



ADAPTATION FUND

ADAPTATION FUND BOARD SECRETARIAT TECHNICAL REVIEW OF PROJECT/PROGRAMME PROPOSAL

PROJECT/PROGRAMME CATEGORY: Regular-sized Project Concept

Country/Region: Côte d'Ivoire

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

Thematic Focal Area: Agriculture

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

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

AF Project ID:

IE Project ID:

Requested Financing from Adaptation Fund (US Dollars): 4,000,000

Reviewer and contact person: Camila Florez

Co-reviewer(s): Pascal Martinez

IE Contact Person:

Technical Summary	<p>The project "Strengthen the resilience of smallholder farmers to the effects of climate change through the adoption of proven innovative technologies and practices" aims to strengthen the resilience of smallholder farmers to the effects of climate change through the adoption of proven innovative technologies and practices.</p> <p>This will be done through the four components below:</p> <p><u>Component 1:</u> Sustainable access to improved water management technologies to build resilience to climate change (USD 1,780,000);</p> <p><u>Component 2:</u> Rice-fish farming to support diversification and climate-resilient rice cultivation system (USD 925,000);</p>
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	<p><u>Component 3: Access to finance strengthened for climate resilient rice and vegetables farming enterprises development (USD 395,000);</u></p> <p><u>Component 4: Knowledge sharing and policies/strategies development (USD 180,000).</u></p> <p><u>Requested financing overview:</u> Project/Programme Execution Cost: USD 380,000 Total Project/Programme Cost: USD 3,660,000 Implementing Fee: USD 340,000 Financing Requested: USD 4,000,000</p> <p>The proposal includes a request for a Project Formulation Grant (PFG) of USD 50,000.</p> <p>The initial technical review raises several issues such as compliance with Environmental and Social Policy and Gender Policy, alignment with national technical standards and lack of duplication of the project as is discussed in the number of Clarification Requests (CRs) and Corrective Action Requests (CARs) raised in the review.</p>
Date:	January 24, 2022

Review Criteria	Questions	Comments
Country Eligibility	1. Is the country party to the Kyoto Protocol?	Yes.
	2. Is the country a developing country particularly vulnerable to the adverse effects of climate change?	Yes. Côte d'Ivoire's agriculture sector is particularly vulnerable to the adverse effects of climate change including changes in temperature and precipitation that affect water availability, soil fertility, land productivity, and as such farmers' livelihoods.
Project Eligibility	1. Has the designated government authority for the Adaptation Fund endorsed the project/programme?	Yes. As per the Endorsement letter dated January 4, 2022.
	2. Does the length of the proposal amount to no more than Fifty	Yes.

	<p>pages for the project/programme concept, including its annexes?</p>	<p>CAR1: Please when using an abbreviation, write the full name in the first instance, followed by the acronym in brackets. ANSWER: Action done. Abbreviations have been described in the first instance</p>
	<p>3. Does the project / programme support concrete adaptation actions to assist the country in addressing adaptive capacity to the adverse effects of climate change and build in climate resilience?</p>	<p>Not clear.</p> <p>The concept note describes concrete adaptation actions in the agricultural sector that will build climate resilience while addressing the adaptive capacity of farmers, planners, and local organizations. However, some clarifications are needed.</p> <p>CR1: The document states, under Output 1.1, that 88 “extension agents <i>will have</i> their technical capacities strengthened” – however, this seems to be already done during the pilot phase. Please clarify if this is part of the proposed project or not.</p> <p>ANSWER: During the pilot project, a small number of agents (43) were trained on solid rain and rice-fish technologies. However, for the extension of the project, more trained agents will be needed to train farmers on the proposed technologies and after estimation, 151 additional agents need to be trained to cover all project areas.</p> <p>Clarifications have been made in the document and focus on the number of agents to be trained. 138 for solid rain and 13 for rice-fish farming.</p> <p>CR2: Output 1.3 proposed adopting a <i>Solid Rain technology</i>. What is the estimated cost to use Solid Rain in a regular basis? While Component 3 addresses access to finance, it is key to comprehend the long-term sustainability of adopting this method.</p> <p>ANSWER: The data recorded during the pilot phase show that: - for an elementary plot of 1 hectare (ha), in vegetables farming, it takes: - 10 Kg of solid rain at a cost of USD 50/Kg, or USD 500 per ha of tomato.</p>

- 10 kg of solid rain at a cost of USD 50/Kg, or USD 500 per ha of cabbage.
 - Per crop cycle in manual irrigation system, the use of solid rainfall results in:
 - a 30% increase in average yield and a 50% reduction in watering time, for tomato
 - 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 1 540 USD per ha per cycle for tomatoes and 1 134 USD per 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 appendix). 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.

CR3: The concrete activities proposed under the output 2.1 are unclear (including the title). The description explains what the technology is and past demonstrations on rice-fish farming, but no concrete action is described. Please clarify.

ANSWER: The title of outcome 2.1 was reworded and incorporated into the concept note as follows:

"Outcome 2.1: The capacities of rice and fish farmers to adopt climate change adaptation technologies under the diversification system with the combination of rice and fish farming, are strengthened."

In addition, the activities to be carried out were identified and integrated in the indicated part (Result 2.1)

CR4: Please clarify output 2.2, the text says 'Rural planners' capacity is required but doesn't present how concretely this will be achieved.

ANSWER: Rural planners are the people who will be used after training to dig the application sites for the rice-fish farming. Clarification on their role has been made. During the pilot phase, it

was difficult to find capacities to help in the implementation of the fish plot, so for the project to be more effective in the implementation of the technology rural planners training are needed to facilitate the dissemination of the technology

CR5: For output 3.1, the text says \$16,102,400 will be mobilized to establish a loan facility or green credit line for farmers. As it is a key element for the project success and scaling-up, it would be useful to elaborate further with more detail how concretely this fund will be mobilized, with which partners and how such amount has been assessed.

ANSWER: From the pilot project, it has been estimated that the mean additional cost to adopt one of the proposed technologies is USD 435.2 for one farmer. And the minimum number of farmers that can benefit from this support is around 37000. The incremental cost of introducing these new technologies is \$432 per farmer. 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 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 guarantee line for the financing of the next campaign, especially for the additional cost related to the introduction of new technologies (if USD50K are deposited, the institution will finance up to USD50K+incremental cost). 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 guarantee lines negotiated during the development phase of the full proposal

CR6: Please clarify output 3.2; what concrete activities would be covered, provided the USD 245,000 allocated to this output?

ANSWER: the concrete activities that will be covered has been detailed in the concept note. All the activities will be linked to the implementation of farmers group on saving and loan association. The project is planning to implement more than 40 farmers group on saving and loan association with a minimum amount of USD 6000 for one association

CR7: Output 3.3. does not provide a clear link between agriculture value chain financing and climate change adaptation. Kindly explain the suitability of such activities in responding to the threats posed by climate change.

ANSWER: the link between agriculture value chain and climate change has been clarify. In fact, production is part of the value chain, and availability of the proposed technology is required to disseminate the technology. Then, the financing of the technology will have an impact on climate adaptation by making available the technology to the farmers.

CR8: The same applies for the output 3.4: “This project will help developing market access strategies...”. What kind of activities would be taken to achieve these strategies?

ANSWER: The activities have been developed. This will be more around the strategies that will allow the farmers to have access to the market and have good prices for their products. Farmers will not only benefit from capacity building but will be accompanied towards formalization. They will receive training on management and governance. These groups will be organized and supported for the establishment of 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.

		<p>CR9: Output 4.2 does not clearly describe how facilitating the participation of private sector in financial facilities for farmers will lead to climate resilience or increased adaptive capacity. Kindly indicate the way such activities support adapting to the threats posed by climate change.</p> <p>ANSWER: Credit accessibility linked to the involvement of private sector through microfinance institutions, insurance companies and government counterparts. More information in the description of the output. During the development phase of the full proposal, discussions will be held with financial institutions, key government partners and the private sector. the proposed scheme will be the establishment of a partnership that will include agricultural insurance providers, a financing institution, and the government. The government would subsidize a portion of the insurance premium, and the financial institution would sign an agreement to facilitate access to financing for farmers that benefit from the insurance. Indeed, since the insurance guarantees a minimum income to the producer, it would represent less risk of default for the financing institution. Key stakeholders will be identified during development phase</p> <p>CAR2: There seems to be a phrase missing in the last sentence of the last paragraph of page 16, under Output 1.1. Please amend accordingly.</p> <p>ANSWER: There were not any phrase missing but the sentence has been restructured to be more understandable.</p>
	<p>4. Does the project / programme provide economic, social and environmental benefits, particularly to vulnerable communities, including gender considerations, while avoiding or mitigating negative impacts, in compliance with the</p>	<p>Not clear.</p> <p>The concept note has identified the productive agricultural sector, whose members are particularly vulnerable to climate change, as its main beneficiary. The document indicates environmental, economic, and social benefits for the beneficiaries and the ecosystem. However, further disaggregation on how the project will benefit vulnerable groups is needed. CR10: The proposal needs to further inform how it will</p>

	<p>Environmental and Social Policy and Gender Policy of the Fund?</p>	<p>benefit women and indigenous communities (if present in the project area). ANSWER: some information has been given in the benefit part.</p> <p>CR11: Please outline how the proposed project will ensure the equitable distribution of benefits to vulnerable households or individuals. ANSWER: The setting up of Village Savings and Credit Associations (VSCAs) will contribute to the economic empowerment of all the women beneficiaries of the project.</p> <p>CAR3: An initial gender analysis is required at this stage and should be provided. The concept note should build on the gender analysis to determine the different needs, capabilities, roles for men and women. ANSWER: At this stage an initial gender analysis has not yet been taken but a detail analysis will be done in the full proposal elaboration.</p>
	<p>5. Is the project / programme cost effective?</p>	<p>Not clear.</p> <p>The proposed project builds on previous farming technology pilots which allows to directly implement the adaptation technologies at the farm level. However, further considerations are needed to evaluate the project's cost effectiveness.</p> <p>Please see CR2, regarding the financial sustainability of using Solid Rain. ANSWER: more information has been added in this section regarding the comments and for CR2</p> <p>CR12: To provide a better sense of cost-effectiveness, the description would benefit from additional consideration of quantitative results, when possible, such as number of beneficiaries (for each kind of beneficiaries), number of application sites, rough</p>

