Concept Note

Enhancing the resilience of rural population with irrigation modern techniques in Benin

Banque Ouest Africaine de Développement (BOAD) | Benin

27 February 2018
## Concept Note

<table>
<thead>
<tr>
<th>Project/Programme Title:</th>
<th>Enhancing the resilience of rural population with irrigation modern techniques in Benin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Country(ies):</td>
<td>Benin</td>
</tr>
<tr>
<td>National Designated Authority(ies) (NDA):</td>
<td>Aina Martin Pepin: <a href="mailto:marnickson@yahoo.fr">marnickson@yahoo.fr</a></td>
</tr>
<tr>
<td>Accredited Entity(ies) (AE):</td>
<td>Banque Ouest Africaine de Développement (BOAD)</td>
</tr>
<tr>
<td>Date of first submission/version number</td>
<td>20180226</td>
</tr>
<tr>
<td>Date of current submission/version number</td>
<td>20180226</td>
</tr>
</tbody>
</table>
Notes

- The maximum number of pages should **not exceed 12 pages**, excluding annexes. Proposals exceeding the prescribed length will not be assessed within the indicative service standard time of 30 days.
- As per the Information Disclosure Policy, the concept note, and additional documents provided to the Secretariat can be disclosed unless marked by the Accredited Entity(ies) (or NDAs) as confidential.
- The relevant National Designated Authority(ies) will be informed by the Secretariat of the concept note upon receipt.
- NDA can also submit the concept note directly with or without an identified accredited entity at this stage. In this case, they can leave blank the section related to the accredited entity. The Secretariat will inform the accredited entity(ies) nominated by the NDA, if any.
- Accredited Entities and/or NDAs are encouraged to submit a Concept Note before making a request for project preparation support from the Project Preparation Facility (PPF).
- Further information on GCF concept note preparation can be found on GCF website Funding Projects Fine Print.
### A. Project/Programme Summary (max. 1 page)

<table>
<thead>
<tr>
<th>A.1. Project or programme</th>
<th>☒ Project</th>
<th>☐ Programme</th>
<th>A.2. Public or private sector</th>
<th>☒ Public sector</th>
<th>☐ Private sector</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.3. Is the CN submitted in response to an RFP?</td>
<td>Yes ☐ No ☒</td>
<td>If yes, specify the RFP:</td>
<td>A.4. Confidentiality</td>
<td>☐ Confidential</td>
<td>☒ Not confidential</td>
</tr>
<tr>
<td>A.5. Indicate the result areas for the project/programme</td>
<td>Mitigation: Reduced emissions from:</td>
<td>☒ Energy access and power generation</td>
<td>☐ Low emission transport</td>
<td>☐ Buildings, cities and industries and appliances</td>
<td>☐ Forestry and land use</td>
</tr>
<tr>
<td></td>
<td>Adaptation: Increased resilience of:</td>
<td>☒ Most vulnerable people and communities</td>
<td>☒ Health and well-being, and food and water security</td>
<td>☐ Infrastructure and built environment</td>
<td>☐ Ecosystem and ecosystem services</td>
</tr>
<tr>
<td>A.6. Estimated mitigation impact (tCO2eq over lifespan)</td>
<td>85 860 tCO2eq</td>
<td>A.7. Estimated adaptation impact (number of direct beneficiaries and % of population)</td>
<td>8 200</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.8. Indicative total project cost (GCF + co-finance)</td>
<td>Amount: USD 8,680,000</td>
<td>A.9. Indicative GCF funding requested</td>
<td>Amount: USD 8,680,000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.10. Mark the type of financial instrument requested for the GCF funding</td>
<td>☒ Grant ☐ Reimbursable grant ☐ Guarantees ☐ Equity</td>
<td>☐ Subordinated loan ☐ Senior Loan ☐ Other: specify ______________________</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.11. Estimated duration of project/programme:</td>
<td>a) disbursement period: 3 ans</td>
<td>A.12. Estimated project/Programme lifespan</td>
<td>10 years</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.13. Is funding from the Project Preparation Facility requested?</td>
<td>Yes ☒ No ☐ Other support received ☐ If so, by who:</td>
<td>A.14. ESS category</td>
<td>☐ A or I-1</td>
<td>☒ B or I-2</td>
<td>☐ C or I-3</td>
</tr>
<tr>
<td>A.15. Is the CN aligned with your accreditation standard?</td>
<td>Yes ☒ No ☐</td>
<td>A.16. Has the CN been shared with the NDA?</td>
<td>Yes ☒ No ☐</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.17. AMA signed (if submitted by AE)</td>
<td>Yes ☒ No ☐</td>
<td>A.18. Is the CN included in the Entity Work Programme?</td>
<td>Yes ☒ No ☐</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.19. Project/Programme rationale, objectives and approach of programme/project (max 100 words)</td>
<td>Brief summary of the problem statement and climate rationale, objective and selected implementation approach, including the executing entity (ies) and other implementing partners. Benin's agricultural population, especially small producers, remains vulnerable to the adverse effects of climate change. The decrease in rainfall, the frequent droughts pockets, the very irregular rain confusing the cultural calendar of the peasant, the rising temperatures intensifying the early evaporation and drying up of water points making it difficult to mobilize irrigation water (lack of technology) and declining soil fertility are the</td>
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1 Concept notes (or sections of) not marked as confidential may be published in accordance with the Information Disclosure Policy (Decision B.12/35) and the Review of the Initial Proposal Approval Process (Decision B.17/18).

