



TECHNICAL REPORT

UNDERSTANDING THE NEXUS OF MANGROVES AND WOMEN IN GUINEA-CONAKRY



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TABLE OF CONTENTS

Acknowledgements	v
Foreword	vii
Abbreviations and acronyms	viii
Executive summary	ix
Introduction	xi
Part one: Conceptual framework	1
I. The issue	2
II. Objectives of the study	3
III. Organization of the elements of the study	3
Part two: Methodological framework	5
IV. Brief introduction to lower Guinea and the study areas	5
1. Subprefecture of Kaback	7
2. Subprefecture of Kanfarandé	7
3. Subprefecture of Kamsar	10
V. Methodology and results of the study	11
1. Location of the study areas and selection of districts	11
2. Data collection	12
3. Processing and interpretation of questionnaires	13
4. Processing and interpretation of the results of the survey of Kaback, Kanfarandé, and Kamsar	17
Site 1: Kaback	17
Site 2: Kanfarandé	30
Site 3: Kamsar	43
VI. Mangrove typology and identification of potential	58
VII. Difficulties encountered during the field mission	58
VIII. Conclusion and recommendations	59
Bibliography	61
List of Figures	
Figure 1: Map of Lower Guinea	6
Figure 2: Map of Study Areas	11
Figure 3: Risk Map - Kaback	25
Figure 4: Land Use (2002, Kaback)	26
Figure 5: Land Use (2022, Kaback)	27
Figure 6: Risk Map - Kanfarandé	37
Figure 7: Land Use (2002, Kanfarandé)	38
Figure 8: Land Use (2022, Kanfarandé)	40
Figure 9: Risk Map - Taigbé	48
Figure 10: Risk Map - Taidi	48
Figure 11: Land Use (2002, Kamsar)	49
Figure 12: Land Use (2022, Kamsar)	51

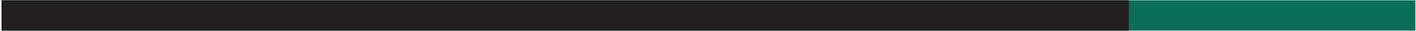
List of Graphs

Graph 1: Activities by Percentage	19
Graph 2: Percentages (2002, Kaback)	27
Graph 3: Percentages (2022, Kaback)	28
Graph 4: Comparison Between 2002–2002, Kaback	30
Graph 5: Mangrove-Centered Activities	32
Graph 6: Percentages (2002)	39
Graph 7: Percentages (2022)	41
Graph 8: Comparison Between 2002 and 2022	43
Graph 9: Percentage of Mangrove-Centered Activities in Kamsar	44
Graph 10: Surface Area as a Percentage (2002)	50
Graph 11: Surface Area as a Percentage (2022)	52
Graph 12: Comparison Between 2002 and 2022	54

List of Tables

Table 1: Mangrove-Centered Activities in Kaback	19
Table 2: Surface Area as a Percentage (2002, Kaback)	26
Table 3: Surface Area as a Percentage (2022, Kaback)	28
Table 4: Changes Between 2002 and 2022, Kaback	29
Table 5: Mangrove-Centered Activities in Kanfarandé	32
Table 6: Surface Area as a Percentage (2002)	38
Table 7: Surface Area as a Percentage (2022, Kanfarandé)	40
Table 8: Changes Between 2002 and 2022, Kanfarandé	42
Table 9: Mangrove-Centered Activities of Women in Kamsar	44
Table 10: Surface Area as a Percentage (2002)	49
Table 11: Surface Area as a Percentage (2022)	51
Table 12: Comparison Between 2002 and 2022	53
Table 13: Interview of Key Local Informants in the Three Study Areas	54
Table 14: Individual Interviews with Deconcentrated Government Services	56

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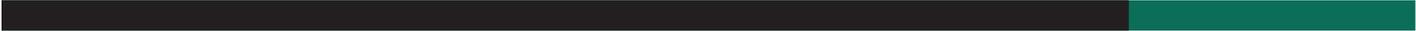


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FOREWORD



Guinea, a developing country with immense natural resources and geographical scope, is currently one of the countries most at risk from environmental degradation, whose repercussions on the living conditions of poor and vulnerable populations are manifested in socioeconomic imbalances.

In order to better understand the relationship between mangroves and women in the Republic of Guinea, the West Africa Coastal Areas (WACA) Program - Resilience Investment Project (ResIP) initiated this analysis of the role of women in the use and rehabilitation of mangroves in West African countries in general, and in Guinea in particular.

Faced with the enormous challenge of reversing the trend of soil and subsoil erosion, flooding, and pollution in coastal regions, this study addresses issues related to the conservation and/or restoration of an endemic species that has become a world asset—the mangrove—because of its ecological and ecosystemic importance. In addition to the diagnosis conducted, the study also proposes solutions to deepen the dialogue between coastal countries and technical and financial partners.

The study allowed for a better understanding of the link between the mangroves and Guinean women through research and field surveys on the selected sites, namely, Kaback, Kanfarandé, and Kamsar. It also generated innovative data to help build capacity and knowledge to save the mangroves along the coastline.

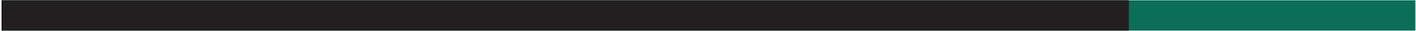
It aims to generate data to help strengthen the knowledge of both government and nongovernment actors to better manage issues pertaining to the relationship between mangroves and women and the livelihoods of communities dependent on mangrove products. It will also enable the government to adopt specific measures to provide appropriate solutions to these communities and strengthen their resilience in a sustainable manner, given that the study has helped shed light on the extreme vulnerability of women living in coastal areas and their heavy dependence on mangrove products.

Lastly, this study has generated innovative data to help build capacity and knowledge to save mangroves and restore degraded areas, while proposing appropriate solutions to these communities to reduce their dependence and strengthen their resilience on a sustainable basis.

ABBREVIATIONS AND ACRONYMS

CBG	Compagnie des Bauxites de Guinée
DPEDD	Prefectural Directorate of the Environment and Sustainable Development
DPEDD	Prefectural Directorate of the Environment and Sustainable Development
EIG	Economic Interest Group
GAC	Global Alumina Corporation
IGA	Income-Generating Activity
MEDD	Ministry of the Environment and Sustainable Development
MPA	Marine Protected Areas
MPEM	Ministry of Fisheries and Maritime Economy
MSI	Mouvement Sauvons nos Iles
NGO	Non-governmental organization
OGM	Maritime Guinea Observatory
OGUI	Guinean Timber Board
PDL	Local Development Plan
PMA	Protected Marine Area
PRAO	West Africa Regional Fisheries Project
PRCM	Regional Partnership for Coastal and Marine Conservation
PREM	Partenariat Recherches Environnement Médias
RC	Rural Commune
ResIP	Resilience Investment Project
SDAM	Mangrove Development Master Plan
SDAM	Mangrove Development Master Plan
SPFF	Forest and Wildlife Prefectural Division
TFPs	Technical and Financial Partners
WACA	West Africa Coastal Areas

EXECUTIVE SUMMARY



This report focuses on the results of the study on the relationship between mangroves and women in the Republic of Guinea, funded by the World Bank under the West Africa Coastal Areas (WACA) Program - Resilience Investment Project (ResIP). This program was established in April 2018 by the World Bank to build resilience in targeted communities and areas in the West African coastal zone. The goal of this program is to gain a structural understanding of the benefits derived from mangrove products by women and the role they play in mangrove conservation.

The context and objectives of the study favored the use of an approach based on four basic methods for collecting information in qualitative research, namely, an interview with 10 key informants from the decentralized services of the Ministry of the Environment and Sustainable Development (environmental agents, water and forests, coastal management center, NGOs, and so forth) in the prefectures of Boké and Forécariah; and interviews with 20 local elected officials in the prefectures of Forécariah and Boké (district chiefs, elders, members of the assembly and leaders of community organizations or civil society), and semistructured individual interviews with 64 rural households in the districts of the three subprefectures of Kaback, Kanfarandé, and Forécariah. Several complementary tools were used, including interviews with institutional stakeholders in Conakry, focus groups, and an observation study to gain a better understanding of the relationship between women and mangroves in the Republic of Guinea.

THE RELATIONSHIP BETWEEN WOMEN AND MANGROVES – PERCEPTIONS, INTERVIEWS, BELIEFS, AND PRACTICES OF RURAL HOUSEHOLDS IN KABACK, KANFARANDE, AND KAMSAR

The report states that 35 percent of women in rural households interviewed in the districts of Bossimiyah, Seydouyah, Matakan, Bolimanda, Youlayen (Kaback); Kanof, Kankouf, Tesken (Kanfarandé); and Taigbé and Taidi (Kamsar) say that the mangrove forest is currently depleted because of the advance of the sea toward the mainland and the construction of roadsteads by mining companies. About 65 percent of the women interviewed believe that the number of people who are dependent on mangrove forest products has increased. This degradation of the environment is essentially due to human activities.

Among the human activities responsible for the degradation of the mangrove ecosystem, logging (cutting mangrove wood) for construction, cooking, and sale is the most important; fish smoking, which requires copious quantities of fuelwood, and traditional salt production are of secondary significance. Of the respondents of both sexes, 85 percent believe that

mangrove wood harvesting is the main cause of mangrove degradation, while 15 percent point to oyster picking and rice cultivation as explanatory factors of mangrove depletion.

For women directly linked to the mangrove, this degradation is manifested by the decrease in socioeconomic profitability for women fish smokers (as a result of the destruction of young fish habitats) and women oyster pickers. For rice farmers facing coastal erosion, this is due to the loss of cultivable or arable land caused by the increase in salinity. The only alternative for these vulnerable people is to help them shift to other income-generating activities such as small-scale trade, market gardening, the establishment of economic interest groups, and the financing of microprojects.