		<p>estimate of the percentage of increase of beneficiary's income, further details on the \$16,102,400 from the loan facility.</p> <p>ANSWER: more information has been given in output 3.2</p> <p>CR13: Please confirm the expected number of persons to be trained (if possible disaggregated by gender) and within the selected areas. Likewise, kindly provide the number of hectares of land that small farmers utilize.</p> <p>ANSWER: The project will support 6900 farmers for solid rain technology with almost 75% of women and young people. And for the rice-fish farming technology, the project will help 195 farmers with almost 15% of women.</p> <p>For Solid Rain, each beneficiary is entitled to 500 m2 of market gardening plots, i.e. a total of 345 ha of market gardening plots for the 6,900 beneficiaries.</p> <p>For rice-fish farming, each beneficiary is entitled to 400 m2 of associated fishpond, i.e. a total of 7.8 ha of associated fishpond for the 195 beneficiaries.</p> <p>CAR4: Table 3, column 2 "Project Costs" is empty. Please revise the table.</p> <p>ANSWER: the amount of each component has been added in the table.</p>
	<p>6. Is the project / programme consistent with national or sub-national sustainable development strategies, national or sub-national development plans, poverty reduction strategies, national communications and adaptation programs of action and other relevant instruments?</p>	<p>Yes.</p> <p>The concept note indicates the project's alignment with Côte d'Ivoire's 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 National Climate Change Adaptation Plan (NAP), and the Nationally Determined Contributions (NDC), among others.</p>
	<p>7. Does the project / programme meet the relevant national technical standards, where</p>	<p>No.</p>

	<p>applicable, in compliance with the Environmental and Social Policy of the Fund?</p>	<p>The concept note indicates the project's alignment with environmental standards and Environmental Impact Assessment; however, other sectoral technical standards have not been considered.</p> <p>CR14: Kindly assess the project's alignment with technical standards relevant to the project, particularly related to agricultural and fisheries sector, but not limited to them.</p> <p>ANSWER: The concept note was aligned with technical national and regional standards.</p> <ul style="list-style-type: none"> - 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 - Agricultural orientation law of Côte d'Ivoire Orientation law on sustainable development Law on Fishing and Aquaculture Decree on the creation, attribution, organization and functioning of the national committee of seeds and plants <p>CAR5: The bullet point "evaluate land issues, development techniques, and operating methods" is repeated and needs to be removed.</p> <p>ANSWER: the bullet point has been removed</p>
	<p>8. Is there duplication of project / programme with other funding sources?</p>	<p>Not clear.</p> <p>The concept note states that consultations have been made with regional authorities and sectoral ministries to ensure synergies and no duplication of the proposed project. The document also provides a limited list of relevant projects and state lack of overlap with all of them; complementarity has not been assessed.</p> <p>CR15: Kindly indicate if there is complementarity with the projects identified, for example drawing lessons from early initiatives that are relevant to the proposed project.</p> <p>ANSWER: a row for the complementarity has been added to respond to this comment.</p>

		<p>CR16: Please provide a thorough list of projects (completed, under implementation or to be implemented) that could potentially overlap with the proposed project, such as the AF regional project “Scaling-up climate-resilient rice production in West Africa” , AF regional project “Integrating Flood and Drought Management and Early Warning for Climate Change Adaptation in the Volta Basin”, GEF project “Food Systems, Land Use and Restoration (FOLUR) Impact Program”, GEF project “Sustainable Industrial Production in the Cassava and other Agro-food Sectors through the Use of Renewable Energy Applications and Low-carbon Technologies”, among others.</p> <p>ANSWER: After comparison with the projects currently being implemented or approved for Côte d'Ivoire, the initial concept note took into account some of the activities planned by the regional project "Scaling-up climate-resilient rice production in West Africa", in particular the "technology on the Intensive Rice Production System". As a result, the relevant component has been deleted and resources have been reallocated to the increase the number of beneficieries for solid rain technologie and for rice-fish farming technologie. Also, a part of the amount have been attribueted to sustain the project by increasing the number of villages savings and credit association</p>
	<p>9. Does the project / programme have a learning and knowledge management component to capture and feedback lessons?</p>	<p>Yes.</p> <p>Component 4 is fully dedicated to learning and knowledge management, and these are also captured in Component 1 (Output 1.1).</p> <p>CAR6: Sentence in section G, p. 31 needs to be completed: “The dissemination of technical-economic data sheets and educational films on the project's achievements will also...”</p> <p>ANSWER: Sentence completed</p>
	<p>10. Has a consultative process taken place, and has it involved all key stakeholders, and vulnerable groups, including gender</p>	<p>Not clear.</p> <p>A consultation process has taken place and is briefly mentioned in section H. However, the information is limited and it does not indicate</p>

	<p>considerations in compliance with the Environmental and Social Policy and Gender Policy of the Fund?</p>	<p>whether gender and vulnerable groups involvement was taken into consideration.</p> <p>CR17: Please provide further details of the consultation process (dates, stakeholders involved, topics discussed).</p> <p>ANSWER: a table has been added in the document</p> <p>CR18: Please clarify/ highlight the gender and vulnerable groups involvement in the consultation process and provide related information.</p> <p>ANSWER: a table has been added to highlight these information</p>
	<p>11. Is the requested financing justified on the basis of full cost of adaptation reasoning?</p>	<p>Not clear.</p> <p>The project planned activities are likely to realize the project targeted adaptation objectives. However, the project justification is too general.</p> <p>CR19: Justification needs to be further elaborated in relation with the cost of the project</p> <p>ANSWER: further justification has been given.</p> <p>Moreover, Outputs 3.3., and 4.2 do not explicitly show how they are supporting climate change adaptation beyond business-as-usual development. Please refer to CR 3 and CR 4.</p> <p>ANSWER: Explanation has been given</p>
	<p>12. Is the project / program aligned with AF's results framework?</p>	<p>Yes.</p> <p>The project would contribute to outcomes 2, 3, 5, 6, and 8 of the AF Strategic Results Framework.</p>
	<p>13. Has the sustainability of the project/programme outcomes been taken into account when designing the project?</p>	<p>Not clear.</p> <p>The sustainability of the project outcomes has been taken into consideration by involving key stakeholders in the development of the</p>

		<p>concept note. However, more information is needed regarding the governance arrangements that would enable the sustainability of the project after its end.</p> <p>CR20: Please clarify how the financial mechanism will be managed after the project ends to ensure farmers continue to have access to funds to afford technologies like <i>Solid Rain</i>.</p> <p>ANSWER: clarified in the concept note</p> <p>CR21: Please indicate the institutional arrangements that would enable continued support for the project outcomes/activities after the project ends.</p> <p>ANSWER: detail institutional arrangements will be proposed in the full proposal.</p> <p>CR22: Please clarify how the sustainability of the outcomes inform the design of the project.</p> <p>ANSWER: Clarification has been made.</p>
	<p>14. Does the project / programme provide an overview of environmental and social impacts / risks identified, in compliance with the Environmental and Social Policy and Gender Policy of the Fund?</p>	<p>No.</p> <p>The concept note has provided a preliminary screening of potential risks; however, information regarding the assessment and the risks themselves is not substantiated. The proposal only classifies risks (e.g., as 'low risk'). An initial gender assessment has not been included.</p> <p>The document indicates that during the formulation of the full proposal, a more in-depth analysis will be carried out to ensure that no relevant risks exist or that if they do, they will be mitigated. It also states that a ESMP will be put in place. However, a full developed proposal requires an in-depth screening of risks.</p> <p>CR23: Please indicate in section K the category in which the screening process has classified the project.</p> <p>ANSWER: Project categorized in B category</p>

		<p>CR24: Please revise section K following the Fund's guidance on compliance with ESP https://www.adaptation-fund.org/wp-content/uploads/2016/07/ESP-Guidance_Revised-in-June-2016_Guidance-document-for-Implementing-Entities-on-compliance-with-the-Adaptation-Fund-Environmental-and-Social-Policy.pdf</p> <p>ANSWER: Noted</p> <p>Please refer to CAR3 above, the initial gender analysis should ideally provide information on gender roles, activities, needs, and available opportunities and challenges or risks for men and women.</p>
Resource Availability	1. Is the requested project / programme funding within the cap of the country?	Yes.
	2. Is the Implementing Entity Management Fee at or below 8.5 per cent of the total project/programme budget before the fee?	<p>No.</p> <p>The Implementing Entity Management Fee (\$ 340,000) is above 8.5% of the total project budget (executing cost plus total project cost, which together are \$ 3,660,000).</p> <p>CAR7: Please adjust the IE management fee.</p> <p>ANSWER: the fee has been adjusted</p>
	3. Are the Project/Programme Execution Costs at or below 9.5 per cent of the total project/programme budget (including the fee)?	<p>No.</p> <p>The execution cost is above the 9.5%.</p> <p>CAR8: Please adjust the value to be at or below 9.5 per cent of the total project budget (including the fee).</p> <p>ANSWER: The reviewer noted that the level was good.</p>
Eligibility of IE	1. Is the project/programme submitted through an eligible Implementing Entity that has been accredited by the Board?	<p>Yes.</p> <p>FIRCA is an accredited National Implementing Entity to the Fund.</p>

Implementation Arrangements	1. Is there adequate arrangement for project / programme management, in compliance with the Gender Policy of the Fund?	n/a at concept stage
	2. Are there measures for financial and project/programme risk management?	n/a at concept stage
	3. Are there measures in place for the management of for environmental and social risks, in line with the Environmental and Social Policy and Gender Policy of the Fund?	n/a at concept stage
	4. Is a budget on the Implementing Entity Management Fee use included?	n/a at concept stage
	5. Is an explanation and a breakdown of the execution costs included?	n/a at concept stage
	6. Is a detailed budget including budget notes included?	n/a at concept stage
	7. Are arrangements for monitoring and evaluation clearly defined, including budgeted M&E plans and sex-disaggregated data, targets and indicators, in compliance with the Gender Policy of the Fund?	n/a at concept stage
	8. Does the M&E Framework include a break-down of how implementing entity IE fees will be utilized in the supervision of the M&E function?	n/a at concept stage
	9. Does the project/programme's results framework align with the AF's results framework? Does it	n/a at concept stage

	include at least one core outcome indicator from the Fund's results framework?	
	10. Is a disbursement schedule with time-bound milestones included?	n/a at concept stage



ADAPTATION FUND

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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

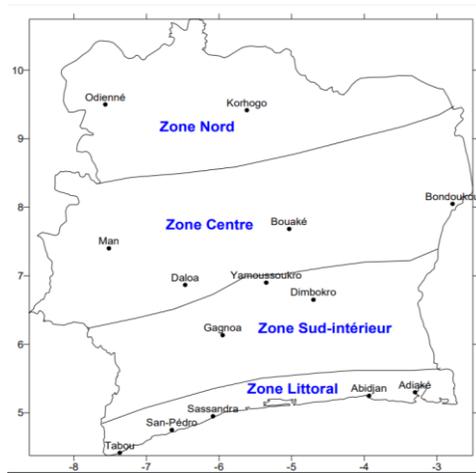
Project Background and Context:

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 kilometers square. 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.