2 See [here](#) for access to project preparation support request template and guidelines

3 Refer to the Fund’s environmental and social safeguards (Decision B.07/02)
main factors affecting agricultural production. The food security remains very precarious and the poverty is ever increasing. This project is initiated to sustainably strengthen the resilience of small-scale farmers. The BOAD is the accredited entity and the Ministry in charge of Agriculture is the executing entity.

B. Project/Programme Information (max. 8 pages)

B.1. Context and baseline (max. 2 pages)

Describe the climate vulnerabilities and impacts, GHG emissions profile, and mitigation and adaptation needs that the prospective intervention is envisaged to address.

Since the end of the 1960s, climatic disturbances have increased in Benin, which has resulted in a temperature increase of 1.1 °C, a decrease in the annual rainfall amplitude of 180 mm. Besides, droughts intensified during the same period, and rainfall intensified by 100 mm/h, reinforcing soil erosion and flooding. In addition, the annual count of rainy days and the 30-day annual maximum precipitation have shown a substantial decrease in recent years.

The most important climatic risks are drought, late and intensive rains and floods with an extreme winds. The biophysical and socioeconomic vulnerability is high due to limited adaptive capacity. As agriculture is of utmost importance for Benin's economy, the agricultural sector will have to adopt adaptation measures to respond to the consequences of climate change that threaten food security. The issue of food security is of concern because of the existence of pockets of severe food insecurity in some at-risk groups, including smallholder farmers. The agricultural productive sector is characterized by the predominance of small farms and its vulnerability to climatic variability and extreme weather events exposing the latter to severe or moderate food insecurity. The survey of the living conditions of rural households reveals that at least 33% of households are unable to meet their minimum food needs. The prevalence of acute malnutrition in the population of children aged 6 to 23 months is 19% and poverty is increasing from 25.2% in 1990 to 35.2% in 2009 and 36.2% in 2011 in a rural area. Revenues and productivity are low and the labor force is only partially valued, making agricultural products very competitive.

The current climate challenges (climatic variability, extreme climate events, climate change) could further exacerbate the challenges, undermine the revival of the agricultural sector and hinder poverty reduction efforts. Indeed, climate models predict an increase in the maximum annual normal temperature for the whole country, ranging from light (1-1.5 °C) to substantial (2.5-3.0 °C). The average annual temperature is expected to increase from 1.0 to 3.0°C in the 2060s, and 1.5 to 5.1°C in the 2090s. The negative consequences of intense and successive periods of droughts and floods could affect food security. They could reduce food production by 6% by 2025 if no adaptation measures are taken. With regard to water resources, the consequences of climate change (reduced rainfall) could reduce the availability of water resources by 40% to 60%, further influencing Benin's food production. This project aims to sustainably strengthen the resilience of small rural producers and support food security through the promotion of innovative irrigation techniques to co-benefit adaptation and mitigation.

Please indicate how the project fits in with the country’s national priorities and its full ownership of the concept. Is the project/programme directly contributing to the country’s INDC/NDC or national climate strategies or other plans such as NAMAs, NAPs or equivalent? If so, please describe which priorities identified in these documents the proposed project is aiming to address and/or improve.

This project is in line with the objectives set by the Beninese government in the development of a climate-resilient agriculture. The Project is in line with the NDC priorities that identify the agriculture and water sectors as highly vulnerable to the effects of climate change. The main objectives under Benin's NDC are to reduce the vulnerability of socio-economic systems and ecosystems to climate variability and change by adopting appropriate policies and measures. According to the NDC, it will strengthen, among others: the availability of water resources, especially during dry periods; climate risk prediction and early warning systems for food security in vulnerable agro-ecological zones, to contribute to the financing of adaptation at local authority level through the strengthening of local governance in terms of planning and budgeting activities.