The majority of the women interviewed in the three localities have had no education. Eighty-four percent of the women interviewed stated that they had an intellectual disability, that is, they had not received any formal education, while 10 percent had completed basic education, or primary school, and 6 percent had received a high school education. In terms of age groups, 35 percent of the women interviewed are 20 to 35 years old; 37 percent are between 35 and 46 years, and 28 percent are 46 years or more.

The women who depend on mangrove products are Indigenous and affirm that they cannot abandon this resource unless the governments makes available to them new techniques that will allow them to meet their needs through income-generating activities (IGAs) and other alternative activities adapted to their environment and way of life. These include general trade, or small business (stores), funding for microprojects (agriculture, African textiles), among others. Products derived from harvesting mangrove are intended primarily for the domestic consumption of households and for sale.

The survey respondents are aware of the loss and degradation of mangrove areas, which affect the socioeconomic activities of the dependent populations.

In addition, 84 percent of women in the three localities visited said that they had never experienced mangrove restoration or rehabilitation projects in their locality, while 13 percent affirmed that there have been such projects

in the past but that they were short-lived. These mangrove restoration efforts have mainly concerned reforestation and the prohibition of wood cutting in some places.

In some areas, the mangrove is conserved by the community through various approaches, but with no restrictions on access. Ninety percent of the women interviewed said that access to the mangroves is open to local residents, while 10 percent said that they are family-owned, and access is controlled.

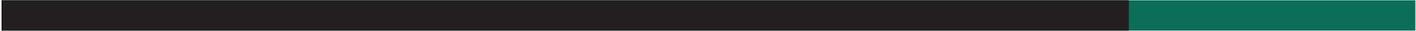
Salt production, market gardening, and rice growing are seasonal, while fish smoking and logging are annual activities.

Overall, the study shows that women use mangrove products for household survival needs, despite the fact that they do not have the means to restore the mangroves and are, in fact, exerting considerable pressure on these mangroves. We are witnessing an antagonism between livelihood and conservation needs. In particular, it is the relationship of dependence between factors related to socioeconomic needs and environmental degradation that explains this situation. In terms of conservation, households are dealing with a lack of means to participate in the diversification of activities or in the monitoring of the mangroves.

The employees of the decentralized government services who were interviewed confirmed that the government, through its Ministry of the Environment and Sustainable Development (MEDD) and the Ministry of Fisheries and Maritime Economy (MPEM), has representatives in the three subprefectures covered by the study. The nature conservationists represented by the forestry agents are mandated to monitor the coastal zones against poaching and environmental destruction in all its forms, but they lack equipment and adequate techniques to provide a quality service.

Since the mangrove areas are not under high surveillance, loggers have adopted a new clever mangrove harvesting technique: they harvest wood deep inside the mangrove (the interior) and leave the exterior to nature. At a glance, the mangrove appears to be flourishing and reflects a beautiful and preserved natural landscape; however, when one ventures into the interior, the damage is visible.

INTRODUCTION



As part of the implementation of the activities of the West Africa Coastal Areas (WACA) Program - Resilience Investment Project (ResIP), established in April 2018 by the World Bank to build resilience in communities and targeted areas in the West African coastal zone, investments in green and climate-resilient infrastructure are planned, particularly in mangrove management and restoration.

Indeed, the objective of ResIP is to reduce the exposure of households in targeted coastal areas to erosion, flooding, and pollution, and to strengthen regional integration in policy, regulation, coastal observation, and coordinated cross-border action.

This document presents the results of analytical studies related to the role of women in the use and rehabilitation of mangroves in the Republic of Guinea.

Specifically, the surface area of mangroves in the Republic of Guinea continues to decrease. In 1956, they occupied 350,000 hectares, compared to 250,000 hectares some 40 years later, according to a study conducted by the Mangrove Development Master Plan (SDAM) in 2000.

This clearing is due to the development of agricultural activities, particularly rice cultivation, and the commercial exploitation of wood. In addition, many people cut wood freely to use as fuel: they use it as a source of domestic energy, for smoking fish or for salt production, as traditionally done in the mangrove areas. With the traditional technique, it is necessary to burn three kilos of wood to obtain one kilo of salt.

The exploitation is thus very localized. The old stands of reproductive individual trees and the young formations are spared.

In most cases, the situation is variable, with intensive harvesting localized downstream of the estuary, with upstream formations being minimally utilized to date. Downstream, the main channel and the coastline are currently being eroded, which is having a significant impact on the dynamics of *Rhizophora* stands. Elsewhere, regeneration seems to be occurring in the inner channels of the Sakama islands. The combination of natural processes and logging may pose a threat to the formations. Nevertheless, as hydrosedimentary dynamics are impossible to predict, only a precautionary principle would be appropriate here (Maritime Guinea Observatory (OGM), Progress Report, May 2005, pp. 98-99).

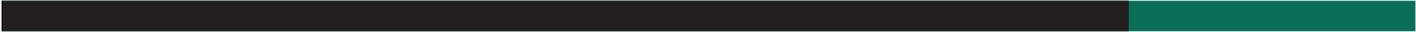
A comprehensive understanding of the potential of mangroves for coastal protection and other co-benefits not available in WACA will help afforestation and mangrove restoration programs to optimize the following:

1. Their coastal protection function;
2. Their climate change mitigation function; and
3. Their contributions to nature-based livelihoods.

This knowledge will also help the private sector identify cost-effective investment opportunities to address complex development challenges in the coastal region.

PART ONE:

CONCEPTUAL FRAMEWORK



The conceptual framework for the baseline study of the relationship between mangroves and women in the Republic of Guinea is based on the compilation and use of scientific studies and research that have been conducted in the targeted coastal and marine areas.

To achieve the objectives of the study, the methodological approach was based on consultation of the results of scientific research in all official national documents on mangroves, specifically on the roles that women play in the use or rehabilitation of mangrove products. Also included were reports on the activities of scientific research institutions, reports on projects financed by technical and financial partners, reports on the impacts on the environment caused by climate change in the Republic of Guinea, and others.

Finally, the results of the literature review corroborated the findings of the field surveys based on the questionnaires developed and validated by the reviewers.

This baseline study is organized around the following research questions identified in the TRD:

1. Which mangrove-centered activities (fish smoking, salt production, oyster picking, etc.) are performed by women in the coastal areas of Guinea-Conakry?
2. Do women use mangrove products for domestic consumption or sell the products on the market?
3. Is household demand fully met by mangrove products?
4. What is the role of mangroves as a primary or secondary source of income for women?
5. What are the characteristics of women who depend on mangroves for their livelihoods (location, age, education, household income, etc.)?
6. What are the seasonal activities of women who depend on the mangroves?
7. What is the extent of women's willingness to switch to alternatives to mangrove products?
8. What are the specific activities that women undertake for mangrove conservation and what roles do they play in conservation, afforestation, and rehabilitation.
9. Is their involvement in mangrove conservation full-time or part-time?
10. What are the characteristics of women involved in mangrove conservation (location, age, education, household income, etc.)?

11. What problems or issues do women face in mangrove conservation?
12. Do women have formal representation or a women's economic interest group (EIG) to voice their interests and concerns?

Based on these questions and field research, we have identified:

- » The activities of women who depend on mangrove products, with particular emphasis on their vulnerability;
- » The environmental impact on the uncontrolled cutting of mangrove products, considering the gender dimension (including women and youth and other vulnerable groups) in terms of the use of products;
- » The environmental risks and their possible impacts on the coastal zones.

I. THE ISSUE

Maritime Guinea is made up of three quite different ecosystems. Each one has its own characteristics and specific morphodynamic functioning, and therefore its own potential and own development constraints.

However, the extent of the interactions that link the tidal marshes to the mangrove swamps at the foothills on the one hand, and to the continental shelf on the other, suggests that these three ecological units constitute a complex system within which each is highly dependent on the others for biophysical and developmental reasons (OGM, Final Summary Report, 2006).

For island and coastal sites, *Rhizophora racemosa* and *R. harrisonii* are the most widely used plant species after oil palm (*Elaeis guineensis*). It is the primary wood material for shoring and framing and the primary fuel for domestic energy and salt and fish smoking (OGM, Final Summary Report, 2006).

The regions of Maritime Guinea are entirely devoted to activities such as fishing, agriculture, arboriculture, rice cultivation, and salt production, while Lower Guinea is primarily a grain producer.

Rice cultivation is the main agricultural activity in Lower Guinea and rice is the country's primary staple food. It covers more than half of the country's cultivated area. Guinea is one of the main rice-producing countries in Africa, although it still cannot meet the basic needs of its population.

Rice growing, which is the most characteristic activity along this coastline, is now an important economic issue for Maritime Guinea. For this reason, the expertise of the Baga rice farmers living north of Conakry (Paulme, 1957; Bouju, 1994 a and b) and of the Balanta (Embaldo, 1990), from whom the Baga undoubtedly drew inspiration in developing their rice-growing technique, is rightly emphasized.

Mangrove rice, called "*Bora Malé*" in Susu ("mud rice"), is a rainfed, non-irrigated rice crop developed in Maritime Guinea on the plains and islands of the lower estuaries that are subject to flooding by high tides. It plays a key role in agricultural production, hence the importance of this sector in coastal areas.

However, despite all the services from which humans benefit in the coastal zones, the mangrove forest today faces a multitude of problems that have caused its degradation. In order to restore this ecosystem, an in-depth study has become necessary to understand the link between humans and their environment and, more particularly, the link between women and the mangrove and the role they play in its preservation.

II. OBJECTIVES OF THE STUDY

GENERAL OBJECTIVE

The objective of this study is to gain a structural understanding of the benefits derived from mangrove products by women and the role they play in mangrove conservation. It will allow us to understand the relationship between the mangrove and Guinean women through research and field surveys on the sites selected for the study, namely Kaback, Kanfarandé, and Kamsar. The study will also enable us to generate innovative data to help build the capacity and knowledge needed to protect mangroves on the Guinean coast and to identify specific measures to provide solutions to these communities and strengthen their resilience in a sustainable manner.

