REPUBLIC OF EQUATORIAL GUINEA

AFRICAN DEVELOPMENT BANK GROUP

General Information

Project Name	:	**SUPPORT PROJECT FOR THE DEVELOPMENT OF VALUE CHAINS IN THE FISHERIES AND AQUACULTURE SECTOR (PASPA)**
Project Reference Number	:	P-GQ-AAF-004
Country	:	Republic of Equatorial Guinea

Directorate General - Central Africa Region (RDGC) Division : RDGC2

SUMMARY

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

MAY 2019

1. CONTEXT AND OBJECTIVES OF THE STUDY

In a bid to reduce its dependence on the oil sector, the Government of Equatorial Guinea has opted to diversify the sources of its economic growth. Its goal is to develop the fisheries sector to encourage self-sufficiency on the domestic market and transform the country into a leading supplier of fishery products in the sub-region.

In Equatorial Guinea, the fisheries sector has a significant margin for progress and development to drive the structural transformation of the national economy and contribute to the improvement of food and nutritional security, wealth and job creation, etc. The fisheries and aquaculture resource potential in both fresh and marine waters is considerable. Equatorial Guinea has an Exclusive Economic Zone of 314,000 km^2, 644 km of coastline as well as many bays, rivers and mangroves. Annual exploitable resources are estimated at approximately 74,000 tonnes of fish and 600 tonnes of shellfish, while annual output, estimated at about 5,000 tonnes, is insufficient to meet the country's consumption needs. Hence, national fish imports are significant.

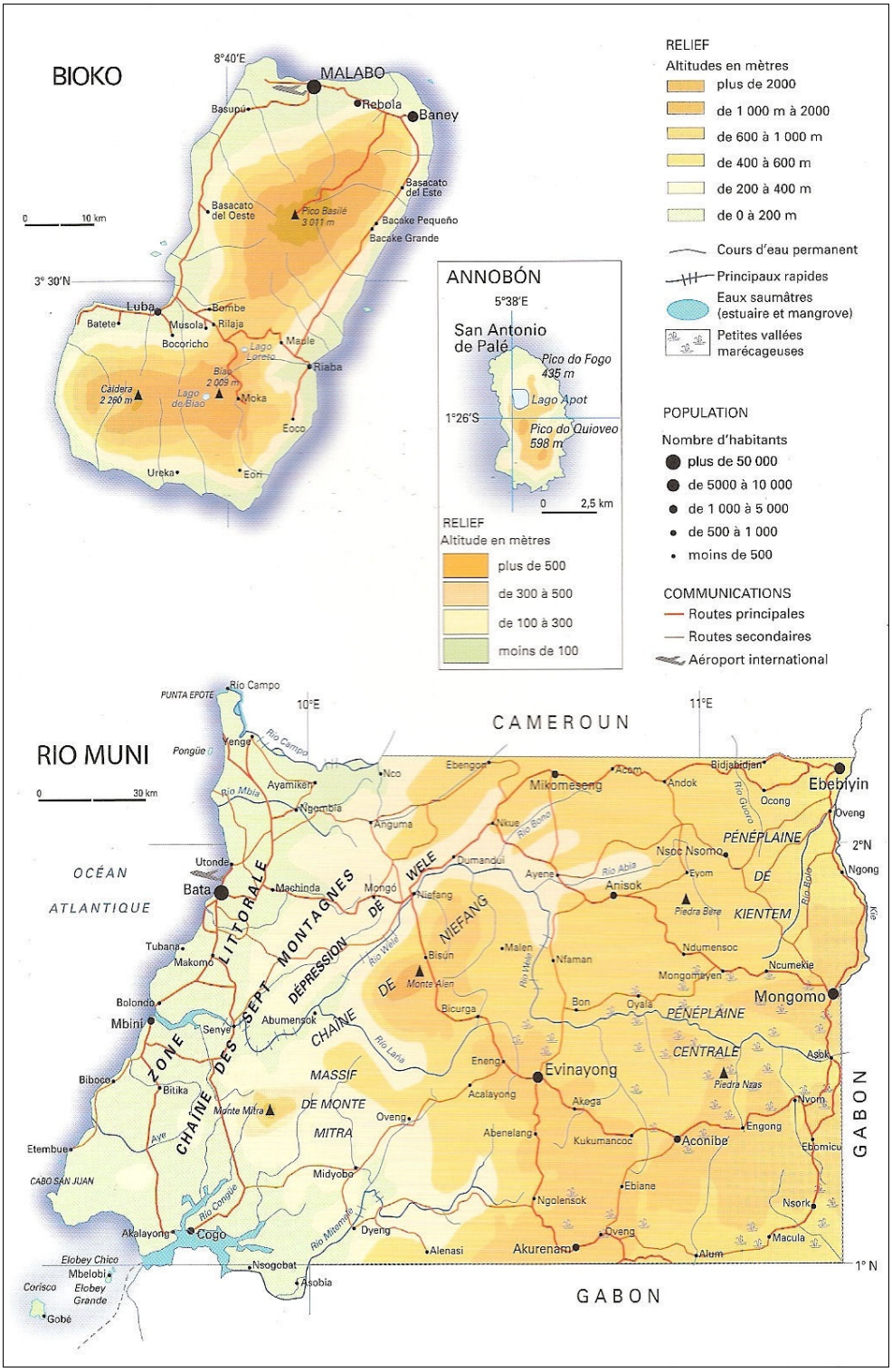
Accordingly, the Bank is providing support to Equatorial Guinea in the implementation of the Support Project for the Development of Value Chains in the Fisheries and Aquaculture Sector (PASPA).