The project is consistent with the NAPA which identified operational and priority adaptation options in the agricultural sector, including: Improving agricultural food production systems and Diversifying rural households' sources of income.

The project responds to the agricultural sector development issue identified by the Strategic Plan for Agricultural Sector Recovery (PSRSA) and highlights three major challenges related to (i) the coverage of food needs, (ii) the increase in incomes, and (iii) improving the attractiveness of agricultural activity and rural areas. These three challenges give the agricultural sector the dual role of accelerating economic growth and contributing to poverty reduction.

Describe the main root causes and barriers (social, gender, fiscal, regulatory, technological, financial, ecological,
The climate change will amplify the phenomena of drought and desertification that already affect Benin. The family farming, which is practiced throughout the territory, remains highly vulnerable to the effects of climate change. The development of irrigation for vegetable production appearing as a way to fill the low production of rainfed seriously affected by climatic disturbances, faces many constraints. The constraints include: (i) the non-control of water; (ii) the land degradation; (iii) the low level of farm development; (iv) the poor adaptation to climate variability and extremes; (v) the level of supervision and accompaniment of the actors; (vi) the inaccessibility of good quality seeds adapted to new climatic realities; (vii) the non-mastery of organic input production technologies; (viii) the difficulties of conservation of agricultural products; (ix) the low level of organization of producers; (x) the narrowness of the local market; (xi) the poor financial capacity of generally poor producers; (xii) the difficulties of access to credit especially for the agricultural sector; and (xii) the land tenure. Project components and activities will be planned to overcome these barriers for efficient project implementation.

Where relevant, and particularly for private sector project/programme, please describe the key characteristics and dynamics of the sector or market in which the project/programme will operate.

B.2. Project/Programme description (max. 3 pages)

Describe the expected set of components/outputs and subcomponents/activities to address the above barriers identified that will lead to the expected outcomes.

The project is intended to be a national operation in the different regions of the country and is structured around the following components: (i) strengthening the technical and organizational capacities of stakeholders and dissemination of lessons learned; (ii) comfort and development of irrigated perimeters; and (iii) support for livelihood diversification and income enhancement for farmers.

Component 1: Strengthening technical capacities for promoting sustainable agriculture, sharing knowledge and disseminating lessons learned

This component aims to strengthen the technical capacities of all stakeholders involved in the promotion of irrigation for the promotion and adoption of resilient technologies and techniques in a context of integrated management of water resources, management water and energy on farms. In addition, lessons learned during the implementation of the project will be disseminated on a larger scale. The planned activities are: (i) Activity 1-1: Capacity building of decentralized technical services of the State. The capacity of the technical services of the Ministry of Agriculture and Environment will be strengthened to enable them to analyze the effects of climate change in combination with food security, livelihoods and vulnerability indicators. This will allow them to monitor local development, mobilize and support communities. These trainings will be in the form of a workshop that will bring together the different categories of managers; (ii) Activity 1-2: Capacity building of producers and local actors to understand and adopt agricultural practices and innovative irrigation techniques in the face of climate change. This activity will be conducted through: (i) the education and training of local communities on the threats of climate change and adaptation and resilience related to food safety; (ii) training of farmers to agricultural practices that preserve sustainable water resources and soil; (iii) the training of local technicians in the installation and repair of modern irrigation systems (drip system, Californian system, etc.) and photovoltaic systems; (iii) Activity 1-3: Organization of climate resilient practices exchange meetings. This activity is to bring together representatives of producers, decentralized technical services, civil society organizations, and representatives of local authorities for exchanges on climate resilient technologies adapted to the local context in the field of agriculture as well as the environment. This sharing of knowledge is an important capital to catalyze the paradigm shift and ensure the sustainability of the project; (iv) Activity 1-4. Dissemination of lessons learned. This will involve producing and disseminating documents and documentaries on lessons learned and best practices tested in the project for strengthening resilience and developing agricultural value chains.

