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USAID/COMFISH Plus Project

PENCOO GEJ

(Collaborative Management for Sustainable Fisheries in Senegal)

Climate Change and Fisheries:

The Experience of USAID/COMFISH and USAID/COMFISH Plus Projects

USAID/COMFISH Plus

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Acronyms and Abbreviations

ANACIM:	National Agency of Civil Aviation and Meteorology
CLPA:	Local Artisanal Fisheries Council
UNFCCC:	United Nations Framework Convention on Climate Change
COMNACC:	National Committee on Adaptation to Climate Change
COMRECC:	Regional Committee on Climate Change
CRODT:	Oceanographic Research Center of Dakar-Thiaroye
CSE:	Ecological Monitoring Center
DEEC:	Directorate of Environment and Classified Establishments
DPM:	Directorate for Marine Fisheries
DPSP:	Directorate for Fisheries Protection and Monitoring
IRD:	Development Research Institute
ISE:	Institute for Environmental Sciences
IUPA:	University Institute of Fisheries and Aquaculture
LPSD/PA:	Sectoral Policy Letter on Fisheries and Aquaculture Development
MEDD:	Ministry of Environment and Sustainable Development
MPEM:	Ministry of Fisheries and Maritime Economy
PSE:	Senegal Emergence Plan
NAP-Fisheries:	National Adaptation Plan for Fisheries and Aquaculture
URI:	University of Rhode Island
USAID:	United States Agency for International Development

Definition of Some Concepts

Climate Change: A change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods (UNFCCC).

Adaptation: Changes in processes, practices, or structures to moderate or offset potential damages or to take advantage of opportunities associated with changes in climate (Cristal Manual, 2008).

***Adaptive capacity*:** Ability of a system, a community or an individual to adapt to the effects and impacts of climate change (including climate variability). It depends largely on economic, social and human resources of a society (Cristal Manual, 2008)

Impacts of climate change: Consequences of climate change on natural and human systems (Cristal Manual, 2008).

***Resilience*:** The magnitude of disturbance that can be absorbed before a system changes its structure. This external disturbance is due to political, economic or environmental change (Adger, 2000).

***Vulnerability*:** According to the Intergovernmental Panel on Climate Change (IPCC): Vulnerability is a combination of impact risk and adaptive capacity.

Vulnerability is the degree to which a system is susceptible to, or unable to cope with adverse effects of climate change, including climate variability and extremes. The vulnerability of the fisheries sector and fishing communities to climate change depends on their exposure, sensitivity and adaptive capacity.

Climate hazards: These are potentially damaging physical events or phenomena that result from weather or climate conditions (Cristal Manual, 2008).

Livelihoods: All the means available to an individual or a community that enable them to live (CARE, 2000).

Summary

This document provides a summary of results achieved from successful practices and experiences in terms of climate change adaptation in the fisheries and aquaculture sector in Senegal. It serves as a capacity building tool to improve the adaptive capacity of coastal communities vulnerable to climate change. The methodological approach used lays emphasis on the need to integrate climate change at all levels (national / local) of planning to improve the resilience of the sector. Similarly, the integration of indigenous and local knowledge, communities' ownership of the approach, institutional scoping and gender mainstreaming are the fundamental principles for the successful implementation of sustainable adaptation.

Figure 1. Socio-economic importance of fisheries: Saint Louis artisanal fishing harbor (Guet Ndar)

Figure 2. Impacts of climate change on the biophysical environment: surf breaks at Saint Louis, Guet Ndar

Introduction

The fisheries sector plays a significant socio-economic role in Senegal. As the leading sector in the national economy, it is the main provider of foreign currency and jobs (about 600,000 jobs, representing 15% of the active population). This economic and social output is largely driven by the high performance of the artisanal fisheries sub-sector, which accounts for more than 80% of the national production. Landings in 2017 were estimated at 544,792 tons, which included 439,080 tons for artisanal fishing, 92,251 tons for industrial fishing and 13,451 tons for inland fishing (source DPM, ANA: Sector Review, 2018). Hence, fishing constitutes a source of income, and provides more than 72% of animal proteins and 47% of total food protein nationwide.

However, the success of the fisheries sector is compromised by several environmental, technological, economic, social and political challenges confronting the industry. In this regard, climate change has become a new environmental challenge that undermines the output of the industry, rendering coastal communities more and more vulnerable. This has led to the question to know whether policies initiated and implemented so far have adequately addressed the current challenges facing the management of fisheries resources to ensure the sustainable, efficient and equitable development of the sector. In this perspective, the USAID/COMFISH and USAID/COMFISH Plus Projects, in collaboration with the ministries responsible for climate change: Ministry of Environment and Sustainable Development (MEDD), Ministry of Fisheries and Maritime Economy (MPEM), scientific research institutions, technical services, civil society, players in the fishing industry, Non-Governmental Organizations (NGOs), supported collaborative strategies at all levels to integrate climate change into fisheries planning at national and local levels in Senegal.

I. Background and rationale

Senegal is located in a marine and coastal ecosystem region known for its intense biological productivity. This zone accounts for a huge proportion in the global fisheries production. This potential is largely due to trade winds blowing parallel to the coast, thereby generating regular coastal upwellings. However, for some years now, the fishing industry has been grappling with challenges arising from unsustainable exploitation of fisheries resources and the impacts of climate change, which put into jeopardy not only the living conditions of populations that depend on fishing for their livelihoods, but also the balance of marine and coastal ecosystems.