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



Source: <http://www.wamis.org/agm/meetings/etdret09/WOS2-Coulibaly.pdf>

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

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

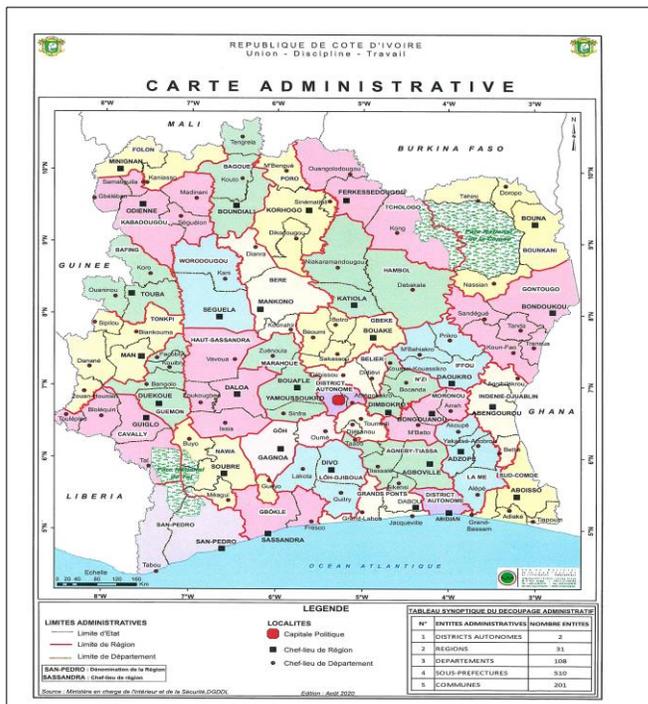
² BNET. 2015. Gestion durable des ressources forestières. Rapport pour les Etats généraux de la forêt, de la faune et des ressources en eau, 31 Juillet 2015 : 89p

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	Poro, Tchologo, Bagoue
Bas-Sassandra	Nawa, San-Pedro, Gbôklè
Vallée du Bandaman	Hambol, Gbèkè
Woroba	Béré, Bafing, Worodougou
Zanzan	Boukani
Abidjan	Abidjan
Yamoussoukro	Yamoussoukro

Source: Third National Communication to the UNFCCC, 2017

Figure 2. Administrative map of Côte d'Ivoire



Socio-economic context

Côte d'Ivoire is a lower middle-income country with a 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 table 1 below gives a snapshot of Côte d'Ivoire at a glance.

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 Côte d'Ivoire. Despite recent attempts, Côte d'Ivoire remains one of the world's countries with the greatest rates of gender inequality, ranking 157th out of 162 countries on the 2018 Gender Inequality Index (GI)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 loans⁵. Agriculture, particularly primary commodities, is highly susceptible to swings in international pricing, which have a negative and variable influence on rural household revenues. Fishing, despite accounting for only 0.9 percent of GDP in 2014, 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 144th out of 182 countries (2019)⁶. It is the 51st most susceptible and 31st least prepared country in the world, according to the same Index. 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, historical long-term trends reveal only a modest increase in temperatures with statistical significance. Long-term rainfall trends have been

³ Plan National de Développement 2021-2025, Tome 1

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

⁵ Country Gender profile, JICA, 2013 and UNDP 2020

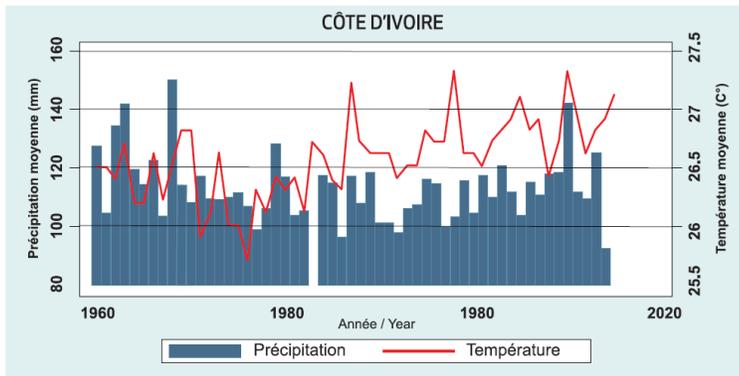
⁶ <https://gain.nd.edu/our-work/country-index/rankings/>

minimal in the past. All regions, on the other hand, 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 time 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 Cote 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 SODEXAM's data in Annex 1. According to the same source, 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 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.

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



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

For Representative Concentration Pathway (RCP) 4.5 and RCP8.5 (Coupled Model Intercomparison Project, Phase 5/CMIP5 included in the 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.

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

⁸ Climate Change National Strategy 2015-2020

⁹ Climate Knowledge Portal, World Bank 2020

¹⁰ Climate Knowledge Portal, World Bank

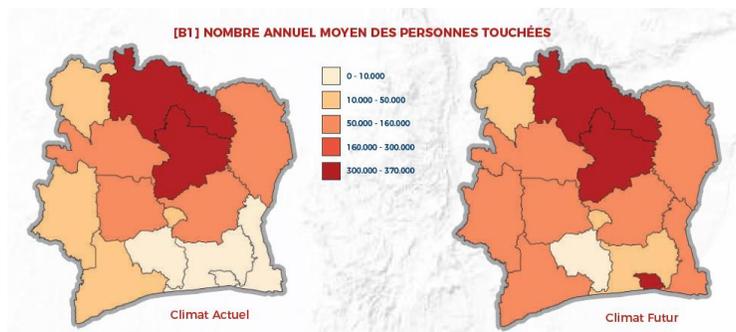
By 2030, the estimated rise in annual mean temperature is expected to range from +0.9 to +1.5°C, +1.3 to +2.3°C by 2050, and +1.5 to +4.1°C by 2085. By 2030, the range is expected to be +0.8 to +1.7°C, +1.0 to +2.8°C by 2050, and 1.0 to +5.2°C by 2085, with the biggest rises in the country's northern 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 start-up of two weeks. In most part 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 by 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 in present days (left) and projected (right)



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

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

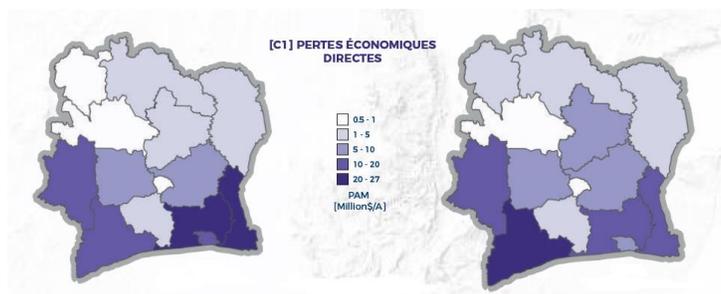
¹⁴ D.J.E.K.B. 2007. Impact des phénomènes ENSO sur la pluviométrie et leurs incidences sur la production cacaoyère. Conférence Internationale pour la réduction de la vulnérabilité des systèmes naturels économiques et sociaux en Afrique de l'Ouest face aux changements climatiques. Ouagadougou du 24 au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

The direct consequences on agriculture are a shortening of the average duration of vegetative growth periods (shifting of the beginning of the cropping season), a 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 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).

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



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

Climate changes affect differently the parts of the country agro-ecological zones

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.

¹⁵ Document de Stratégie Nationale de Lutte contre les Changements Climatiques

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 • 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 	<ul style="list-style-type: none"> • Medium to low vulnerability of natural resources and agriculture production systems. • 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 specially the farmers communities to build resilience and adapt to the future impacts. The current project is high lightened rice cultivation and vegetable farming.

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

The food sector, particularly rice cultivation and vegetables 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) practices, that can help mitigate greenhouse gas emissions in the rice greenhouse gas emissions in the rice sector¹⁷. The water deficit is also highly impacting the production of vegetable which growth is depending of 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 a strong demand for food products, including rice, vegetables and aquaculture products. Unfortunately, national production of most of these products is not sufficient to cover domestic demand, resulting in heavy dependence on importations.

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.

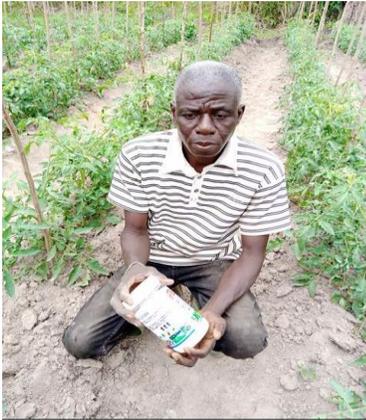
Two (2) innovative solutions related to "Solid Rain" and rice-fish farming were tested in the farming environment to provide sustainable solutions to the problem of water management in vegetable farming and rice cropping systems while improving crop productivity and producers' revenues. The tests have 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.

Three (3) innovative solutions related to "Solid Rain", the Intensive Rice Cultivation System (IRCS) 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 "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 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 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



• The Intensive Rice Cultivation System (IRCS) is an irrigated rice cultivation system that requires little irrigation water, less seeds and is less costly, improving paddy yield by 67% to 100%¹⁸.

¹⁸-Performance agronomique du système de riziculture intensive (sri) en côte d'ivoire

• **Figure8: Intensive-rice-cultivation system**



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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 to 65 farmers for solid rain technology from January 29th, 2019 to June 2021, and to 150 farmers for rice-fish farming technology from June, 24th, 2019 to November 2021.

Demonstrations of the three (3) 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.

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It is therefore important to increase the dissemination of these technologies that are resilient to the effects of climate change in all-of the country's vegetable and rice production areas by strengthening the production capacities of farmers and sustain the adoption of these technologies by creating suitable financing system and strengthening national regulations for Climate Smart Agriculture technologies dissemination.

The main challenges related to the proposed technologies lies to the lack of access of water management. This problem is accentuated by the scarcity of water due to the impact of climate change and the rainfall variability. Access to finance can also prevent farmers to adopt the tested technologies, communication between farmers can also biased the scaling up of the successful practices.

The proposed project is designed to address the above challenges. It is also a direct response to NAP priorities in that it targets rural populations and aims to improve and diversify agriculture production system and thus makes it more climate resilient. The proposed intervention with AF funding has been designed by Government, with the support of 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 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. So Solid rain will be used in vegetables 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 (Gbékê region), Mbahiakro (Iffou region), Dimbokro, Bocanda (Nzi region), Touba (Bafing region) Tiébissou (Belier region), Bouaflé (Marahoué region) and Abengourou; Agnibilekro (Indénié Djuablin region).

And 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 (Haut Sassandra region).

The region chosen for solid rain technology are justified mainly by the fact that those are the vegetable production region in the country and farmers are facing lack of water due to reduction and variability of rainfall. Therefore, the solid rain technology is the adequate solution to the management of water resources and sources.