Component 2: Comfort and development of irrigated perimeters with resilient and low-carbon techniques

This component aims to promote irrigation with innovative technologies such as drip system for irrigation, the Californian system and a solar pumped water discharge as adaptation and community resilience building measures against the adverse effects of climate change and energy crises to address food insecurity and greenhouse gas emissions resulting from water abstraction activity for irrigation. Under this component, 300 ha of irrigated crops will be developed. The project will preferably intervene on sites under development and will ensure that the intervention sites have land security. These are: (i) Activity 2-1: Development and comfort of irrigated perimeters with modern climate resilient techniques. It will be question of landscaping perimeters by putting in place innovative irrigation techniques. The choice is oriented on the drip system and the Californian system as the case may be. This choice is justified by the fact that these systems are water efficient and allow to provide the plant with essential needs for its development. The
performance of these systems are respectively 85% and 95%; (ii) **Activity 2-2**: Support for access to safe and clean energy for the drainage of irrigation water. This activity involves the acquisition and installation of solar kits (solar panels, solar pumps and accessories) to ensure the energy of dewatering. This energy source whose potential remains largely available in the country is a guarantee for the operation of all the developed areas and solve the thorny problem of the acquisition and transportation of fuel, major constraint to the optimal exploitation developed perimeters. The use of this energy source anticipates the risk of non-exploitation of the perimeters because of the uncontrolled costs of the ever-increasing fuel price; (ii) **Activity 2-3**: Support for the enhancement of developed sites. This activity will consist in helping the beneficiaries to exploit the managed sites in an optimal and sustainable way. The project will provide support in the acquisition of quality seeds (in collaboration with agrarian research institutions), the promotion of organic manure through the development of manure pits, the promotion of integrated pest management practices, supports on site and advice on good agricultural practice for proper development of developed sites.

**Component 3: Support for the development of agricultural value chains**

This component is the value of agricultural products in order to diversify sources of income for women and youth. At least 50 women's and youth groups will benefit from the development activities of the agricultural value chain. The activities to be developed under this component are: (i) **Activity 3-1**: Group formation on product recovery techniques and market access. Generally, producers are more interested in activities of production and do not always have the technical capacity and sufficient technology for the preservation and processing of agricultural products. Studies have shown that processing activities add value to producers. Groups of young people and women will therefore be trained in techniques for the valorization and conservation of agricultural products. Clusters will also be trained in market access, recordkeeping and account management; (ii) **Activity 3-2**: Support for the acquisition of product processing equipment. The project will support the groups formed in the acquisition of micro-processing units of products. These micro-units will use solar energy for their operation. The project will organize and encourage microfinance institutions to support scaling up development, agricultural product development.

**Component 4: Project Management, Coordination and Monitoring**

This component consists of setting up a unit for coordinating, managing and monitoring the project activities at the technical, administrative, financial and accounting levels. Monitoring and evaluation activities will be conducted under this component and results shared with other actors.

In terms of rationale, please describe the theory of change and provide information on how it serves to shift the development pathway toward a more low-emissions and/or climate resilient direction, in line with the Fund’s goals and objectives.

This project's innovative approach to adaptation and mitigation is in accordance with the objectives of the Green Climate Fund. The approach of organizing exchange meetings between representatives of producers, decentralized technical services, civil society organizations, and representatives of local authorities on climate resilient technologies adapted to the local context in the field of agriculture in relation to climate change is an innovative approach to catalyze paradigm shifts and ensure the sustainability of the project.

In terms of adaptation and improvement of productivity: Usually the producers make water drainage with motor pumps and practice gravity irrigation. This type of more widespread irrigation is ineffective at more than 50% in terms of water management. This project intends to focus on the drip irrigation system which has several advantages in terms of water management, a rare resource due to the decrease in rainfall and very significant evaporation. These techniques will provide the plant with the water needed and improve production. The same amount that was used on 1 ha could be used on 2ha as part of the project. The project will promote the management and conservation of soil fertility through incentive mechanisms and capacity building activities of producers.

In terms of mitigation: The project plans to move from fossil energy to renewable energy, especially solar energy, as part of the drainage of irrigation water from the perimeters. The use of motor pumps for water extraction contributes to the emission of greenhouse gases because these motor pumps operate on the basis of fossil fuels including gasoline as an energy source to operate the irrigation system on the irrigated perimeters. The integration of solar energy systems will significantly reduce emissions related to this energy source.

In terms of improving producers’ incomes: This project supports the promotion and valorization of agricultural products through their transformation. The agricultural value chain approach would be promoted with a view to enabling producers to have easy access to markets. Which will allow the improvement of living conditions.
Describe how activities in the proposal are consistent with national regulatory and legal framework, if applicable.