SPECIFIC OBJECTIVES

To achieve the overall objectives, the specific objectives are as follows:

- » Compile a comprehensive list of mangrove-centered activities conducted by women in the coastal areas of Guinea-Conakry;
- » Determine whether women use mangrove products for home consumption or sell the products in the market.
- » Analyze women's roles in mangrove conservation, reforestation, and rehabilitation.

III. ORGANIZATION OF THE ELEMENTS OF THE STUDY

In response to the situation of soil degradation caused by salinization affecting the land and the uncontrolled cutting of mangroves, the World Bank has invested in the restoration of these lands by seeking to gain a better understanding of the causes of degradation and their

impacts in order to plan its interventions more effectively. This platform was created to attract expertise and funding and to deepen the dialogue between countries and technical and financial partners.

Under the ResIP, each country has allocated funds to make investments in green and climate-resilient infrastructure and, in particular, in the management and restoration of mangroves. Mangrove forests are increasingly being recommended as part of broader coastal management strategies, as mangroves can significantly reduce the vulnerability of coastal areas. It is to this end that the study of the relationship between mangroves and women and the role they play in their conservation and rehabilitation in the three targeted subprefectures was initiated, thereby providing a broader vision that will promote the protection and restoration of mangrove habitats and provide a database to build a response strategy to address the impacts of climate change on mangroves.

The study was based on the following:

1. Mangrove-centered socioeconomic activities of women in Guinea;
2. Analysis of the use of mangrove products in domestic consumption or sale on the market;
3. Analysis of women's roles in mangrove conservation, afforestation, and rehabilitation in Guinea;
4. Lessons learned about the relationship between women and mangroves in Guinea.

The main finding from the literature review is the very fragmentary nature of studies on the relationship between women and mangroves and its limited recognition in public documents and government policies. However, Guinea is not an exception among countries in coastal areas that are undergoing natural upheavals such as flooding, coastal erosion, and other large-scale environmental impacts. A series of floods in seasonal rice-growing areas have been observed in Kaback, for example, as well as in other sites.

PART TWO:

METHODOLOGICAL FRAMEWORK

IV. BRIEF INTRODUCTION TO LOWER GUINEA AND THE STUDY AREAS

The Republic of Guinea is a coastal country located in West Africa, with a surface area of 245,857 km². Its population was 12 million at the last census, conducted in 2014. Population projections show the rapid growth rate of the population, which is expected to reach about 16 million by 2030, 20 million by 2040, and 25 million by 2050. As elsewhere in Africa, one of the striking characteristics of its population is its youth.

Maritime Guinea or Lower Guinea, which is the subject of this study through the three target areas, is a low-lying coastal region. The climate is sub-Guinean. Rainfall often exceeds 2,000 mm annually. This region is characterized by mangroves, which cover 18 percent of the national territory. Economic activities are mainly based on rainfed rice cultivation, fishing, fruit growing, industry, mining, services, etc.

The region is home to 30 percent of the Guinean people. The population is mainly concentrated in the capital, Conakry, which is also the main place of settlement for internal migrants and immigrants, mainly from the West African subregion.

Maritime Guinea brings together three highly differentiated ecosystems. Each one has specific characteristics and morphodynamic functioning, and thus its own development potential and constraints. However, the extent of the interactions that link the tidal marshes to the mangrove swamps at the foothills on the one hand, and to the continental shelf on the other, suggests that these three ecological units should be considered as constituting a complex system within which each is heavily dependent on the others for biophysical and development reasons.

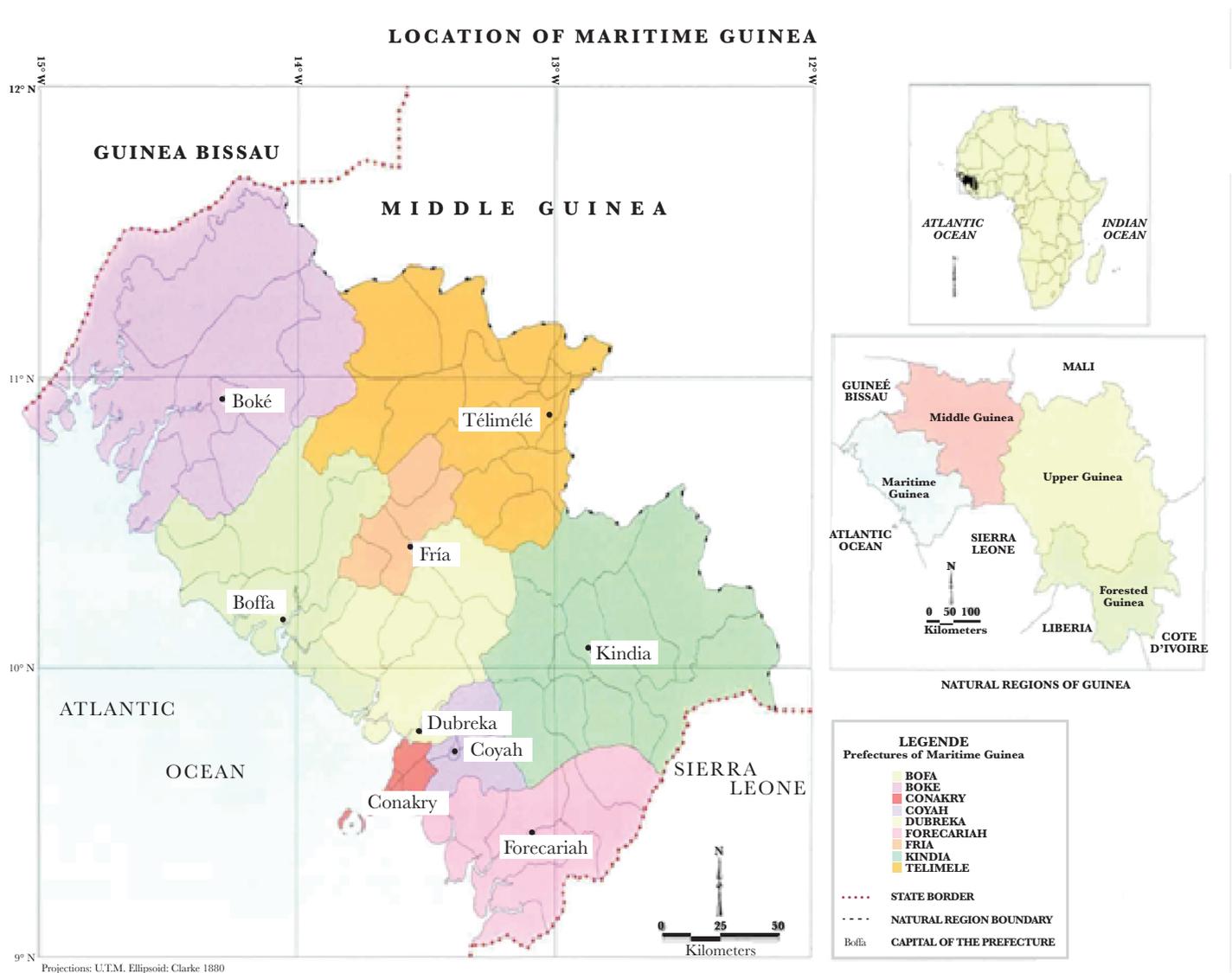
Indeed, with the exception of the highlands and slopes, which exclusively play the key role of sediment production, the ecological complex is essentially built around hydrological flows. They allow the circulation and transfer of mineral and organic elements from one ecological unit to another, maintaining the productive potential of the mangrove soils by sedimentary contributions conveyed by agitation and marine

currents, and enriching coastal waters by terrigenous contributions from floods. As we have noted, the most original ecosystem and the one that offers the greatest diversity of resources is the mangrove. It cannot be considered to be uniform. Under an apparent monotony, it is a real mosaic of microenvironments that is at the origin of multiple interfaces.

It is the abundance of these interfaces that generates considerable biodiversity and productivity in a relatively small area. The distinctive characteristics and dynamics

mentioned above prevent the mangrove ecosystem of the Guinean coast from being seen as a simple interface between ocean and continent. Its spatial extension and the specificity of the ecological conditions that characterize it and that have led to a specialization of its flora and fauna, make the mangrove an ecological unit in its own right. The interpenetration of the ecological units linked to the climatic hydrosedimentary variations has produced a mosaic of microenvironments with diversified potential (Mangrove Observatory, Atlas Infographique de la Guinée Maritime, 2001).

FIGURE 1: MAP OF LOWER GUINEA



Source: Atlas Infographique de la Guinée Maritime

1. SUBPREFECTURE OF KABACK

1.1. **Geographic location of Kaback:** The Rural Commune (RC) of Kaback is an island located 60 km from the capital of the prefecture of Forécariah between 09°16 and 09°24 north latitude and 13°19 and 13°25 west longitude at an altitude of 47 m above sea level.

The Kaback RC is located at the center of a delta formed by the Soumbouyah, Moribay, Kissis-kissi, and Méllakoré rivers. This delta is mostly composed of the islands of Kakonia, Kaback, and Tana.

1.2. **Human environment:** The RC has 27,362 inhabitants over an area of 116.2 km², divided into eight districts, 32 sectors, and 64 hamlets. The average size of a family is seven people. The population of the Kaback RC is essentially composed of Susu. The Peulh, who engage in small-scale trade, are welcomed and housed by the local population. The dominant language is Susu. Also present are the Témínè, the Baga, and the Malinké people. The Kaback RC has eight districts.

1.3. **Climate:** It has a tropical climate with oceanic influences, known as the Maritime Guinean tropical climate.

1.4. **Soil:** Alluvial fluvio-marine soils.

1.5. **Hydrography:** The RC has a hydrographic network made up of rivers and the Kenèndé, Khouloundé, and Gbérébounyi basins, all of which have a regular pattern and flow into the sea.