This inclusive project will therefore generate considerable positive outputs and impact. However, some of the activities planned under the project, such as the construction or rehabilitation of certain infrastructure, the development of aquaculture basins and the drilling of boreholes (depending on their magnitude and the location of the host environment) are likely to have negative impacts on the biophysical and human environments if preventive or mitigation measures are not taken.

There will be no risk of community displacement or resettlement, nor any loss of major assets during project implementation. The project is classified in Category 2. It is subject to an Environmental and Social Assessment (ESA), accompanied by an Environmental and Social Management Plan (ESMP), prepared in accordance with Equatorial Guinea's environmental and social requirements (*Ley Reguladora del Medio Ambiente de Guinea Ecuatorial No. 07/2003*) and with the Bank's policies, procedures and safeguard requirements under the Integrated Safeguards System (ISS) and the Operational Safeguards (OS).

The ESMP identified, analysed and assessed the potential significant environmental and social effects and impacts of project activities. It then recommended the mitigation, improvement, safety, follow-up and environmental monitoring measures to be implemented. It also determined the costs associated with these various measures.

Map No. 1: Eco-geographical and Socio-economic Characteristics of Equatorial Guinea



2. PROJECT DESCRIPTION

The overall objective of the project is to contribute to promoting value chains in the fisheries and aquaculture sector and improve the living conditions of the population. Specifically, it aims to increase fish production through sustainable management of small-scale fisheries, aquaculture and industrial fishing.

With regard to beneficiaries, the project aims to directly support micro, small and medium-sized enterprises (MSMEs) and cooperatives/groups, and to provide targeted support to young people and women (students in vocational schools and universities, budding or experienced female and male entrepreneurs operating in the fisheries and aquaculture sector either informally or formally). In total, more than 20,000 direct and indirect jobs will be created, 45% of which will be for young people and 50% for women.

PASPA will provide institutional support to several sector ministries (Fisheries, SMEs, Labour/Employment/Social Protection, Environment, etc.), the private sector (employers' organizations, chambers of commerce), vocational training institutions and NGOs by giving guidance to direct beneficiaries in order to ensure the sustainability of project achievements, etc.

The estimated total cost of the project is UA 56.625 million, or about CFAF 45.896 billion. The following table presents the project components, sub-components and activities.

Table 1: Project Components and Sub-Components

Components	Description
Component A: **Improving access to fishing, aquaculture and drinking water supply infrastructure**	A1 - Support for industrial fishing: Rehabilitation of two (2) cold-storage rooms and a fish market; procurement of a fishing vessel to be managed under a PPP; rehabilitation of the wharf and cold-storage facilities (cold-storage room, ice-making plant); etc. A2 - Support for small-scale fishing: Construction and equipment of two fishing gear procurement centres; construction and equipment of two (2) fish conservation, processing (smoking) and marketing units; support for stakeholders in accessing credit; rehabilitation of three (3) wharves and a fish market; construction of two (2) fish analysis laboratories A3 - Support for aquaculture: Rehabilitation of three fish farms to be used as incubators; development of three aquaculture sites under a PPP management contract A4 - Drinking water supply and sanitation: Drilling of 50 boreholes and construction of 100 latrines.
Component B: **Capacity-building for stakeholders in the fisheries and aquaculture sector**	B1 - Entrepreneurship promotion: Creation of 500 SMEs and 200 viable and competitive cooperatives/groups in the fisheries and aquaculture value chains; creation of 15,000 jobs, including 45% for young people and 50% for women; signature of 15 fisheries and aquaculture infrastructure PPP management contracts. B2 - Training, awareness: Training for young people in the fishing professions and business management (CLE and the ILO training programmes GYB, SYB and SIYB); development of two training modules in the fisheries sector for the University and the Vocational Training Centre; award of 40 higher education scholarships; training of 20 university teachers in the fisheries sectors and value chains; training of 500 executives from the relevant ministries (Fisheries/hydraulics, Finance, Labour/Employment, Environment, SMEs) and partner structures (employers, chambers of commerce, NGOs, INCOMA) in sector surveys, fishing techniques, company/cooperative management programmes (STED, COOP, SIYB etc.); organization of awareness and information sessions for 300 people on AIDS, malnutrition and waterborne diseases; development of a mechanism to anticipate skills and job needs; training of 500 cooperatives/groups of women and young people, SMEs, traders trained in fishing techniques (conservation, smoking, salting, processing of fishery products, bundling, etc.) while respecting health, hygiene and waste management standards; conduct of a food

Components	Description
	consumption survey B3 - Organizational development: Organization/structuring of artisanal fishermen into groups/cooperatives; establishment and strengthening of 500 additional groups/cooperatives/young promoters in business management (TREE, COOP, SIYB, GYB, CLE and SYB methodologies) B4 - Support for the decision-making process: Development of a harmonized/integrated information system for fisheries statistics; provision of technical assistance (TA) to implement the project.
Component C: **Project management and coordination**	Coordination of project activities; administrative, accounting and financial management; procurement of goods, works and services; implementation of a communication plan; monitoring and evaluation of project implementation, etc.