Indeed, marine and inland ecosystems are more and more weakened and vulnerable. According to UNEP Report “Climate Change and Africa, 2010”, the fisheries sector is vulnerable to climate change. This will lead to an increased degradation of fisheries resources and a decrease in the volume of catches by 2020, with potential consequences on the income of populations, the fight against poverty and the achievement of the goal of ensuring food self-sufficiency. This decrease in production, which has become a reality in the fisheries sector, is coupled with the loss of

infrastructure and production means of artisanal fishing communities who depend constantly on fishing and related activities for their livelihoods. Although several initiatives have been developed and supported to boost the resilience of the sector, the problems persist.

Against this backdrop, the USAID/COMFISH and USAID/COMFISH Plus Projects intervened to support climate integration at all levels of planning of fisheries policies. These projects aim to contribute to the sustainable management of fisheries through the continuous improvement of the sector's performance using an integrated, participatory and inclusive approach to ensure the resilience of the sector and adaptation of fishing communities vulnerable to climate change.

1.1. Institutional and legal framework

Given its importance, the fisheries sector has been classified among the drivers of economic growth under Pillar I of the Senegal Emergence Plan (PSE). Hence, fisheries and maritime economy are expected to contribute to boosting competitiveness, food security, nutrition as well as job and wealth creation.

Strategic guidelines for the development of the sector are covered in the Multi-Annual Public Expenditure Planning Document (DPPD) and enunciated in the Sectoral Policy Letter on Fisheries and Aquaculture Development (LPSD/PA), which constitutes a reference framework for the Ministry of Fisheries and Maritime Economy in as much as sustainable management of fisheries resources is concerned. This new Letter, covering the period 2016-2023, is to enable the sector to contribute to boosting food security, economic growth and local development with a view to addressing current challenges confronting the development of the sector, especially climate change. To achieve this objective, the LPSD/PA has integrated climate change into its Specific Goal 1 "Ensuring sustainable management of fisheries resources and habitat restoration" and Strategic Pillar 3: "Restoring marine ecosystems and fresh water bodies". This is a demonstration of Senegal's commitment and willingness to comply with international requirements contained in the regulatory texts of the United Nations Framework Convention on Climate Change (UNFCCC) through the climate change adaptation planning in the medium and long term on one hand, and Intended Nationally Determined Contributions of each sector on the other hand. This commitment was restated by Senegal through the development of a National Adaptation Plan for Fisheries and Aquaculture (NAP-Fisheries) with technical and financial support from the USAID/COMFISH Project. Furthermore, in view of inadequate institutional mechanisms for a proper dissemination of climate information in the sector, the National Fisheries and Climate Change Platform (PN-PCC/SN) was established by Ministerial Order. This framework is expected to strengthen the institutional mechanism for climate change integration through the National Committee on Climate Change (COMNACC).

1.2. Socio-economic situation

The growth in the artisanal fisheries industry has a strong correlation with the growth of the Senegalese coastal population because of its role as social safety net for rural agricultural populations who bear the brunt of successive droughts. This situation increasingly drives Senegalese fishermen out of Senegal's Exclusive Economic Zone (EEZ). As a result, 30% of Senegal's landings are recorded by other countries of the sub-region (USAID/COMFISH / CRODT, 2013). This situation is exacerbated by other factors associated with climate change, with direct or indirect adverse effects on the living conditions of coastal communities. These adverse effects include environmental degradation (including soils and mangroves), the salinization of coastal soils and fresh waters, erratic and poor rainfall (floods and droughts), coastal erosion, desertification and advancing sand dunes, water and wind erosion, changes in upwellings.

Figure 3. Sardinella landings in Saint Louis (COMFISH Survey in Saint Louis)

1.3. Vulnerability of marine and coastal ecosystems

Fishing is an activity that belongs to a complex and dynamic system that depends on the biological production of marine and coastal ecosystems. As it functions, this system depends on its interrelation with economic, social and climatic systems. Vulnerability studies supported by the USAID/COMFISH Project and other research institutions demonstrate the high vulnerability of marine and coastal ecosystems due to their heavy dependence on climatic factors such as upwellings, precipitations, temperature, salinity, winds, etc. Climate change affects phytoplankton, fishes (biogeography and phenology of species); these factors alter the dominance and distribution of many species (for example small pelagic species) as well as the structure, functioning and diversity of marine ecosystems in Senegal. As for coastal systems, they are considered as important hubs for energy and material exchange, thereby playing a very important role in biochemical cycles. Hence, coastal systems are subjected to natural forcing such as climate influence. Climate variability mainly results in a significant rise in sea level, coastal erosion, loss of biodiversity. This reproduction zone for many species is mostly sensitive. In view of the foregoing, it stands to reason that the future of maritime and inland fishing will depend on the evolution of the marine

environment which undergoes modifications as a result of climate change and the influence of cations from anthropogenic sources. Therefore, fishing is subjected to anthropogenic and natural constraints which impact marine and coastal biological systems.