1.6. **Vegetation:** The island of Kaback is almost entirely made up of coastal plains; they include three swampy forests located in the mangrove hinterland in which the water table, having no impact in the dry season, still provides constantly moist soil. These are the forests of Kèka, Karangbani, and Filitagui.

1.7. **Wildlife:** Wildlife would have been abundant and varied a few decades ago. But as their refuge, namely the forest formations, have become increasingly depleted, the animals have become scarcer. We can note, however, the presence of various primates, such as duikers, agouti, and squirrels. The aquatic fauna remains abundant in spite of the strong pressures to which it is subjected (Source: Kaback PDL, 2015-2019).

2. SUBPREFECTURE OF KANFARANDÉ

2.1. **Geographic location:** The RC of Kanfarandé has the distinction of being made up of several islands and a section that is entirely on the mainland, making it a unique region in the Republic of Guinea.

Formed by 15 districts, seven of which are on the islands, the Kanfarandé RC covers an area of 1,725 km². It derives its distinctiveness from the Tristao islands, composed of a group of islands and islets that extend to several marine environments up to the border with Guinea-Bissau.

The 15 districts of Kanfarandé are fairly homogeneous in size, with the exception of Koukouba district, which at 161 km² represents 14 percent of the territory of the RC. This size is undoubtedly related to the physical specificity of this district.

Only the Kambilam district is entirely on the mainland, with no tidal areas. It is also in this district that the largest sector of Kanfarandé is located: the Bissitè sector, covering 64 km². This is the most isolated sector in the RC, because this sector has few cultivable areas and lacks the amphibian component, thus reducing the diversity of agroecological features and making it less attractive to the population.

Kanfarandé is one of the largest RCs in Maritime Guinea, but it is also one of the most heterogeneous because it is fragmented into multiple small islands that are all sectors. This subprefecture faces many problems related to

its particular nature. The island areas of the RC are often less isolated than the few mainland areas because of the absence or inadequacy of communication infrastructure.

- 2.2. **Climate:** It has a tropical coastal climate with two distinct alternating seasons: a dry season that is becoming progressively longer, from November to May, and the rainy season from June to October.

The rainfall toward the coast amounts to 3,000 mm annually. Temperatures vary widely and in March, April, and May, temperatures climb to 40 °C and above. In November and January, the average is lower, at 20 °C.

The atmospheric humidity is high, averaging between 60 and 80 percent. The monsoon is the dominant wind coming from the sea, while the harmattan blows from the continent toward the sea. However, it has very remarkable effects (cold nights, dry and hot winds during the day).

- 2.3. **Terrain:** The terrain of the RC of Kanfarandé is slightly rugged. From the sea to the mainland, there are vast mangrove lowlands, hinterland mangroves, and relatively fertile shallows.

- 2.4. **Vegetation:** The low population density and extensive size of the Kanfarandé RC explain the existence of large areas of forest and savanna. In some areas, there are several stands of dry and humid forests. These areas also include locations that are worthy of note owing to their unusual character within the RC, such as the areas of Katfoura and Tchangban and the bird island of Alcatraz, to name a few.

- 2.5. **Like the other RCs, Kanfarandé comprises mainly two distinct types of forest formations:**

» **The mangrove formation:** it covers the entire coastline and is fully exploited by woodcutters, fish smokers, salt extractors, oyster pickers, and other users for domestic

purposes. It is also the spawning ground of halieutic species (fish and others) and a transition area for migratory birds.

» **The forest formations:** composed essentially of shrub and grassy savanna, these types of formations are favorable to the species of *parinari exelsa*, *haroungana madagascariensis*, *waru chamae*, *combretum*, *diopiros heudeloti*, and others. It is noteworthy that this zone is subject to bush fires caused by herders and farmers. The lack of appropriate techniques means that every year hectares of forest go up in smoke.

- 2.6. **Hydrography:** Inlets, estuaries such as the Rio Campony, Rio Baranba, and Rio Nunez, and water bodies (the Tonkima, the Boffadar marsh creeks, and the Dobaly marsh creeks) form the hydrographic network of the Kanfarandé RC.

Large estuaries carve out this coastline and divide up the RC between the border and the Rio Nunez. Farther south, the Rio Campony separates the four isolated districts of Kapkin, Kasmack, Kadignet, and Katfoura from the large group of islands and peninsulas in the south. The large group of Kanfarandé districts is located between the Rio Kogon to the north and the Rio Nunez to the south and is crossed by a very dense network of tidal channels, the two main ones being the Tonkima and Boffadar marsh creeks.

- 2.7. **Population:** The Kanfarandé RC has a population of more than 21,796 inhabitants spread over two distinct zones (the islands and the mainland) with a total area of 1,725 km². It is one of the largest RCs in Maritime Guinea. The population of the Kanfarandé RC is certainly one of the oldest on the Guinean coast. While the population is still small, it is made up of distinct ethnic groups according to their geographical location: there are the Nalu, Balanta, and Baga in the island zone, and the Landouma, Diakanké, Diola Peuhl, Susu, and the Nalu in the mainland part of the RC.

Kanfarandé is the most northerly of the Guinean coastal RCs, bordering Guinea-Bissau to the northwest, and bounded by the RCs of Sansalé to the north, Tanènè to the northeast, Kolabouyi to the east, and Kamsar to the southeast.

2.8. **People's occupations:** The main productive activities in the Kanfarandé RC are fishing, agriculture, livestock production, palm oil extraction, traditional salt extraction, poultry farming, and small-scale trade.

2.9. **Fishing:** It should be noted that because of its position in relation to the sea, Kanfarandé is an important part of the Guinean coastline, where intensive artisanal and industrial fishing activities are carried out. Owing to these abundant and rich halieutic resources, the fishing sector is by far the most profitable activity for the people. The Kanfarandé RC offers immense fishing potential, thanks to the Atlantic Ocean and the inlets that facilitate the reproduction and proliferation of numerous fish species.

Fishing has become a source of employment and labor, owing to the various production chains involved (fishers, fishmongers, smokers, buyers, etc.).

Various materials are used, according to the types of fishing. Generally, there are dugout canoes and pampas (type of boat), nets with different mesh sizes depending on the type of fish to be caught, hooks, and so on.

Artisanal fishing is practiced in the open sea and in estuaries, inlets, and channels.

2.10. **Agriculture:** Agriculture is one of the main economic activities in Kanfarandé RC; it employs the largest proportion of the active workforce. This essential activity is strongly influenced by the different landforms and the habits of the farmers, depending on the ethnic group. Despite the diversity of zones and ethnic groups, a large part of the population engages in this activity, although it remains subsistence agriculture.

The farming system is predominantly rice cultivation. Flooded rice cultivation in the mangrove is the most productive in the region and is practiced mainly by the Nalu, Baga, and Balanta. Rice cultivation is closely followed by the growing of cashew nuts, peanuts, fonio, cassava, and maize. Fruit crops are not well developed. Fruits such as mangoes, coconuts, kola nuts, oranges, and bananas are grown. Acajou ("cashew") cultivation is developing at an increasing rate.

In this RC, two production systems corresponding to the following morphological units are practiced by the people:

» **The coastal plain (mangrove):** an excellent area for flooded rice cultivation based on transplanting; this is the preferred area of the Nalu, Baga, Balanta, and Djola. The biggest production of rice in the area comes from this section;

» **The transition zone (mangrove-plain):** Slash-and-burn agriculture is practiced in this zone where the Peulhs, Landouma, Diakhanké, and Nalu are found. The main crops in this zone are cashew nuts, fonio, corn, groundnuts, hillside rice, and cassava.

It should be noted that crop yields on the hillsides are often exceptionally low (500 to 800 kg per ha for rice, and 300 to 500 kg per ha for other crops).

2.11. **Livestock:** Although agriculture and fishing are the main economic activities, livestock farming is no less important in social and economic terms. The livestock population is mainly composed of cattle, sheep, goats, pigs, and poultry. Despite the abundance of plains and grazing areas, livestock farming remains poorly developed, most likely because of the isolation of the area, which makes it difficult, if not impossible, to sell livestock products and by-products, and also because of the geographic location of the RC, where a large part of the land is located on the islands. Second, pig farming is an activity practiced exclusively by the Balanta. Indeed, the pig is an important part

of the Balanta culture, especially during funerals, initiations, and field work. Pig rearing is based on seasonal migration.

- 2.12. **Extraction of palm oil:** This activity is practiced by all ethnic groups, mainly by women, in order to meet their consumption needs at the weekly markets. Income is generally low, given the remoteness of the settlements and the time spent using methods that are, for the most part, rudimentary. The income is generally used to maintain the balance between agricultural, fishery, and livestock products in households.
- 2.13. **Traditional salt extraction:** once practiced solely by the Baga and Nalu, this activity is now practiced by all the ethnic groups of the RC on the islands and on the mainland. Salt extraction balances the budget of many households. It enables some women to cover their expenses independently. In terms of local consumption, needs are largely met on the coast and in many of the surrounding subprefectures. Salt is also used for smoking fish on the islands.
- 2.14. **Commerce:** This activity is not developed on the mainland of the RC. It is practiced on a large scale in the islands where traders, generally the Peulh, are based in the fishermen's camps. At this level, bartering or the exchange of products for money is practiced (Source: Kanfarandé PDL, 2017).