PASPA will be implemented under the responsibility of the Ministry of Fisheries and Water Resources. Its implementation mechanism will include a Project Implementation Unit (PIU) composed of a National Coordination unit in Malabo and a regional office on the mainland (Bata), housed at the Regional Fisheries Delegation office. Activities will be executed by service providers, who will be recruited on a competitive basis. The regional departments of the ministries concerned (Trade and SMEs, Social Affairs and Gender Equality, Environment, etc.) will be closely involved in monitoring and the acceptance of project deliverables.

3. STRATEGIC, LEGAL AND INSTITUTIONAL FRAMEWORK APPLICABLE TO THE PROJECT

The "*Antorcha Guinea"* or "Dynamic Prosperity" model reflects Equatorial Guinea's 2020 vision as an emerging country and a model for successful transition from an oil economy to a diversified economy. To achieve this vision, Equatorial Guinea has developed and implemented the PNDES (National Economic and Social Development Plan) termed "*Equatorial Guinea Horizonte 2020*". Fisheries and employment are priority focus areas of the PNDES.

The "*Guinea Ecuatorial Modelo Ecológico*" programme under PNDES 2020 also aims to promote actions that guarantee the protection of the environment and the preservation of natural resources.

In the field of the environment and natural resource management, Equatorial Guinea has developed various strategies and policies primarily aimed at ensuring the rational and sustainable management of the its land and natural resources; with the goal of organizing, regulating and managing their use.

The main documents relevant to the project are:

- the **National Environmental Management Plan (*Plan Nacional del Manejo de Medio Ambiente - PNMMA***), updated by the Environment and Development Report, presented by the government at the Johannesburg Summit (South Africa, September 2002);

- the **Forest and Sustainable Biodiversity Management Policy**, which recognizes two types of forest - namely production forests and protected forests - and creates the National System of Protected Areas (SNAP) of Equatorial Guinea;

- the **National Climate Change Adaptation Plan (PANA)**, which has identified various adaptation and mitigation measures to combat climate change in Equatorial Guinea;

- the **National Strategy and Action Plan for Biodiversity Conservation (*Estrategia nacional y plan de acción para la conservación de la diversidad biológica - ENPADIB*)**, which outlines Equatorial Guinea's vision, mission, principles, national and specific objectives aimed to conserve its biodiversity, as well as indicators to monitor implementation of the strategy;

- the **National Action Plan for the Coastal and Marine Ecosystems of Equatorial Guinea**, which calls for various actions and measures to ensure the sustainable management of these ecosystems; and

- the **National Hydrological Plan,** which aims to provide access to drinking water for at least 90% of the population, etc.

Regarding the regulatory and institutional framework, the 2012 Constitution reaffirms the country's commitment to the preservation of biodiversity and its environment. Law No. 7/2003 of 27 November 2003 on environmental regulation establishes the legal framework for environmental management in Equatorial Guinea and regulates the basic standards for the preservation and protection of natural environments, including, *inter alia*, the quality of their components (air, water, soil, etc.). This law also led to the creation of the National Institute for the Environment and Nature Preservation (*Instituto Nacional de Conservacion del Medio Ambiente* INCOMA).

Hence, INCOMA is tasked with promoting government policy in the field of environmental management (Article 156). However, Law No. 7/2003 of 27 November 2003 on environmental regulation does not yet have any implementing decrees and orders specifically codifying and establishing the benchmarks, content, methodology and administrative procedures for environmental and social assessments (ESIAs) in Equatorial Guinea. The guidelines setting out the methods and procedures for preparing ESIAs have not yet been formulated.

In relation to the targeted sector, Law No. 3/2007 of 23 July 2007 regulating the waters and coastlines of the Republic of Equatorial Guinea is the core instrument governing the management of inland surface water resources, rivers, ponds, lakes, groundwater, as well as the sea and its shores, etc. Law No. 10/2003 of 17 November 2003 regulating fishing activities and Decree No. 130/2004 of 14 September 2004 implementing the law regulating fishing govern the management of fishery resources in Equatorial Guinea's marine and inland waters.

In connection with the project, the following instruments should also be taken into account: Law No. 4/2009 of 18 May 2009 on land tenure; Law No. 10/2012 of 24 December 2012 and Decree No. 121/2011 of 5 September 2011 on the general organization of work; Forestry Law No. 1/1997 of 18 February 1997 on the use and management of forests; Law No. 8/1988 of 31 December 1988; and Law No. 4/2000 of 22 May 2000 regulating wildlife, hunting and protected areas; etc.

Equatorial Guinea has ratified most of the international conventions on the environment and natural resource management. At the regional level, Equatorial Guinea is a member of COMIFAC (Central African Forests Commission), RAPAC (Central African Protected Areas Network), etc.

The African Development Bank, which is a partner of the country, has also developed an Integrated Safeguard System (ISS) as its strategy for promoting socially inclusive and environmentally sustainable growth. The ISS comprises five (05) Operational Safeguards (OSs): *(i) OS1- Environmental and Social Assessment; (ii) OS2- Involuntary resettlement, land acquisition, population displacement and compensation; (iii) OS3- Biodiversity and ecosystem services; (iv) OS4 - Pollution prevention and control, hazardous materials and resource efficiency; (v) OS5- Labour conditions, health and safety.* In this context, OSs 1, 3 and 5 are applicable to the project.

4. DESCRIPTION OF THE PROJECT ENVIRONMENT

The development of fishing, which is the objective of the project, will have effects and impacts on a much larger geographical area, the marine environment as well as river and marine ecosystems. Therefore, in addition to the targeted areas and sites, project activities will impact the entire country, extending possibly to the Gulf of Guinea.