Project activities are consistent with Benin's development policies and strategies. The actions to be undertaken will comply with the regulatory texts governing the management of the environment (Environmental Framework Act and environmental and social impact assessment procedures). Component 2 activities will meet national and international standards, as appropriate, for the construction and installation of hydraulic infrastructure and solar energy systems.

Describe in what way the Accredited Entity(ies) is well placed to undertake the planned activities and what will be the implementation arrangements with the executing entity(ies) and implementing partners.

The accredited entity is the West African Development Bank (BOAD). It is a regional institution for financing the development of the States of the West African Monetary Union (WAEMU). The activities developed in this project are in accordance with the BOAD's flagship areas of intervention: climate change and renewable energies. The project will be implemented in collaboration with the Ministry in charge of agriculture and all the actors involved in the development of irrigation in Benin, the environment and climate change.

Please provide a brief overview of the key financial and operational risks and any mitigation measures identified at this stage.

Project risks are financial, political and technical.

<table>
<thead>
<tr>
<th>Type of risk</th>
<th>Risk</th>
<th>Level</th>
<th>Mitigation measure</th>
</tr>
</thead>
<tbody>
<tr>
<td>Financial</td>
<td>Currency instability, market price and availability of inputs for the project</td>
<td>Low</td>
<td>All funds will be maintained in USD for international purchases to reduce the impact of price and currency fluctuations. Procurement should be developed in accordance with the project work plan to ensure availability of inputs in a timely manner.</td>
</tr>
<tr>
<td>Policy</td>
<td>Political and security instability affects the implementation of the project</td>
<td>Low</td>
<td>The project will operate in politically and securely secure areas and every effort will be made to ensure that project activities are carried out with the participation of all relevant stakeholders, including government departments and local structures.</td>
</tr>
<tr>
<td>Technical</td>
<td>Low capacity of stakeholders to implement project activities</td>
<td>medium</td>
<td>Component 1 capacity building activities for stakeholders will help overcome this obstacle</td>
</tr>
</tbody>
</table>

B.3. Expected project results aligned with the GCF investment criteria (max. 3 pages)

The GCF is directed to make a significant and ambitious contribution to the global efforts towards attaining the goals set by the international community to combat climate change, and promoting the paradigm shift towards low-emission and climate-resilient development pathways by limiting or reducing greenhouse gas emissions and adapting to the impacts of climate change.

<table>
<thead>
<tr>
<th>Impacts and indicators</th>
<th>Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>GCF impacts and core indicators</td>
<td></td>
</tr>
<tr>
<td>Area (ha) of agricultural land made more resilient to climate change through agricultural practices</td>
<td>300 ha</td>
</tr>
<tr>
<td>Expected tons of carbon dioxide equivalent (t CO2 eq.) to be reduced or avoided (Mitigation only)</td>
<td>85 860</td>
</tr>
<tr>
<td>Number of households adopting a wider variety of livelihood strategies/coping mechanisms</td>
<td>1 200</td>
</tr>
<tr>
<td>Direct beneficiaries for sites development</td>
<td>7 200</td>
</tr>
<tr>
<td>Direct beneficiaries for development of agricultural chains value (other than the beneficiaries of sites development which are included in the activities of development of agricultural chains value)</td>
<td>500</td>
</tr>
<tr>
<td>Directs beneficiaries for the capacity building</td>
<td>500</td>
</tr>
<tr>
<td>Indirect beneficiaries</td>
<td>10 000</td>
</tr>
</tbody>
</table>
2. Paradigm shift potential

The present project as a whole is directed towards a paradigm shift in the development of agriculture, particularly irrigated under the conditions of climate change.

Indeed, this project plans to implement innovative approaches that allow beneficiaries to adapt while improving their income, contributing to the reduction of greenhouse gas emissions. It is an approach of co-benefits adaptation / mitigation. These innovations involve the paradigm shift in terms of water abstraction currently carried out using water pumps and non-water-efficient irrigation techniques (more than 45% water loss) towards efficient and effective irrigation, useful for water and energy saving with GHG emission reduction. In addition, the project introduces a "value chain development" component focused on the valorization of the products resulting from the development of the site.

This project, through its innovation in improving access to water resources through innovative irrigation practices, has significant replication potential to cover a larger number of areas. Interesting results and new lessons are expected from the implementation of the project regarding modern techniques used and climate change adaptation measures. Reflections should be made on the weaknesses of the project to propose new solutions that will be disseminated with the assets of the project. It is expected that the adaptation measures proposed for this project and their results can be incorporated into the lessons learned program. Capacity building actions through training on the techniques and technologies promoted by the project will allow rapid adoption and appropriation of these techniques and technologies.