Regarding the rice-fish farming, the reason linked to the selection of the cited regions lies to the promotion of food and nutritional security among rice farmers who do not have resources that can allow them to have access protein. Hence, the diversification of the income sources and of types of agricultural production is a solution to this issue.

~~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), Bouake (Gbékê region), Mbahiakro (Iffou region), Dimbokro, Bocanda (Nzi region), and Agnibilekro (Indénié Djuablin region).~~

~~The Intensive Rice Cultivation system is chosen to be implemented in rice production prone regions: Korhogo (Poro region), Boundiali, (Bagoue region), Ferkessédougou (tchologo region), Katiola (Hambol region), Bondoukou (Gontougo region), Touba, (Bafing region), Yamoussoukro, (Belier region), Bouake, Sakassou (Gbékê region), Daoukro, Mbahiakro (Iffou region), Abengourou (Indénié Djuablin region), Agboville, Tiassale (Agneby Tiassa region), Divo (Lôh-Djiboua region), Gagnoa, Oumé (Gôh region) and Vavoua, (Haut Sassandra region).~~

~~The last technology, 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) and Daloa, Vavoua, Issia (Haut Sassandra region).~~

The financial component of the project will be implemented in all the project covering region and the development of policies and strategies will be national. The sites were selected after

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consultations with the stakeholders in all the selected regions for their demand for the extension of the pilot project to 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**. ~~Specifically, the project aims to achieve the following:-~~

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 vegetables 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 to adopt climate change adaptation technologies under the diversification system with combined rice and fish farming are enhanced.	<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 organizations strengthened to improve climate resilient rice and vegetable farming practices with increased productivity and household income through microfinance facility.		324,000
	3.3. Comprehensive climate adaptation plans developed for each value chain with identified public and private sources of funding.		50,000

	<u>3.4. Market access strategy developed to facilitate the commercialization of the products</u>		<u>50,000</u>
<u>4. Knowledge sharing and policies/strategies development</u>	<u>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...)</u>	<u>Enabling policies, strategies and legal frameworks are developed and adopted, and knowledge for the project sustainability shared.</u>	<u>130,000</u>
	<u>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.</u>		<u>50,000</u>
<u>1. Project execution cost (9,5%)</u>			<u>319,845</u>
<u>2. Total project cost</u>			<u>3,366,791</u>
<u>3. Project cycle Management Fee charged by the Implementing Entity (8.5%)</u>			<u>313,364</u>
<u>4. Amount of financing required</u>			<u>4,000,000</u>

Project/Programme-Components	Expected-Concrete-Outputs	Expected-Outcomes	Amount-(US\$)
<u>1. Sustainable access to improved water-management-technologies to build-resilience to climate-change</u>	<u>1.1 Extension agents' capacities to disseminate-adaptations-technologies to farmers enhanced</u>	<u>Capacities of rice and vegetables farmers-communities to apply-sustainable-and-improved water-management-technologies to build-resilience to climate-change developed</u>	<u>110,000</u>
	<u>1.2 Rice farmers capacities to adopt climate-adaptation-technologies on ICRS built</u>		<u>595,000</u>
	<u>1.3 Craftsmen capacities on rotative weeder-manufacture built</u>		<u>25,000</u>
	<u>1.4 Vegetable farmers capacities to adopt climate-adaptation-technologies on Solid Rain built</u>		<u>1-050-000</u>
<u>2. Rice- fish farming to support diversification and climate-resilient rice</u>	<u>2.1 Rice farmers and fish farmers capacities to adopt climate-adaptation-technologies on rice-fish</u>	<u>Climate-resilient rice-cultivation system-developed, scaled-up and providing fish</u>	<u>450,000</u>

cultivation system	farming diversification system enhanced	production	
	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		465,000
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 through partnership with local microfinance and local management committed	Credit schemes tailored to scale up proven resilient rice and vegetable farming technologies	50,000
	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		245,000
	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...)	Enabling policies, strategies and legal frameworks are developed and adopted, and knowledge for the project sustainability shared.	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%)			380,000
2. Total project cost			3,280,000
3. Project cycle Management Fee charged by the Implementing Entity (8.5%)			340,000
4. Amount of financing required			4,000,000

Projected Calendar:

Indicate the dates of the following milestones for the proposed project/programme

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 to farmers and the country 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 vegetables 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 socioeconomic 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 make them food secure 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), five (5) zones respectively. During these pilot phases, thirteen (13), 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. Then 151 new agents will be trained to increase the number of trained agents for the technologies' dissemination, then 138 for solid rain and 13 for rice-fish farming.

The pilot projects for the demonstration of proven "Solid Rainfall", rice-fish farming and Intensive Rice Cultivation System (IRCS) technologies covered thirteen (13), five (5) and twenty-four (24) zones respectively. During these pilot phases, thirteen (13), thirty (30) and forty-five (45) extension agents will have 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.

This capacity building action will be carried out through the organization 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, focus will be made on Training of Trainers (lead farmers) associated Farmers' Field Days activities.

Output 1.2: Rice farmers capacities to adopt climate adaptation technologies on IRCS built

The System of Intensive Rice Cultivation (IRCS) is a set of rational cultivation techniques using very little or no chemical fertilizer, established by Father Henri de LAULANIE, an agricultural engineer in Madagascar, to significantly increase rice yields. In Côte d'Ivoire, yield gains of 67% have been recorded in irrigated rice cultivation through the practice of IRCS. IRCS is therefore based on four main principles, which are (i) the use of very few seeds (8 to 10 kg of seeds per hectare), (ii) a high organic fertilization, (iii) the use of very little water and (iv) transplanting young seedlings (08 to 15 days old).

It thus makes it possible to adapt to climate change, which is reflected, among other things, in the frequent water deficits of recent years in the rice-growing basins (rainfed lowlands). Moreover, the eco-agricultural character of IRCS contributes to the preservation of the environment through the reduction of the quantity of methane, a greenhouse gas 26-time polluting than carbon dioxide, in the environment.

A pilot IRCS demonstration project was initiated by the National Agronomic Research Center (Centre National de recherche Agronomique (CNRA)) with two hundred and forty (240) producers in thirteen (13) departments of the country's rice-growing areas, resulting in an average increase in paddy yields of 60%.

The large-scale dissemination of IRCS is therefore a challenge to be met in order to contribute significantly to rice food security and adaptation to climate change in Côte d'Ivoire.

As part of the scaling up of IRCS, activities will focus on (i) the installation of demonstration plots to train farmers on the technique, (ii) training of irrigated rice farmers through the demonstration plots, (iii) training of rural artisans on the techniques of manufacturing the rotating weeder, (iv) post-training follow-up of farmers producing rice, and (v) training of farmers producing rice through the demonstration plots, (vi) post-training follow-up of irrigated rice farmers in the application of the technique on their individual plots, (vii) support for the structuring of producer groups, and (viii) organization of exchange visits (Farmers Field Days) for farmers who have not benefited from training on the demonstration plots.

Output 1.2.3: 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 RicoICO, a Mexican chemist, offers a credible alternative **forte** 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 vegetables 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.

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

Diversification is crucial for risk reduction, particularly 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 on rice-fish farming diversification system. Diversification can have a positive impact on farmers' their 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.

Output 2.1 Rice farmers and fish farmers capacities to adopt climate adaptation technologies on rice-fish farming diversification system

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). The rice-fish culture technique of juxtaposing fish ponds and rice ponds allows for the production of 3-5 tons of fish/hectare of 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 were 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 fish ponds as proposed in this project.

The data recorded during the pilot phase show that: for an elementary plot of 1 hectare (ha), in vegetables farming, it takes 10 Kg of solid rain at a cost of USD 50/Kg, or USD 500 per ha of tomato and 10 kg of solid rain at a cost of USD 50/Kg, or USD 500 per ha of cabbage.

Per crop cycle in manual irrigation system, the use of solid rainfall results in a 30% increase in average yield and a 50% reduction in watering time, for tomato 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 1540/ha per cycle for tomatoes and USD 1134/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). 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.

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.

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 a facilitation in the access of finance to support the purchasing of the material. This is critical for the people of Côte d'Ivoire's socioeconomic 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 money to support their families. Many impoverished households are at risk of being unable to apply climate adaption technologies due to a lack of resources. The proposed project will strengthen access to finance for climate resilient rice and vegetables 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 building resilience for the poor households and women groups. Therefore, this project will provide some technical assistance to interested farmers' organizations and identified finance institution 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 in inputs and technologies

application. The rational of the estimation of this amount is linked to the mean of additional cost that a farmer need to adopt one or the other technology, the mean cost is around USD 435.2 for a farmer. The country has around 37000 farmers or more that can be positively impacted by this adaptation technology. The incremental cost of introducing these new technologies is \$435.2 per farmer. 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 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 guarantee line for the financing of the next campaign, especially for the additional cost related to the introduction of new technologies (if USD50K are deposited, the institution will finance up to USD50K+incremental cost). 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 guarantee lines negotiated during the development phase of the full proposal.

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 your 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 risk of not having refund is one of the reasons for 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~~The better~~ access to finance lies ~~with~~to a good organization and capacities of farmers groups. The project will support the local cooperative or professional organizations by strengthening their organization, administrative, managerial, and financial skills. This will facilitate linkage with financial institution due to more risk alleviation related

~~to a group instead of individual farmer.~~

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 over the duration of 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 trainings that will allow them to be operationalize and be in partnership with microfinance institutions. This organization will help in the availability of the technologies and the reorganization of the value chain through farmers platforms to access to market. The project is planning to implement more than 40 associations with a minimum amount of USD 6000 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 constitute 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. And the financing of the technologies resilient to climate change will affect the availability of the technologies and the augmentation of productivity.

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

Reliable market access increases productivity increases profits, and enhances 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 a difficult time finding markets in which to sell their goods. Their remote location, high transportation costs, limited experience, and lack of business skills and an organization that could give them with 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.

~~Reliable market access increases productivity, increases profits, and enhances food security. It is possible to alleviate poverty and hunger for producing families and communities by taking appropriate measures to limit market risks and unequal market power. Many rural farmers have a hard time finding markets to sell their goods in. Their~~

remote location, high transportation costs, limited experience, and lack of business skills and an organization that could give them with the bargaining leverage they need to interact on an equal basis with other market intermediaries are all stumbling blocks. With better access to domestic and international markets, small farmers may sell more food of higher quality and at higher prices. Farmers are more inclined to invest in their own businesses as a result, boosting the amount, quality, and range of products they produce⁴⁹. This project will help developing market access strategies for farmers to increase their income from the productivity of the implementation of the proposed adaptation technologies. Farmers will not only benefit from capacity building but will be accompanied towards formalization. They will receive training on management and governance. These groups will be organized and supported for the establishment of 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.