Figure 4. Houses destroyed by flood in Saint Louis

II. Challenges confronting the sector as a result of climate change

The artisanal fisheries sector in Senegal enables communities to provide for their needs in terms of livelihoods, income and food protein. One of the major threats of climate change on the fisheries industry is its impact on fisheries resources and by extension on food security. According to recent projections (NAP-Fisheries / Aquaculture), by 2050, overall natural fish production is expected to decline as a result of the decrease in upwellings (movement of cold water rich in mineral salt to the surface). Inland fishing, which accounts for 13% of national catches, could also be adversely affected by the downward trend in rainfall in some regions, leading to salinization and acidification in some zones. Under the current circumstances, climate change constitutes a real challenge in the development of the fisheries sector in Senegal. Hence, the sector is confronted with the following questions and challenges: what changes will occur in the climate, and what will be the resulting risks for vulnerable fishing communities in Senegal, whose vulnerability to natural disasters is already high (climate projection and scenarios)? What is the impact of climate change on fisheries in view of the risks of ecosystem disturbances and the threats for the entire food chain? Who will be the key stakeholders and players involved? Finally, what specific analytical / monitoring mechanisms, tools to be put in place to effectively assess the economic impact of climate change on the artisanal fisheries sector? To address this situation, it is important to improve scientific knowledge on climate change while integrating indigenous knowledge and skills. In response to this need, various processes and strategies have been developed by the USAID/COMFISH and USAID/COMFISH Plus Projects for a better integration of climate change adaptation into the planning of the fisheries sector at local and national levels in collaboration with all stakeholders.

III. Adaptation initiatives supported by the USAID/COMFISH Project

3.1. Success factors

Local climate change adaptation plans. Given the complex nature of the issue of climate change, and in order to better take into account the peculiarities of each maritime region, the USAID/COMFISH and USAID/COMFISH Plus Projects supported the development and roll-out of six local participatory climate change adaptation plans by the Local Artisanal Fisheries Councils of Ziguinchor, Kafountine, Saint Louis, Rufisque/Bargny, Sindia Nord/Sindia Sud and Joal/Fadjiouth. For each local plan developed, a vulnerability assessment of the area in question was conducted. This local initiative helped to establish links among the following elements: Assessment of climate risks and vulnerability; gender mainstreaming, adaptation planning at grassroots level, and integrated and participatory budgeting. As part of the process to integrate adaptation into local development planning, the project laid a strong emphasis on technical assistance and capacity building for local players and all stakeholders involved to encourage and support them to integrate climate change at all levels of local governance.

Figure 5. Meeting of the Monitoring/Steering Committee of the Local Climate Change Adaptation Plan, CLPA Kafountine and a copy of the Memorandum setting up the committees.

National Climate Change Adaptation Plan for Fisheries and Aquaculture in Senegal (NAP-Fisheries). The USAID/COMFISH and USAID/COMFISH Plus Projects, in collaboration with the Ministry of Fisheries and Maritime Economy (MPEM) and the Ministry of Environment and Sustainable Development (MEDD), supported the climate change adaptation and integration into the fisheries development policies and strategies through the development of the 2035 National Adaptation Plan for the Fisheries and Aquaculture Sector, the first of its kind in Senegal and West Africa approved by the Ministries of Fisheries and Environment.

Figure 6. Signing of the document of the National Adaptation Plan / Fisheries (Ministries of Fisheries and Environment)

This strategic guidance document for the fisheries sector, in furtherance of the NAP steered by the Directorate of Environment and Classified Establishments (DECC), the National Committee on Climate Change, contributes to the planning of medium and long-term adaptation measures in the sector and aims to help countries to meet their commitments through the NDCs (Nationally Determined Contributions).

National Fisheries and Climate Change Platform (PN-PCC/SN). The need to bring together all institutions to work together in addressing the issue in each sector was of paramount importance for the success of the various process and actions aimed at planning adaptation in fisheries policies, supported by the USAID/COMFISH and COMFISH Plus Projects. This has been the rationale for the establishment of the National Fisheries and Climate Change Platform (PN-PCC/SN) by Inter-ministerial Order ***No 07-980 of 12 May 2017*** in collaboration with the Ministry of Fisheries and Maritime Economy (MPEM) and the Ministry of Environment and Sustainable Development (MEDD). This process was extended to the local level with the establishment of the first local platform of Mbour.

Figure 7. Representatives of the PN-PCC/SN member institutions

Early warning system and safety at sea of actors in the artisanal fishing industry.

In view of recurring maritime accidents and loss of human lives, the USAID/COMFISH and COMFISH Plus Projects, as part of the implementation of the local adaptation plans in collaboration with the National Agency of Civil Aviation and Meteorology (ANACIM), supported the establishment of a National Early Warning System (EWS). This system has helped to improve the production and dissemination of climate information to actors in the artisanal fishing industry in order to curtail the risks of maritime accidents. To support this process, capacity building trainings have been conducted at all levels. This system has been an innovation in the safety of actors in the artisanal fishing industry at sea**.**

Supporting the resilience of women processors in the artisanal fisheries sector

In view of the vulnerability of women processors in the artisanal fishing industry, the project (USAID/COMFISH and COMFISH Plus) put in place a large-scale program aimed at: building the technical and organizational capacity of women processors to identify and develop sustainable management tools and approaches tailored to their needs. These strategies have been developed to improve socio-economic and environmental conditions with a view to boosting women processors' resilience to the effects of climate change.