The component 1 of the project is dedicated to building technical and institutional capacity and disseminating lessons learned. The capacity building activities concern all the actors involved in the project (government services, private operators, farmers' organizations, producers, etc.). These activities will enable the actors to assimilate the techniques promoted in the framework of the project. Knowledge sharing and learning will be based on a project knowledge management strategy, with communication activities tailored to target groups. Some means of communication such as radio broadcasts. This project is a pilot project at the national level. The lessons learned will be used to propose, to the financing of the Government and the Donors and the populations, a large scale project that can help the populations to better adapt to the harmful effects of the climate change.

3. Sustainable development potential

- Environmental co-benefits

Sustainable management of water resources and their quality: The use of innovative irrigation techniques will reduce water loss. Generally, the efficiency of the irrigation techniques used is low. As an indication, the efficiency of the gravity system is about 56%. This contributes to poor water management. The drip system and California system technology has a yield of 95% and 85% respectively. This reduces water losses by 30 to 40%.

Reducing Fossil Fuel Consumption and Greenhouse Gas Emissions: In practice, producers use fossil fuel-
powered motor pumps, particularly gasoline, as an energy source to power the irrigation system on IPs. According to the information available, the fuel consumption is between 0.75 to 1 liter per hour and a motor pump is used for the development of 0.25 ha of crops. Considering that a crop year lasts on average 90 days of irrigation, fossil fuel consumption would be 2,700 liters / ha / crop year, or 810,000 liters for the 300 hectares promoted under the project. With two crop seasons per year, the annual fuel consumption on 300 ha would be 1.62 million liters. This project will therefore save the consumption of 32.4 million liters of fuel over a period of 20 years (average life of solar panels).

**Improvement or maintenance of soil quality and maintenance of biodiversity:** The project provides for the establishment of soil conservation activities. Agroforestry and composting actions will be promoted through an incentive mechanism. These actions are likely to limit soil degradation, delay or modify water erosion dynamics and improve soil quality. Which will be beneficial for the production.

- **Social co-benefits**

**Improved food security and nutritional health:** In Benin, according to the results of the Global Vulnerability and Food Security Analysis (AGVSA 2014), 11% of households in Benin face severe or moderate food insecurity and 34% of households are exposed to food insecurity. The project, by improving agricultural production, population income and air quality, will improve the health and food security of the population. The benefits generated will improve access to care services by the beneficiaries.

**Contribution to poverty reduction:** In Benin, the severity of poverty has increased from 0.039 in 2011 to 0.12 in 2015. This increase in poverty is partly due to the deterioration of household income, which comes mainly from agriculture. Improving the income of the 7,700 people from site development and transformation activities will help reduce poverty in the intervention area.

**Improved access to education:** Improving incomes increases the financial capacity of beneficiaries to ensure the proper education of their children. This will limit the risk of abandoning classes, the majority of which are due to the parents' lack of financial means.

- **Economic co-benefits**

  **Jobs creation:** the implementation of the project will create direct jobs, consisting mainly of local labor and indirect jobs around the sites. Valuation activities are a potential source for youth and women's employment.

  **Revenue improvement:** The improvement in production will generate substantial income for the beneficiaries. The same is true for agricultural products valorization activities.

  **Amount of foreign currency savings:** The present project integrates the solar energy component as a source of irrigation water dewatering energy to replace fossil-fueled generators. This substitution of energy will prevent the consumption of fossil fuels, a significant part of which is still imported by the country causing the exit of foreign currencies with negative consequences on the country's trade balance.

- **Gender-sensitive development impact**

  Support for the transformation of the products promoted by this project will enable women to have added value. Generally in the project area human strength is always used for watering. Among these human forces, we meet the women who are also engaged in this task. The implementation of this project will allow them to pursue other occupations such as the establishment of income-generating activities. In accordance with GCF's gender policy, the proposal will: (i) include qualitative and quantitative gender indicators; (ii) align with national policies and gender priorities; and (iii) strengthen equitable opportunities for women throughout the project cycle. Women, men, young people, children will be affected by the benefits of the project from the preparation until the closure of the project. In choosing direct beneficiaries, the gender criterion will be included to give women, youth and adults the opportunity to participate fully in the project. A gender analysis will be conducted during the preparation of the project for equitable consideration of women, men, young people, the elderly and children. Special attention will be given to vulnerable groups.