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Component 4: Knowledge sharing and policies/strategies development

The real project impact project resides in the ability of the beneficiaries to share their experience and help in the extension of the technologies among his fellow farmersmates who did not participate in the project. This requires a good planning of knowledge and experience sharing and the availability of regulations, policies and strategies to facilitation 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 in the development and organization of 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.

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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,

⁴⁹ <https://www.ifad.org/en/market-access>

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 operator and financial institution), through their intervention in this tripartite agreement, facilitate farmers' access to financing; this financing allows farmers to access climate change adaptation technologies.

Also, insuring risk in small-scale agriculture faces particular 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.

Policies and strategies establish the principles, aims, and priorities of agricultural policy, as well as farmer training and advisory services, biodiversity and genetic resource protection, and biosecurity and biosafety. Agricultural policies, according to the law, are aimed at ensuring agricultural development, increasing productivity, strengthening food safety and security, protecting and improving natural and biological resources, developing producer organizations, strengthening agricultural markets, and ensuring rural development. This project aims to assess and adapt policies and strategies gaps to ensure and facilitate the participation of the private sector in financial facilities for farmers

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 fish pond will provide a water reserve that will help to overcome the constraint of water shortage. The technique of juxtaposing the fish pond 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

At the social level, the project will contribute to

- **I**mprove 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;
- **C**reate additional direct and indirect jobs engendered by the scaling up of the chosen technologies;
- **I**ntegrate the three (3) technologies into the technical itineraries of vegetable and rice crops without modifying the cultivation habits and techniques;
- 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.

The livelihood activities supported by the project will have a multiplier effect and the benefits are expected to trickle down to more vulnerable. By documenting the lessons learned, the young generation is 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.

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 level of vulnerability of farmers specially rice and vegetable farmers. Their sources of incomes 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 training of an important number of farmers for the project to cover as much as cultivation cycle as possible in the three years. The farmers will have capacities and abilities to use and share the technologies among their peers for 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 production, rice and fishes. This activity will help in reduction of malnutrition, water wastage and food insecurity among rice farmers community.

The sustainability of this project resides in the ability of farmers to adopt effectively the technologies after the project, then 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.

The added value of the increased production and reduced irrigation load induced using solid rain is USD 1540/ha per cycle for tomatoes and USD 1134/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...). 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 2132, specifically USD 332 of additional gain per ha for rice cultivation and USD 1800 generated over a cycle for a 400 m² fishpond.

The project will support 6900 farmers for solid rain technology with almost 75% of women and young people. And for the rice-fish farming technology, the project will help 195 farmers with almost 15% of women.

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 production, rice and fishes. This activity will help in reduction of malnutrition, water wastage and food insecurity among rice farmers community.

The sustainability of this project resides in the ability of farmers to adopt effectively the technologies after the project, then 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.

Table 3: Project cost effectiveness

Project component	Project cost (USD)	Concrete adaptation benefits	Avoided losses	Trade-offs
Component 1: Sustainable access to improved water management technologies to build resilience to climate change	<u>1,631,781</u>	<ul style="list-style-type: none"> • Increased food availability due to improved agricultural practices • Water availability for crop and livestock production • Reduced time spent by women and children in watering farms • Increased household income • Increased knowledge on 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 affected by loss of water and food
Component 2: Rice-fish farming to support diversification and climate-resilient rice cultivation system	<u>1,081,010</u>	<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 • Water wastage 	<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
Component 3: Access to finance strengthened for climate resilient rice and vegetables farming enterprises development	<u>474,000</u>	<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 	<ul style="list-style-type: none"> • Increased cost of adaptation for flood and drought victims

			climate smart agriculture technologies	<ul style="list-style-type: none"> • Increased cost of providing food for hunger victims
Component 4: Knowledge sharing and policies/strategies development	<u>180 000</u>	<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 adaption 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 our 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:

1. Pillar 1: strengthening productive transformation, developing industrial clusters and digitizing the economy;
2. Pillar 2: development of human capital and improvement of its productivity;
3. Pillar 3: strengthening inclusion, national solidarity and social action;
4. 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 and;
5. 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:

- ✓ ~~D~~to demonstrate the Government's awareness of and commitment to promoting development that combines economic efficiency, social equity and environmental protection;
- ✓ ~~G~~to give itself visibility and organize its action in favor of sustainable development;
- ✓ ~~E~~to 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 Ivory Coast;
- ✓ 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:

- ✓ 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,
- ✓ To present the major challenges of Côte d'Ivoire in the face of climate change,
- ✓ To 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-sylvo-pastoral and fisheries sector, and the positive impact of this development on the environment and society as a whole.

Specifically, the NAIP focuses on achieving three strategic objectives:

- ✓ The development of agro-sylvo-pastoral and fisheries value added;
- ✓ Strengthening environmentally friendly agro-sylvo-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 (NDC) 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 identify 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, AFAT Agriculture, AFAT 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

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.
- ✓ 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.

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

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.

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 irrigated 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

<u>Project/program</u>	<u>Objective</u>	<u>Synergy with the proposed project</u>	<u>Complementarity with the proposed project</u>
<u>Project for adaptation to climate change and stabilization of the population's livelihoods in southwest Côte d'Ivoire (PACCS).</u>	<u>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.</u>	<u>No duplication. The proposed project does not only target region affected by conflict but all the rice cultivation regions in the country.</u>	<u>No complementarity. The two projects are divergent from their objectives.</u>
<u>GCF-FAO project to reduce emissions by promoting deforestation-free cocoa production in Côte d'Ivoire.</u>	<u>Stop agriculture-related deforestation, improve agricultural productivity, preserve biodiversity, restore forest cover and improve farmers' livelihoods.</u>	<u>No duplication. The project is not targeting cocoa farmers and deforestation.</u>	<u>No complementarity. The two projects are not targeting the same crops then the beneficiaries are different.</u>
<u>West Africa Coastal Areas Program</u>	<u>help countries harmonize their management of infrastructure and natural resources to increase their resilience to climate change in general, and to coastal erosion and flooding in particular.</u>	<u>No duplication. The project objective is totally different and does not affect coastal zones.</u>	<u>No complementarity. The two projects are totally different and targeting different execution areas.</u>
<u>GCF readiness grant</u>	<u>Strengthening Côte d'Ivoire's Capacity and Ownership to Access Climate Finance for GCF Country Programme</u>	<u>No duplication. This project is to prepare the country to get more access to climate</u>	<u>No complementary. The two projects are not targeting the same areas and the objectives</u>

	<u>Implementation</u>	<u>finance and does not target the agricultural sector</u>	<u>are different.</u>
<u>The Agro-Industrial Pole Project in the Belier Region</u>	<u>The sectoral objective of the project is to contribute to increased food and nutritional security.</u>	<u>No duplication. This project can complement the objective of this regional project by targeting the rice sector</u>	<u>There is a complementarity on the two projects because the two are link to the increasing level of food and nutritional security and will contribute to the objective of the country to alleviate poverty.</u>
<u>The project to support agricultural infrastructure in the Indénié-Djuablin region (PAIA-ID)</u>	<u>Contribute to the improvement of food security and the reduction of poverty in rural areas.</u>	<u>No duplication. This project can complement the objective of this regional project by targeting the rice sector</u>	<u>There can be complementarity because this project can use the agriculture water infrastructure developed here can be used in the proposed project for a better result.</u>
<u>Project to support the development of the cassava and vegetables sectors in Côte d'Ivoire (PRO2M)</u>	<u>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.</u>	<u>No duplication. This project is not taking rice cultivation even adaptation technologies into account</u>	<u>The two projects are not on the same sites. But targeting the reduction of use of water to produce vegetables in green houses.</u>
<u>Scaling-up climate-resilient rice production in West Africa funded by Adaptation Fund</u>	<u>The global objective of the project is to improve climate resilience and increase rice system productivity of 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.</u>	<u>No duplication. The current project will complement the already funded project.</u>	<u>There is complementarity between the two projects. The funded project will target climate resilient rice production specifically Intensive 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 positive impact on each other.</u>
<u>Integrating Flood and Drought Management and Early Warning for Climate Change Adaptation in the Volta Basin funded by Adaptation Fund</u>	<u>The main objective of the project is to assist the six countries (Benin, Burkina Faso, Côte d'Ivoire, Ghana, Mali and Togo) in the</u>	<u>No duplication. The two projects are not targeting the same goals.</u>	<u>There can be complementarity between these two projects because the beneficiaries of the</u>

	<u>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.</u>		<u>current project can use the early warning system from the AF project to guide their activities.</u>
<u>GEF project "Food Systems, Land Use and Restoration (FOLUR) Impact Program</u>	<u>Seeking to transform food and land use systems, the program consists of a global knowledge platform and 27 country projects.</u>	<u>No duplication. The two projects are not targeting the same goals.</u>	<u>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</u>

Project/program	Objective	Synergy with the proposed project
<u>Project for adaptation to climate change and stabilization of the population's livelihoods in southwest Côte d'Ivoire (PACCS).</u>	<u>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.</u>	<u>No duplication. The proposed project does not only target region affected by conflict but all the rice cultivation regions in the country.</u>
<u>GCF-FAO project to reduce emissions by promoting deforestation-free cocoa production in Côte d'Ivoire.</u>	<u>Stop agriculture-related deforestation, improve agricultural productivity, preserve biodiversity, restore forest cover and improve farmers' livelihoods.</u>	<u>No duplication. The project is not targeting cocoa farmers and deforestation.</u>
<u>West Africa Coastal Areas Program</u>	<u>help countries harmonize their management of infrastructure and natural resources to increase their resilience to climate change in general, and to coastal erosion and flooding in particular.</u>	<u>No duplication. The project objective is totally different and does not affect coastal zones</u>
<u>GCF-readiness grant</u>	<u>Strengthening Côte d'Ivoire's Capacity and Ownership to Access Climate Finance for GCF Country Programme Implementation</u>	<u>No duplication. This project is to prepare the country to get more access to climate finance and does not target the agricultural sector</u>
<u>The Agro-Industrial Pole Project in the Belier Region</u>	<u>The sectoral objective of the project is to contribute to increased food and nutritional</u>	<u>No duplication. This project can complement the objective of this</u>

	security.	regional project by targeting the rice sector
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
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

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 socio economic 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.
- ~~The dissemination of technical-economic data sheets and educational films on the project's achievements will also~~

➤ 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

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, 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.

Details on the consultations from the project have been summarize in the following table.