Figure 8. Provision of equipment for women at Joal (Khelcom)

3.2. Methodological approach and implementation strategies

- ***Methodological approach***

To facilitate the integration of climate change into the planning of fisheries policies at national and local levels, the project (USAID/COMFISH and COMFISH Plus), from the beginning, opted for dialogue and consultation with policy-makers (Ministry of Fisheries and Maritime Economy, Ministry of Environment and Sustainable Development), scientific researcher institutions (CRODT, IUPA, ISE, LPAO, IRD, CSE), grassroots actors, civil society and all other stakeholders involved in the approach. This led to the conduct of vulnerability assessments at all levels to identify

adaptation needs at local and national levels. To ensure the success of this strategy, a learning by doing approach has been adopted at all levels. Therefore, the experiences of various stakeholders, local knowledge, best local adaptation practices and scientific experience have been integrated into the process. This collaborative approach at all levels facilitated the buy-in and support of all stakeholders involved, especially grassroots professional fisheries organizations, including women working in the industry. This has been the key to the success of this innovative initiative for the integration of climate change into the strategic planning of the fisheries sector. To facilitate the implementation of these strategies, and encourage stakeholders (institutions and players in the industry) to take ownership of them, all the documents on the planning of climate change adaptation, supported by the project, have been validated at all levels and approved by administrative and territorial authorities (local and national).

Figure 9. Consultation with grassroots stakeholders in Saint Louis and Mbour

- ***Implementation strategy***

To support the implementation of adaptation strategies supported and in collaboration with central institutions, decentralized technical services and local actors (CLPAs), the project facilitated the establishment of a consultation mechanism at all levels to pave the way for sustainable adaptation planning to build the resilience of vulnerable fishing communities.

The major strategies supported for the implementation of adaptation options as contained in the documents on artisanal fisheries planning at local and national levels in Senegal are itemized below:

Stakeholder participation and capacity building It is important to take into account the concerns and needs of all stakeholders involved as regards adaptation both at national and local levels. This participation requires necessarily capacity building for communities and the taking into account of their indigenous knowledge for inclusive planning with a view to sustainability.

Establishment of official implementation bodies and permanent consultation frameworks. To ensure sustainability and a better harmonization of implementation actions at national and local levels, it is imperative to set up coordination committees to work on the issue of climate change and implementation options. Therefore, a National Fisheries and Climate Change Platform has been

put in place to support the monitoring / evaluation of the implementation of the NAP-Fisheries. At local level, monitoring (CLPAS) and steering (decentralized technical services) committees have been set up to support the implementation of local climate change adaptation plans.

Close monitoring and support. In view of the complex nature of the issue of climate change, monitoring, and technical and financial support are needed at all levels. In this perspective, the project (USAID/COMFISH and COMFISH Plus) provided support and monitoring at all levels for the NAP-Fisheries process in Senegal, from planning to implementation (Local, national and regional).

IV. Presentation of fact sheets on successful climate change adaptation experiences supported by the USAID/COMFISH and COMFISH Plus projects

4.1. Fact sheet on the early warning system and safety at sea of actors in the artisanal fishing industry

4.1.1. Background

Within the context of climate variability, marked by the frequent occurrence of extreme weather events, including poor weather at sea, fishing communities are becoming more and more vulnerable. Managing adverse climatic conditions has become one of the challenges for socio-economic development in the fisheries sector in Senegal. The fisheries sector is affected by these changes through the degradation of marine and coastal ecosystems, leading, among other things, to scarcity of fishing resources, which causes fishermen to explore far-off fishing zones, resulting in many casualties and disappearances at sea with heavy loss of lives and equipment. To illustrate, about 140 persons lost their lives or disappeared in 2017, which was 63% higher as compared to 2016 which recorded 92 victims. Loss of equipment is estimated at one hundred and forty million eighty thousand five hundred (140,080,500) CFA Franc. The major causes of those accidents are the non-observance of meteorological instructions and the overloading of transportation boats. The greater part of maritime casualties was recorded at the mouth of Saint-Louis, where it is difficult to cross the sand bar in February, and in Béttenty, where a canoe capsized in April 2017, claiming the life of 22 women. (source DPSP; 2017)

To deal with these challenges, several initiatives have been developed in collaboration with decentralized technical fisheries services, the National Agency of Civil Aviation and Meteorology, the Directorate for Fisheries Protection and Monitoring the USAID/COMFISH and COMFISH Plus projects, to put in place an Early Warning System (EWS) to facilitate access to and availability of meteorological information to sea users. Access to weather and climatic information is of paramount importance for productivity and the resilience of marine and coastal ecosystems, but also for food security at national level. This has been one of the most successful experiences in Senegal, highly appreciated by vulnerable fishing communities.

4.1.2. Rationale

- Recurrent casualties among fishermen due to bad weather conditions (swells, winds, storms, dust...);
- Frequent destruction of fishing equipment;
- Frequent disappearances and loss of human lives;
- Capsizing of boats at sea;
- Collision of boats at sea;
- Fishermen's insecurity at sea;

4.1.3. Description of the initiative

The SMS platform for the dissemination of meteorological warnings to operators in the artisanal fishing industry is an innovation in the dissemination of meteorological information to producers (fishermen). It is an Early Warning System aimed at providing real-time information to fishermen and technical services on weather forecast and extreme weather conditions at sea (strong swells, strong winds, fog, storms...).