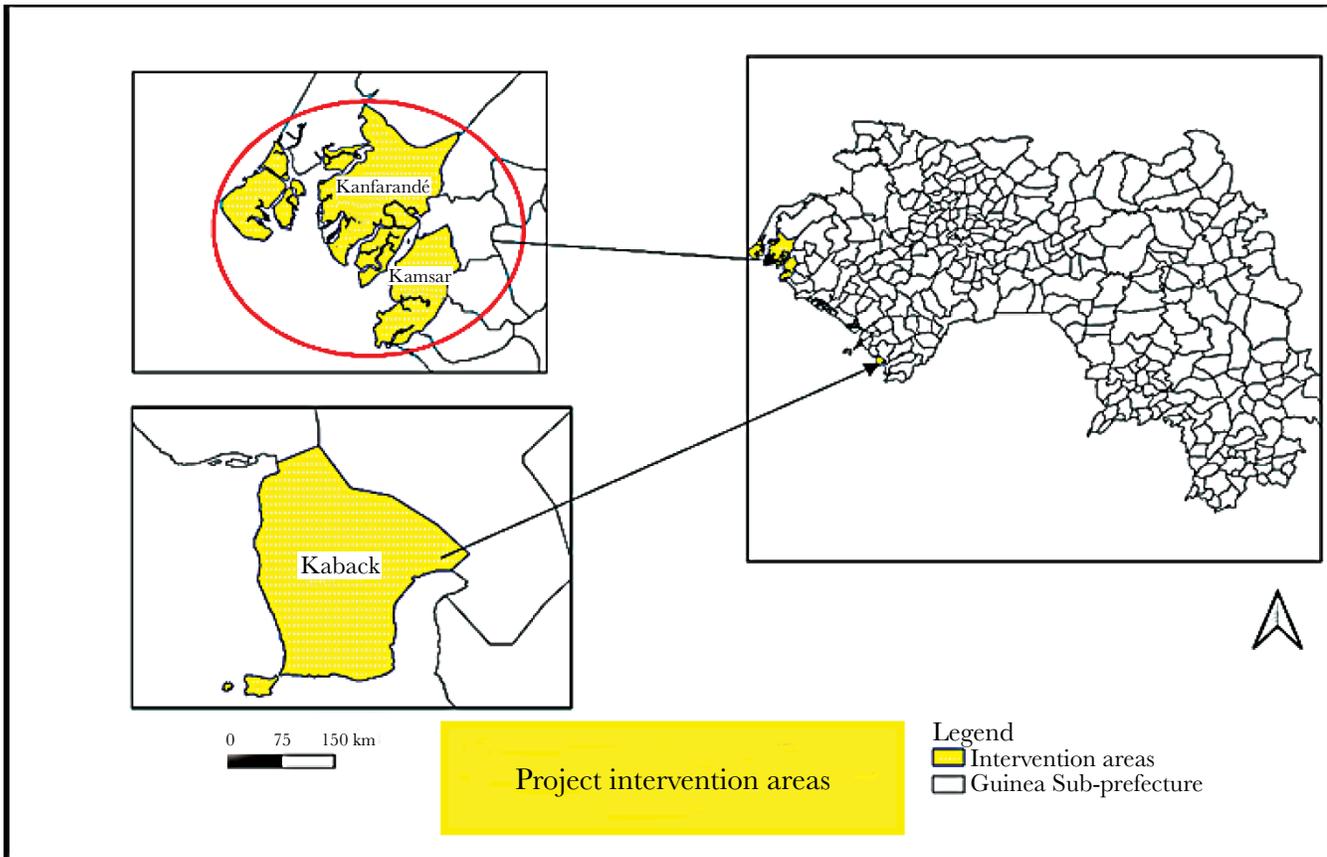
3. SUBPREFECTURE OF KAMSAR

- 3.1. **Geographic location:** Located 35 km southwest of the prefecture of Boké, the RC of Kamsar is bordered to the north by the Rio

Nunez and the subprefecture of Kanfarandé, to the south by the subprefecture of Bintimodia, to the east by the subprefecture of Kolaboui, and to the west by the Atlantic Ocean. It covers an area of 472 km².

- 3.2. **Climate:** The subprefecture of Kamsar on the Atlantic coast has a climate dominated by sea winds and has two alternating seasons: a rainy season from June to November and a dry season in December.
- 3.3. **Terrain and hydrography:** In Kamsar, there is a coastal plain about 50 km wide. Numerous rivers (*rios* in Portuguese) irrigate this plain before flowing into the sea. These *rios* are navigable in all seasons.
- 3.4. **Vegetation:** The vegetation is dominated by the mangrove, with mangrove trees 5 to 10 m high. Palm and coconut trees also grow in this area.
- 3.5. **Population:** The subprefecture has a population of well over 360,000 inhabitants and is part of the Boké prefecture. Originally a small fishing village, it is now a town in northwestern Guinea located about 3.5 hours north of Conakry on the Rio Nunez estuary of the Atlantic Ocean. It is an industrial center for the Compagnie des Bauxites de Guinée (CBG), with a rail connection to the nearby Sangarédi plateau, which is one of the world's largest bauxite reserves. It covers an area of 472 km².

FIGURE 2: MAP OF STUDY AREAS



Source: Gadmin

V. METHODOLOGY AND RESULTS OF THE STUDY

The methodology used in this work is based on three elements: the collection of information, the processing and analysis of data, and the drafting of the final document.

1. LOCATION OF THE STUDY AREAS AND SELECTION OF DISTRICTS

Within the three areas of study, a number of criteria for mangrove-centered activities in the estuary zones were established.

In Kaback, the districts of Bolimanda, Seydouyah, Matakan, Bossimiyah, and the Kenendé sector were

selected. These districts were selected on the basis of the level of women's activities in the mangrove.

In Kanfarandé, we selected Kanof, Kankouf, and Tesken, a sector of the Kanfarandé Centre district, because of the mangrove coastal zone and the life of the islanders, which offered the prospect of studying activities focused on the mangroves and women.

In Kamsar, Taigbé and Taidi were also chosen for the same reasons: to observe the island communities in their daily life.

The charts contain information on mangrove-centered activities, socioeconomic life, demographic characteristics, policy rules and regulations on the mangrove, among others.

2. DATA COLLECTION

This was the first phase of the project, which consisted of a review of the literature and lessons learned from national and institutional activities, through field visits, administration of questionnaires and interview guides, data collection, sample analysis, and photography of impacted areas.

The methodology was therefore as follows:

- » The documentation was the starting point and the most essential part of this work, in that it allowed for a better understanding of the objective of the study and a more accurate picture of the area. Thus, various works and websites dealing with the link between mangroves and women and the benefits they derive from using these products were consulted. The study was based on consultations and leveraging the findings contained in official documents on mangroves, with a focus on the role of women in the Republic of Guinea. We consulted and used mainly (i) policy and strategy documents on mangrove management from the Ministry of the Environment, (ii) activity reports from scientific research institutions, (iii) final reports from projects financed by Technical and Financial Partners (TFPs), and (iv) reports on environmental and social impact studies conducted in the coastal zone.
- » The field visits consisted of visiting the three sites selected for the study, mainly in the districts bordering the estuary, to identify the sites where mangrove-centered activities are more visible. The questionnaires were administered during the visits in the 10 neighboring districts spread over the three study areas.
- » The questionnaires targeted 150 people distributed as follows at each site: 10 oyster pickers, 10 salt producers, 10 fish smokers, 10 palm oil producers, four rice farmers, two mangrove wood sellers, one agent from the environmental service, one agent from the coastal management center, one NGO agent, and an elected official from the commune, for a total of 50 people per study site. However, these targets were not met, owing to the reluctance of respondents to answer questions and the timing of some activities, such as palm oil and black soap production, which had not yet begun.
- » The household questionnaires included individual forms on mangrove-centered socioeconomic activities and were administered to 28 households in the subprefecture of Kanfarandé Centre, specifically in the districts of Kanof, Kankouf, and Tesken; 12 households in the subprefecture of Kamsar, district and sector of Taigbé and Taidi; and 24 households in the subprefecture of Kaback, districts of Bolimanda, Bossimayah, Matakan, and Seydouyah. Thus, with 5 to 10 questionnaires per district, we were able to collect information on the link between women and the mangrove and the benefits they derive from it through their activities, the roles they play in its conservation and/or restoration, and the causes and consequences of its degradation or disappearance, among other things.
- » This was followed by the introduction of an interview guide for local informants, including district chiefs, elders, members of the assembly and leaders of community organizations, and the prefectural directors of the decentralized services of the Ministry of the Environment. Thus, 20 local informants were interviewed in the three study areas; seven prefectural directors of the three sites; and two NGOs.
- » In addition, five focus groups were formed and six observational interviews were conducted in the three study areas.
- » With the help of a digital camera and a cartography expert, photographs were taken in the three study areas and in the districts whose geographical coordinates were recorded with Earth software.
- » Lastly, the collection of various data analysis samples in areas with low, medium, or severe degradation.
- » The household survey was conducted from January 25 to February 4, 2022. The main sites for the survey were Kamsar, Kanfarandé, and Kaback (Lower Guinea).

3. PROCESSING AND INTERPRETATION OF QUESTIONNAIRES

The relationship between mangroves and women cannot be addressed without considering the dependence of women on this environment, which is a source of income and household subsistence. Without their involvement, we would not understand their reasons for using the products of the ecosystem; hence the need to seek their opinions on the various activities they carry out in this environment and their impacts on the environment. Thus,

questionnaires were administered to the majority of this vulnerable group in the three study areas of Kaback, Kanfarandé, and Kamsar.

These questionnaires targeted households whose subsistence activities depended on mangrove products.

Pirogue (narrow canoe) trips were made to observe mangroves and mangrove-centered activities in all 10 districts of the three study areas. Some districts visited were only reachable by pirogue.

PHOTOS 1–23. PHOTOGRAPHS TAKEN DURING THE FIELD VISITS IN THE THREE STUDY AREAS



Photo 1. Raising awareness about mangroves in Tesken



Photo 2. Family photo in Tesken mangrove.



Photo 3. Scraping of salt brine powder in Kanof.



Photo 4. Collection of salty soil from a *tanne* (salty lands) by Kankouf women.



Photos 5, 6. Wood on Kankouf landing bay for sale and salt bagged last year.



Photo 7. Women working up to 22 hours a day in Tesken.



Photo 8. Funnel for filtering brine in Tesken.



Photo 9. Mangrove wood cut in the mangrove.