Located in the central-western part of the African continent, within the Gulf of Guinea, Equatorial Guinea has a surface area of 28,051 km², and consists of an island part comprising two islands (Annobon and Bioko), and a mainland part known as Rio Muni, which borders Cameroon in the north, and Gabon in the south and east.

Map No. 2: Location of Equatorial Guinea

Eco-geographic and Biophysical Characteristics

Equatorial Guinea belongs to the Guinea Current Large Marine Ecosystem (GCLME). The Gulf of Guinea region abounds with fish resources and has high productivity areas. However, its marine biodiversity is deteriorating due to various factors, namely: deforestation, overexploitation of resources, climate change, various types of pollution, urbanization and uncontrolled occupancy of coastal and maritime areas, etc.

With regard to the direct project area, the two eco-zones of Equatorial Guinea, comprising a mainland part and an island part, have specific biophysical characteristics (climatic, geological, geomorphological, floral, etc.). The mainland has metamorphic and granitic rocks; undeveloped coastal sands, podzolic soils and allomorphic mangrove soils, etc. along the coastline; and lateritic soils on sedimentary rocks). The island part has humic (dark-brown) andosols and Precambrian basalt conglomerates.

Equatorial Guinea has a bimodal equatorial climate, with two short dry seasons between two rainy seasons. Rainfall varies from 3,500 mm on the mainland to less than 2,000 mm on the peneplains. Bioko Island has one of the highest rainfall rates in Africa, with more than 10,000 mm per year. Average temperature ranges from 23 to 25°C on the island part of the country and from 28 to 31°C on the mainland part.

Renewable water resources are estimated at 26 km^3, including 25 km^3 for surface water and 10 km^3 for groundwater. The groundwater tables lie at a depth of 100 to 150 metres below the Earth's surface.

In terms of mining resources, Equatorial Guinea has crude oil and natural gas deposits off the coast and in the sedimentary basin. Alluvial gold is mined by hand and the country also has traces of uranium, manganese, titanium, etc.

Equatorial Guinea has about 1,626 million ha of dense tropical rainforest, representing 58.0% of the total national surface area (FAO, 2010). The mainland region is covered by the Congo Basin forest, which has a surface area that exceeds 2 million km^2 and spreads across six countries.

Surveys have shown that Equatorial Guinea's forests have a very rich biodiversity, with at least 3250 vascular plant species, 2% of which are endemic, and 694 species of amphibians, birds, mammals and reptiles. The country's national system of protected areas comprises 13 protected areas covering a total of 590,955 hectares, or 21% of the national territory.

With regard to climate change, trends show a 0.6°C rise in temperature since 1960, and an overall 2.1% decrease in rainfall. Many models estimate that sea levels would rise by 0.13 to 0.56 metres relative to the 1980-1999 level. Impacts on the fisheries sector will include: changes in salinity and the attendant negative effects on spawning grounds, coastal erosion, changes in the coastal environment, torrential rains that will limit fishermen's mobility, species migration, reduced catches, loss of certain species, loss of livelihoods and reduced food security, etc.

GHG emissions are estimated at 31,313 kt of CO_2 equivalent (World Bank, 2012b). Deforestation and forest degradation are estimated to account for the emission of 65 million and 128 million tonnes of CO_2 per year respectively (R-PIN 2008). Despite considerable efforts made to generalize the use of butane gas, a significant proportion of the energy sources

used for cooking is firewood in rural areas and charcoal in the cities. However, the carbon stock estimate in Equatorial Guinea's forests is 203 million tonnes in living biomass (FAO, 2010).

Socio-economic Characteristics

Equatorial Guinea's population is estimated at 1,225,377 inhabitants, distributed among 262,157 households, with a slight predominance of women who represent 53% of the total. Population density is about 45 inhabitants/km², and 70% of the inhabitants live in urban areas. About 72% of the population lives on the mainland predominantly in the coastal area, while 88% of the island region's inhabitants live in the province of Bioko Norte, mainly in the capital, Malabo. Foreigners account for 17.15% of the total population, with 77% of them being male.

The literacy rate is 98.26% (2015). However, almost a third of the students enrolled in secondary school do not complete the cycle (i.e., 34% for boys and 30% for girls). Life expectancy at birth varies by gender - about 54.6% for women, compared to 51.7% for men.[1] In 2015, 65% of the population could not meet their daily food and nutritional needs according to FAO/WHO standards. About 47.9% of the total population has access to a potable water source; of this number, 72.5% live in urban areas and only 31.5% in rural areas. Fewer than one in five households (18%) use improved pit latrines. Malaria, acute respiratory infections and diarrhoeal diseases account for more than half of all consultations.

Considering that its net enrolment ratio for girls is almost at parity, Equatorial Guinea has a good record in terms of gender equality in the education sector. However, there are still disparities relating to place of residence, with only 40% of girls in rural areas completing primary school compared to 56% in urban areas. Despite progress in education and health, gender-based violence persists, and gender inequality[2] is evident in politics and land tenure. Only 12% of women own land compared to 88% of men. The current legislature has 20 women (20%). A Ministry of Social Affairs and Gender Equality has been established. In the current government team (Decree No. 16/2018 of 6 February 2018), there are only two full-fledged Ministers, two Deputy Ministers, two Vice-Ministers and four Secretaries of State who are women.