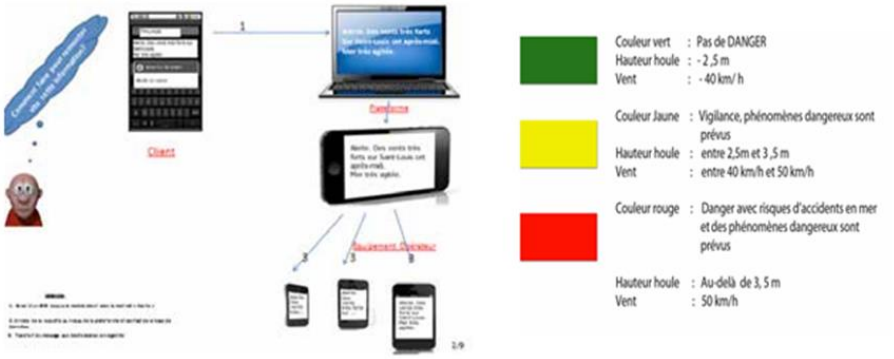
To curtail the risks of accidents at sea, as a result of bad weather conditions, stakeholders need to take advance measures by putting in place preventive actions.

Therefore, it remains a necessity for actors in the artisanal fishing industry in Senegal to be fed with the appropriate understandable information on a timely basis. Certainly, technical fisheries service's receive the weather forecast through traditional channels (Emails...), and then relay the information to producers. According to the latter, this system falls short of facilitating the dissemination of the information at all levels, especially to the boat captains for whom the information is essential to anticipate measures to be put in place to ensure safety at sea in view of recurring accidents due to bad weather conditions and their consequences (loss of equipment and human lives). The SMS-based Early Warning System is a system aimed at improving the dissemination and utilization of meteorological information for the benefit of actors in the artisanal fishing industry.

It is made up of:

- A daily weather forecast dissemination platform via mobile phone. Hence, warning text messages on weather forecast are sent simultaneously to all stakeholders (technical services, all members of the ICC of the CLPA, local media), and recorded in the database of all weather forecasts disseminated, kept by the ANACIM. The use of mobile phone as channel of dissemination aims to reach the maximum number of actors.

- In addition to SMS warnings, a system of flags with different colors (3 colors) coded according to the danger, has been put in place to beef-up the information dissemination system. Green flag means weather conditions are favorable for fishing activities (2.5m high swells and 40km/h winds) with low risks of accident. Yellow means that dangerous weather events are in the forecast (between 2.5m and 3.5m high swells and 40 and 50km/h winds) with less risks of accidents. Red is an indication of bad weather conditions (more than 3.5m high swells and more than 50km/h winds) with high risks of accident.



4.1.4. Dissemination system

All stakeholders have been trained for an optimal utilization of the system. Regular assessments are conducted to determine the efficiency of the system, and continuous improvement actions are put in place in collaboration with other USAID projects with the same line of intervention, such as the USAID/CINCERE project, which has recently enhanced the SMS warning system with the use of VOICE (in Wolof and French languages) to reach uneducated actors. This system is combined with the distribution of life jackets, overalls, and GPS to more than 19 CLPAs to enhance safety at sea. When launched, the artisanal fishing boats geo-localization system, being developed by the Ministry of Fisheries, will further enhance this early warning system, which covers the entire Senegalese coast.

Figure 10. Stakeholder training

Figure 11. Delivery of equipment to ANACIM

Figure 12. Delivery of safety equipment to operators

4.1.5. Results achieved

- Provision of real-time warnings and weather forecasts to operators in the artisanal fishing industry;
- Availability of more accessible information dissemination channels to operators;
- Better understanding of extreme weather events;
- Enhanced safety for artisanal fishermen;
- Facilitation of the ownership of meteorological information by actors in the industry (high rate of adoption with more and more SMS disseminated to sea users);
- Technical capacity building for ANACIM and the DPSP to improve the dissemination of weather information;

Number of warnings disseminated: 71,672 (2014-2018);

Number of training sessions: 21 training workshops (2013-2018)

Number of people trained: 1,217 including 156 by the USAID/CINSERE project (2013-2018)

Number of direct beneficiaries: 109,329.

Technical implementation agency: ANACIM:

Beneficiaries: local actors in the artisanal fishing industry through the CLPA (Local Artisanal Fisheries Council)

Partners: USAID/COMFISH and COMFISH Plus, URI, USAID/CINSERE

Central administration: DPSP, ANAM, DPM, HASMARR

Contact: ANACIM:

4.2. Fact sheet on the National Fisheries and Climate Change Platform

4.2.1. Background

In view of the multiplicity of operators and the complex nature of this field of activity, it is essential to have in place a functional consultation framework, bringing together all stakeholders in the fishing industry and the coastal maritime environment to ensure effective integration of climate change in policies. This framework will also be tasked with supporting, monitoring and ensuring the implementation of the 2035 National Adaptation Plan for the Fisheries and Aquaculture Sector. In this perspective, the USAID/COMFISH and COMFISH Plus projects, in collaboration with all stakeholders involved in the process of integrating climate change into policies, supported the establishment of the National Fisheries and Climate Change Platform (PN-PCC/SN) by Inter-Ministerial Order No 07-980 of 12 May 2017 between the Ministry of Fisheries and Maritime Economy and the Ministry of Environment and Sustainable Development.

4.2.2. Rationale for the initiative

- Facilitate a better consultation between actors and stakeholders;
- Harmonize adaptation measures at all levels;
- Create a framework for scientific thinking on climate change and fisheries in Senegal;

- Implement fisheries policies that integrate climate change;
- Enhance the operation of existing consultation frameworks;
- Improve coordination, monitoring / evaluation of interventions of fisheries policies that integrate climate change.