Photos 10, 11. Market gardening in Kanfarandé Centre.



Photos 12, 13. Oysters hanging on mangrove root and shells in Kankouf.



Photos 14, 15. Fish smoking facility in Kanfarandé Centre.



Photos 16, 17. Access bridge to Taigbé in the Kamsar area. Pirogue sunk in the mud in Taigbé.



Photos 18, 19. Smoking at home in Taigbé.



Photo 20. Traditional salt preparation site in Taigbé.



Photo 21. Reddish mangrove leaves affected by bauxite residues.



Photos 22, 23. Hectares of rice fields in Taigbé.

The following information was obtained from the results of the survey.

4. PROCESSING AND INTERPRETATION OF THE RESULTS OF THE SURVEY OF KABACK, KANFARANDÉ, AND KAMSAR

❖ COMPONENT ON THE SEMISTRUCTURED QUALITATIVE SURVEY

SITE 1: KABACK

1. Mangrove-centered activities in Kaback

Mangrove-centered activities in the Kaback area include fishing, smoking, oyster picking, logging for the construction of fishing canoes and for domestic purposes, salt production, rice farming, red oil production, black soap production, shrimp fishing, and bread ovens, according to the Prefectural Director of the Environment and Sustainable Development (DPEDD). All of these activities are practiced in the coastal areas of the Republic of Guinea, particularly in the Kaback area.

Rhizophora racemosa and *R. harrisonii* are the most widely used plant species and constitute the primary fuel for smoking fish to enhance its taste, for domestic energy, and for salt production. There is a real disparity between wood

harvesting and the potential of each of the logging sectors; as a result, mangrove wood resources are dwindling under the pressure of logging.

Traditional fish smoking techniques rely on the use of intense and prolonged heat that dehydrates the fish by about 70 percent of its weight. This operation fills the fish with antiseptic substances in the smoke and gives it an appreciable taste. This activity is often carried out by women. According to artisanal fishing statistics, nearly 26,000 metric tons of fresh fish are caught each year, and it is estimated that 80 percent of the fish is smoked, and that 90 percent of the wood used for smoking is taken from the mangrove. At this rate, the consumption of wood risks accelerating the disappearance of the woody capital of the mangrove. The “*koumbousi*” type of smoking uses on average 2.85 kg of wood per kg of fish. The “*banda*” type uses 3.10 kg of wood for each kg of fish and is the most popular (Maadjou BAH, National CBD Focal Point) SD.

In the Kaback area, artisanal fishing is more advanced than all other activities, but it is practiced only by men, and the types of fish caught are machoiron, *Ethmalosa fimbriata* (bonga), *Arius spp* (machoiron), *Sardinella maderensis* and *Sardinella aurita* (sardinella), and *Sphyraena barracuda* (barracuda). Women in the mangrove fish mainly for tilapia, crabs, and oysters.

2. Mangrove-centered activities of women in Kaback

Mangrove-centered activities of women in Kaback include fish smoking, logging (cutting and selling mangrove wood), harvesting mangrove fuelwood for domestic purposes, salt extraction, rice cultivation or lowland rice cultivation, market gardening, and oyster picking; women most often practice these activities to provide for their families. The commercial exploitation of wood is now an emerging activity in Kaback. The mangrove forest is an essential energy resource for the development of new economic opportunities. Also, owing to the lack of modern smoking centers, many women smoke their fish at home using machoiron, tilapia, *Ethmalosa fimbriata* (bonga), and other types of fish.

The women, however, cut mangrove wood for commercial and domestic purposes, and at times face enormous difficulties such as physical injury during the harvesting of the wood. The men are more involved in fishing and rice cultivation, and they sometimes engage in logging for the manufacture of boats using *Rhizophora*, which is considered to be a resistant wood. There seems to be a division of roles between the sexes.

The activities practiced by both men and women are often rice cultivation or the cultivation of lowland rice, called *Bora Maâlé* in the Susu language, and market gardening. The men plow to prepare the land and build dikes. The women plant the rice nurseries. The men are also involved in salt production and building the *tanké* (type of filter).

Of the women interviewed in Kaback, 46 percent engage in smoking fish, 25 percent in logging (cutting mangrove wood), 8 percent in rice cultivation, 8 percent in oyster picking, 8 percent in salt extraction, and 5 percent in market gardening. However, since these activities are highly dependent on mangrove wood, the uncontrolled harvesting of mangrove wood remains the main activity of women in the coastal areas of Kaback.

In addition, the biggest problem in the Kaback area is the rise in salinity in the rice plains, which has led to a decline in the profitability of rice-growing operations. Communities

are faced with the depletion of uncultivable soil because of the salinity level. This is reflected in the responses of the women interviewed: the number of people dependent on mangrove products has increased by 71 percent, while activities in the mangroves fell by just 29 percent.

It should be noted that logging remains the main economic activity of the rural communities in the coastal areas visited in Kaback. *Rhizophora racemosa* is mainly cut for sale as wood for smoking fish. Also, bakers use it for baking bread, salt producers for cooking, soap making, and the production of red oil during cooking.

Rice cultivation in the lowlands and market gardening are often intended for household consumption, depending on the harvest; since all these products are grown extensively in the rainy season, agricultural production depends largely on rainfall. For this very reason, rice and market gardening cannot be considered stable economic activities.

In addition to logging, the most important economic activities practiced by the women of Kaback are fish smoking, rice farming and salt extraction. These activities are a means of spreading risk in the household budget. Oyster picking is mainly for domestic consumption. According to one female oyster picker, “a basin of oysters after drying can yield 3 kilos of oysters.”

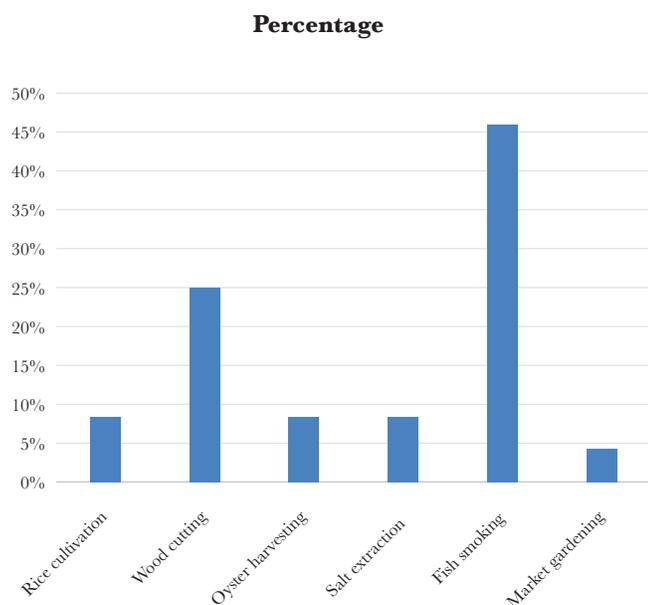
On the islands and in the coastal area, fishing is considered a primary economic activity for men. Large-scale fishing is carried out using motorized canoes in the coastal area, while in the islands with limited access to the market, artisanal fishing and processing of fish products are practiced.

In general, the harvesting of mangrove wood for sale is done throughout the day on a full-time basis, depending on the tides, and most women depend on these mangrove products for both subsistence and commercial purposes.

TABLE 1: MANGROVE-CENTERED ACTIVITIES IN KABACK

Activity	Percentage
Rice growing	8%
Wood harvesting	25%
Oyster picking	8%
Salt extraction	8%
Fish smoking	46%
Market gardening	5%
Total	100%

GRAPH 1: ACTIVITIES BY PERCENTAGE



3. Mangrove products for domestic consumption or commercial sale

In Kaback, only 20 percent of mangrove products are destined for family consumption, while 80 percent are marketed and sold in local markets for commercial income. Profits from mangrove products are often spent on food, clothing, schooling, and family health. Most women who produce mangrove products depend on them. *Rhizophora racemosa* wood is cut into small pieces by the women and piled up before being sold at the local market. A pile of three pieces (kg equivalent) of wood can cost GF 5,000,

and buyers often come to collect it at the landing bay. Small branches of *Avicennia* are often used as fuelwood for domestic consumption.

A woman interviewed in the Kenendé sector of the Seydouyah district told us the following story: “We have been in the mangroves since we were children, and we used to accompany our mothers in selling mangrove wood; today, it is our main activity and source of income. In the past, 20 years ago, the profits from mangrove products covered the primary and secondary needs of the family. I was able to pay for my children’s education, clothing, food, and so on, but today there is a decline in products, and we are increasingly poor. The only way to survive is to turn to rice growing or market gardening, and there too the dikes have broken down and it is difficult for us to obtain 10 bags of rice in our fields because of the high level of salinity.”

In the Kaback region, particularly in the Seydouyah district of the Kenendé sector, the women who cut mangrove wood do so for commercial purposes, and it is their main source of income. They are the ones who cut the wood and chop it up before reselling it. It is a full-time activity, and the harvesting of mangrove wood is organized according to the tides. The Kenendé sector is home to a mangrove wood market managed by women.



Photo 24. Mangrove wood piled up by women.

In the districts visited at the Kaback site, the secondary activities of women include harvesting oysters and making coconut oil, palm oil, and soap.

However, in the district of Matakang, fish smoking remains the main activity of women, followed by market gardening, small trade, and the sale of oyster cakes, among other things.

According to the president of the Matakang district, the mangrove belongs to the State and the Kaback community. Access is open in some places, such as in Kenendé, Bolimanda, and Bossimiyah, but in Matakang the community has introduced, through the local authorities, a monitoring system and a ban on cutting mangroves. Access is therefore controlled in this community, but despite this restriction, women still enter the mangrove to harvest the wood.

4. Socioeconomic and demographic characteristics of the representative sample of Kaback women engaged in mangrove activities

Of the women interviewed, 43 percent are between 20 and 35 years of age; those between 35 and 45 years of age represent 28 percent, while 29 percent of these women are between the ages of 45 and 65 and over. Despite this diversity of ages, all of the women interviewed have been engaged in mangrove-centered activities for more than 20 years. The Susu ethnic group still represents the majority of Indigenous villagers.