Equatorial Guinea has significant natural resources and an extensive network of infrastructure and facilities (roads, ports, wharves, airports, etc.). Its quasi-permanent hydrographic network is conducive to the development of fishing and aquaculture. Furthermore, the country's equatorial climate and extensive land surface area endow it with significant aquaculture potential. Given this potential, Equatorial Guinea could easily feature among leading fishing nations in Africa. Its main large species are grouper, mullet, tuna, sardine, barracuda, etc.

Main Environmental and Social Challenges of the Project

These challenges relate to the preservation of ecosystems and the sustainable management of resources and potential in a context where the fishing sector, which has become the focus of attention, is undergoing major changes at the regional and global levels.
Marine and coastal ecosystems play a crucial role in the provision of goods and services, as well as the development of activities that can have significant socio-economic effects and impact on the development of countries. Seas, oceans and coastal ecosystems also contribute

[1] *Informe de Desarrollo Humano 2014, UNDP*
[2] Source: Nations Unies, Commission économique pour l'Afrique, Profil pays Guinée Equatoriale, 2016

to climate regulation via the production of oxygen and the absorption of significant amounts of carbon dioxide. They are a significant source of food and nutrition for communities and are crucial for various other socio-economic activities (transportation, tourism, recreation, etc.). However, they are subjected to a range of pressures such as increased coastal erosion, degradation of natural habitats, loss of coral reefs and mangroves, extinction of certain species, etc.

In addition, over the past 30 years, aquaculture has become the fastest-growing food industry in the world. According to the FAO, its contribution to total global seafood production is estimated at 42%. By 2030, aquaculture contribution to global output is expected to reach 110 million tonnes/year. However, Africa's contribution is only 2.2% and that of sub-Saharan Africa is less than 0.7% of world production.

5. STAKEHOLDER CONSULTATIONS

During the project development and ESMP design process, discussions and focus group consultations were organized through a participatory approach, targeting administrative authorities, technical service managers, fishermen's organizations, women involved in fish processing and the affected communities, in order to: (i) inform and share views with key stakeholders about the project; (ii) collect information on site characteristics and the potential impacts of planned activities; (iii) collect any opinions, views, expectations and concerns, suggestions and recommendations on the project.

According to the results of these consultations, all the stakeholders interviewed acknowledge the relevance of the project and consider that it will have significant positive impacts in terms of the opportunity to diversify activities, improve incomes, create jobs, reduce poverty and unemployment, reduce youth outmigration, etc. According to the women who process fish products, the project can potentially improve working conditions and increase their income.

Fisheries services perceive the project as an opportunity to improve fisheries management and monitoring conditions. Discussion with the structures in charge of environmental and social issues focused on the regulatory framework and procedures applicable to the project, the assessment of ESMP implementation, environmental and social assessment capacity, the future monitoring mechanism, etc.

The risks expressed by the stakeholders concern the weakness of monitoring resources, the risk of increased pressure on resources, the decline in income due to an increase in the number of fishermen and those involved fish processing, the marginalization of certain groups, etc.

The main recommendations concern the organization of sector stakeholders, the implementation of capacity-building measures for the various stakeholders, credit lines, support for the processing and marketing of products, information and awareness-raising for the various stakeholders, etc.

As regards aquaculture, boreholes and latrines, there was great appreciation of the planned activities and their impact on the population. The recommendations generally concern the consensual selection of sites, the application of best practices during implementation, the establishment of consultation frameworks to optimize management, etc.

6. KEY ENVIRONMENTAL AND SOCIAL IMPACTS AND IDENTIFIED RISKS

The potential impacts of the programme were evaluated by cross-referencing certain project activities (sources of impact) with the environmental and social components of the host environments.

Positive Impacts of the Project

PASPA will generate considerable positive effects and impact at the national, regional and local levels. It will contribute to diversification of the national economy's sources of growth, improve food and nutritional security, create wealth and jobs, reduce poverty, improve living conditions and quality of life (boreholes and latrines), reduce unemployment and youth outmigration, etc. New courses will be opened in training centres for young people and for women who are heavily involved in processing, sale, distribution and marketing activities.

The project's capacity-building programme will make it possible to curb the adoption of certain fishing practices (over-harvesting, use of unauthorized mesh nets and prohibited products, etc.).

Impacts on Climate Change

The activities planned under the project do not pose a significant climate risk. Most of them are part of Equatorial Guinea's PANA, and will help to build the resilience of ecosystems and communities to climate change through better fisheries management, the application of best practices, the development of traditional/artisanal fisheries and aquaculture as a form of adaptation, etc. These activities also help to improve rural livelihoods, create income-generating opportunities, contribute to greater social equity, and reduce pressure on natural resources, etc.

Potential Negative Impacts of the Project

Some activities in Component A are likely to have significant negative impacts and effects on the biophysical and human environments, particularly those related to: improving access to fishing infrastructure; aquaculture development; drinking water supply and latrine installation. However, the aquaculture support component, in particular, is likely to have the most significant negative impacts.

Boreholes, latrines and fish farms will be constructed in rural areas which, according to the survey, are very sparsely populated but still have significant natural resources that are relatively well preserved. Rehabilitation/construction of infrastructure (wharves, markets, cold-storage rooms, etc.) will be carried out in settled, mainly urban, areas. The potential sites do not present any major risks, as they are relatively unoccupied.

However, PASPA targets the fishing sector, which has become a major political, environmental and social challenge. This sector has become highly sensitive because any action taken in a given area will have global effects and impacts that will be felt beyond that area.

