for the fish farm structures, (ii) topographic survey of the site, (iii) elaboration of the development plan and evaluation of the costs of the works, (iv) preparation of the land, (v) construction of the ponds and (vi) the first impoundment of the structures.

These trainings will cover the following modules:

- Topographic survey of fishpond sites
- Staking of fishpond sites
- Layout of fishpond sites
- Digging of fish ponds
- Location of pipes for the connection of fish ponds with rice ponds
- Filling the fish ponds with water

After their training, these rural managers will be able to build fishponds next to the rice paddies for project beneficiaries. Also, after the project, they will be able to be solicited by other people interested in the technology, which will facilitate the dissemination of this technology. These activities will be further detailed in the full project development.

Output 2.3 Application sites of the rice-fish farming technique developed

The actions to reinforce the knowledge and scale up rice-fish culture will be reflected in (i) the installation of educational units for the training of rice-producing farmers in the new extension zones, (ii) the training of rice-producing farmers in the new extension zones, (iii) the training of rural planners on rice-fish culture management techniques, (iv) evaluation and support for the development of application sites for farmers in the pilot phase areas and those in the new extension areas, (v) post-training follow-up of farmers in the application of the rice-fish farming technique, (vi) organization of study tours, and (vii) support for the structuring of existing beneficiary groups with a view to strengthening them. The implementation of all of these activities will make it possible to strengthen the adaptive capacities of farmers by reducing the risks of rainfall variability and to improve productivity and earnings.

Component 3: Access to finance strengthened for climate resilient rice and vegetables farming enterprises development

The sustainability of a technology dissemination project resides in the ability of the beneficiaries to adopt effectively the technology. This requires facilitation in the access of finance to support the purchasing of the inputs, tools and costs related to construction. This is critical for the people of Côte d'Ivoire's socio-economic development, particularly for those who live in rural areas and rely on agriculture for their livelihood. This component will assist communities in water-stressed areas whose vulnerability is being exacerbated by climate change. Reduced earnings have a significant impact on their social well-being since they are unable to maintain an adequate level of financing to support their families. Many impoverished households are at risk of being unable to apply climate adaptation technologies due to a lack of resources.

The proposed project will strengthen access to finance for climate-resilient rice and vegetable farming enterprises.

Output 3.1. An adaptation-oriented micro-finance scheme that supports the uptake of resilient rice and vegetable farming technologies through partnership with local microfinance and local management committed

This intervention aims at facilitating communities from the project areas to have access to finance to keep the opportunity of adopting the proposed technologies in a sustainable manner. This is a potential activity to sustain the generation of income and build resilience for poor households and women groups. Therefore, this project will provide some technical assistance to interested farmers' organizations and identify financial institutions to establish a loan facility or green credit line for farmers. Based on the previous pilots and the envisaged scaling up, USD 16,102,400 will be mobilized to meet the estimated demand for inputs and technologies application. The estimate was determined by calculating the mean additional cost that a farmer needs to adopt one or the other technology, the mean cost is around USD 435,2 per farmer. The country has around 37,000 farmers or more that can be positively impacted by this adaptation technology. The objective is to set up a mechanism in partnership with financial/microfinance institutions that have branches at the project sites. Farmers will be accompanied towards formalization and will be grouped into clusters. These groups will gather the financial resources of the different members and constitute an envelope that will be entrusted to the institution of the zone in the form of a term deposit while waiting for the financing of the next campaign. The term deposit will serve as a guaranteed line for the financing of the next campaign, especially for the additional cost related to the introduction of new technologies (if USD50K is deposited, the institution will finance up to USD50K+incremental cost at least). The percentage of the guaranteed coverage will be negotiated on a case-by-case basis according to the risk tolerance of each partner institution. In the long run, these financial institutions will develop a better understanding of the agricultural activity and a working relationship with the producer groups, which will facilitate the mobilization of additional financing. The partner financial institutions will be identified, and the conditions of these guaranteed lines will be negotiated during the development phase of the full proposal.

At the end of the project, the same *modus operandi* will be maintained, i.e., the domiciliation of a portion of the income of the producer groups, which will be formalized at that stage. This percentage of the income of the producer groups domiciled at banks/financial institutions will continue to be term deposits that can be considered a guaranteed line. Within the producer groups, management committees will be set up with members elected for a term to be determined in consultation with the stakeholders. The management committees will report periodically to the various farmers and will be able to benefit from the support of ANADER technicians. Over the year and agricultural campaigns, the partner banks/financial institutions will develop a better knowledge of the agricultural activities financed, of the income that can be generated and therefore will also have a better appreciation of the risks to develop the appropriate mitigating measures. The lasting relationship and the track record will overall facilitate access to finance for farmers.

Output 3.2. Existing cooperatives/professional organizations strengthened to improve climate resilient rice and vegetable farming practices with increased productivity and household income through microfinance facility.

Risk management aids in the identification, assessment, and management of hazards to capital, earnings, and savings. Financial threats or hazards can originate from a variety of places, such as financial uncertainties, strategic management failures, legal liabilities, accidents, and natural disasters. The fear of taking the risk of not having a refund is one of the reasons for the traditional finance system to fund agricultural activities. In Côte d'Ivoire, the risk that is lied to a smallholder farmer taken alone cannot allow him to be financed by a financial institution to sustain his adoption of climate adaptation technologies. Improved access to finance lies with good organization and capacities of farmers' groups.

The project will support local cooperative or professional organizations, beneficiaries of the project, by strengthening their organization, administrative, managerial, and financial skills in order to facilitate links with financial institutions. This capacity building will be done through training sessions and regular coaching throughout the project for leaders, members and staff of cooperatives and professional

organizations in the vegetable, rice and fish value chains. The concrete activities that will be covered will be the implementation or strengthening of the village savings and loan association and village management committee. Farmers' groups will benefit from training that will allow them to operationalize and partner with microfinance institutions. This organization will help the availability of the technologies and the reorganization of the value chain through farmers' platforms to access the market. The project plans to implement more than 40 associations with a minimum amount of USD 6,000 for one association.

Output 3.3. Comprehensive climate adaptation plans developed for each value chain with identified public and private sources of funding.

Agriculture continues to be an important means of alleviating poverty, but a lack of funding can stifle its growth. Simultaneously, agriculture is growing into a global system that demands high-quality, competitive products and is organized in value chains that frequently exclude smallholders. Agriculture value chain financing provides a chance to broaden the scope of financing while lowering the cost and risk. It can also contribute to more inclusive value chains by making resources accessible for smallholders to participate in higher-value market opportunities. The project will promote the development of value chain financing, which constitutes an opportunity for public and private sources of funding in this era of climate change. Indeed, adaptation to climate change requires the adoption of resilient technologies. Access to these technologies presents costs that value chain actors, mainly producers, cannot always meet on their own. To this end, the project's actions will develop financing strategies to promote access to credit for value chain actors, especially small producers. To this end, financing models based on contract farming schemes will be tested during the project. Feasibility studies will be carried out to identify attractive and bankable models according to the value chains involved (vegetables, rice and fish). The various relevant models identified will be implemented and improved as needed. Moreover, the financing of the technologies resilient to climate change will affect the availability of the technologies and the augmentation of productivity.

Output 3.4. Market access strategy developed to facilitate the commercialization of the products

Reliable market access increases productivity and profits, thus enhancing food security. It is possible to alleviate poverty and hunger for producers' families and communities by taking appropriate measures to limit market risks and unequal market power. Many rural farmers have difficulty finding markets to sell their goods. Their remote location, high transportation costs, limited experience, lack of business skills and an organization that could give them the bargaining leverage they need to interact on an equal basis with other market intermediaries are all stumbling blocks. With better access to markets, small farmers can sell more products of better quality and at remunerative prices. Farmers are therefore more likely to invest in their farms, to increase the quantity, quality and types of products to market. Thus, through the activities of this component, it will be a question of allowing the productions resulting from the adoption of the technologies of adaptation promoted to be better sold and to generate a consequent surplus value able to support the additional cost induced by the investments made for their productions. To this end, it will be necessary to support the marketing of products by developing marketing strategies adapted to the value chains involved (vegetables, rice and fish). These strategies will be underpinned by the prior conduct of studies for a better knowledge of current and potential markets. Farmers will not only benefit from the capacity building but will be accompanied by formalization. They will receive training in management and governance. These groups will be organized and supported to establish collection and sales points. It will allow them to move towards harmonizing sales prices and to have more leverage during negotiations on setting prices per kilogram. These collection and sales points will facilitate market access for producers.

Component 4: Knowledge sharing and policies/strategies development

The real project impact resides in the ability of the beneficiaries to share their experience and help in the extension of the technologies among their fellow farmers who did not participate in the project. This requires good planning of knowledge and experience sharing and the availability of regulations, policies and strategies to facilitate the dissemination and adoption of the proposed solutions among the farmers' communities. This component will help assist communities in water-stressed areas whose vulnerability is being exacerbated by climate change. The proposed project will help develop and organize farmers' communities to better react to the impact of the project.

Output 4.1. Capacity building and knowledge sharing system established based on strengthened extension services/Lead farmers program (ToT Model) with consolidated modules and training guidelines

Positive effects will be enhanced, and climate resilience measures will be aided if activities are properly implemented. Communities and local government authorities shall be properly informed and involved in decision-making aimed at community responsibilities and benefits. The project's goal is to increase human and technical ability to integrate adaptation concerns into planning processes, which is critical for long-term development. Training materials and technical guides implemented in components 1 and 2 will be consolidated into image-based tools and videos in different dialects. Lessons learned and success stories will be documented and disseminated in order to share best practices, raise community awareness, and build capacity on climate resilience measures.

Output 4.2. Policies/strategies and institutions gaps assessed and adapted to ensure and facilitate the participation of the private sector, including the creation of incentive mechanisms.

The policies and strategies establish the principles, objectives, and priorities of agricultural policy, as well as training and advisory services for farmers, biodiversity and protection of genetic resources, biosafety and biosecurity. According to the law, agricultural policies aim to ensure agricultural development, increase productivity, strengthen food security, protect, and improve natural and biological resources, develop producer organizations, strengthen agricultural markets and ensure rural development. This project aims to assess and adapt policy and strategy gaps to ensure and facilitate private sector participation in financial facilities for farmers.

As indicated in output 3.3, financing models based on contract farming schemes will be implemented during the project. This scheme involves a tripartite relationship between a financial institution, a technical operator (a processing company or other formally constituted and banked buyer) and the farmers' professional organization. These private actors (technical operators and financial institutions), through their intervention in this tripartite agreement, facilitate farmers' access to financing; this financing allows farmers to access climate change adaptation technologies. Furthermore, insuring risk in small-scale agriculture faces problems that are not usually encountered by the broader insurance sector. An index insurance-based scheme will be promoted to ensure the sustainability of the projects after it ends. An insurance-based index can help farmers keep the same level of income when the weather conditions are not favourable. Index-based Insurance guarantees an indemnity payable to the insured for production losses resulting from rainfall deficits during the rainy season. The same level of income gained by the farmers with the insurance-based index will allow the farmers to continue using the adaptation technologies and ensure the sustainability of the project.