Women between the ages of 20 and 35 are often involved in oyster harvesting, market gardening, mangrove wood cutting, and fish smoking. These are the youngest and most active, while those between 36 and 45 years of age are mainly involved in fish smoking, and sometimes in wood cutting and salt production. The women who smoke fish do not necessarily cut mangrove wood. The oldest women, aged 46 to 65 and over, are often the ones who practice market gardening and rice cultivation, salt production, or sometimes fish smoking. The younger women help them in their work.

The main activity of the women of Kaback is smoking fish, practiced by 46 percent of the women interviewed; mangrove wood cutting comes second, at 25 percent, while salt extraction accounts for 8 percent of the sample.

The majority of women respondents have no formal education. Some 80 percent say they have never studied, 12 percent have a high school education, and 8 percent have a basic education. Women respondents who are engaged in a mangrove activity are either married or widowed and have a high number of dependents. A local informant in Bolimanda district told us that a household may have as many as seven to eight dependent children.

The proportion of household income was considered 70 percent to 80 percent satisfactory 20 years ago and met the needs of the household, but today the household income is no longer adequate and is generally low: 60 percent of the women interviewed confirm that they have an average income that covers only 45 to 60 percent of the family's needs, while 40 percent state that their income is 30 to 40 percent too low. This decline in income in the mangroves is reflected in the degradation of the areas and anthropogenic pressures. It was noted in all the districts visited in the Kaback area that when fishing flourishes, the incomes of the fish smokers increase by 60 to 70 percent, whereas when the catches decrease, people are faced with serious livelihood challenges.

The Indigenous people of the Susu ethnic group carry out 38 percent of the activities in the mangrove, while only 22 percent are migrants who have settled in Kaback and are often involved in fishing and small-scale trade.

The study showed that the women of Kaback have not benefited from any mangrove restoration projects except in the district of Bossimiyah, where an NGO, **Mouvement Sauvons nos Iles (MSI)**, had initiated a mangrove rehabilitation project one year ago in degraded areas that are currently being regenerated.

5. Seasonal activities of women engaged in mangrove activities

Fish smoking and woodcutting are done annually by women on a full-time basis. The two activities complement each other and go hand in hand. Mangrove wood for smoking fish is purchased in quantity and stored in the smoking sheds. A pile of three pieces of wood can cost GF 5,000; the women can sell from GF 300,000 to GF 500,000 worth

of wood per day, depending on the needs of the buyers. People celebrating weddings and christenings prefer it to other fuelwood. Commonly called *kinsi* in Susu, the price soars during the rainy season because of the difficult access to mangroves during the lean season. In addition,

salt production, oyster picking, commercial logging, soap making, rice cultivation, market gardening, and red oil and coconut production are practiced seasonally and part-time for domestic purposes.

CALENDAR OF SEASONAL ACTIVITIES BY MONTH

Category	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Women	Salt production, oyster harvesting, logging, soap making, palm oil				Rice growing, fish smoking			Rice growing, market gardening, fish smoking				
	Smoking and mangrove harvesting are practiced all year round.											
Men	Logging, fish preparation				Fishing, plowing fields, repairing dikes			Rice growing, fishing				
Both men and women	Logging, repairing of salt filters				Plowing and field preparation			Rice growing				

6. Willingness to switch to alternatives to mangrove products

The women who work with mangrove products have no other source of livelihood or income from alternatives; they depend solely on this environment. Most of the women interviewed said that they are now willing to switch to other alternatives if the resources are made available to them. They are determined to stop this activity because the benefits they receive from it do not cover 100 percent of their family's needs, and the opportunities for alternatives are often limited. They would like to practice general trade (chafing gear, sale of fishing equipment, and so on), training in income-generating trades, entrepreneurship, building modern smoking centers, as well as receive training in new smoking techniques, training in the production of solar salt, training in dyeing, creating community centers for women's empowerment (associations, women's groups, cooperatives, and so forth).

Eighty percent of the women interviewed in the Kaback area are seeking funding to create income-generating activities (IGAs) or economic interest groups (EIGs), or to set up market gardening activities or businesses in general. They are not abandoning fish smoking but are asking

for the construction of modern ovens that consume less fuelwood, such as shorkor ovens. About 20 percent of the women interviewed say they are not quitting the activity (fish smoking), but rather are seeking to modernize their practices by building their capacity, but are determined to abandon mangrove wood cutting.

Notwithstanding the degradation of the rice fields, the women are calling for the rebuilding of the Kaback dikes. As the elder of the Bolimanda district told us, if the rice paddies are 100 percent operational, activities in the mangroves will cease concomitantly. Harvests are currently low in the rice paddies because of the high level of salinization, thereby exerting pressure on the mangroves.

7. Mangrove conservation and restoration

We had little information on mangrove conservation and restoration efforts. However, an NGO called "Mouvement Sauvons nos Iles" (MSI) had initiated a mangrove restoration project in the Bossimiyah district, where the barren areas were replanted one year ago. The women's role in this project was to water the mangrove nurseries and to assist in the reforestation of the plants with the men; the mangroves are very young and are currently in a regeneration phase.



Photos 25, 26. Regenerating mangrove trees in the district of Bossimiyah.

According to the district president, *“the efforts made by the Bossimiyah communities to monitor and ensure the proper management of the replanted mangroves are notable and are generally advocated by the sector chiefs of the surrounding communities through awareness campaigns. We conduct outreach campaigns during the lean seasons to help them understand the danger of mangrove cutting and the benefits that these products provide.”*

In the district of Matakang, the community itself, in collaboration with the president of the community’s youth group, has set up committees known as mangrove monitoring brigades, on which women are represented, to provide protection. Their roles are to maintain the stability of the ecosystem by advising other women not to intrude on it.

Moreover, in the Matakang area, the cutting of mangroves is totally prohibited. According to the village elder, Mayor Ibrahim, *“we must protect our environment, especially since we are in an area submerged by the sea. The only protection for us is the mangroves (in Susu, worifiri) that surround us. Our role as village elders is to advise women and youth not to destroy our environment.”*

The study found that conservationists in the Kaback area are not well equipped and often face enormous problems in traveling to experience the realities of the mangrove forests; it also found that monitoring is limited to the landing bay of the mangrove forests.

8. Women’s activities in mangrove conservation, rehabilitation, and/or restoration

A key section of the questionnaire focused on mangrove conservation efforts by women. In this section, we did not obtain much information on mangrove conservation projects, as the women interviewed said that they had never experienced mangrove restoration projects, except for one project in Bossimiyah district. The women involved in this project were located 500 m from the reforestation site. During the preparatory phase, they participated in decision-making and were responsible for watering the mangrove nurseries and assisting the men in reforesting the plants. They were regularly active and responsible for monitoring the reforested areas.

According to the Prefectural Director of the Environment and Sustainable Development (DPEDD), the population dependent on mangrove products is increasing, owing to the influx of migrants to Kaback. In the past, a RASK project led by Dr. Kandet Bangoura was undertaken, where the women of the locality created a mangrove forest on the coast. The role of the women in that project was to plant mangrove nurseries in barren areas in order to reforest and create new nurseries. Unfortunately, the project was discontinued.

During the study, we found that some women had adopted an adequate system or technique to conserve this environment. The women who pick oysters now scrape the

base of the mangrove trees, whereas before they used to cut the roots of the mangrove trees to extract the oysters. Also, women salt producers have remained in the same place each year to collect brine before starting the activity, whereas in the past they used to cut the *Avicennia* to allow the salt water to filter through each year in different areas.

Other households are faced with a lack of resources to participate in diversification activities or in the monitoring of mangroves; although they are aware that the mangrove is gradually being depleted, for lack of other resources they continue to venture out in search of a livelihood.

In the districts visited in Kaback, some women who harvest mangrove products claimed that the mangrove tree restores itself naturally. Therefore, according to them, mangroves can be restored and regenerated without human effort; however, they are willing to join an NGO or a mangrove restoration project.

9. Demographic and socioeconomic characteristics of women engaged in mangrove conservation

The women engaged in mangrove conservation activities are between 20 and 45 years of age, active and young, and are engaged in mangrove-centered activities. They are either married mothers or widows and have more than 20 dependents. Of the women interviewed, 90 percent are Indigenous, while the 10 percent considered to be migrants are women who have married Indigenous men and who have also been resident in the localities for more than 15 to 30 years. Their level of education is low.

10. Challenges faced by women in mangrove conservation

Most of the women interviewed said that they face financial challenges, and that mangroves are the only place where you can easily make money if you have the determination. The study also showed that the women who cut mangrove wood are willing to abandon this activity, which is extremely dangerous. Likewise, those who smoke fish want to improve smoking conditions through the shorkor ovens that the PRAO-GN project

is building in Koukoudé; these are modern ovens that consume less fuelwood. With regard to salt extraction, the women are asking to be trained in the production of solar salt on tarpaulins.

As a woman interviewed in Bossimiyah told us, “We have let the mangrove regenerate, but we have problems with market gardening, as our plains are flooded by the sea. We are asking for help from the State and projects to help us build our dikes.”

Some of the challenges they face are the following:

- » Lack of means of subsistence and financial support to undertake an activity;
- » Lack of support from women’s associations;
- » Repair of dikes to promote market gardening and rice growing;
- » Lack of modern sheds for smoking;
- » Lack of materials or inputs for market gardening activities;
- » Difficulties in recovering money after the sale of smoked fish by the women of the group;
- » Lack of training or capacity building in mangrove rehabilitation.

11. Composition of women’s groups

The majority of the women interviewed belong to informal associations commonly called “*sère*.” Ninety-eight percent of them belong to these groups, which function as revolving funds in the form of tontines. The advantage of belonging to one of these associations is that women can help each other and obtain a loan to start an activity; the loan is repayable at the end of the current month. This allows other members of the group to benefit in turn from loans.