In aquaculture, the main risk to be considered relates to site selection and the disposal of wastewater (effluent). Effluent generally contains the residue of therapeutic products, uningested food, metabolic excretions, faeces, dead fish, etc. Another risk to be considered is

that biological interaction resulting from the accidental escape of farmed fish or the introduction of alien species into the ecosystem can also lead to changes in the genetic characteristics of wild populations and the transmission of pathogens or parasites.

During the construction phase, the impacts common to all these project structures (fish farms, latrines, boreholes, socio-economic facilities, etc.) are inherent in the risks of social and land conflicts arising from site selection, works-related air and noise pollution and destruction of the plant cover to clear the sites, in rural areas. The increase in pirogue traffic following the construction of the wharves will also leave an impact (noise/vibration, product spills, etc.).

7. MEASURES TO OPTIMIZE AND ENHANCE POSITIVE IMPACTS AND ADDITIONAL INITIATIVES

Various support and improvement measures are already provided for by the PASPA (governance improvement programme, technical capacity-building, monitoring, surveillance and control of fisheries, improvement of value chains, support for the promotion of income-generating activities, etc.). In terms of communication and rural information activities, the project will finance IEC campaigns on best fishing and aquaculture practices, the operation and maintenance of structures, the organization and training of village groups where water points are located, training for the maintenance of boreholes and latrines, etc. For the health and nutrition sector, community-based nutrition education will also be provided on good dietary practices and the consumption of fish for its mineral and protein content. Two (2) studies on the Gender Development Strategy and improving women's and youth access to rural finance have also been included.

The decentralized technical services of the Ministry of Livestock and Fishery Resources (MPRH) in Bata, with those of INCOMA will be supported with office equipment, IT and vehicles in order to improve their capacity for intervention and monitoring in the field.

8. MEASURES TO MITIGATE NEGATIVE IMPACTS

The measures mainly focus on the impacts of aquaculture, rehabilitation and construction activities.

The following table presents the mitigation and optimization measures related to aquaculture farms

Table 2: Measures to Optimize and Mitigate the Negative Impacts of Aquaculture Farms

Components	Risks/effects and impact	Mitigation measures
Meteorological	The quantity and quality of water are of vital importance to aquaculture. A sharp drop in atmospheric pressure can lead to a decrease in the dissolved oxygen available in water; Heavy rains can cause flooding, erosion, etc., and affect water bodies and quality; Excessive heat can cause the water temperature to rise, thereby reducing dissolved oxygen.	Choose the right locations, select an ideal site to minimize possible effects related to climate risks. Establish facilities in areas with optimal depth and flow to facilitate the dispersion and absorption of organic matter from the fishpond.
Discharge	Discharge from an aquaculture facility is characterized by its chemical components as well as some organic components in the form of suspended solids. It comprises wastewater, nitrogen, phosphorus, dissolved oxygen, suspended solids, etc.	Analyse the different methods of capture and discharge, and use the method that will have a lower impact on the environment; Regularly clean the ponds; Avoid the use of antibiotics for prophylaxis and encourage the exploration of alternative measures; Control turbidity and light conditions in water; Control dosages and effects of the products used; Establish an adequate system for the management of effluent and other wastes (settling, etc.); Refrain from disposing of discharge in an aquatic environment or sensitive ecosystem; Avoid proximity to protected areas, sensitive ecosystems and residential areas (establish a minimum radius to reduce risks); Properly remove and dispose of dead organisms.
Biodiversity	The escape of farmed fish can have negative effects on surrounding biodiversity (habitat invasion, competition for food, predation on wild individuals and native species, transmission of pathogens and risk of genetic modification). A malfunction in the systems can lead to changes in the water flow rate; accumulation of organic sludge, eutrophication, etc.)	Act with caution, given the lack of available information on the effects of aquaculture farm waste on the host environment; Apply best practices and properly size structures to avoid disrupting or degrading water quality, causing hydrological changes, or disturbing the dynamics and natural evolution of the host system; Promote herbivorous species (tilapia, carp, etc.); Encourage the use of biological systems that absorb organic matter; Reduce biological interactions, by minimizing the possibility of escape, introduction of exotic species, etc.; Properly maintain the facilities, implement control measures and keep the facilities in good sanitary condition to prevent the transmission of diseases to the environment.

Components	Risks/effects and impact	Mitigation measures
		The use of pellets that have a lower environmental impact is highly recommended. Organic matter from aquaculture farms must be assimilated by the host environment without any negative impact on ecosystems. Apply biosecurity measures to limit the introduction of pathogens into farms.
Communities	Risk of restricted access to certain water bodies; Risk of communities losing interest in traditional fishing activities; Frustration if positive effects of the project are not felt at the local level (jobs, fish supply, etc.); Deterioration in quality of life; Various types of pollution.	Select site by consensus; Support the development of traditional and artisanal fisheries; Favour local workers in recruitment; Apply best practices; Adopt a waste and discharge management plan; Select site in consultation with all stakeholders; Comply with BD clauses and safety measures.

The following table presents the mitigation measures for boreholes.

Table 3: Mitigation Measures for Boreholes

Specific activities	Potential impacts	Measures to mitigate negative impacts
Works phase	• Noise, pollution by construction site waste, health and safety problems (accidents)	Select site by consensus; Comply with BD clauses and safety measures.
Operation phase	• Depletion of the water table • Risks of conflict in the management of structures and marginalization of certain groups	Consider the potential of the water table and assess its capacity to sustain demand; Establish frameworks for consultation with users; Build capacity; Raise awareness.