4. **Needs of recipient:**

Agriculture, which is the main socio-economic activity, a source of income for the majority of the Beninese population, is affected by climate disruption. The decrease in rainfall, the frequency of pockets of drought, the very rains irregularity, the increase of temperatures intensifying the evaporation and the early drying up of the water points disturb the agricultural production. Food security remains very precarious and poverty is gaining ground. The most affected populations are small agricultural producers who have neither the technical means nor the financial means to develop adequate adaptation
strategies or access to the market to obtain food. The counter season irrigation, which appeared to be a means to support food security, is also facing water problems, technical problems and technologies. In addition, people do not have the technical and technological means to value products. The populations strongly need a reinforcement of their technical capacities to develop climate-resilient adaptation strategies, a support to have the appropriate technologies, a support and advice for the development of sites and a technical and technological support to promote agricultural products. This in the interest of lastingly reducing their vulnerability to climate shocks, of supporting their food and nutritional security and improving their incomes.

5. Country ownership:
The project fits into the guidelines of Benin's Nationally Determined Contribution (CDN), which is now a reference framework for climate change in the country. Through the objectives set, the project meets the guidelines established in the national plan for economic and social development (2016-2020). The project is part of the vision and objectives of the second generation rural national program (PNSR II). The project will be executed by the Ministry in charge of Agriculture through the Directorate of Rural Engineering. This project has been identified with the actors of the agricultural world.

6. Efficiency and effectiveness:
The project has an interesting cost-effectiveness advantage with respect to the techniques and technologies promoted in the project. The implementation of the project will reduce emissions by 85,860 t CO2e-. Considering the financing requested from the GCF, ie USD 8,680,000, the cost per tonne of CO2 is US $ 101.

Added to this, the benefits of adapting vulnerable populations to the adverse effects of climate change, improving incomes and valuing agricultural products, as well as reinforcing the capacities of actors to initiate activities with co-benefits adaptation / attenuation outside the project.

B.4. Engagement among the NDA, AE, and/or other relevant stakeholders in the country (max ½ page)
Please describe how engagement among the NDA, AE and/or other relevant stakeholders in the country has taken place and what further engagement will be undertaken as the concept is developed into a funding proposal.

The project was identified in agreement with the Direction of the Rural Engineering, the NDA, the BOAD (accredited entity) and all the actors involved in the agriculture in particular irrigated agriculture.

C. Indicative Financing/Cost Information (max. 3 pages)

C.1. Financing by components (max ½ page)
Please provide an estimate of the total cost per component/output and disaggregate by source of financing.

<table>
<thead>
<tr>
<th>Component/Output</th>
<th>Indicative cost (USD)</th>
<th>GCF financing</th>
<th>Co-financing</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Amount (USD)</td>
<td>Financial Instrument</td>
</tr>
<tr>
<td>Component 1: Strengthening technical capacities for promoting sustainable agriculture, sharing knowledge and disseminating lessons learned</td>
<td>1 000 000</td>
<td>1 000 000</td>
<td>Grant</td>
</tr>
<tr>
<td>Component 2: Comfort and development of irrigated perimeters with resilient and low-carbon techniques</td>
<td>5 400 000</td>
<td>5 400 000</td>
<td>Grant</td>
</tr>
<tr>
<td>Component 3: Support for the development of agricultural value chains</td>
<td>2 000 000</td>
<td>2 000 000</td>
<td>Grant</td>
</tr>
<tr>
<td>Project activities cost</td>
<td>8 400 000</td>
<td>8 400 000</td>
<td></td>
</tr>
<tr>
<td>Project management (8.5%)</td>
<td>680 000</td>
<td>680 000</td>
<td>Grant</td>
</tr>
<tr>
<td>Total project cost</td>
<td>8 680 000</td>
<td>7 748 000</td>
<td></td>
</tr>
</tbody>
</table>
Agriculture plays a leading role in Benin's economies. However, it remains highly exposed to climate disruption. The Government of Benin, despite its good will to contribute to the mitigation of climate change and to strengthen the resilience of the populations that has been translated into NAPA and the NDC, the country does not have sufficient resources to face the necessary investments. In addition, the local market remains tight and access to credit from private financial institutions remains very difficult when it comes to agricultural activities. The risk of a poor harvest with the advent of the changing climatic changes remains one of the main reasons. Without external mobilization, the vulnerability of small producers will grow as climate predictions predict that the coming years will record more extreme events of climate change. Hence the solicitation of resources from the GCF to finance the resilience activities of vulnerable smallholders to the adverse effects of climate change. Assuming that one of the GCF’s flagship objectives is to promote a paradigm shift towards low-emission and climate-resilient development, it is in a good position to provide essential support for the sound implementation on of projects in general, and more specifically this project, which aims to contribute to ensuring sustainable food security by strengthening the resilience capacities of agriculture, especially that of small producers to climate change in Benin, and the mitigation of greenhouse gas emissions. GHGs, through the promotion of innovative irrigation techniques. GCF funding will enable: (i) populations vulnerable to climate change to significantly improve their own resilience to the adverse effects of climate change; (ii) learn from the implementation of funded activities for replication of the project in other areas and regions of the country.