There are a number of potential partner institutions identified to support the guaranteed lines of finance, which have worked with farmers and offered green finance, such as: ADVANS, BAOBAB, Banque Populaire (formerly CECF), COOPEC, ECOBANK and BNI (which is a national implementing entity of the IFAD-GCF funded project that creates green lines of credit for smallholder farmers through a project called Inclusive Green Finance). To benefit from the financial scheme, the VSCA must be formalized (a receipt of recognition by the prefecture) and have an account opened for at least 3 to 6 months in a microfinance institution. Once the savings conditions are met, the VSCA can request a credit of 3 times the amount saved at an average monthly rate of 1.5% (i.e. 9% over 6 months). The credit obtained, whose amount is estimated from the members' needs, is redistributed to the members on credit at a rate of 10% over a period not exceeding 6 months. With this internal rate of 10%, VSCA will have a margin of at least 1% which will be saved in the VSCA savings account and will be used as a guarantee for the loans of the following campaign or will be redistributed at the end of the year to the members. The decision is taken in a participative way with all the members of the General Assembly.

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B. Describe how the project / programme provides economic, social and environmental benefits, with particular reference to the most vulnerable communities, and vulnerable groups within communities, including gender considerations. Describe how the project / programme will avoid

or mitigate negative impacts, in compliance with the Environmental and Social Policy and Gender Policy of the Adaptation Fund.

The project aims to strengthen the resilience of smallholder farmers to the effects of climate change through the adoption of proven innovative technologies and practices in a context of variability and irregularity of rainy seasons. The success of food crop production, mainly vegetables and rice, has become uncertain or has low productivity. This negatively impacts the income of producers and represents a serious problem for the country's food security. The realization of this project will offer benefits at three levels: economic, social and environmental.

Economic benefits

This project will contribute to improving the productivity of the beneficiaries' farms through all-season production and diversification of activities. The implementation of the project will provide daily and/or temporary jobs to direct farmer beneficiaries, local enterprises (solid rain distributors, rotative weeder manufacturers etc.) and other residents qualified for the proposed work (clearing, soil preparation, setting up nurseries, transplanting, weeding, monitoring against birds, harvesting). In addition, the popularization of these technologies will contribute not only to the reduction of production costs (reduction of the costs of purchasing agricultural inputs and costs related to irrigation) but also to the increase in the production of vegetables and rice paddy in irrigated systems. Farmers in the project areas will thus be able to generate production surpluses, in addition to domestic consumption. This excess could be destined for markets and constitute a source of income (new or additional) for the farmer.

Environmental benefits

The degradation of hydro-agricultural infrastructures on rice-growing perimeters sometimes makes it difficult to operate them at certain times of the year due to the lack of irrigation water. The fishpond will provide a water reserve that will help to overcome the constraint of water shortage. The technique of juxtaposing the fishpond and the fish box will thus enhance the water resources of the irrigated rice production sites. One of the major advantages of IRCS is its eco-agronomic character, which places a premium on organic fertilization. Indeed, the use of rice-based compost will reduce mineral fertilizer inputs by saving NPK. The proportion of mineral fertilizer used by the farmers (vegetables and rice farmers) targeted by the project will be reduced at the end of the project. In addition, (i) the reduction of water wastage by infiltration or evaporation for plant irrigation, (ii) the valorization of rainwater stored and then mixed with "solid rain", (iii) the reduction of at least one third (1/3) of the percolation of nutrients into the soil are real opportunities to protect the environment from drought, erosion, desertification, and groundwater pollution. The use of the rotative weeder has a definite advantage in terms of the quality of weeding in the plots (impeccable weeding with a muddy surface around the plants) and favors the zero use of herbicides among rice farmers who would practice chemical weeding.

Social benefits

The project aims to promote improved livelihoods for smallholder farmers, including women farmers and marginalized communities, such as marginalized and vulnerable groups, as it links access to financial services, knowledge, technology, and other value chain inputs. The project will promote equal access for women to decent work and enjoy the same opportunities, rights and obligations in all spheres of their daily lives, have equal access to training, gain financial independence; share family responsibilities and be free from all forms of coercion, intimidation and violence; be able to make decisions that will have a positive impact on their health and safety and that of their family members. Generally, the project will contribute to:

- Improve the working conditions of the workers by reducing the drudgery of the work in general, but particularly the physical work for the irrigation of the vegetables' plots.
- Create additional direct and indirect jobs engendered by the scaling up the chosen technologies.
- Integrate the three (3) technologies into the technical itineraries of vegetable and rice crops without modifying the cultivation habits and cropping itinerary.
- Have additional time to participate in socio-cultural and family activities.
- Increase the farmers' revenue to reduce their vulnerability.

In addition, the exchange visits will provide opportunities to establish and/or strengthen relationships between local and national partners in the horticultural and rice sectors. Specifically for the Solid Rain,

75% of the beneficiaries are women and youth groups, while for the rice-fish farming technology, 15% of the beneficiaries are women and youth groups. The project will help women and youth groups to:

- **Increase women and youth groups' income through diversification.** The project will allow women and youth to engage in other production activities, thus they can generate higher income through diversification in the value chain.
- **Provide access to finance.** The Village Savings and Credit Associations (VSCAs) will allow all women beneficiaries to access loans, in order to finance their micro-businesses.
- **Improve skills and knowledge.** Women and youth will be trained for both technical/field and management training.
- **Improve the working conditions.** The Solid Rain technology will reduce the watering time by 50% and therefore, will reduce the workload, improve their health and allow them to give more attention to their families or communities.
- **Promote a more equitable household workload.** The project will use the household methodology, which will involve men and women as a couple with equal participation in the activities to achieve control of the project's resources by taking into account the specific needs of each gender. This will also help gender relations, mutual trust, and ensure effective participation of women in decision making.
- **Significantly reduce youth unemployment through innovative solutions.** The livelihood activities supported by the project will have a multiplier effect and the benefits are expected to trickle down to the most vulnerable. By documenting the lessons learned, youth are expected to take up the innovations by seeing the economic benefits derived from the implementation of climate-smart agricultural practices, IRCS and rice-fish farming systems.

At this stage, an initial gender analysis was conducted, which allows us to characterize the gender profile of the various project intervention zones. The analysis consisted of establishing the current situation of the beneficiaries and local communities regarding gender. Using gender diagnostic tools, we learned about the situation of men and women in their communities (positions held, working conditions, etc.). Then, to collect data on the identification and selection of beneficiaries, training and activities carried out, and finally, to highlight gender inequalities.

The analysis results showed that the targeted crops in the project areas, such as vegetables, are highly dominated by young people and women (about 80%), and rice-fish farming is highly dominated by men (about 90%). Women control a large part of the value chain, from production to commercialization of vegetable products and rice and fish. The men control the production of rice and fish in the context of rice-fish farming. However, they are confronted with a need for human and technical capacity building, which is reflected in a lack of skilled labor and of tools adapted to their activities. This need is reinforced by the context of climate change, which increases vulnerability in the conduct of their agricultural and fish farming activities, particularly climatic variability (irregular rainfall), which results in long dry spells, and wet spells that are sometimes poorly distributed. Faced with this situation, most young people and women are confronted with a decrease in the productivity of their farms, due in large part to water scarcity. As a result, these actors feel the need for adaptation technology based on water control and management. The initial gender analysis also showed the different needs, capabilities, roles, activities, available opportunities and challenges for both men and women. In addition, an in-depth assessment will be carried out at the stage of developing the full proposal to ensure that all aspects of equity, accountability and representation are fully integrated into the project.

To ensure that gender is considered for an equitable sharing of resources, the project focuses on women and youth groups from the formulation stage. All stakeholders (men and women in their multiple dimensions) will be involved in the identification, design, planning, implementation, monitoring and evaluation of project activities. This will have the advantage of considering the specific needs of the different actors and will facilitate the targeting of development sub-projects at the level of each actor.

The project will ensure that vulnerable groups are involved in consultations to identify needs, difficulties and challenges. The project will demonstrate compliance by:

- Describing the process of allocating and distributing project benefits.
- Describing how this process ensures fair and impartial access to benefits and does not impede access of any group to the essential services and rights indicated in the 15 environment and social principles of The Adaptation Fund Environmental and Social Policy.
- Conducting a risk analysis to identify and assess the risk of impeding access to essential rights and services, and of exacerbating existing inequalities.
- Conducting stakeholder mapping in order to identify the potential beneficiaries, rivals, disputants, marginalized, or vulnerable people.

In addition, the results of the projects will be informed by sex-disaggregated and gender data analysis, intervention design and results-based management through comprehensive monitoring, evaluation, and learning system.

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

Under the business-as-usual scenario, water scarcity will increase the vulnerability of farmers, especially rice and vegetable farmers. Their sources of income will be significantly reduced, which will in turn affect the livelihoods of their communities. Although the economic worth of water and adaptation technologies is still unknown, their adoption and management can be a good place to start in the battle against climate change. As a result, if the project is not implemented, adaptation costs will be greatly increased by assisting these vulnerable communities who will be in distress, particularly during extreme weather occurrences. If the problem of water availability is not addressed, a lot of time will be spent looking for water instead of doing other household or business tasks that could create cash. These communities will be much less vulnerable as a result of the concrete adaptation efforts specified in this project.

Training of extension agents is aimed at increasing the capacities of agents who will allow the technologies to be disseminated among farmers' communities for adoption. The number of skilled agents will allow the training of a large number of farmers for the project to cover as much cultivation cycle as possible in the three years. The farmers will have the capacities and abilities to use and share the technologies among their peers for a cost-effective adaptation process. The diversification of sources of income will allow farmers to be less vulnerable to the effect of climate change by using the same amount of water for two different productions, rice and fish. This activity will help in the reduction of malnutrition, water wastage and food insecurity among rice farmers' community.

The sustainability of this project resides in the ability of farmers to effectively adopt the technologies after the project, and green finance facilitation will help in that way. The re-shaped strategies and policies aiming to support the adoption of the proposed technologies after the project will also help in the sustainability of the outcome and the cost effectiveness of the project. Financial sustainability will be initiated by several revolving fund mechanisms with the beneficiaries of grant-making projects. The principle is to get beneficiaries to manage the funds or inputs received as a loan that they repay to themselves to continue the activity when the project ends. Through a very participatory approach, project beneficiaries analyze and choose the mechanism that suits them. For instance, the funds are given to the groups via accounts opened in their names in a banking structure that is a partner in the project on the basis of the needs identified within them. These groups distribute the funds among their members according to the amount of the respective projects. In the form of a mutual guarantee, the members agree to repay the loan within their group according to a schedule and terms consistent with the project's business plan that has been identified. In this way, the groups are solely responsible for the banking structure. As for the members, they are responsible for each other. The funds repaid according to the schedule defined in advance by the business plan are transferred to an account dedicated to repayment and opened in the partner bank.

During repayment, savings are built up by the group in its own account, opened at the same time as the repayment account. After repayment, the savings are used to refinance activities. The groups can also apply for loans from the dedicated account to develop or diversify their activities (see the report on the economic integration project for women victims of gender-based violence). For instance, the beneficiaries of the project create Villages Savings and Credit Associations (VSCA). Individual and group accounts are opened for them through mobile money and an agreement is signed between the project, the VSCA network and the microfinance or bank. The financial institution grants loans to their members with the joint guarantee of the members.

The added value of the increased production and reduced irrigation load induced using solid rain is USD 1,540/ha per cycle for tomatoes and USD 1,134/ha per cycle for cabbage. As a result, the use of solid rain in vegetable crops is more profitable for the producer. (See table in annexes A, Economic elements of solid Rain). This makes it possible to bear the additional cost of introducing solid rain. In addition, the time saved by reducing watering could be used by the farmers to carry out other activities. Regarding rice-fish farming, the combination of fish farming and rice farming gives the farmer a total additional gain of about USD 2,132, specifically USD 332 of additional gain per ha for rice cultivation and USD 1,800 generated over a cycle for a 400 m² fishpond.