Figure 9 : Consultation workshop



Table 5: Recapitulation of the consultation activities

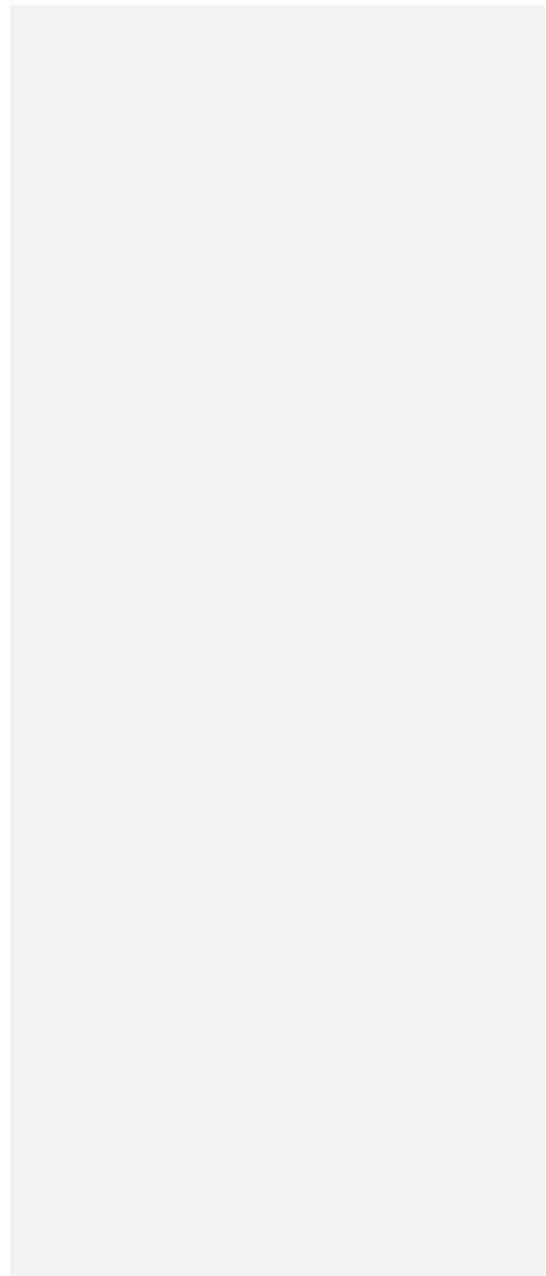
PERIOD/DATE	VISITED AREAS	Number of participants	Stakeholders	Subject discussed
<u>From 30th January to 22nd february 2019</u>	<u>Tiassalé (South)</u> <u>Yamoussoukro (Center)</u> <u>Korhogo (North)</u> <u>Touba (North-west)</u> <u>Agnibilékro (East)</u>	<u>125</u> <u>(13% of women)</u>	<ul style="list-style-type: none"> ➤ <u>Prefects</u> ➤ <u>Customary chiefs</u> ➤ <u>Land chiefs</u> ➤ <u>Local representatives of the Ministries of Agriculture and Animal Production</u> ➤ <u>Producer groups (vegetable farmers, rice farmers, fish farmers)</u> ➤ <u>Youth and women's associations</u> ➤ <u>Media (local radio stations)</u> 	<ul style="list-style-type: none"> ➤ <u>Difficulty for women and young people in some regions to access land to grow food crops</u> ➤ <u>Soil impoverishment in rice cultivation</u> ➤ <u>Seasonality of water points (mainly in the north and center)</u> ➤ <u>Painfulness and cost of daily manual watering</u> ➤ <u>Difficulty in retaining rainwater for cultivation to cope with the seasonality of the rains and the irregularity of the rains</u>
<u>From 23rd september to 3rd october 2019</u>	<u>Abengourou (East)</u> <u>Oumé (Center-west)</u> <u>San Pédro (South-west)</u> <u>Soubré (South-west)</u> <u>Yamoussoukro (Center)</u>	<u>298</u> <u>(10% of women)</u>		
<u>14th december 2021</u>	<u>Abidjan</u> <u>(National consultation workshop)</u>	<u>53</u> <u>(25% of women)</u>	<ul style="list-style-type: none"> ➤ <u>Ministry of Agriculture and Rural Development</u> ➤ <u>Ministry of Water and Forests</u> ➤ <u>Ministry of Environment and Sustainable Development</u> ➤ <u>Ministry of Women, Family and Children</u> ➤ <u>Ministry of the Interior (General Directorate of Decentralization and Local Development);</u> ➤ <u>Development Agency [Rice Development Agency (ADERIZ), FIRCA, ANADER, Société d'Exploitation et de Développement Aéroportuaire, Aéronautique et Météorologique (SODEXAM)]</u> ➤ <u>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)</u> ➤ <u>Producers' organizations (Interprofession Oignon de Côte d'Ivoire, Association Nationale des Aquaculteurs de Côte d'Ivoire)</u> 	<ul style="list-style-type: none"> ➤ <u>Discussion of the project idea entitled "Strengthening smallholder farmers' resilience to climate change impacts through the adoption of proven technology and practices".</u>

			<ul style="list-style-type: none"> ➤ <u>Local authorities (Associations of Regions and Districts of Côte d'Ivoire (ARDCI), Union of Cities and Communes of Côte d'Ivoire (UVICOCI)):</u> ➤ <u>Primacy: National Observatory of Equity and Gender (ONEG)</u> ➤ <u>Private sectors (Terres chaudes, Chambre Nationale des Métiers de Côte d'Ivoire)</u> ➤ <u>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))</u> ➤ <u>Technical and Financial Partners (National Coordination of the Global Environment Facility, GGGI, Secretariat of the Debt Reduction and Development Contract (C2D))</u> ➤ <u>Media: FIRCA Communication Department</u> 	
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I. 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.

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, in particular, 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.

The component 1 related to water management and adoption of the 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 and must be available for farmers. The availability of the technology for beneficiaries' farmers for the project is costly and justified. 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 for 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 the component 3 and 4. Having access to finance to adopt the proposed technology and access to market will help the farmers to 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 company are critical for the exit strategy and their cost is justified.

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

Sustainability aspect was taken into consideration by involving key stakeholders from the design stage. This is demonstrated by involving administrative authorities which have 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 results.

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 a sustainable production of the cultivated areas.

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 a 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 the use of the proposed technologies in case of extreme weather conditions.

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 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>	√	Risk: Low Potential impact: High <i>The full proposal will be compliant with all relevant existing national laws and regulations</i>
<i>Access and Equity</i>	√	Risk: Low Potential impact: Low <i>The project will ensure equitable access to project benefits by all community members</i>
<i>Marginalized and Vulnerable Groups</i>	√	Risk: Low Potential impact: Moderate/High <i>Although during concept note development marginalized and vulnerable groups were consulted, more intensive consultations will be done during full proposal development</i>
<i>Human Rights</i>	√	Risk: Low Potential impact: Moderate/High <i>The project will adhere to national and international human rights standards, policies, rules and regulations</i>
<i>Gender Equality and Women's Empowerment</i>	√	Risk: Moderate Potential impact: Moderate/High <i>Gender will be mainstreamed in all project components</i>
<i>Core Labour Rights</i>	√	Risk: Low Potential impact: High <i>The project will adhere to core labour rights during implementation</i>
<i>Indigenous Peoples</i>	No risk observed	Risk: Low Potential impact: Low <i>No differentiation in ethnicity observed in project sites</i>
<i>Involuntary Resettlement</i>	No risk observed	Risk: Low Potential impact: Low <i>No involuntary resettlement is expected to take place</i>
<i>Protection of Natural Habitats</i>	√	Risk: Low Potential impact: High <i>Project activities aim to promote conservation</i>

<i>Conservation of Biological Diversity</i>	√	Risk: Low Potential impact: High <i>Project activities related to restoration of ecological balance aim to enhance biodiversity conservation</i>
<i>Climate Change</i>	√	Risk: Low Potential impact: High <i>The project will contribute to climate change adaptation measures. No GHG emissions anticipated</i>
<i>Pollution Prevention and Resource Efficiency</i>	√	Risk: Low Potential impact: High <i>Adhere to established national and international pollution standards</i>
<i>Public Health</i>	√	Risk: Low Potential impact: High <i>The project design will ensure that public health is not adversely affected</i>
<i>Physical and Cultural Heritage</i>	No risk observed	Risk: Low Potential impact: Low <i>Baseline study will be conducted to identify the presence of physical and cultural heritage sites</i>
<i>Lands and Soil Conservation</i>	√	Risk: Low Potential impact: Moderate/High <i>The project will promote conservation of soil and land resources</i>

PART III: IMPLEMENTATION ARRANGEMENTS

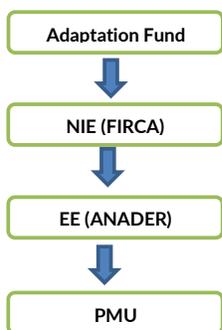
A. Describe the arrangements for project / programme implementation.

The National Designated Authority (NDA) for UNFCCC and all climate change projects in Côte d'Ivoire is the Ministry of Environment and Sustainable Development Office. The NDA oversees all actions and interventions related to climate change and communicate to UNFCCC and its associated Boards or Committees. The project will be implemented by the AF-accredited NIE (FIRCA) and will be executed by the National Agency for Rural Development Support (ANADER) which mission is "to contribute to the improvement of living conditions in rural areas through the professionalization of farmers and professional agricultural organizations by designing and implementing appropriate tools and approaches, and programs adapted to ensure sustainable and controlled development". ANADER will work closely with all the regions where the project will be implemented. ANADER will be seconded by technical partners including the Global Green Growth Institute (GGGI) in the execution of component 3 and 4 of the project.

The Project Management Unit (PMU) will be comprised of Project Coordinator, Technologies sharing experts, Project Accountant, M & E officer Communication officer, project assistants and technicians etc..... The PMU will be guided by the Project Consultative Committee (PCC), which will be constituted by members from the relevant ministries departments and organizations, private sector organization; Ministry of Agriculture and Rural Development, Ministry of Livestock and Fisheries Resources House, and local government authorities.

The project coordinator will be seconded to the project from FIRCA, the project accountant and M&E officer from ANADER. Those seconded to the project will receive a modest monthly allowance for their time spent in the project. Other officers from partner institutions and departments will receive some allowance when they get involved in field activities. The M & E officer, apart from monitoring the project progress he/she will also be responsible for coordinating ESMP activities. He/she will also be responsible for documenting and disseminating the project results and lessons learnt to fulfill the knowledge management aspect.