4.2.3. Composition of the PN-PCC/SN

The PN-PCC/SN is composed of key professionals and actors in the fishing industry, government institutions such as the Ministries of Finance and Environment, parliamentarians, the Economic, Social and Environmental Council, local communities, Non-Governmental Organization (NGOs), technical and financial partners, (TFP), research institutions, universities and the private sector.

4.2.4. Methodological approach

To implement the National Fisheries and Climate Change Platform, consultations were held at various levels. Firstly, there was a mapping of all stakeholders involved through a diagnostic study on consultation frameworks working on fisheries and climate change. This mapping exercise helped to better identify key stakeholders in the fisheries industry and the coastal maritime environment that need to be involved in the process of developing the National Fisheries and Aquaculture Adaptation Plan. This led the Ministry of Fisheries and Maritime Economy to put in place a functional framework, bringing together research institutions, government institutions and communities for integrated adaptation of the fisheries sector to climatic hazards. This stage was followed by the establishment of local platforms, including that of Mbour which was the first.

Figure 13. Establishment of the Local Fisheries and Climate Change Platform / Mbour

Figure 14. PN-PCC/SN logo

4.2.5. Results achieved

- Inter-ministerial Order No 07-980 of 12 May 2017, establishing the National Fisheries and Climate Change Platform (PN-PCC/SN);
- Establishment of a consultation framework on climate change and fisheries;
- Supporting the operation of the PN-PCC/SN (development of a roadmap and implementation support);
- Establishment of the Local Fisheries and Climate Change Platform for the Mbour Department with implementation units.
- Identification of a logo and development of the Website of the National Fisheries and Climate Change Platform.

PN-PCC/SN Secretariat: Directorate for Marine Fisheries

Chairmanship and Vice-chairmanship: CONIPAS and HCCT

Beneficiaries: Minister of Fisheries and Maritime Economy (MPEM), local actors in the artisanal fishing industry through the CLPA (Local Artisanal Fisheries Council)

Technical and Financial Partners: USAID/COMFISH and COMFISH Plus, URI

4.3. Fact sheet on the 2035 National Adaptation Plan for the Fisheries and Aquaculture Sector

4.3.1. Background

The Government of Senegal has embarked on the fight against climate change by signing and ratifying the United Nations Framework Convention on Climate Change (UNFCCC) respectively in June 1992 and in May 1994; the Kyoto Protocol in July 2001 and recently the Paris Agreement in April 2016. This has enabled Senegal to put in place planning tools such as the national implementation strategy, national communications, the National Adaptation Program of Action (NAPA) and Intended Nationally Determined Contributions (INDCs, demonstrating the country's commitment at national level. In view of the vulnerability of Least Developed Countries (LDCs)

such as Senegal, the 17th Conference of the Parties to the United Nations Framework Convention on Climate Change, in its Decision 5/CP.17, urged the parties to plan their adaptation in the medium and long term, based on the guidelines of the National Adaptation Plan (NAP). This document highlights stakeholders' specific adaptation needs, institutional, regulatory and legal capacity gaps, funding and budgeting mechanisms, and strategic opportunities for the monitoring of the NAP-Fisheries. By so doing, this national plan provides the fisheries and maritime economy sector, with a specific planning document on sustainable strategies for the adaptation of marine and coastal ecosystems and vulnerable coastal communities. In accordance with this Decision, the Ministry of Fisheries and Maritime Economy (MPEM), through the Directorate for Marine Fisheries (DPM), launched the process for the development of the NAP for the fisheries sector with technical and financial support from USAID/COMFISH and COMFISH Plus in collaboration with the United Nations Development Program (UNDP), the Ministry of Environment and Sustainable Development through the Directorate of Environment and Classified Establishments (DEEC), and the National Committee on Adaptation to Climate Change (COMNACC) in September 2015.

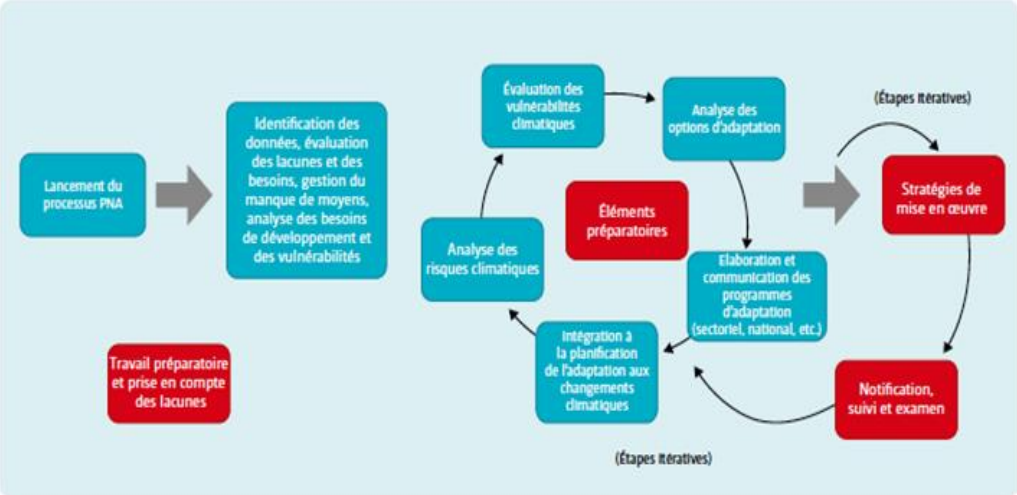
4.3.2. Objective of the initiative

- Put in place a medium and long-term approach to curtail the vulnerability of the fisheries sector to the adverse effects of climate change;
- Facilitate the consistent integration of climate change adaptation into policies and strategies in the fisheries sector;
- Mainstream climate risks into budgeting and planning at national level.