The project will support 6,900 farmers (of whom approximately 75% of women and young people) with solid rain technology with almost The project will also support 195 farmers (of whom approximately 15% of women) with rice-fish farming technology, so that each farmer will benefit from one fish-farming application site for a total of 195 fish-farming application sites. The surface that will be covered for solid rain technology is 500m² per farmer for a total of 345 hectares, and for the rice-fish farming, it will be 400m² trap per farmer for a total of 7.8 hectares in total. In addition, 26 rural planners will be trained in the development of fish-farming application sites. The availability and management of water to scale up this technology will be provided by the furnishing of 55 micro dams which will be put in place during the project activities.

The alternative to the proposed technologies would have been to promote the use of groundwater through wells or boreholes. These types of solar-powered water sources could provide supplemental irrigation, during the rainy season, or full irrigation during the dry season while avoiding CO₂ emissions. But this irrigation system can only be applied to the vegetable production system, not the rice system. For the rice system, surface water is required. In addition, this proposed alternative solution must be closely monitored and managed by government hydrological institutions to avoid exacerbated water depletion during recurrent dry periods. A local assessment of groundwater availability and replenishability must be undertaken before implementing this alternative, which requires a high initial cost that farmers cannot afford without adequate technical assistance and financial support. Indeed, this type of installation is suitable for relatively large common production plots, considering the high investment cost (feasibility studies, drilling, submersible pump, solar panels and related equipment), in addition to the maintenance cost. In the case of our project, the beneficiaries are small farmers installed on small and fragmented plots. This alternative is therefore not adapted to our target, unless they are grouped together on common production plots, which is not feasible, as this would create land problems to be solved.

Table 3: Project cost effectiveness

Project component	Project cost (USD)	Concrete adaptation benefits	Avoided losses	Trade-offs
<i>Component 1: Sustainable access to improved water management technologies to build resilience to climate change</i>	1,631,781	<ul style="list-style-type: none"> • Increased food availability due to improved agricultural practices • Water availability for crops and livestock production • Reduced time spent by women and children in watering farms • Increased household income • Increased knowledge of water resources management • Increased resilience to climate change impacts 	<ul style="list-style-type: none"> • Crop and livestock loss due to drought and flooding • Food insecurity • Malnutrition • Loss of time to water farms 	<ul style="list-style-type: none"> • Dependence on food aid because households cannot produce sufficient food for families • Reduced productivity due to loss of suitable land for crop production • Increased vulnerability to climate change impacts • Lack of reliable and sufficient source of water which increases government spending • Increase government spending of humanitarian food supplies for communities that have been affected by loss of water and food
<i>Component 2: Rice-fish farming to support diversification and climate-resilient rice cultivation system</i>	1081,010	<ul style="list-style-type: none"> • Reduction of risk in production • Diversification of source of income • Water management knowledge increased • Increased farmers income 	<ul style="list-style-type: none"> • Food insecurity • Malnutrition • Waste water 	<ul style="list-style-type: none"> • Dependence on food aid because households cannot produce sufficient food for families • Increased vulnerability to climate change impacts • Reduced adaptive capacity of communities • Increased adaptation cost

<i>Component 3: Access to finance strengthened for climate resilient rice and vegetables farming enterprises development</i>	474,000	<ul style="list-style-type: none"> • Access to green finance • Adoption of climate resilient agriculture technologies 	<ul style="list-style-type: none"> • Vulnerability to climate change issue • Loss of project sustainable impact • Incapacity to adopt climate smart agriculture technologies 	<ul style="list-style-type: none"> • Increased cost of adaptation for flood and drought victims • Increased cost of providing food for hunger victims
<i>Component 4: Knowledge sharing and policies/strategies development</i>	180 000	<ul style="list-style-type: none"> • Adaptation technologies knowledge shared • Policies and strategies that promote climate adaptation technologies adopted • Increased coordination of climate actions at local level • Increased resilience to climate change impacts • Improved ability to explain project outcomes and important takeaways 	<ul style="list-style-type: none"> • Vulnerability to climate change issue • Loss of project sustainable impact • Incapacity to adopt climate smart agriculture technologies • Loss of livelihoods • Food insecurity 	<ul style="list-style-type: none"> • Increased victims of climate impact impacts due to poor planning and unpreparedness of the government • Increased adaptation cost • Unsustainable climate change adaptation interventions

D. Describe how the project / programme is consistent with national or sub-national sustainable development strategies, including, where appropriate, national adaptation plan (NAP), national or sub-national development plans, poverty reduction strategies, national communications, or national adaptation programs of action, or other relevant instruments, where they exist.

The proposed project is consistent with both national and international strategies and plans. It is consistent with the Government of Côte d'Ivoire National Development Plan 2021-2025, the National Sustainable Development Strategy, the National Strategy to Promote Green Jobs, The Climate Change National Program, the National Program of Agricultural Investment, the Climate Smart Agriculture Strategy, the Climate Smart Agriculture Investment Plan, the Climate Change and Gender national document Ivorian Nationally Determined Contributions (NDC).

National Development Plan (PND): The Plan National de Development (PND) 2021-2025, Cote d'Ivoire's five-year national development plan, is currently being finalized ahead of its launch later this year, this has understandably been delayed due to the onset of the pandemic. The PND will provide one suggested structuring for the suggested green growth indicators.

The PND sets out four major objectives, GGGI welcomes the inclusion of the SDGs within the overarching objectives, setting a clear direction for Cote d'Ivoire and the PND to deliver on these strategic goals.

"With a view to "Accelerate the march towards emergence through the industrialization of the economy and a better distribution of the fruits of growth", and in accordance with the prospective documents (CI 2040) and ten-year planning (CI 2030), the PND 2021-2025 is structured around the following five pillars:

Pillar 1: strengthening productive transformation, developing industrial clusters and digitizing the economy.

Pillar 2: development of human capital and improvement of its productivity.

Pillar 3: strengthening inclusion, national solidarity and social action.

Pillar 4: regional development through the creation of competitive economic poles, the development of infrastructure to support growth, the preservation of the environment and the fight against climate change

Pillar 5: deepening governance in all its aspects and modernizing the state".

National Sustainable Development Strategy: The national sustainable development strategy is the backbone of government action in this area. Indeed, given the impossibility of addressing all the issues simultaneously, the strategy will make it possible to establish a priority between the axes of intervention and objectives in order to orient the actions of the departments and agencies in the field of sustainable development. It will bring added value to the governmental action in sustainable development, since it will allow to better coordinate, harmonize and conciliate these actions. In sum, Côte d'Ivoire is developing the strategy to:

- ✓ Demonstrate the Government's awareness of and commitment to promoting development that combines economic efficiency, social equity and environmental protection.
- ✓ Give itself visibility and organize its action in favor of sustainable development.
- ✓ Fulfill its responsibilities for the protection of the planet, in accordance with the principle of "common but differentiated responsibility".

National Strategy to Promote Green Jobs: The main objective of this strategy is to provide Côte d'Ivoire with a national strategy and a reference system for the promotion of green jobs and professions. Specifically, the strategy is based on the following orientations:

- ✓ The presentation of the general situation of employment in Côte d'Ivoire.
- ✓ The diagnosis of the framework for the promotion of green jobs in Côte d'Ivoire.
- ✓ The definition of the vision and strategic axes of green job promotion in Côte d'Ivoire; and
- ✓ The implementation mechanism and the budgeted action plan.

Climate Change National Program: This strategy aims to:

- ✓ Take stock of the climate at the global and national levels and of the sectors most vulnerable to climate change in Côte d'Ivoire,
- ✓ Present the major challenges of Côte d'Ivoire in the face of climate change,
- ✓ Propose the great strategic orientations and the governmental priorities according to the principal risks incurred by the various components of the society in front of the climate changes,
- ✓ Propose the overall plan of the governmental actions aiming at increasing the resilience of the Ivorian society towards climate change.

National Program of Agricultural Investment (NAIP): The second generation NAIP (NAIP II) aims at a sustainable and competitive Ivorian agriculture that creates of equitably shared wealth. This vision poses the dual challenge of a coordinated development of the agro-silvo-pastoral and fisheries sector, and the positive impact of this development on the environment and society.

Specifically, the NAIP focuses on achieving three strategic objectives:

- ✓ The development of agro-silvo-pastoral and fisheries value added.
- ✓ Strengthening environmentally friendly agro-silvo-pastoral and fisheries production systems.
- ✓ Inclusive growth, guaranteeing rural development and the well-being of the population.

National Strategy on Climate Smart Agriculture in Côte d'Ivoire: the overall objective of the strategy is to "develop a national smart agriculture to increase agricultural productivity, ensure food security and climate resilience of the sector". This objective contributes to the implementation of the nationally determined expected contributions (INDC) and the Biennial Update Report (Bur) for Côte d'Ivoire. Specifically, the strategy is based on the following orientations:

- ✓ Strengthen the institutional and legal framework for the development of Climate Smart Agriculture (CSA).
- ✓ Supporting research and development and innovation in CSA.
- ✓ Strengthen national capacities in the field of CSA.
- ✓ Raise awareness, communicate and popularize CSA technologies and practices.
- ✓ Establish a sustainable financing mechanism for the NACSA.

National Drought Plan: The National Drought Plan aims at providing Côte d'Ivoire with effective tools, both institutional and legal, to better cope with natural hazards in order to reduce the country's vulnerability to drought. It will allow the establishment of principles or modes of action for the management of drought and its consequences. Also, it will contribute to identifying the impacts of drought to determine the stakes, to determine the adaptation measures to be implemented by the actors in order to elaborate a relevant management strategy. The implementation of the plan will contribute to risk reduction by helping to better understand the hazards related to drought, to better understand the root causes of vulnerability and to better identify the mechanisms for societal resilience. Specifically, the National Drought Plan will help the country prepare for the onset of drought according to three key pillars:

- ✓ Establish drought monitoring and early warning systems.
- ✓ Assessing the vulnerability and risks of drought in different climatic regions of the country.
- ✓ Implementing measures to limit the impacts of drought and better manage the consequences.

National plan to combat desertification and land degradation in Côte d'Ivoire: The national actions' plan, as a strategic framework for combating land degradation and deforestation for sustainable development, is articulated around the following main orientation or strategic axes

- ✓ Improvement of the living conditions of vulnerable populations.
- ✓ Improvement of the state of degraded ecosystems.
- ✓ Consolidation of the global benefits of an effective implementation of the Convention to Combat Desertification.
- ✓ Mobilization of sustainable resources in favor of the fight against desertification.

The National Climate Change Adaptation Plan (NAP): The National Climate Change Adaptation Plan (NAP) has set three (3) strategic axes to address the issue. They are related to:

- ✓ Strategic Area 1: Promote the integration of climate change in sectoral policies and strategies, in development planning and strengthen the institutional and legal framework.

- ✓ Strategic Area 2: Improve and disseminate national knowledge on climate change and build the capacity of actors.
- ✓ Strategic axis 3: Promote measures to mitigate the effects of climate change in all sectors. Thus, it is clearly stated that "the government's approach to adaptation is to establish a NAP that reduces vulnerability to the impacts of climate change by building adaptive capacity and resilience of populations by building on existing development planning processes. Adaptation planning will focus in the first phase on the sectors identified as most vulnerable: agriculture, water access, land use, coastal zones, and health. ..." (excerpt For a National Adaptation Plan (NAP) Process that Addresses Gender Issues in Côte d'Ivoire, February 2019, Ministry of Environment and Sustainable Development, Republic of Côte d'Ivoire.)