Figure 9 : Project implementation arrangements



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

Risk type	Risk category	Risk level	Mitigation measures
Financial risk	Timely disbursement of funds	Low	<p>Fund requests and project progress reports will be timely prepared, communicated and submitted to the Adaptation Fund and other relevant stakeholders to ensure adequate feedback is provided to speed up fund's disbursement.</p> <p>The Project Team will follow required standards and templates as provided by the Adaptation Fund to ensure proper reporting and avoid unnecessary delays</p>
	Financial control risk	Low	<p>Appropriate structures at the ministerial level and local government authorities exist for proper management and control of the public funds. The project will follow these structures and international accounting standards (IAS) and to all Generally Acceptable Accounting Principles (GAAP) to meet all accounting requirements related to reporting, control and transparency and auditing.</p>
Project risk	Project performance	Low	<p>Project Team will be carefully constituted based on skills and capacity to manage project on Climate Change intervention as well good monitoring tools to facilitate implementation of this project</p> <p>Detailed work plans will be developed and be approved by both the Project Consultative Committee and FIRCA.</p>
	Participation of stakeholders	Low	<p>Participation of stakeholders will consider widely involved from early stages of the project design, implementation, monitoring and evaluation during the entire life of project cycle. Involvement of key stakeholders at community level and inclusion of vulnerable to climate change adaptation communities and groups such as youth, women, local leaders, community beneficiaries, and farmers association as well as responsible ministries will facilitate to mitigating any risks related to stakeholders' involvement.</p>

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.

The following proposed project will be considered as Category B (because its potential adverse environmental impacts on human populations or environmentally important areas—including wetlands, forests, grasslands, and other natural habitats—are low). The population and workers will be sensitized on health risks mainly COVID-19 related risks.

Individual project activities will be analyzed according to the ANADER, FIRCA and AFs' Environmental and Social Policy requirements in order to identify potential risks and appropriate mitigation measures. An Environmental and Social Management Plan (ESMP) will be prepared according to the set requirements, with the aim to:

- assessing possible measures to avoid, minimize and / or mitigate risks identified;
- develop a monitoring plan
- promote a policy for high quality of environmental and social practices.

All the costs related to mitigation measures and monitoring of environmental and social parameters will be included in the project budget.

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.

The Monitoring and Evaluation framework of the project will be designed according to the procedures set by FIRCA and by the AF. The Results framework gives the performance indicators against which the project will be evaluated and specifies the baseline as well the objectives to be achieved. The M&E plan includes monitoring of environmental parameters to meet the requirements of ESMP. The detailed M&E plan will be prepared and agreed upon within a month after the project starts.

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.

The results framework of the project defines success indicators for project implementation and the respective means of verification. A monitoring and evaluation system for the project will be established, based on the indicators and means of the means verification, will be confirmed during the launching event. Any changes to be done to the results framework will require approval by the Project Steering Committee.

The inception workshop is crucial for enhancing understanding of the projects and its implementation, building ownership for project results and agreeing modalities of project execution, documenting mutual agreement for proposed execution arrangements amongst stake holders and beneficiaries.

Table 65: the results framework with indicators to output level, baseline, targets, sources of verification and assumptions

Project component	Project outcome	Outcome indicators	Means of verification	Baseline	Results- /targets	Assumptions
Sustainable access to improved water management technologies to build resilience to climate change	Capacities of rice and vegetables farmers communities to apply sustainable and improved water management technologies to build resilience to climate change developed	Number of extension agents trained on IRCS technology	Project report	few numbers of extensions agents and farmers trained from the pilot project	114-	Beneficiaries are open for the adoption of the proposed adaptation technologies
		Number of extension agents trained on "solid rain" technology			96-	
		Number of extension agents trained on rice fish farming technology			22-	
		Number of vegetable farmers trained in the use of "ICRS" technology			4750-	
		Number of craftsmen trained on rotating weeder manufacture			38	
		Number of vegetable farmers trained in the use of "Solid Rain" technology			4800-	
Rice fish farming to support diversification and climate resilient rice cultivation system	Climate resilient rice cultivation system developed, scaled up and providing fish production	Number of farmers trained in rice fish farming	Project report	few farmers have been trained on rice fish farming technology	165-	Beneficiaries are open for the adoption of the proposed adaptation technologies and willing to diversify their portfolio
		Number of rural planners trained in rice fish farming management techniques			22	
		Number of micro dams developed for the application of rice fish farming			65-	
		Number of sites developed for the application of rice fish farming			165-	
Access to finance strengthened for climate resilient	Credit schemes tailored to scale up proven resilient rice and vegetable	Number of cooperatives/professional organizations strengthened	Project report	there is no green credit line available for farmers to adopt	30	Beneficiaries are willing to pay to continue the adoption of

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rice-and-vegetables-farming-enterprises-development	farming-technologies	Number of local management committees created and strengthened		adaptation-technologies	30	the-technologies-after-the-project-execution-period
		Number of comprehensive climate adaptation plans developed for climate finance			3	
		Number of Market access strategy developed			3	
Knowledge-sharing-and-policies/strategies-development	Enabling policies, strategies and legal frameworks are developed and adopted, and knowledge for the project sustainability shared.	Number of exchange and sharing experience visits organized	Project report	there is no policies and strategies to allow and facilitate climate change adaptation	79	Beneficiaries are happy to share the results and their experience using the proposed technologies
		Number of capacities building training session			15	
		Number of Policies/strategies and institutions gaps assessed and adapted			3	

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Table 6: the results framework with indicators to output level, baseline, targets, sources of verification and assumptions

<u>Project component</u>	<u>Project outcome</u>	<u>Outcome indicators</u>	<u>Means of verification</u>	<u>Baseline</u>	<u>Results /targets</u>	<u>Assumptions</u>
<u>Sustainable access to improved water management technologies to build resilience to climate change</u>	<u>Capacities of rice and vegetables farmers communities to apply sustainable and improved water management technologies to build resilience to climate change developed</u>	<u>Number of extension agents trained on "solid rain" technology</u>	<u>Project report</u>	<u>13</u>	<u>138</u>	<u>Beneficiaries are open for the adoption of the proposed adaptation technologies</u>
		<u>Number of extension agents trained on rice-fish farming technology</u>		<u>20</u>	<u>13</u>	
		<u>Number of vegetable farmers trained in the use of "Solid Rain" technology</u>		<u>65</u>	<u>6900 (75% of women and young people)</u>	

<u>Rice-fish farming to support diversification and climate-resilient rice cultivation system</u>	<u>Climate-resilient rice cultivation system developed, scaled-up and providing fish production</u>	<u>Number of farmers trained in rice-fish farming</u>	<u>Project report</u>	<u>150</u>	<u>195 (15% of women)</u>	<u>Beneficiaries are open for the adoption of the proposed adaptation technologies and willing to diversify their portfolio</u>
		<u>Number of rural planners trained in rice-fish farming management techniques</u>		<u>0</u>	<u>26</u>	
		<u>Number of micro dams developed for the application of rice-fish farming</u>		<u>05</u>	<u>55</u>	
		<u>Number of sites developed for the application of rice-fish farming</u>		<u>05</u>	<u>195</u>	
<u>Access to finance strengthened for climate resilient rice and vegetables farming enterprises development</u>	<u>Credit schemes tailored to scale-up proven resilient rice and vegetable farming technologies</u>	<u>Number of cooperatives/professional organizations strengthened</u>	<u>Project report</u>	<u>No green credit line available for farmers to adopt Adaptation Technologies</u>	<u>40</u>	<u>Beneficiaries are willing to pay to continue the adoption of the technologies after the project execution period</u>
		<u>Number of local management committees created and strengthen</u>			<u>40</u>	
		<u>Number of comprehensive climate adaptation plans developed for climate finance</u>			<u>3</u>	
		<u>Number of Market access strategy developed</u>			<u>3</u>	
<u>Knowledge sharing and policies/strategies development</u>	<u>Enabling policies, strategies and legal frameworks are developed and adopted, and</u>	<u>Number of exchange and sharing experience visits organized</u>	<u>Project report</u>	<u>No policies and strategies to allow and facilitate climate change adaptation</u>	<u>45</u>	<u>Beneficiaries are happy to share the results and their experience</u>
		<u>Number of capacities building training session</u>			<u>15</u>	

	<u>knowledge for the project sustainability shared.</u>	<u>Number of Policies/strategies and institutions gaps assessed and adapted</u>			<u>3</u>	<u>using the proposed technologies</u>
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F. Demonstrate how the project / programme aligns with the Results Framework of the Adaptation Fund

Table 7.6: alignment with the AF results framework

Project Objective(s) ²⁰	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 IRCS 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 1,780,000
	Number of extension agents trained on "solid rain" technology			
	Number of extension agents trained on rice-fish farming technology			
	Number of vegetable farmers trained in the use of "ICRS" technology			
Rice-fish farming to 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	1,081,010 925,000
	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	474,000 395,000
	Number of local management committees created and strengthen			
	Number of comprehensive climate adaptation plans developed for climate finance			
	Number of Market access strategy developed			

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²⁰ The AF utilized OECD/DAC terminology for its results framework. Project proponents may use different terminology but the overall principle should still apply

Knowledge sharing and policies/strategies development	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.

Table 87: Detailed budget for the proposed project

<u>Expected Outputs</u>	<u>Output budget</u>	<u>Inputs</u>	<u>Year 1</u>	<u>Year 2</u>	<u>Year 3</u>	<u>TOTAL</u>
<u>Component 1: Sustainable access to improved water management technologies to build resilience to climate change</u>						
<i>Expected outcome: Capacities of rice and vegetables farmers communities to apply sustainable and improved water management technologies to build resilience to climate change developed</i>						
<u>Extension agents' capacities to disseminate adaptations technologies to farmers enhanced</u>	<u>72,381</u>	<ul style="list-style-type: none"> ➤ <u>Agents' capacities building session</u> ➤ <u>Consultancy services</u> 	<u>72,381</u>			<u>72,381</u>
<u>Vegetable farmers capacities to adopt climate adaptation technologies on Solid Rain built</u>	<u>1,559,400</u>	<ul style="list-style-type: none"> ➤ <u>Farmers' training</u> ➤ <u>Farmers' training kits</u> ➤ <u>Farmers' installation kits</u> ➤ <u>Farmers' coaching and follow-ups session</u> 	<u>720,000</u>	<u>720,000</u>	<u>119,400</u>	<u>1,559,400</u>
<u>Component 2: Rice-fish farming to support diversification and climate-resilient rice cultivation system</u>						
<i>Expected outcome: Climate-resilient rice cultivation system developed, scaled-up and providing fish production</i>						
<u>Capacities of rice and fish farmers to adopt climate change adaptation technologies under the diversification system with combined rice and fish farming are enhanced.</u>	<u>526,440</u>	<ul style="list-style-type: none"> ➤ <u>Farmers' training</u> ➤ <u>Farmers' training kits</u> ➤ <u>Farmers' installation kits</u> ➤ <u>Farmers' coaching and follow-ups session</u> 	<u>230,000</u>	<u>230,000</u>	<u>66,440</u>	<u>526,440</u>
<u>Rural planners on rice-fish farming diversification management system trained</u>	<u>10,000</u>	<ul style="list-style-type: none"> ➤ <u>Training of rural planners trained to developed rice-fish application site</u> 	<u>5,000</u>	<u>5,000</u>		<u>10,000</u>
<u>Application sites of the rice-fish farming technique developed</u>	<u>544,570</u>	<ul style="list-style-type: none"> ➤ <u>Development of micro dams</u> ➤ <u>Development of ponds</u> 	<u>290,000</u>	<u>254,570</u>		<u>544,570</u>
<u>Component 3: Access to finance strengthened for climate resilient rice and vegetables farming enterprises development</u>						
<i>Expected outcome: Credit schemes tailored to scale-up proven resilient rice and vegetable farming technologies</i>						