4.3.3. Methodological approach

The methodology used to develop the National Adaptation Plan for the fisheries and aquaculture sector is based on the technical guidelines of the National Adaptation Plans developed by the Group of Experts of Least Developed Countries. These guidelines suggest four elements for the process of national adaptation plans. This approach is currently being used for the development of National Adaptation Plans for other vulnerable sectors in Senegal.

- Element A: Preparatory work and consideration of gaps;
- Element B: Contents of the preparatory phase;
- Element C: Implementation strategy;
- Element D: Notification, monitoring and review.



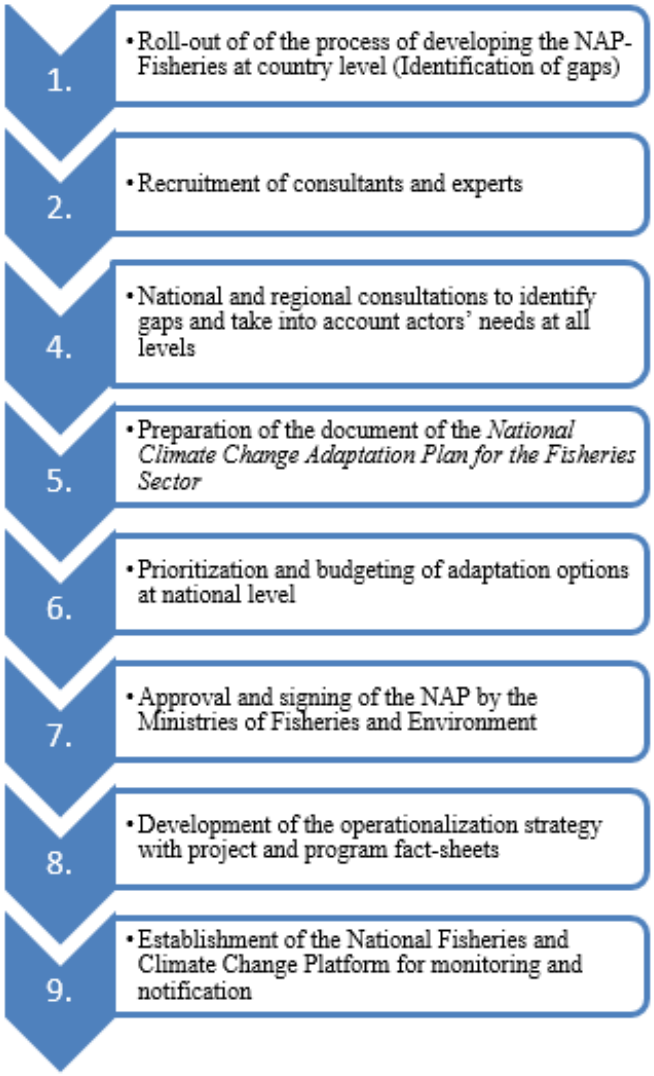


Figure 15. NAP-Fisheries development process

4.3.4. Results achieved

- Integration of climate change into fisheries planning and policies in Senegal (the Sectoral Policy Letter on Fisheries and Aquaculture Development);
- Development of the first National Sectoral Adaptation Plan in Senegal and West Africa (2016);
- Development of an implementation strategy (project and program fact-sheets);
- Establishment of a National Fisheries and Climate Change Platform (2017);
- Organization of a training for members of the national platform on climate finance (2018);

Technical and Financial Partners: USAID/COMFISH and COMFISH Plus who supported the entire development and implementation process of the NAP-Fisheries and the National Fisheries and Climate Change Platform.

Other partners involved:

UNDP: rolled-out the national process for all sectors

URI: implementing institution for the USAID/COMFISH and COMFISH Plus projects

Institutions involved: Ministry of Fisheries and Maritime Economy (MPEM), Ministry of Environment and Sustainable Development (MEDD), Directorate for Marine Fisheries (DPM), Directorate of Environment and Classified Establishments (DEEC), Ministry of Economy, Finance and Planning, COMNACC.

Contact: Directorate for Marine Fisheries (DPM) / Directorate of Environment and Classified Establishments (DEEC), National Committee on Adaptation to Climate Change (COMNACC)