Nationally Determined Contributions: the revision of Côte d'Ivoire's NDCs was an opportunity to update the priority sectors for adaptation (5 sectors retained: Agriculture/Livestock/Aquaculture, Forestry and Land Use, Water Resources, Health and Coastal Areas) and to maintain the 4 priority sectors for mitigation (Energy, Agriculture, Forestry, Waste). This revision of the NDCs also allowed for the integration of cross-cutting themes such as gender, local communities, and green jobs. Côte d'Ivoire's commitment through its NDC aims to reduce GHG emissions by 30.41% by 2030.

Sustainable Development Goals (SDGs): The proposed project will tackle the issues directly related to the SDGs such as Goal 1. End poverty in all its forms everywhere, Goal 2. End hunger achieve food security and improved nutrition and promote sustainable agriculture, Goal 6. Ensure availability and sustainable management of water and sanitation for all, Goal 13. Take urgent action to combat climate change and its impacts, Goal 14, Conserve and sustainably use and Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss. Apart from the national and international plans and strategies, the proposed project is aligned with the technical national and regional standards:

Regulation on the harmonization of rules governing quality control, certification and marketing of plant seeds and seedlings and the implementing texts for the ECOWAS and UEMOA areas: The purpose of the Regulation is to harmonize the rules governing the control of certification and marketing of vegetable seeds and seedlings in the Member States. This harmonization aims to guarantee the good quality and to determine the origin of varieties of plant species listed in the West African Catalogue of Plant Varieties and of Plant Species and Varieties as defined in Article 9 of this Regulation.

Agricultural orientation law of Côte d'Ivoire: This law aims to: specify actions for the optimal development of the country's agro-ecological potential and agricultural know-how; create an environment conducive to the development of a structured agricultural sector; create the conditions for the modernization of family farming and agricultural enterprises, in order to promote the emergence of a structured, competitive agro-industrial sector that is integrated into the subregional and international economy to develop an agricultural sector that contributes to food sovereignty, food and nutritional security, poverty reduction and job creation; to improve the environment and living conditions in rural areas; to contribute to the fight against forced labor and the worst forms of child labor; to restore or preserve biodiversity; to control, mobilize and manage surface and groundwater resources. The provisions of this law apply to the entire agricultural sector in general, including agriculture; forestry; agroforestry; aquaculture; livestock; and fishing.

Fisheries and Aquaculture Act: This law, composed of 121 articles divided into six (6) titles, governs fishing and aquaculture activities and applies to fishing in waters under Ivorian jurisdiction; fishing in continental waters; fishing in waters outside Ivorian jurisdiction for vessels flying the Ivorian flag; any natural person or legal entity practicing fishing or aquaculture in continental waters or in water under Ivorian jurisdiction; fishing units, establishments and aquaculture farms; related fishing and aquaculture operations. Specifically, this text aims to: establish the general principles of conservation and management of fishery resources and the exercise of fishing and aquaculture activities; improve

the governance of fisheries and aquaculture through participatory management based on the training and supervision of stakeholders; combat IUU fishing; protect, conserve and manage fishery resources in a sustainable and rational manner as a national heritage, for present and future generations to affirm the principle of the participation of the actors of the fishery resources sector and of the local communities in the conservation and management of fishery resources; to put in place and improve the legal and institutional framework for the exercise of responsible fishing; to formulate and implement the appropriate measures; and to promote the protection of bio-aquatic resources and ecosystems.

Law n° 2015-532 of July 20, 2015 on the Labor Code: This law guides individual and collective relations in the field of work. In all establishments subject to this Code, except for agricultural establishments, the normal working hours of personnel, regardless of their sex or method of remuneration, are set at forty hours per week. This duration may be exceeded by applying the rules relating to equivalence, overtime, and the recovery of lost working hours, and to modulation. This law is very relevant to the project in that it serves as a guide for employer-employee relations during the implementation of the project.

Law n°98-750 of December 23, 1998 modified by the law n°2004-412 of August 14, 2004 on rural land tenure: The legal framework for rural land tenure is constituted by the Ivorian Constitution, but also by Law n°98-750 of December 23, 1998 relating to rural land tenure, modified by Laws n° 2004-412 of August 14, 2004 amending the 1998 Law and n° 2013-655 of September 13, 2013, relating to the time limit for the establishment of customary rights on customary land and modifying Article 6 of Law n° 98-750 of December 23, 1998, relating to rural land tenure. This law establishes the foundations of the land policy relating to the rural land domain, notably the recognition of a customary rural domain and the validation of the existing management of this domain, the association of village authorities and rural communities in the management of the rural land domain and in the recording of customary rights and their transformation into real rights. Some project activities will require the acquisition of land in rural areas. This law will make it possible to identify the holders of these lands with a view to a contractualization.

Law n°98-755 of 23 December 1998 on the Water Code: lays down the general principles applicable to the protection of the water domain in Côte d'Ivoire. It sets the objectives for the management of water resources, hydraulic works and facilities according to the following points.

- Hydraulic developments and works subject to the authorization regime are subject to a prior environmental impact study (Title II, Chapter III, Article 29);
- installations, developments, works and activities likely to hinder navigation, to present dangers for public health and safety, to harm the free flow of water, to degrade the quality and quantity of water resources, to increase, in particular, the risk of flooding, to seriously harm the quality or diversity of the aquatic environment (Title II, Chapter III, Article 31) are subject to a prior authorization before any implementation;
- the installations, works and activities which, not being likely to present such dangers, must nevertheless respect the prescriptions enacted by the legislation in force (Title II, Chapter III, Article 31, second paragraph) are subjected to a preliminary declaration;
- the protection of hydraulic installations and works (Title III, Chapter III, Article 54).

This text is relevant to the present project in that the implementation of the sub-projects could have a close relationship with the water resource, both in terms of withdrawal and in terms of achieving its physical and chemical quality. The project will have to comply with these requirements for the protection of water sources and reservoirs in its area of intervention in order to avoid their pollution and wastage:

Loi n° 2014-390 du 20 juin 2014 d'orientation sur le développement durable : This law constitutes a guide for the implementation of the project. It guides all development actions according to the principles of sustainable development. This law will be particularly emphasized within the framework of the citizen commitment which aims at the appropriation of the various activities of the project by

the beneficiaries for a rational and sustainable management of the water resource and the hydraulic works which will be carried out for the current generations.

Decree no. 96-894 of November 8, 1996 determining the rules and procedures applicable to the impact of a project on the environment: This decree is of major importance within the framework of the project insofar as it frames, on the one hand, the environmental and social assessments and, on the other hand, makes it compulsory for the population to be consulted and participate in all procedures and decisions that could have an impact on their environment.

· **Decree n° 71-74 of 16 February 1971: it is related to the procedures of domanial and landed property:** Decree n°71-74 of 16 February 1971, grants de jure recognition (articles 1 and 2) with a limited legal scope in that customary rights are defined "as simple rights of use on state land, personal to those who exercise them". In practice, however, few people take this narrowing of their scope into account. Very often, customary rights are assimilated to property rights of Roman conception. Even modern courts come to forget modern land law and make this identification, even giving primacy to claims based on customary law over the public records of the land registration books.

The project is also consistent with the Decree on the creation, attribution, organization and functioning of the National Committee on Seeds and Plants, the Specific legal texts on pesticides in Côte d'Ivoire and OHADA Uniform Act on the Law of Cooperative Societies.

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

The proposed project is aligned with relevant national technical standards and meets requirements stipulated by Environmental code and Environmental Impact Assessment (EIA) and Environmental Audit (EA) Regulations. The adaptation actions to be carried out within the framework of the application of the technologies will be in conformity with the various codes in force, in particular the environmental code. The relevant regulatory text applicable to the present project is the Framework Law n° 96-766 of October 3, 1996, bearing the Environment Code. This Code sets the general framework of legal and institutional texts relating to the Environment. It aims at:

- ✓ to protect the soils, subsoils, sites, landscapes and national monuments, plant formations, fauna and flora and particularly the classified domains, the national parks and existing reserves;
- ✓ to establish the fundamental principles intended to manage, to protect the environment against all forms of degradation in order to develop the natural resources, to fight against all kinds of pollution and nuisances;
- ✓ to improve the living conditions of the various types of population in the respect of the balance with the surrounding environment;
- ✓ to create the conditions for a rational and sustainable use of natural resources for present and future generations;
- ✓ to guarantee to all citizens, an ecologically healthy and balanced living environment;
- ✓ to ensure the restoration of damaged environments.

In its Article 22, it is stipulated that "The competent authority, under the terms of the regulations in force, may refuse the building permit if the constructions are of such a nature as to be detrimental to the character or integrity of the surrounding area.

- The identification of sites to be developed, taking into account the selection criteria defined in the guidelines;
- Conducting a site assessment of the selected lowland in order to:
 - Determine whether its development is consistent with existing policies;
 - Define the current and future uses;

- Conduct the economic and environmental analysis;
- Evaluate land issues, development techniques and operating methods.
- The definition of the role of the different actors, both state (ministry and structures under its authority) and private, and possibly technical and financial partners.
- Strengthening the capacities of decision-makers, professionals, beneficiaries and scientific research the realization of monitoring and evaluation (technical, environmental and performance) in order to draw positive lessons to be disseminated/perpetuated.

According to Environmental Code (2016), this project does not require a full Environmental Impact Assessment, but rather an Environmental Report detailing potential impacts and mitigation measures. With regard to the Adaptation Fund AF categorization, the project can be categorized as Category B, meaning that it has potential adverse impacts, but in small number and scale, not widespread and easily mitigated through an ESMP.

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

Several previous works relating to the rehabilitation and/or development of market gardening and rice growing sites have been carried out with a view to using them for market gardening and irrigated rice development. Through the Competitive Fund for Innovation and Sustainable Agriculture, innovations have been demonstrated in the farming environment in order to provide solutions for improving the performance of farmers and adapting to the effects of climate change. The present project aims to amplify the results obtained during the demonstration phases by involving a larger number of beneficiaries and creating enabling environment for sustainable access and uptake of proposed climate-resilient technologies. The proposed project and its interventions will avoid any duplication of actions and funding sources. During conceptualization and designing of this project, consultations were made with all the concerned regions authorities and relevant sector ministries whereby it was clear that no similar interventions exist in such region. This will further be confirmed during the development of the full project proposal where a more detailed stakeholder consultation will be conducted. This will ensure that no duplication of project or funding sources is done. However, there are some projects which are implementing some activities related to climate resilience and adaptation to climate change. The table below shows some of related projects for climate change adaptation conducted in Côte d'Ivoire.

Table 4: Climate Change related project/program in Côte d'Ivoire

Project/program	Objective	Synergy with the proposed project	Complementarity with the proposed project
Project for adaptation to climate change and stabilization of the population's livelihoods in southwest Côte d'Ivoire (PACCS).	Stabilize the livelihoods of vulnerable populations affected by the conflict in Moyen Cavally and Bas Sassandra, through improved food security and capacity building for sustainable adaptation to climate change.	No duplication. The proposed project does not only target region affected by conflict but all the rice cultivation regions in the country.	No complementarity. The two projects are divergent from their objectives
GCF-FAO project to reduce emissions by promoting deforestation-free cocoa production in Côte d'Ivoire.	Stop agriculture-related deforestation, improve agricultural productivity, preserve biodiversity, restore forest cover and improve farmers' livelihoods.	No duplication. The project is not targeting cocoa farmers and deforestation.	No complementarity. The two projects are not targeting the same crops then the beneficiaries are different
West Africa Coastal Areas Program	help countries harmonize their management of infrastructure and natural resources to increase their resilience to climate change in	No duplication. The project objective is totally different and does not- affect coastal zones	No complementarity. The two projects are totally different and targeting different execution areas.