The following table presents the mitigation measures for socio-economic infrastructure (wharves, market, cold storage, etc.).

Table 4 Mitigation Measures for Infrastructure

Potential negative impacts	Mitigation measures
Works phase	
Dust, noise, pollution from construction site waste, health and safety issues resulting from the works Risk of accidents	Comply with the BD clauses; Enforce safety measures, protective equipment; Establish a waste collection and disposal system.
Operation phase	

Potential negative impacts	Mitigation measures
Poor management of structures (deterioration, waste proliferation; etc.)	Set up a mechanism to ensure sustainability (generating own resources); Ensure sound management; Apply the rules of good governance; Raise users' awareness of hygiene measures; Establish an operational waste collection and management system.
Risk of marginalization of certain groups	Organize an information and awareness-raising campaign.

The following table presents a breakdown of the project's main mitigation measures.

Table 5: Breakdown of Main Mitigation Measures

Phases	Negative impacts	Mitigation measures	Breakdown details
Right-of-way clearance and works	Clearing of the vegetation cover	• Engage in rigorous site selection; • Carry out compensatory reforestation.	• ESMP
		• Take action to control erosion, where appropriate.	• BD
	Air pollution Noise pollution, dust Risk of accident during the works	• Protect workers (PPE); • Put up signage on worksites (signs, reflective strips, etc.); • Design and make available a health and safety manual for the site; • Apply best practices and comply with environmental and social clauses.	• BD
	Waste generation	• Collect and properly treat liquid, solid and excavated waste; • Dispose of waste in authorized locations; • Apply best practices.	• BD
Operation	Pressure on natural resources and risk of conflicts between users	Establish operational consultation frameworks / Involve the various stakeholders and local authorities. Apply best practices. Implement an information and awareness programme.	Project Implementation Unit (PIU) State

9. INSTITUTIONAL ARRANGEMENTS AND CAPACITY-BUILDING REQUIREMENTS

Institutional Arrangements to Implement the ESMP

Various stakeholders will be involved in implementing the environmental and social measures of PASPA. The main ones are: the Project Steering Committee (PSC), in which the General Directorate for the Environment (*Instituto Nacional de Conservacion del Medio Ambiente* (INCOMA) will be integrated; the Environmental Monitoring Committee (EMC) which is an offshoot of the PSC, the Project Implementation Unit (PIU), which will recruit a part-time Environmental and Social Impact Assessment (ESIA) Expert tasked with coordinating the implementation and monitoring of environmental and social aspects and serving as the interface with the other stakeholders.

Other structures and organizations will also be involved in ESMP implementation, namely: the administrative authorities of the targeted entities, the communities concerned, NGOs, etc.

Once the sites have been clearly determined and the project design is validated, more detailed environmental impact studies (site ESMP) must be carried out for certain activities, especially aquaculture, in order to assess all the effects and impacts of the activity on the environment.

The table below summarizes the actions and activities to be considered during project implementation.

Table 6: Integration of the environment during project implementation

Phases	**Phases**	**Environmental actions to be undertaken**
1. Studies and preparation	Feasibility studies	- Prepare and validate the TORs for any environmental assessments to be carried out.
		- Validate environmental and social assessments.
	Detailed project Preparation of bid and execution documents	- Review environmental and social assessments/include environmental and social requirements into bidding documents as well as works and control contracts; - Review institutional arrangements to implement environmental and social requirements.
3. Calls for bids	Bid analysis and award of contracts	- Include a sufficiently weighted environmental rating criterion in the bid analysis and evaluation grid.
4. Execution	Project launch (start)	- Hold a kick-off meeting to inform and raise awareness among all institutional stakeholders, including the population, on project activities, duration and programming of works, potential impacts, recommended measures and their respective roles and responsibilities during the implementation process.
	Works	- Monitor and control compliance with environmental requirements and commitments and the effectiveness of protection measures; - Include an environmentalist or a health and safety manager in the control teams and within the company, where appropriate; - Ensure that environmental and social actions that cannot be carried out by construction companies are entrusted or subcontracted to more specialized entities (e.g., tree planting, awareness-raising on STI/HIV/AIDS); - Seek remedies for unforeseen negative effects; - Evaluate the treatment of expected and unexpected impacts.
5. Completion of the project		- Ensure that the environmental acceptance report is an integral part of the interim or final acceptance process; - Prepare a retrospective environmental assessment report.
6. Operation phase		- Monitor environmental and social measures.

Environmental and Social Assessment Capacity-Building Programme

The consultants found that INCOMA, which is responsible for promoting the environmental policy, does not have the adequate technical and logistical capacity to perform its mission effectively. The institute has little experience in environmental and social safeguards. Its staff profiles are not very diversified. Many sectors and fields of expertise such as forestry, ecology, agronomy, environmental and social assessments, law, sociology, demography, etc., are not yet covered. The service has very few, if any, instruments for measuring or collecting data and indicators on components of the various environments.

Other structures and stakeholders responsible for implementing natural resource management, particularly at the decentralized level, do not also have proven expertise in their field, nor the means and resources to perform their mission successfully. Regulations and missions pertaining to the environment and natural resource management are disparate, relatively

unknown by the structures responsible for implementing them, or not applicable due to the lack of laws and implementing decrees, etc.

The various meetings revealed the urgent need to design and implement a programme to strengthen institutional, technical, logistical and other capacities in the field of environmental and social safeguards and natural resource management.