<u>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</u>	<u>50,000</u>	<ul style="list-style-type: none"> ➤ <u>Partnership with financial institution</u> ➤ <u>Concept note development</u> ➤ <u>Consultancy services</u> 	<u>20,000</u>	<u>20,000</u>	<u>10,000</u>	<u>50,000</u>
<u>Existing cooperatives/professional organizations strengthened to improve climate resilient rice and vegetable farming practices with increased productivity and household income through microfinance facility.</u>	<u>324,000</u>	<ul style="list-style-type: none"> ➤ <u>Consultation</u> ➤ <u>Workshops</u> ➤ <u>Partnership establishment</u> ➤ <u>Consultancy services</u> 	<u>120,000</u>	<u>120,000</u>	<u>84,000</u>	<u>324,000</u>
<u>Comprehensive climate adaptation plans developed for each value chain with identified public and private sources of funding.</u>	<u>50,000</u>	<ul style="list-style-type: none"> ➤ <u>Consultation</u> ➤ <u>Workshops</u> ➤ <u>Partnership establishment</u> ➤ <u>Consultancy services</u> ➤ <u>Concept note development</u> 	<u>20,000</u>	<u>20,000</u>	<u>10,000</u>	<u>50,000</u>
<u>Market access strategy developed to facilitate the commercialization of the products</u>	<u>50,000</u>	<ul style="list-style-type: none"> ➤ <u>Consultation</u> ➤ <u>Workshops</u> ➤ <u>Partnership establishment</u> ➤ <u>Consultancy services</u> 	<u>20,000</u>	<u>20,000</u>	<u>10,000</u>	<u>50,000</u>
<u>Component 4: Knowledge sharing and policies/strategies development</u>						
<i>Expected outcome: Enabling policies, strategies and legal frameworks are developed and adopted, and knowledge for the project sustainability shared.</i>						
<u>Capacity building and knowledge sharing system established based on strengthened extension services/Lead farmers program (ToT Model) with consolidated</u>	<u>130,000</u>	<ul style="list-style-type: none"> ➤ <u>Consultation</u> ➤ <u>Workshops</u> ➤ <u>Training sessions</u> ➤ <u>Consultancy services</u> ➤ <u>Concept note development</u> 	<u>40,000</u>	<u>40,000</u>	<u>50,000</u>	<u>130,000</u>

<u>modules and training guidelines (MRV training...)</u>						
<u>Policies/strategies and institutions gaps assessed and adapted to ensure and facilitate the participation of the private sector, including the creation of incentive mechanisms.</u>	<u>50,000</u>	<ul style="list-style-type: none"> ➢ <u>Consultation</u> ➢ <u>Workshops</u> ➢ <u>Consultancy services</u> 	<u>20,000</u>	<u>20,000</u>	<u>10,000</u>	<u>50,000</u>
Project Management cost (9.5%)						
<u>Project Execution Costs</u>	<u>380 000</u>	<u>Project staff salaries</u>	<u>41,000</u>	<u>41,000</u>	<u>41,000</u>	<u>123,000</u>
		<u>Communication</u>	<u>8,000</u>	<u>4,000</u>	<u>4,000</u>	<u>16,000</u>
		<u>Equipment</u>	<u>17,000</u>			<u>17,000</u>
		<u>Office supply</u>	<u>1,000</u>	<u>1,845</u>	<u>2,000</u>	<u>4,845</u>
		<u>Meetings and workshop</u>	<u>10,000</u>		<u>10,000</u>	<u>20,000</u>
		<u>Travel</u>	<u>59,000</u>	<u>13,000</u>	<u>13,000</u>	<u>85,000</u>
	<u>Monitoring and Evaluation</u>	<u>Mid-Term evaluation</u>		<u>18,000</u>		<u>18,000</u>
		<u>Terminal Evaluation</u>			<u>18,000</u>	<u>18,000</u>
	<u>Audit</u>	<u>Project audit</u>			<u>18,000</u>	<u>18,000</u>
SUB-TOTAL						<u>319,845</u>
Project Cycle Management Fee Charged by the Implementing Entity (8.5%)						
						<u>313,364</u>
TOTAL						
						<u>4 000 000</u>

Expected-Outputs	Output budget	Inputs	Year 1	Year 2	Year 3	TOTAL
Component 1: Sustainable access to improved water management technologies to build resilience to climate change-						
<i>Expected outcome: Capacities of rice and vegetables farmers communities to apply sustainable and improved water</i>						

<i>management technologies to build resilience to climate change developed</i>						
Extension agents' capacities to disseminate adaptations technologies to farmers enhanced	110,000	<ul style="list-style-type: none"> ➤ Agents' capacities building session ➤ Consultancy services 	110,000			110,000
Rice farmers capacities to adopt climate adaptation technologies on ICRS built	572,000	<ul style="list-style-type: none"> ➤ Farmers' training ➤ Farmers' training kits ➤ Farmers' installation kits ➤ Farmers' coaching and follow ups session 	261,500	261,500	72,000	595,000
Craftsmen capacities on rotating weeder manufacture built	25,000	<ul style="list-style-type: none"> ➤ Training of craftsmen on rotating tool manufacturing 	12,500	12,500		25,000
Vegetable farmers capacities to adopt climate adaptation technologies on Solid Rain built	1,050,000	<ul style="list-style-type: none"> ➤ Farmers' training ➤ Farmers' training kits ➤ Farmers' installation kits ➤ Farmers' coaching and follow ups session 	485,000	485,000	80,000	1,050,000
Component 2: Rice fish farming to support diversification and climate resilient rice cultivation system						
<i>Expected outcome: Climate resilient rice cultivation system developed, scaled up and providing fish production</i>						
Rice farmers and fish farmers capacities to adopt climate adaptation technologies on rice fish farming diversification system	450,000	<ul style="list-style-type: none"> ➤ Farmers' training ➤ Farmers' training kits ➤ Farmers' installation kits ➤ Farmers' coaching and follow ups session 	205,000	205,000	40,000	450,000
Rural planners on rice fish farming diversification management system trained	10,000	<ul style="list-style-type: none"> ➤ Training of rural planners trained to developed rice fish application site 	5,000	5,000		10,000
Application sites of the rice fish farming technique developed	465,000	<ul style="list-style-type: none"> ➤ Development of micro dams ➤ Development of ponds 	247,000	218,000		465,000
Component 3: Access to finance strengthened for climate resilient rice and vegetables farming enterprises development						
<i>Expected outcome: Credit schemes tailored to scale up proven resilient rice and vegetable farming technologies</i>						
An adaptation oriented micro finance scheme that supports the uptake	50,000	<ul style="list-style-type: none"> ➤ Partnership with financial institution ➤ Concept note development ➤ Consultancy services 	20,000	20,000	10,000	50,000

of resilient rice and vegetable farming technologies through partnership with local microfinance and local management committed						
Existing cooperatives/professional organizations strengthened to improve climate resilient rice and vegetable farming practices with increased productivity and household income through microfinance facility.	270,000	<ul style="list-style-type: none"> ➤ Consultation ➤ Workshops ➤ Partnership establishment ➤ Consultancy services 	90,000	90,000	65,000	245,000
Comprehensive climate adaptation plans developed for each value chain with identified public and private sources of funding.	50,000	<ul style="list-style-type: none"> ➤ Consultation ➤ Workshops ➤ Partnership establishment ➤ Consultancy services ➤ Concept note development 	20,000	20,000	10,000	50,000
Market access strategy developed to facilitate the commercialization of the products	50,000	<ul style="list-style-type: none"> ➤ Consultation ➤ Workshops ➤ Partnership establishment ➤ Consultancy services 	20,000	20,000	10,000	50,000
Component 4: Knowledge sharing and policies/strategies development						
<i>Expected outcome: Enabling policies, strategies and legal frameworks are developed and adopted, and knowledge for the project sustainability shared.</i>						
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...)	130,000	<ul style="list-style-type: none"> ➤ Consultation ➤ Workshops ➤ Training sessions ➤ Consultancy services ➤ Concept note development 	40,000	40,000	50,000	130,000

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	<ul style="list-style-type: none"> ➤ Consultation ➤ Workshops ➤ Consultancy services 	20,000	20,000	10,000	50,000
Project Management cost (9.5%)						
Project Execution Costs	380,000	Project staff salaries	50,000	50,000	50,000	150,000
		Communication	10,000	5,000	5,000	20,000
		Equipment	20,000			20,000
		Office supply	1,500	1,500	2,000	5,000
		Meetings and workshop	12,500		12,500	25,000
		Travel	70,000	15,000	15,000	100,000
	Monitoring and Evaluation	Mid Term evaluation		20,000		20,000
		Terminal Evaluation			20,000	20,000
Audit	Project audit			20,000	20,000	
SUB-TOTAL						380,000
Project Cycle Management Fee Charged by the Implementing Entity (8.5%)						
						340,000
TOTAL						
						4,000,000

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

	Year 1	Year 2	Year 3	Total
Scheduled date	January 2023	January 2024	January 2025	
Project funds	1,536,000	1,397,000	347,000	3,280,000
Execution costs	164,000	91,500	124,500	380,000
NIE fee	102,000	102,000	136,000	340,000
TOTAL	1,802,000	1,590,500	607,500	4,000,000

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	Year 1	Year 2	Year 3	Total
Scheduled date	January 2023	January 2024	January 2025	
Project funds	1,557,381	1,449,570	359,840	3,366,791
Execution costs	136,000	77,845	106,000	319,845
NIE fee	94,009	94,010	125,345	313,364
TOTAL	1,802,000	1,590,500	607,500	4,000,000

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

A. Record of endorsement on behalf of the government² *Provide the name and position of the government official and indicate date of endorsement.*

<p>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</p>	<p>Date: <i>January, 4, 2022</i></p>
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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*

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

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 Djin Edmond

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



ADAPTATION FUND

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
Ministry of Environment and Sustainable Development

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- Frequency 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 Pricen(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		
	Designation	Quantity	Price	Designation	Quantity	Price
INPUTS	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		
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 ICRS						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