Project/program	Objective	Synergy with the proposed project	Complementarity with the proposed project
	general, and to coastal erosion and flooding.		
GCF readiness grant	Strengthening Côte d'Ivoire's Capacity and Ownership to Access Climate Finance for GCF Country Programme Implementation	No duplication. This project is to prepare the country to get more access to climate finance and does not target the agricultural sector	No complementary. The two projects are not targeting the same areas and the objectives are different.
The Agro-Industrial Pole Project in the Belier Region	The sectoral objective of the project is to contribute to increased food and nutritional security.	No duplication. This project can complement the objective of this regional project by targeting the rice sector	There is a complementarity between the two projects because the two are linked to the increasing level of food and nutritional security and will contribute to the objective of the country to alleviate poverty. This will be studied in the project preparation phase. The project is still ongoing, but the current project can learn from the development of rice and vegetables farming and add the adaptation technologies this will enable the outcomes of the previous project to be leveraged.
The project to support agricultural infrastructure in the Indénié-Djuablin region (PAIA-ID)	Contribute to the improvement of food security and the reduction of poverty in rural areas.	No duplication. This project can complement the objective of this regional project by targeting the rice sector	There can be complementarity because this project can use the agricultural water infrastructure developed here can be used in the proposed project for a better result.
Project to support the development of the cassava and vegetables sectors in Côte d'Ivoire (PRO2M)	Contribute to food security and job creation through the promotion of quality, modern, sustainable, climate change resilient food production (other than rice) and through reliable and equitable marketing, allowing for regular market supply.	No duplication. This project is not taking rice cultivation even adaptation technologies into account	The two projects are not on the same sites, but both are targeting the reduction of water use to produce vegetables in green houses. The themes are the same, but the technologies are different will be difficult for this project to use the results of the former project. The social and environmental outcomes could however be considered as learning points for this project and studied further as part of the project preparation study. Also, the management board put in place in the PRO2M can be leverage in the current project for more impacts and exit strategy of the project.
Scaling-up climate-resilient rice production in West Africa	The global objective of the project is to improve climate resilience and increase rice system productivity of	The "Scaling up climate-resilient Rice Production in West Africa" project will use the IRCS	There is complementarity between the two projects. The funded project will target climate resilient rice production specifically the Intensive

Project/program	Objective	Synergy with the proposed project	Complementarity with the proposed project
funded by Adaptation Fund	smallholder rice farmers across West Africa using a climate-resilient rice production approach. The project aims to reach around 153,000 rice growers and indirectly benefit around 1.5 million people.	technology, while this project will not use the IRCS technology. Some IRCS beneficiaries from the regional projects will be selected depending on the region, to take benefit from the rice-fish farming technology, which is using the IRCS for its application. There will be no duplication between the two projects, however, this project will explore the synergy in the rice-fish farming between the two projects in some regions and identify the collaboration framework at full proposal stage.	Rice Cultivation System. The proposed project will capitalize on the result of this activity to diversify the types of income of farmers by adding fish farming to the rice farming where the two farms will have a positive impact on each other.
Integrating Flood and Drought Management and Early Warning for Climate Change Adaptation in the Volta Basin funded by Adaptation Fund	The main objective of the project is to assist the six countries (Benin, Burkina Faso, Côte d'Ivoire, Ghana, Mali and Togo) in the implementation of coordinated and joint measures to improve their existing management plans at regional, national and local level and to build on the lessons learned from the past and current projects related to disaster risk reduction and climate adaptation.	No duplication. The two projects are not targeting the same goals.	There can be complementarity between these two projects because the beneficiaries of the current project can use the early warning system from the AF project to guide their activities.
GEF project "Food Systems, Land Use and Restoration (FOLUR) Impact Program	Seeking to transform food and land use systems, the program consists of a global knowledge platform and 27 country projects.	No duplication. The two projects are not targeting the same goals.	There can be complementarity between these two projects because the beneficiaries of the current project can use the restored land from this project to develop their agricultural activities

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

This project has been designed based on the lessons learned from the pilot projects and adaptation needs arising from stakeholders. The project's learning and knowledge component is captured under Components 1, 2, and 4 (all activities).

The implementation of the project is accompanied by a communication strategy whose objective is to valorize the achievements by capitalizing on them and disseminating them to rural actors and authorities in charge of rural community development. This strategy can be broken down as follows:

- Project launch workshops: These are designed to inform and discuss with stakeholders

(producers, their professional organizations, authorities, etc.) the opportunities offered by innovations in the quest for better use of market garden and rice growing sites.

- Exchange visits and study tours: These are designed to allow beneficiaries to share the experiences of producers in localities where the technologies have been implemented. These exchanges could generate interest in the innovations to be disseminated.

- Training of producers: this aims to provide knowledge of the three (3) technologies to producers in the market gardening and rice growing areas in order to arouse their interest in their practice and then their gradual adoption in the environment as and when satisfactory results are achieved.

- Review workshops and a workshop to capitalize on the project's achievements: these are planned to share the results and raise awareness among opinion leaders on the advantages and opportunities of the innovations in the area. During these meetings, the testimonies of the beneficiaries will help to better appreciate the socioeconomic benefits of the technologies in the rural environment.

- The dissemination of technical-economic data sheets and educational films on the project's achievements will also contribute to the valorization of the achieved results.

- The participation of the executing entity technicians other than those from the project areas, will offer the possibility of a better understanding of the project's results.

- The participation of executing entity technicians other than those from the project areas offers the opportunity to disseminate the technologies in other localities than those of the project.

- Local radio stations in the executing entity zones will be used to disseminate technical messages through animations by technicians.

- Electronic extension guidelines of the technologies (image-based tools, films etc.) will be provided on the executing entity website in several local languages, thus reaching a large number of producers.

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

In the process of identifying and formulating the project, several actors and stakeholders were consulted. During the various supervision missions of the Coordination Unit of the Sustainable Agricultural Sectors Program, the beneficiaries always expressed their wish to see the program's support extended to the development of production infrastructures and support for equipment in terms of agricultural inputs and materials, given the resources they would need to mobilize to adapt technologies (especially for rice-fish farming ponds). Also, agreements were received from more than two hundred (200) producer groups (the Agreement will be shared at the fully developed proposal stage), including seventy (70) women from the departments covered by the executing entity zones of Séguéla, Sinfra, Zuénoula, Bouaflé, Daloa, Vavoua, Boundiali, Dabakala, Ferkessedougou, Katiola, Korhogo, Minignan, Odienné, Tingrela, Bangolo, Man, Toulepleu, Biankouma, Duékoué, Kouibly and Danané. These agreements were the moral support and verbal agreements for the entity to spread the proposed technologies.

Two Focus Group Discussions were conducted in 2019 and a national workshop was conducted in 2021.

- 1) January-February 2019 – which was attended by 125 participants; of whom 16 participants are women.
- 2) September-October 2019 – which was attended by 298 participants; of whom 29 participants are women.
- 3) December 2021 – which was attended by 53 participants; of whom 13 participants are women.

The 2 Focus Group Discussions/consultation workshops in 2019 were attended by the local government and communities including marginalized/minority groups who represent various groups/organizations e.g., prefects, customary chiefs, land chiefs, local representatives of the

Ministries of Agriculture and Animal Production, producer groups (vegetable farmers, rice farmers, fish farmers), youth and women's associations, and media (local radio stations). During the Focus Group Discussions, we visited the target areas: Tiassalé (South), Yamoussoukro (Center), Korhogo (North), Touba (North-west), Agnibilékro (East), Abengourou (East), Oumé (Center-west), San Pédro (South-west), Soubré (South-west), to understand the threats and challenges on the ground.

The national workshop in 2021 was attended by representatives from various Ministries, development agencies, university, local authorities, the private sectors, CSOs, financial institutions and local communities including vulnerable groups. The discussion was mainly about the project idea, including (i) the context of the project, (ii) the definition of the technologies and the location of the project, (iii) the objectives of the project, (iv) the components and expected results, and (v) the implementation schedule.

Please refer to Table 5: Recapitulation of the Consultation for detailed information.

It should be noted that the pilot project aimed at strengthening the resilience of small-scale agricultural producers to the effects of climate change, particularly those related to the scarcity of water resources, had as a targeting principle, the vulnerability of these actors to the availability of water resources for watering their crops. It should be remembered that the agricultural production system in Côte d'Ivoire is rainfed. This makes the sector de facto vulnerable to climate change. Consequently, the list of people consulted is made up of people identified by ANADER in the context of its traditional activities of supervising small agricultural producers, and who were facing the problem of the scarcity of water resources.

In addition, ANADER applied for 2 innovative projects managed by FIRCA. The satisfactory results obtained by these 2 projects during the pilot phases were shared during the evaluation workshops and disseminated through the ANADER system. The technicians relayed the information to the producer groups that they supervise in their daily work. Thus, in response to the call for proposals launched by FIRCA to identify adaptation projects to be submitted to the Adaptation Fund, ANADER, through its field system informed and identified producer groups that agreed in principle (moral guarantors) to benefit from these two technologies that provide solutions to their major concerns in terms of water resource management in order to ensure the sustainability of their market garden crops, fish ponds and rice pits during dry periods of the year.

Marginalized and vulnerable groups will be identified through participatory diagnoses in the various localities targeted by the project. These diagnoses will highlight the stakeholders in the area, their specific needs, and the constraints and difficulties of these stakeholders. Needs will then be prioritized, and the various stakeholders mapped in order to identify vulnerable and marginalized targets and better respond to their specific needs, in accordance with FIRCA's gender policy. The PFG will help for this larger ground consultations.

Regarding the notion of indigenous people as stipulated by the United Nations Declaration on Indigenous Peoples, Côte d'Ivoire does not have any indigenous peoples on its territory.

Details on the consultations from the project are summarized in the following table.