The following table provides an outline of the environmental and social assessment training programme, which will be further developed during implementation.

Table 7: Capacity-building Measures

Stakeholders involved	Training topics	Expected results
Technical services, Programme Management Unit, Communities, NGOs; Consultants, etc.	• Screening procedure for sub-projects • Development of a guide for the environmental and social management of sub-projects • Environmental assessment, monitoring and surveillance. • AfDB Procedures	• Monitor and supervise the implementation of the ESMP and other environmental measures that may arise during implementation

Environmental and Social Monitoring Indicators and System

The following tables presents a system for monitoring measures.

Table 8 Monitoring System for Environmental and Social Components

Monitoring elements and indicators	Monitoring methods and systems	Responsible entity	Frequency
Water - Pollution - Eutrophication - Sedimentation - Hydrological regime	- Groundwater and surface water monitoring; - Monitoring of activities which use surface water; - Visual assessment of watercourse flow; - Turbidity control of watercourses and water bodies; - Control of mitigation measures.	Control mission	On a daily basis during the works
		Specialized Services; Research Centre; Hydraulic Service; Project Implementation Unit (PIU); INCOMA; Environmental Monitoring Committee (EMC).	Quarterly; Beginning, mid-term and end of works.
Soil - Erosion/gullying - Pollution/degradation	- Evaluation of measures to combat salinization; - Visual evaluation of soil erosion control measures.	Control mission	On a daily basis during the works
		PIU; INCOMA; Specialized services; Environmental Monitoring Committee.	Semi-annual; Beginning, mid-term and end of works
Vegetation/fauna Degradation rate Reforestation rate	- Deforested surface area (in ha), number of trees destroyed per specie; - Reforested or planted surface area (in ha), number of plants per specie; - Control and monitoring of sensitive areas; - Monitoring of harmful impact on wildlife.	Control mission	On a daily basis during the works
		PIU; INCOMA; Forest Service; Environmental Monitoring Committee.	Quarterly; Beginning, mid-term and end of works
Human Environment Living environment Socio-economic	- Control of the occupancy of private land/farmland; - Respect for historical heritage and sacred	Control mission	On a daily basis during the works

Monitoring elements and indicators	Monitoring methods and systems	Responsible entity	Frequency
activities Land occupancy	sites; - Control of the impact on production sources; - Management of conflicts and disputes: establishment of a consultative framework and a communication plan.	Services concerned PIU Environmental Monitoring Committees	Beginning, mid-term and end of works
Hygiene and health Air and noise pollution	Verification of: - the presence of disease vectors and outbreaks of waterborne diseases; - various diseases related to projects (STI/HIV/AIDS, etc.); - compliance with on-site hygiene measures;	Control mission	On a daily basis during the works
Safety during the works	- the monitoring of waste management practices.	PIU; Health districts; Environmental Monitoring Committee.	Quarterly; Beginning, mid-term and end of works
	Verification of: - the availability of safety instructions in the event of an accident; - compliance with traffic regulations; - the wearing of adequate protective equipment.	Control mission	On a daily basis during the works

10. COSTS OF ESMP MEASURES

The cost of some measures has already been provided for and covered by the project. Some other best practice measures will be included in the BDs during the works. The cost of measures specifically covered by the ESMP is estimated at CFAF 275,000,000. The breakdown of costs is presented in the following table:

Table 9: Cost of the ESMP

Measures	Costs in CFAF
Environmental and social impact assessment (ESIA) expert	FP (financed by the project)
Development and implementation of a capacity-building programme on environmental and social assessment	150,000,000
Design and implementation of an awareness programme on best fishing practices	50,000,000
Support and capacity-building for women who process and sell fish (organization, management, marketing, best practices, etc.)	FP
Community support measures (construction of boreholes and latrines, school repairs)	FP[3]
Support for the monitoring ESMP implementation	50,000,000
Environmental audit/Mid-term and final evaluations	25,000,000
TOTAL	275,000,000

[3] Included in the project cost

11. INDICATIVE SCHEDULE FOR THE IMPLEMENTATION OF ENVIRONMENTAL AND SOCIAL MEASURES AND REPORTING

The following table presents the indicative schedule for ESMP implementation.

Table 10: Indicative Schedule for the Implementation of Environmental and Social Measures

Measures	Proposed actions		Duration of works				
			Year 1	Year 2	Year 3	Year 4	Year 5
Mitigation measures	ESMMP		During implementation				
Monitoring measures	Environmental monitoring and surveillance of the project	Local monitoring	During implementation				
		Supervision	Every month during works				
	Evaluation	Mid-term		2nd year			End of works
		Final					
Production of ESMP implementation reports (monthly, quarterly, half-yearly and annually)							

ESMP implementation will give rise to the production of periodic monitoring and surveillance reports as well as appraisal and supervision reports by the various stakeholders and structures involved in the exercise.

12. CONCLUSION

The study showed that PASPA will have considerable positive impacts and effects in terms of the improved management of fisheries in Equatorial Guinea as well as an improvement of the living conditions of target communities by providing opportunities to enhance and diversify production systems. Apart from fish farms, the planned activities are not likely to have any major negative impacts. Specific measures have been recommended to mitigate the various risks that might arise from this aquaculture component. The ESMP has identified and quantified various other measures and provisions that could mitigate and reduce all risks and impacts related to the implementation of the project, if the recommended measures are strictly applied.

11 Contact persons

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