4.4. Fact sheet on enhancing the resilience of women processors in the artisanal fisheries sector

4.4.1. Background

The fisheries sector is very vulnerable to the effects of climate change. This couples with the fragile nature of marine and coastal ecosystems as well as poor fishing and fisheries resources conservation practices. Meanwhile, the survival of coastal communities largely depends on the exploitation and utilization of fisheries resources. The artisanal processing of fisheries products is a tremendous leverage in the fight against poverty while contributing to food security and job creation among women who are the dominant force in this sub-sector. However, this sector is grappling with enormous disturbances that translate into the scarcity of fishing resources (due to overfishing / overcapacity, poor fishing practices and failure to adequately add value to artisanal and industrial resources). This situation is exacerbated by the lack of hygiene at the sites, lack of facilities and equipment suitable to the needs of operators and inadequate support in identifying income generating means and sources. These socio-economic, anthropogenic and natural factors have the potential to compromise the development of this sub-sector made up mainly of women (most vulnerable section of the population), which is supposed to contribute to the security or well-being of families. It is against this background that the USAID/COMFISH and COMFISH Plus projects, in collaboration with the Ministry of Fisheries and Maritime Economy (MPEM), through the Directorate for Marine Fisheries (DPM), worked with all women processors operating in the sector through the National Network of Women in the Fishing Sector to build the organizational, managerial, leadership, and management capacity of women processors to equip them with skills to defend their interests in the political decision-making process, but also to enhance their economic power with a view to their empowerment. The intervention of the USAID/COMFISH and COMFISH Plus projects in this area focused on Local Artisanal Fisheries Councils (CLPAs) of Joal/Fadjiouth (Tann and Khelcom sites), Sindia Nord (Ndayane site), Rufisque /Bargny (Ndéppé, Domaine bi and Khelcom sites); Sindia Sud (Pointe Saréne, Mballing sites), Yénne /Dialaw (Yenne Tood, Yenne Kaw , Yenne Guedj and Ndiangal sites); Mbour (Mballing, Saly and Guéro sites); Cayar and Sine Saloum (Missirah and Diamniadio sites) .

4.4.2. Objective of the initiative

- Support innovative climate change adaptation initiatives for the benefit of women processors, including their active participation in governance processes and structures (CLPAs) with a view to developing and implementing participatory plans for the management of fisheries resources;
- Promote knowledge integration;
- Promote the integration women's indigenous knowledge on adaptation initiatives;
- Strengthen the leadership of women processors and build their capacity in the management of grants intended to support climate change adaptation initiatives;
- Put in place and test mechanisms to diversify resources and add value to fisheries products;
- Scale up the dissemination of information and sensitization on climate change, its impacts and potential adaptation strategies;

4.4.3. Methodological approach:

To support women's empowerment and the enhancement of the value of processed fisheries products, the USAID/COMFISH and COMFISH Plus Projects, in collaboration with CLPAs and women processors in the sector, supported the development and implementation of strategies aimed at improving their living conditions, as well as socio-economic and environmental conditions. This requires the revamping of grassroots women's organizations through the roll-out of charters and the establishment of hygiene committees. Hence, consultations were organized at every stage of the development and implementation process of the strategy, bringing together all stakeholders involved (CLPAs, local communities, fisheries departments, NGOs and other grassroots partners). This led to the identification and formulation of environmental, financial and administrative management measures by beneficiaries. The measures, following their validation, constituted the Hygiene Charter and Code of Conduct for women processors who have been activated and organized into Hygiene Committees. To ensure sustainability of the strategy, the projects (USAID/COMFISH and USAID/COMFISH Plus) provided managerial capacity development for the women, with management tools tailored for and accessible to beneficiaries. Community relays of the projects are an integral part of this strategy as they support women in the monitoring and wider dissemination of the Charter.

Figure 16. Community level consultation (Khelcom/Bargny)

Figure 17. signing and approval of the Charter by women (Diamniadio Saloum

4.4.4. Results achieved

- Establishment of 19 (nineteen) committees and hygiene charters:
- Improvement of women's means of production (rehabilitation of processing areas of Mballing, Pointe Saréne and Yenne Todd);
- Establishment of the first modern processing unit at Cayar, accredited by the UE, and the FDA;
- Provision of production materials and equipment (fish boxes and crates, gloves, bowls, wheelbarrows, ovens, drying trays, storage room, etc...);
- Installation of solar dryers at the modern site of Cayar in collaboration with the National Renewable Energy Agency (ANER);
- Establishment of 14 functional literacy classes in partnership with the Directorate for Literacy and National Languages (DALN) (with 420 women reached by the program).
- Support the revolving credit scheme of women processors of Cayar, Yénne Todd and Sendou (For example, with a support of 1,000,000 CFA Francs, Yenne women were able to generate 1,400,000 CFA Francs in 6 months);
- Support the Income Generating Activities (IGAS) of women processors of Diamniadio (maraichage), Guéréo and Ndayane (rental of equipment);
- Support the organizational dynamics of modern processing sites of Goxu macc, Pencum Sénégal, Mbao etc.
- More than 8,000,000 CFA Francs mobilized by all women processors at the end of the internal fund-raising organized during the sanitation exercise, and from the user charges on the equipment provided by the COMFISH Plus project;
- Technical capacity of 10,000 women built since the inception of the project in administrative, financial, hygiene / quality management tools etc...
- Scale-up of initiatives through inter-committee exchange visits to Guéréo, Missirah and Cayar.

Figure 18. Capacity building and provision of equipment at Missirah (Saloum) and Guéréo (Sindia Nord)

Figure 19. Provision of equipment and literacy education for women at Joal (Khelcom) and Diamniadio (Saloum)

Figure 20. Dryers installed at Cayar and exchange visits to Cayar and Missirah

Figure 21. Products of the modern processing unit of Cayar for export to Europe and the United States (salted / dried tuna and smoked shrimps)

Direct beneficiaries: women processors operating in the fishing industry

Partners: USAID/COMFISH and COMFISH Plus, URI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