Figure 9 : Consultation workshop



Table 5: Recapitulation of the consultation activities

PERIOD/DATE	VISITED AREAS	Number of participants	Stakeholders	Subject discussed
From 30th January to 22nd February 2019	Tiassalé (South) Yamoussoukro (Center) Korhogo (North) Touba (North-west) Agnibilékro (East)	125 (13% of women)	<ul style="list-style-type: none"> ➤ Prefects ➤ Customary chiefs ➤ Land chiefs ➤ Local representatives of the Ministries of Agriculture and Animal Production ➤ Producer groups (vegetable farmers, rice farmers, fish farmers) ➤ Youth and women's associations ➤ Media (local radio stations) 	<ul style="list-style-type: none"> ➤ Difficulty for women and young people in some regions to access land to grow food crops ➤ Soil impoverishment in rice cultivation ➤ Seasonality of water points (mainly in the north and center) ➤ Painfulness and cost of daily manual watering ➤ Difficulty in retaining rainwater for cultivation to cope with the seasonality of the rains and the irregularity of the rains
From 23rd September to 3rd October 2019	Abengourou (East) Oumé (Center-west) San Pédro (South-west) Soubré (South-west) Yamoussoukro (Center)	298 (10% of women)		
14th December 2021	Abidjan (National consultation workshop)	53 (25% of women)	<ul style="list-style-type: none"> ➤ Ministry of Agriculture and Rural Development ➤ Ministry of Water and Forests ➤ Ministry of Environment and Sustainable Development ➤ Ministry of Women, Family and Children ➤ Ministry of the Interior (General Directorate of Decentralization and Local Development); ➤ Development Agency [Rice Development Agency (ADERIZ), FIRCA, ANADER, Société d'Exploitation et de Développement Aéroportuaire, Aéronautique et Météorologique (SODEXAM)] ➤ Universities and research centers (Nangui Abrogoua University, University of Korhogo, Ivorian Center for Economic and Social Research, Swiss Center for Scientific Research, University of Daloa) 	<ul style="list-style-type: none"> ➤ Discussion of the project idea entitled "Strengthening smallholder farmers' resilience to climate change impacts through the adoption of proven technology and practices". <p>The important point in the agenda dealt with the status of the concept note of the selected project. At this level, the focus was on (i) the context of the project, (ii) the definition of the technologies and the location of the project, (iii) the objectives of the project, (iv) the components and expected results, and (v) the implementation schedule.</p> <ul style="list-style-type: none"> ➤ Discussions focused on the innovations proposed by the project, notably the technical and economic results, the targeting of beneficiaries and intervention areas, the stakeholders involved and their involvement at the regional level. ➤ During this meeting, the participants (association of vegetable farmers and breeders) were particularly concerned about adaptation issues related to the proposed innovations. Farmers and fish farmers were concerned about the accessibility of the proposed technologies and the impact on the qualitative and quantitative growth of fish from the rice-fish ponds. To these questions, the technology providers present at the consultations reassured the various stakeholders of the availability and accessibility of the technologies in quantity and

			<ul style="list-style-type: none"> ➤ Producers' organizations (Interprofession Oignon de Côte d'Ivoire, Association Nationale des Aquaculteurs de Côte d'Ivoire) ➤ Local authorities (Associations of Regions and Districts of Côte d'Ivoire (ARDCI), Union of Cities and Communes of Côte d'Ivoire (UVICOCI)); ➤ Primacy: National Observatory of Equity and Gender (ONEG) ➤ Private sectors (Terres chaudes, Chambre Nationale des Métiers de Côte d'Ivoire) ➤ Civil society [Observatoire Ivoirien pour la Gestion Durable des Ressources Naturelles (OI-REN); Federation of Energy, Environment and Sustainable Development Networks and Associations (FEREAD), Jeunes Volontaires pour l'Environnement (JVE)] ➤ Technical and Financial Partners [National Coordination of the Global Environment Facility, GGGI, Secretariat of the Debt Reduction and Development Contract (C2D)] ➤ Media: FIRCA Communication Department 	<p>quality. With regard to the impact on qualitative and quantitative development, assurance was given that the taste and morphological qualities of the fish produced from these technologies would be maintained</p> <ul style="list-style-type: none"> ➤ The various innovations and their benefits were explained, including issues related to water control for solid rain, and optimization of water resources and organic inputs for rice-fish farming. ➤ Emphasis was placed on the water holding capacity of plants for solid rainfall, water management of fishponds and rice pits, and reduction of chemical fertilizers using water enriched with fish excreta, decomposed organic matter, and farm feeds contained in the fishpond water.
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1. Provide justification for funding requested, focusing on the full cost of adaptation reasoning.

Funds requested from the Adaptation Fund will be used to strengthen the capacity of food crop producers to adapt to climate change through the dissemination of innovative and proven technologies in 24 regions of Côte d'Ivoire to produce tangible and sustainable impacts. Farmers of these regions will continue to be negatively affected from the impacts of climate change and fail to meet the livelihood needs should their practices not be enhanced by approaches developed by this project. As highlighted in the introductory section, the sites and communities identified are highly vulnerable to inconsistent rainfall patterns and water availability. The adoption of the recommended strategies will enable enhanced resilience of farming practices to be anchored within community farming practices.

With the current practice (no AF scenario), communities will have no capacity to address the challenge of inadequate sustainable water supply for irrigation farming and domestic use in the project area. This means that farmers will continue to depend on rainfed agriculture which may or may not result to harvesting reasonable crop yields since rains are not reliable. Most of the households will face shortage of food and poor household income thus leading to food insecurity and abject poverty. The most affected groups will be women and children, especially female headed households that solely depend on farming for their livelihoods in some regions. Women are highly impacted compared to men due to their increased workload farming activities for the household.

AF funding to disseminate rice cultivation technologies will enable adaptation technologies spreading throughout for rice farmers. By funding capacity building of the extension system, training of farmers on the tools in the field and post-training follow-up, support for the establishment of farmers' application sites, training and involvement of local actors in the value chains of the sectors concerned in order to ensure effective support for farmers, the AF will contribute to supporting Côte d'Ivoire to achieve Sustainable Development Goal 1. End poverty in all its forms everywhere, Goal 2. End hunger achieve food security and improved nutrition and promote sustainable agriculture, Goal 6. Ensure availability and sustainable management of water and sanitation for all, Goal 13. Take urgent action to combat climate change and its impacts, Goal 14, Conserve and sustainably use and Goal 15. Protect, restore and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

Component 1, related to water management and adoption of solid rain technology is important for farmers' adaptation capabilities strengthening. The cost of adoption of this technology is justified by the fact that it is sold by a third party to the farmers at a certain cost. The availability of the technology for beneficiaries' farmers for the project is costly and justified. For farmers, business as usual is the fact that they must cope with the water scarcity issue, with usual expenses for their production. But solid rain technology, which is considered as an adaptation technology for water scarcity issues due to climate change. This technology has a cost for its adoption, then the difference between the production cost in business as usual and the production cost with the solid rain technology can be considered as the cost of adaptation. The additional amount that has to be paid by the farmers to adopt the technology made available by the seller (third party distributor of the technology) can be viewed as the cost of adaptation to solid rain. For component 2, the diversification of the activities of rice farmers is important in the project to reduce the chemical fertilizers used. The reduction will reduce the impact of the crop on climate change. The cost of fish farming and water management for the mixed technology is justified by the impact that the project is targeting. The sustainability of the project after it ends is linked to components 3 and 4. Having access to finance to adopt the proposed technology and access to market will help the farmers increase their income and build resilience to climate change. The farmers' group strengthening, implementation of association savings and credit, partnership with microfinance institutions and insurance companies are critical for the exit strategy and their cost is justified.

The problem identified in the framework of this activity concerns the control of water and chemical inputs. With this new technology, the water from the fishpond, enriched with nutrients (farm feed, fish excrement, decomposition of organic matter, etc.), is poured into the rice paddy at the end of the fish

production cycle. This system allows the rice paddy to be fertilized with organic matter, reducing the use of chemical fertilizers while enhancing the use efficiency of nutrients. Also, the same amount of water used to produce fish is optimized to irrigate the rice in the rice paddy, which is juxtaposed to the fishpond, thus providing efficient management of available water resources. This has the advantage of allowing the producer to continue his activity in any season and to reduce his dependence on chemical inputs. The project is therefore more “climate smart” than traditional methods, and more sensitive to issues of water pollution, supporting the adaptive capacity of the water system for both agricultural and household usage.

With regard to the solid rain technology, the water retention capacity generated by the plant following its application allows the producer to reduce the frequency of watering by half. This has the advantage of reducing the workload and allowing the plants to resist water stress due to irregular rainfall. These measures facilitate the efficient management of water resources in the context of fluctuating climatic conditions and stringent demands on water resources. GGGI as a partner for this work will provide its in-house adaptation scenario development tool (Green Economy Model) piloted in its work as part of its LT-LEDs in Burkina Faso and Ethiopia. This modeling tool can be leveraged during the project preparation phase and will enable the simulation of the outcomes of the interventions while taking into consideration projected climate scenarios.

Ethiopia: Modelling climate impacts in the Green Economy Model

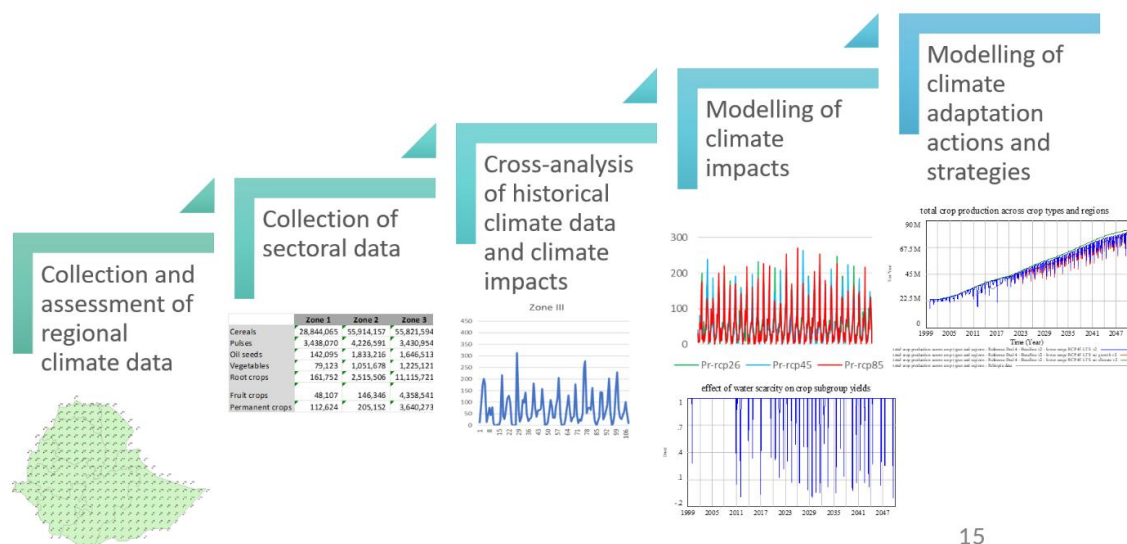


Figure 10: Application of the Green Economy Model underway in Ethiopia. This tool will guide the application of the project interventions in order to fully take into consideration the climate impact of the project site.