Describe alternative funding options for the same activities being proposed in the Concept Note, including an analysis of the barriers for the potential beneficiaries to access to finance and the constraints of public and private sources of funding.

The capital market in Benin for the development of agricultural projects is precarious and remains in an embryonic state. Access to finance is through loans with a high interest rate. Due to the unpredictability of the climate, financial institutions are reluctant to finance agricultural projects. Generally, access to loans is conditional on a financial contribution from the client that can reach 25 to 50%. Target populations are poor farmers who are vulnerable to climate change.

Justify the rationale and level of concessionality of the GCF financial instrument(s) as well as how this will be passed on to the end-users and beneficiaries. Justify why this is the minimum required to make the investment viable and most efficient considering the incremental cost or risk premium of the Project/Programme (refer to Decisions B.12/17; B.10/03; and B.09/04 for more details). The justification for grants and reimbursable grants is mandatory.

Benin is one of the Low Developed Countries (LDCs). The country is heavily indebted. These debts represent 53.6% of GDP in 2018. These debts have been restructured with the HIPC Initiative. This requires the country to receive authorizations from the International Monetary Fund (IMF) to incur new debts. But the IMF does not allow the country to take high-rate loans even if they are concessional. The IMF prefers grants for the country. This limits Benin in its development and particularly in its initiatives to fight against climate change. With regard to climate-related projects, and given the urgency of the needs on the ground, traditional donors in Benin are trying to find donations to finance these projects or, at least, to improve the loans they give to the country. The request for a grant to the GCF to finance this project is a must necessity if the country wants to carry out the project.

For private sector proposal, provide an overview (diagram) of the proposed financing structure

C.2. Justification of GCF funding request (max. 1 page)

C.3. Sustainability and replicability of the project (exit strategy) (max. 1 page)
campaign per year, and especially the promotion and valorization of products through a value chain approach, producers can pragmatically draw added value from the project. The results achieved will be sustained over time and will achieve a high level of replicability of activities through: (i) effective partnership with local public institutions, organized rural civil society (FOs, etc.) and the private sector in the design and implementation of the activities, ii) the assurance of the economic and financial profitability of the equipment put in place through the sub-projects financed. However, farmer groups will be sensitized and trained on the environmental, economic and financial management of sub-projects to ensure performance in achieving the expected results and sustainability of the project as a whole. The ultimate goal of the actions of this project is to transform producers into autonomous agricultural entrepreneurs. As a result, awareness and training campaigns will be conducted by NGOs and other local environmental groups. NGOs and associations active in agricultural promotion, with expertise in the field of environment and entrepreneurship will be retained to perform these services. Training and awareness topics will focus on: (i) environmental and social issues related to the development of small-scale irrigation; (ii) environmental management and good agricultural practices; (iii) the management and organization of a farm. The project will also train the selected producers in management (business plan and technical and economic monitoring) and banking (blocked savings account, financial education) to ensure the sustainability of investments. All these actions will be executed in a way that respects GCF principles.

For non-grant instruments, explain how the capital invested will be repaid and over what duration of time.

D. Supporting documents submitted (OPTIONAL)

☐ Map indicating the location of the project/programme
☐ Diagram of the theory of change
☐ Economic and financial model with key assumptions and potential stressed scenarios
☐ Pre-feasibility study
☐ Evaluation report of previous project
☐ Results of environmental and social risk screening

Self-awareness check boxes

Are you aware that the full Funding Proposal and Annexes will require these documents? Yes ☒ No ☐

• Feasibility Study
• Environmental and social impact assessment or environmental and social management framework
• Stakeholder consultations at national and project level implementation including with indigenous people if relevant
• Gender assessment and action plan
• Operations and maintenance plan if relevant
• Loan or grant operation manual as appropriate
• Co-financing commitment letters

Are you aware that a funding proposal from an accredited entity without a signed AMA will be reviewed but not sent to the Board for consideration? Yes ☒ No ☐