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

The sustainability aspect was taken into consideration by involving key stakeholders from the design stage. This is demonstrated by involving administrative authorities, which have a legal mandate to oversee development activities in the project sites in addition to beneficiaries. The project intends to achieve its objectives by improving the knowledge of the actors, strengthening partnerships with local and national actors of the value chains of the concerned commodities. The progressive transfer of technologies to the community and the establishment of a financial vehicle during the project facilitates the sustainability of actions once the project is over. The development of partnerships with development structures and the involvement of local organizations of beneficiaries, through the participation of their representatives in

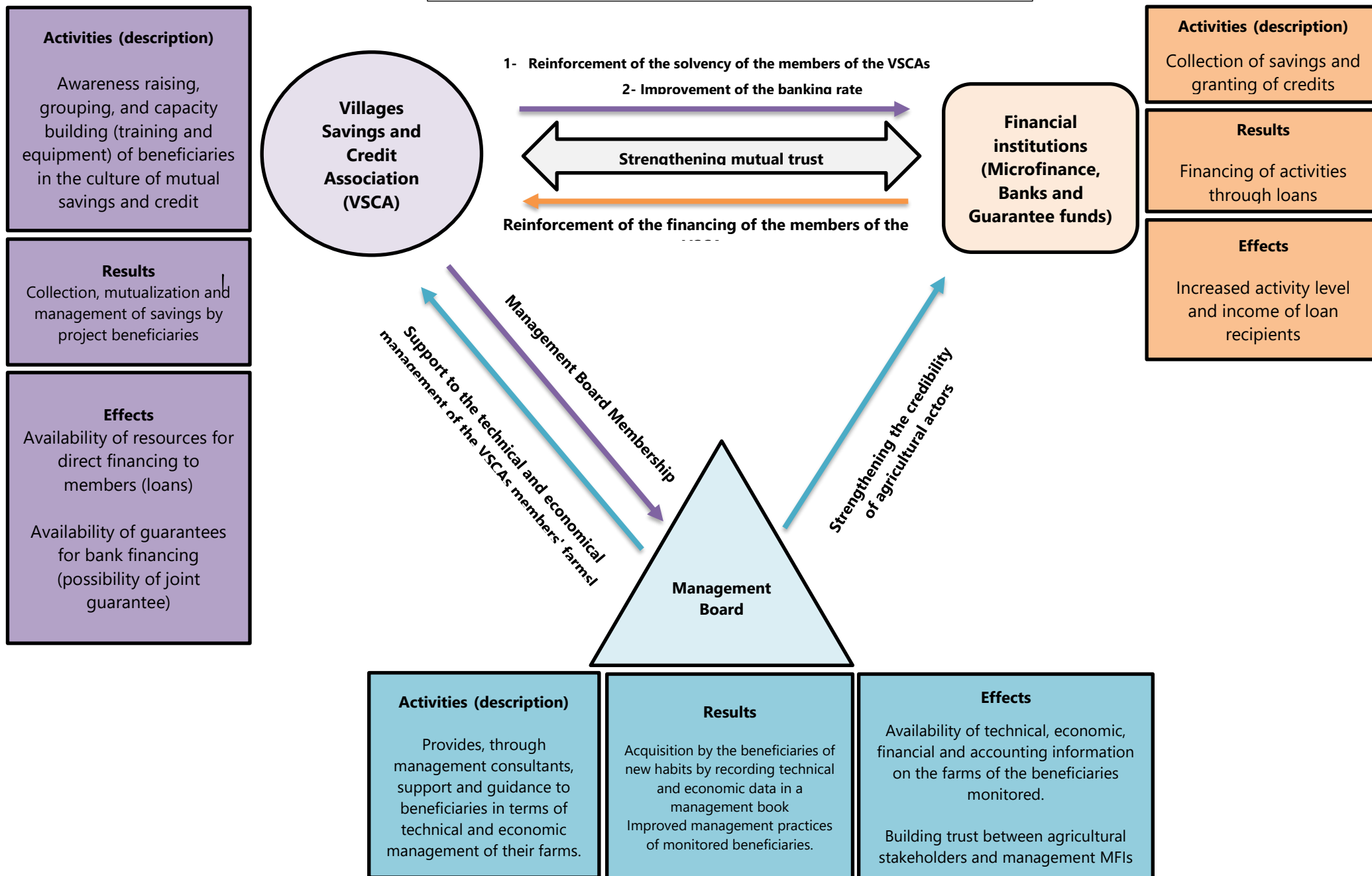
the monitoring and integration of project activities after its completion will ensure the sustainability of the results.

The option envisaged by the project is to work with producer group members. It will be a matter of improving the capacities of these groups in terms of governance (management committees of the developments, management of the supply of inputs, management of marketing, credit committees, mechanisms of functioning of these committees, training of the members of these committees in the execution of their tasks, etc.). The implementation of the project is accompanied by a communication strategy aimed at enhancing the value of the achievements by capitalizing on them and disseminating them to rural actors and authorities in charge of rural community development.

Finally, at the environmental level, the reduction in the use of chemical fertilizers and the use of compost for vegetables and rice will preserve the quality of water and soils for sustainable production of the cultivated areas. Some partnerships will be necessary to design the sustainability of the project. Partners like banks, insurance companies and governments counterparts are important. A strategy and policy on an index-based insurance scheme will help in the financial aspect after the project ends. It will support the de-risking of the use of the proposed technologies in case of extreme weather conditions.

The model that underpins the design of this project and the different outputs is the success of the pilot project, which has demonstrated productivity gains and therefore improved the financial conditions of farmers through the introduction of these technologies. The capacity-building activities, the support towards formalization and the establishment of management committees will be the means to ensure the sustainability of this project. In addition, the mechanism that will be put in place with the banks/financial institutions will guarantee access to the necessary financing to carry out the campaigns and ensure the continuity of the activities. The following scheme provides information on how the financial sustainability of the adoption of the proposed technologies will help beneficiaries access green finance after the project ends and how green finance can help maintain its sustainability.

Figure 11: DYNAMIQUE OF THE SUSTAINABLE OF ACCESS TO FINANCE SCHEME



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

Identification and analysis of potential risks that would emanate from the implementation of project activities will be carried out in detail to ensure that proper adaptation and mitigation measures are in place for the observed negative impacts, and an Environmental and Social Management Plan (ESMP) prepared, in accordance with the requirements of Environmental and Social Standards for FIRCA and ANADER and the AF. The project can be categorized in category B for its possible impact on the environment.

Checklist of environmental and social principles	No further assessment required for compliance	Potential impacts and risks – further assessment and management required for compliance
<i>Compliance with the Law</i>	Ö	<p>Risk: Incompliance with all applicable domestic and international laws and regulations. Likelihood: Low Potential impact: High</p> <p>Measures: The IE will ensure that the project will comply with applicable domestic and international law, as well as a description of the legal and regulatory framework for any project activity that may require prior permission.</p>
<i>Access and Equity</i>	Ö	<p>Risk: Inability to ensure and monitor fair and equitable access to all community members. Likelihood: Low Potential impact: Low</p> <p>Measures: The IE will ensure that the project should provide fair and equitable access to project benefits by all community members that are inclusive, and will be designed and implemented in a way that will not impede access of any group to the essential services and rights mentioned in the principle by:</p> <ol style="list-style-type: none"> 1) conducting stakeholder mapping in order to identify the potential beneficiaries, rivals, disputants, marginalized, or vulnerable people. 2) using a risk analysis to identify and assess the risk of impeding access to essential rights and services, and of exacerbating existing inequalities
<i>Marginalized and Vulnerable Groups</i>	Ö	<p>Risk: Impose any disproportionate adverse impacts on marginalized and vulnerable groups. Likelihood: Low Potential impact: Moderate/High</p> <p>Measures:</p> <p>The marginalized and vulnerable groups were identified through an initial stakeholder mapping and also consulted through 2 Focus Group Discussions in 2019 and a national workshop in 2021. The list of participants that were consulted, a report on the outcomes and concerns raised during the consultation workshops will be shared at the fully developed proposal stage. In addition to the initial stakeholder mapping and consultations that were conducted in 2019 and 2021, more in-depth analysis on the stakeholder mapping and intensive consultations will be</p>

		done during full proposal development, including 1) identify and quantify the marginalized, minority and vulnerable groups; 2) describe the key findings and characteristics of the marginalized, minority and vulnerable groups 3) identify adverse impacts that each marginalized, minority and vulnerable group are likely to experience, and 4) identify the monitoring mechanism that may be needed during the project implementation.
<i>Human Rights</i>	Ö	<p>Risk: Occurrence of human rights violations Likelihood: Low Potential impact: Moderate/High</p> <p>Measures: The project will adhere to national and international human rights standards, policies, rules and regulations, including UDHR. IE will ensure that human rights issues will be part of consultations with stakeholders during the identification and/or formulation of the project, provide an overview of the relevant human rights issues (if any) and monitor the implementation.</p>
<i>Gender Equality and Women's Empowerment</i>	Ö	<p>Risk: Unequal access for men and women Likelihood: Moderate Potential impact: Moderate/High</p> <p>Measures: Gender will be mainstreamed in all project components. An initial gender analysis was provided, and an in-depth analysis will be completed at the full proposal development stage. IE will assess current situation, potential risks and legal and regulatory context and will proactively take measures to promote gender equality to ensure equal access to benefits and that there are no disproportionate adverse effects.</p>
<i>Core Labour Rights</i>	Ö	<p>Risk: The project activities do not meet the core labour standards due to limited knowledge of labour rights standards. Likelihood: Low Potential impact: High</p> <p>Measures: The project will adhere to core labour rights and incorporate ILO standards in the design and implementation, as well as create awareness of how the standards may apply.</p>
<i>Indigenous Peoples</i>	No risk observed but a full risk assessment will be undertaken at the fully developed proposal stage	Following the UNDRIP guideline on the definition of indigenous people, we confirm that there is no indigenous population in the targeted project areas. A full risk assessment will be undertaken at the fully developed proposal stage.
<i>Involuntary Resettlement</i>	No risk observed but a full risk assessment will be undertaken at the fully developed proposal stage	There is no risk of involuntary resettlement because the land that will be used in the project is the property of the selected farmers that are already in use for agricultural production. The project will only bring the technologies to the already used land. Thus, there is no risk of involuntary resettlement. A full risk assessment will be undertaken at the fully developed proposal stage.
<i>Protection of Natural Habitats</i>	No risk observed but a full risk assessment will be undertaken at the fully developed proposal stage	The land and spaces that will be used for the project are already used in agricultural production. Apart from the fishponds that will be dug in already used lands, which are close to the rice farm, and thus there is no risk of destruction of any natural habitat. A full risk assessment will be undertaken at the fully developed proposal stage.
<i>Conservation of Biological Diversity</i>	Ö	<p>Risk: Loss of biological diversity Likelihood: Low Potential impact: High</p>

		Measures: Project activities related to restoration of ecological balance aim to enhance biodiversity conservation. IE will identify: 1) the presence in or near the project area of important biological diversity; 2) potential of a significant or unjustified reduction or loss of biological diversity and 3) describe the measures to be taken to minimize impacts.
<i>Climate Change</i>	Ö	<p>Risk: Increase in greenhouse gas emissions Likelihood: Low Potential Impact: High</p> <p>Measures: The project will contribute to climate change adaptation measures. No GHG emissions anticipated. The project will demonstrate compliance by carrying out a qualitative risk assessment for each of the mentioned drivers of climate change, plus any impact by the project on carbon capture and sequestration capacity.</p>
<i>Pollution Prevention and Resource Efficiency</i>	Ö	<p>Risk: Increase pollution and resources inefficiency Likelihood: Low Potential impact: High</p> <p>Measures: The project will adhere to established national and international pollution standards, as well as minimize all sources and forms of energy, water, and other resources in a reasonable and cost-effective way, as well as the production of waste and the release of pollutants.</p>
<i>Public Health</i>	Ö	<p>Risk: Negative impact on public health Likelihood: Low Potential impact: High</p> <p>Measures: The project design will ensure that public health is not adversely affected by performing health impact screening and assessment in compliance with the relevant WHO recommended practices.</p>
<i>Physical and Cultural Heritage</i>	No risk observed	
<i>Lands and Soil Conservation</i>	Ö	<p>Risk: Degradation or conversion of productive lands that provides ecosystem services Likelihood: Low Potential impact: Moderate/High</p> <p>Measures: The project will promote conservation of soil and land resources as the soil conservation will be incorporated in project design and implementation. The IE will identify the presence of fragile soils and potential soil loss activities, as well as measures that will be taken to minimize productive land degradation or ecosystem service impacts.</p>

PART III: IMPLEMENTATION ARRANGEMENTS

- A. Describe the arrangements for project / programme implementation.**
- B. Describe the measures for financial and project / programme risk management.**
- C. Describe the measures for environmental and social risk management, in line with the Environmental and Social Policy and Gender Policy of the Adaptation Fund.**
- D. Describe the monitoring and evaluation arrangements and provide a budgeted M&E plan, in compliance with the ESP and the Gender Policy of the Adaptation Fund.**
- E. Include a results framework for the project proposal, including milestones, targets and indicators, including one or more core outcome indicators of the Adaptation Fund Results Framework, and in compliance with the Gender Policy of the Adaptation Fund.**
- F. Demonstrate how the project / programme aligns with the Results Framework of the Adaptation Fund**

Table 7: alignment with the AF results framework

Project Objective(s) ¹⁸	Project Objective Indicator(s)	Fund Outcome	Fund Outcome Indicator	Grant Amount (USD)
Impact: Productivity of vegetable and rice farms is significantly improved despite the effects of climate change and farmers revenue has increased				
Sustainable access to improved water management technologies to build resilience to climate change	Number of extension agents trained on “solid rain” technology	Outcome 8: Support the development and diffusion of innovative adaptation practices, tools and technologies	8.1. No. of innovative adaptation practices, tools and technologies accelerated, scaled-up and/or replicated	1,631,781
	Number of extension agents trained on rice-fish farming technology			
Rice-fish farming to support diversification and climate-resilient rice cultivation system	Number of farmers trained in rice-fish farming	Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	6.2.1. Type of income sources for households generated under climate change scenario	1,081,010
	Number of rural planners trained in rice-fish farming management techniques			
	Number of micro dams developed for the application of rice-fish farming			
	Number of sites developed for the application of rice-fish farming			
Access to finance strengthened for climate resilient rice and vegetables farming enterprises development	Number of cooperatives/professional organizations strengthened	Outcome 6: Diversified and strengthened livelihoods and sources of income for vulnerable people in targeted areas	6.1 Percentage of households and communities having more secure access to livelihood assets	474,000
	Number of local management committees created and strengthen			
	Number of comprehensive climate adaptation plans developed for climate finance			
	Number of Market access strategy developed			

<i>Knowledge sharing and policies/strategies development</i>	Number of exchange and sharing experience visits organized	Outcome 7: Improved policies and regulations that promote and enforce resilience measures	7.2. No. of targeted development strategies with incorporated climate change priorities enforced	180,000
	Number of capacities building training session			
	Number of Policies/strategies and institutions gaps assessed and adapted			

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

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

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

A. Record of endorsement on behalf of the government

Provide the name and position of the government official and indicate date of endorsement.

Mr. Marcel Ignace Fodjo Adaptation Fund National Designated Authority Economist, Engineer Environmental Technical Assistant in Charge of Climate Resources Mobilization; Ministry of Environment and Sustainable Development	Date: <i>January, 4, 2022</i>
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B. Implementing Entity certification*Provide the name and signature of the Implementing Entity Coordinator and the date of signature. Provide also the project/programme contact person's name, telephone number and email address*

I certify that this proposal has been prepared in accordance with guidelines provided by the Adaptation Fund Board, and prevailing National Development and Adaptation Plans (National Climate Change Strategy, National Development Plan, National Agricultural Investment Plan, Climate Smart Agriculture National Investment Plan) and subject to the approval by the Adaptation Fund Board, commit to implementing the project 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

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.

ATSIN Yao Léon

Implementing Entity Coordinator

Date: *January, 4, 2022*

Tel. and email: +225 2722 528 181
atsiny@firca.ci

Project Contact Person: AYEMOU Djatin Edmond

Tel. And Email: +225 0707 880 380
ayemou@firca.ci



Project Formulation Grant (PFG)

Submission Date: 4th January 2022

Adaptation Fund Project ID:

Country: **Côte d'Ivoire**

Title of Project/Programme: **Strengthen the resilience of smallholder farmers to the effects of climate change through the adoption of proven innovative technologies and practices.**

Type of IE (NIE/MIE): **National Implementing Entity (NIE)**

Implementing Entity: **Fonds Interprofessionnel pour la Recherche et le Conseil Agricoles (FIRCA)**

Executing Entity/ies: **Agence Nationale d'Appui au Développement Rural (ANADER)**

A. Project Preparation Timeframe

Start date of PFG	March 2022
Completion date of PFG	November 2022

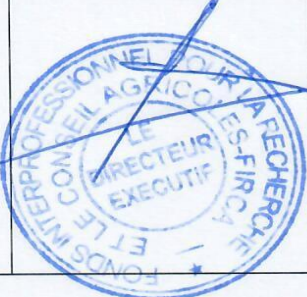
B. Proposed Project Preparation Activities (\$)

Describe the PFG activities and justifications:

List of Proposed Project Preparation Activities	Output of the PFG Activities	USD Amount
Literature review	Detailed literature review, a list of reviewed literatures	1,800
Stakeholders' workshops for validating the project design and inputs for full proposal development	Workshop reports, validated project design, improved design, inputs to the design process	10,800
Field visits in the project area for validating project design and obtaining inputs for full project proposal development	Validated project design	11,300
Detailed analysis of project components	Well described and detailed Project components	3,700
Development of project logframe and results framework	Detailed Project Logframe and Results Framework developed	2,500
Detailed project budget development	Detailed and concrete project budget	1,700
Preliminary Environmental Impact Assessment (EIA) of the proposed project	EIA report, EIA review report and Environmental Clearance Certificate	5,750
Full project proposal development	Full Project Proposal developed	8,200
Implementing Entity's Management Fee		4,250
Total Project Formulation Grant		50,000

C. Implementing Entity

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

Implementing Entity Coordinator, IE Name	Signature	Date (Month, day, year)	Project Contact Person	Telephone	Email Address
ATSIN Yao Léon		January, 4 th 2022	AYEMOU Diatin Edmond	+225 0707 880 380	ayemou@firca.ci

MINISTRY OF ENVIRONMENT AND
SUSTAINABLE DEVELOPMENT

GENERAL COORDINATION OF PROGRAMS
AND PROJECTS

NATIONAL CLIMATE CHANGE PROGRAM

N°00001/MINEDD/CAB/CGPP/PNCC/fmi

REPUBLIC OF CÔTE D'IVOIRE
Union - Discipline - Work



Abidjan, 04 JAN. 2022



Letter of Endorsement by Government

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

Subject: Endorsement for *Strengthen the resilience of smallholder farmers to the effects of climate change through the adoption of proven innovative technologies and practices.*

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

Accordingly, I am pleased to endorse the above project concept note with support from the Adaptation Fund. If approved, the project will be implemented by Fonds Interprofessionnel pour la Recherche et le Conseil Agricoles (FIRCA) and executed by Agence Nationale d'Appui au Développement Rural (ANADER).

Sincerely,



FODJO Marcel Ignace

Adaptation Fund National Designated Authority
Engineer Environmental, Economist

Technical Assistant in Charge of Climate Resources Mobilization
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ANNEXES

A. Economic elements of SOLID RAIN

To measure the economic profitability related to the use of the hydro-retainer in vegetable crops, the expenses considered will be the cost of the product and those related to the irrigation of the crops. The other expenses will be considered as fixed.

1- Frequence and irrigation time

The frequency of watering of vegetable crops (cabbage and tomato) varies from 5 to 6 days of watering in week for 1 watering can of 10 liter per m² in general. The duration of watering for these crops is 3 months of intense watering in the conditions of the farmer with 5 days of watering in the week. Watering frequencies are reduced by 50% with hydro-retention irrigation (Solid Rain), i.e. 2.5 days of watering per week.

Watering	cycle lenght	frequence	total number
without hydro-retainer	3 months	5 days/week	60 days
with hydro-retainer	3 months	2,5 days/week	30 days
Margin hydro-retainer	0	2,5 days/week	30 days

60 days of watering are observed for the irrigation of tomato and cabbage plots without hydro-retention against 30 days of watering for the irrigation with hydro-retention.

2- Yield

Hydro-retention irrigation allows an increase of 30% in the yield of vegetable crops for cabbage and tomato. The reference yield in the farming environment is 11 T/ha for tomato and 15 T/ha for cabbage.

Yield (T/ha)	tomato	cabbage
without hydro-retainer	11	15
with hydro-retainer	14,3	19,5
Margin hydro-retainer	3.3	4.5

3- Cost effectiveness

The purchase cost of the hydro-retainer is 25 000 Fr / kg, For 1 Hectare of cabbage or tomato crop, 10 kg of solid Rain is needed.

The costs of watering are evaluated in man/day and it takes 8 men per to irrigate 1 hectare of tomato or cabbage plot with watering cans. The cost of the irrigation day is fixed at 1000 Fr CFA on average. The selling prices of tomato and cabbage vary on the market according to the periods. The minimum price of USD 0.35/kg for cabbage and USD 0.6/kg for tomato will be retained.

Label	Tomato				cabbage			
	Unit	Quantity	Unit Price (USD)	Total Price (USD)	Unit	Quantity	Unit Price (USD)	Prix Total Price (USD)
1-Solid rain purchasing	kg	10	50	500	kg	10	50	500
2- Reduction of watering	Hj	30	2	60	Hj	30	2	60
3- Yield increase	kg/ha	3 300	0.6	1980	kg/ha	49	0.35	1575
Gross Margins (3+2-1)				1540				1134

The margin linked to the increase in production and the reduction of the irrigation load induced using solid rain is clearly superior to the purchase cost of the product.

The time saved by reducing watering is spent on other activities that could bring income to the household

4- Management of water sources

Reducing watering frequencies leads to a decrease in the amount of water used for watering, and thus to a more sustainable management of the available water sources.

COST EFFECTIVENESS RICE-FISH FARMING

1. Cost effectiveness on 1000 m² of ICRS

LABEL	MINERAL FERTILIZATION			FERTILISATION AVEC COMPOST		
INPUTS	Designation	Quantity	Price	Designation	Quantity	Price
	NPK	20 kg	20	Wood powder	4 sacs	8
	Urea	10 kg	10	Ash	4 sacs	6
	Herbicide	0,5 l	5,5	Animal droppings	6 sacs	24
	Seeds	4 kg	4,8	Charcoal powder	4 sacs	6
				Seeds	1 kg	1.2
TOTAL INPUTS COST			40.3			45.2
COSTS						
	Tillage	2,5 trap	10	Tillage	2,5 trap	10
	Nursery	1 planche	2	Nursery	1 planche	2
	Transplanting	2,5 trap	7.5	Transplanting	2,5 trap	10
	Weeding	2,5 trap	2	Weeding	2,5 trap	7.5
TOTAL			21.5			29.5
PRODUCTION (kg)			1.29			749
SELLING PRICE (F/KG)			0.4			0.4
MARGINS (USD)			258.4			299.6
PROFITS GENERATED WITHOUT HARVESTING EXPENSES			238.9			270.1
MARGIN DIFFERENCE DUE TO IRCS						33.2

Comment:

The gross margin of USD 33.2 was calculated on an area of 1000 m², if we extrapolate it on 10x 1000m², that is to say 1 hectare, we will have a gross margin of 10x USD 33.2, that is to say USD 332

2. Profitability fish farming

- The production of fish in a 400m² trap is 3 tons per cycle on average.
-
- Average selling price : USD 2.4/KG

Product : 3000 Kg x USD 2,4 : **USD 7200**

Charges : USD 1,8x 3000 Kg : USD 5400

MARGES : 3 600 000 – 2 700 000 = 900 000 F

Total Product : 332 + 1800 = USD 2132

Link to a video on rice-fish farming https://youtu.be/qsLOWIToZ_c