As a result, these associations are generally informal and have no legal administrative documents; this is why members of these groups often encounter financial difficulties and/or are victims of embezzlement.

The important thing here is to help them set up an economic interest group that is recognized by the prefectural authorities. This will allow them to obtain external aid.

PHOTOS 27 TO 31. ACTIVITIES IN THE KABACK AREA



Photo 27. Matakang mangrove lowlands.



Photo 28. Depleted area, Bolimanda.



Photo 29. Interview in Youlayan,



Photos 30, 31. Oyster picker returning from the harvest in Kenendé.

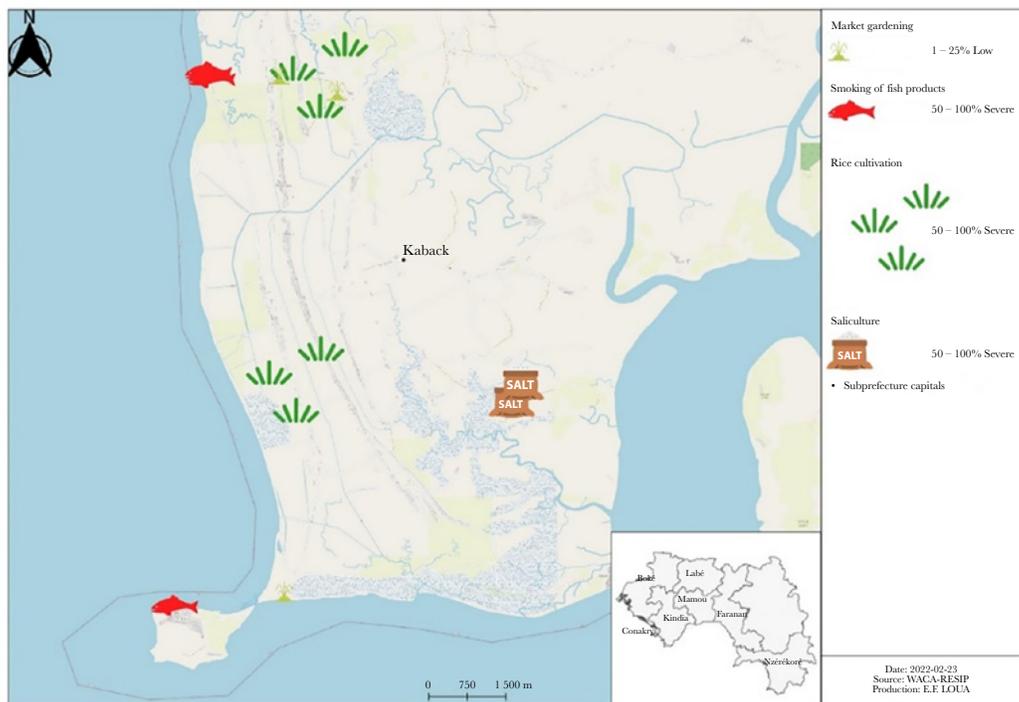
12. Mangroves under threat from activities in Kaback

The map reveals that rice farming and salt production pose a clear threat (50–100 percent), and that the rice-growing areas were once mangrove forests that have been replaced by rice paddies, as a result of high anthropogenic pressure from wood cutting. This in turn led to the advancement of the sea toward the mainland and the degradation of mangrove areas.

Protective dikes had been constructed to enable individuals to use flooded, degraded areas. However, according to a village elder, these dikes eventually failed.

Mangrove harvesting for fish smoking continues to pose the greatest threat to Kaback’s mangrove habitat. It remains the flagship activity that has a significant impact on mangrove health and is the most practiced by both men and women.

FIGURE 3: RISK MAP - KABACK



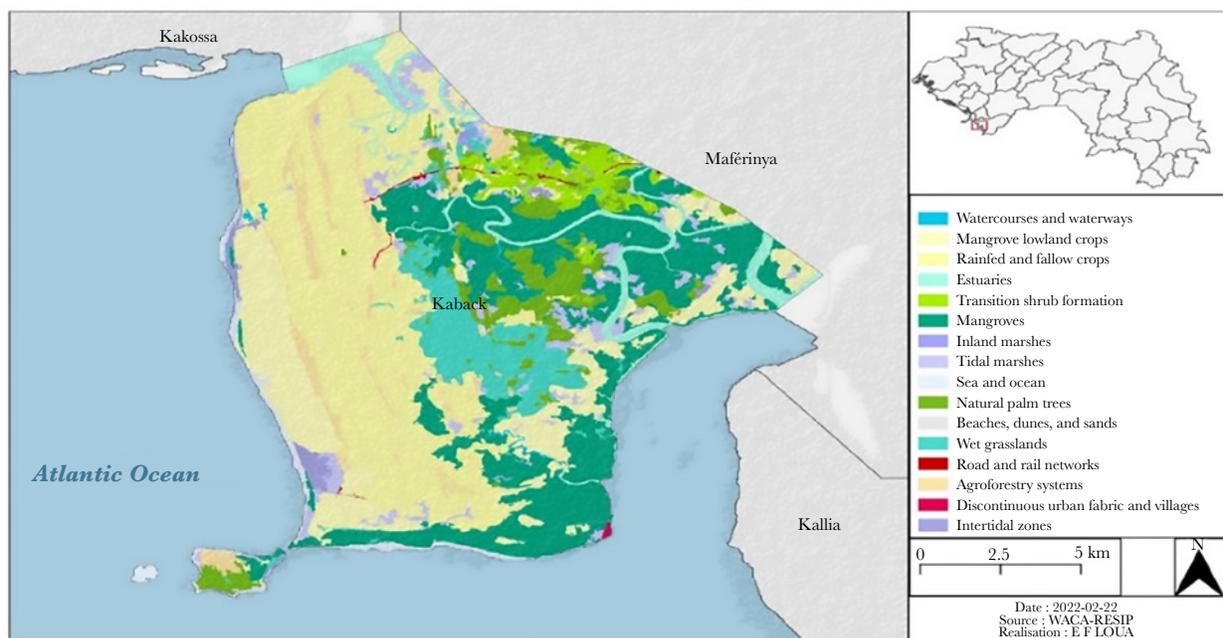
Source of the field study

13. Comparative land use map (2002–2022)

The comparison map for the period 2002–2022 shows a slight change in the current conditions in the Kaback area and provides us with a broader picture of changes over the past 20 years in human activities conducted in its environment.

In 2002, the marshes had not advanced much toward the mainland, there were vast mangrove lowland crop areas, and the mangrove forest was less degraded. A portion of the mangrove forest has been lost and replaced by fallow rainfed crops, and estuaries have been replaced by tidal marshes.

FIGURE 4: LAND USE (2002, KABACK)



Source: Spot héritage 2002

TABLE 2: SURFACE AREA AS A PERCENTAGE (2002, KABACK)

Area	Surface area in ha (2002)	Percentage
Watercourses and waterways	27.27	0%
Mangrove lowland crops	1,852.10	15%
Rainfed and fallow crops	3,520.52	29%
Estuaries	606.07	5%
Transition shrub formation	386.38	3%
Mangroves	2,880.31	23%
Inland marshes	43.36	0%
Tidal marshes	550.77	4%
Sea and ocean	216.40	2%
Natural palm trees	739.07	6%
Beaches, dunes, and sands	8.71	0%
Water bodies	2.34	0%
Wet grasslands	845.45	7%
Road and rail networks and associated spaces	24.33	0%
Agroforestry systems (combination of perennial crops and forest species)	491.42	4%
Discontinuous urban fabric and villages	8.91	0%
Intertidal zones	113.64	1%
Total	12,317.04	100%

GRAPH 2: PERCENTAGES (2002, KABACK)

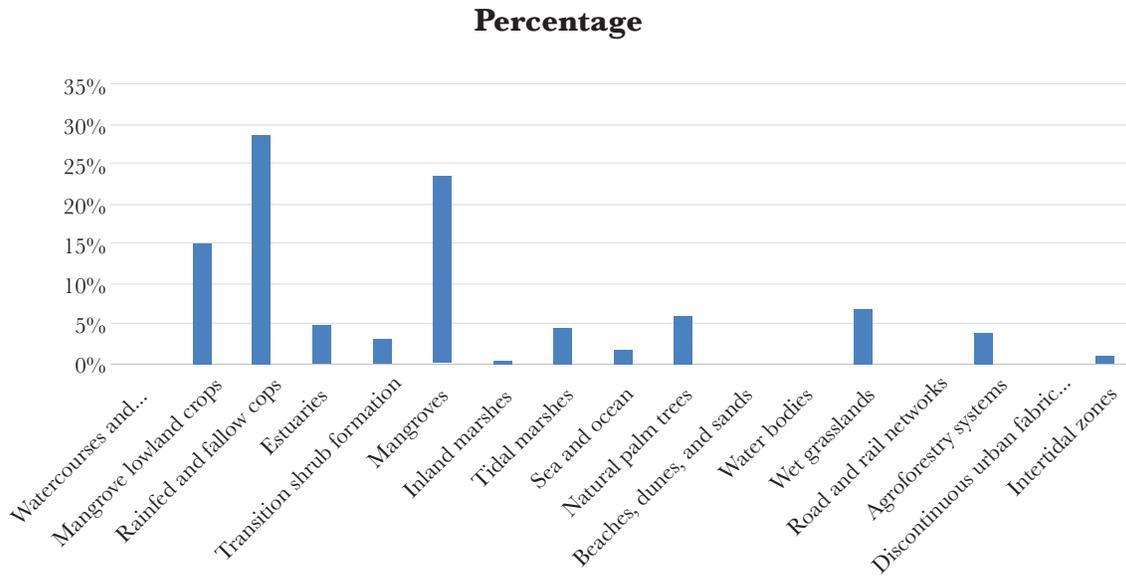
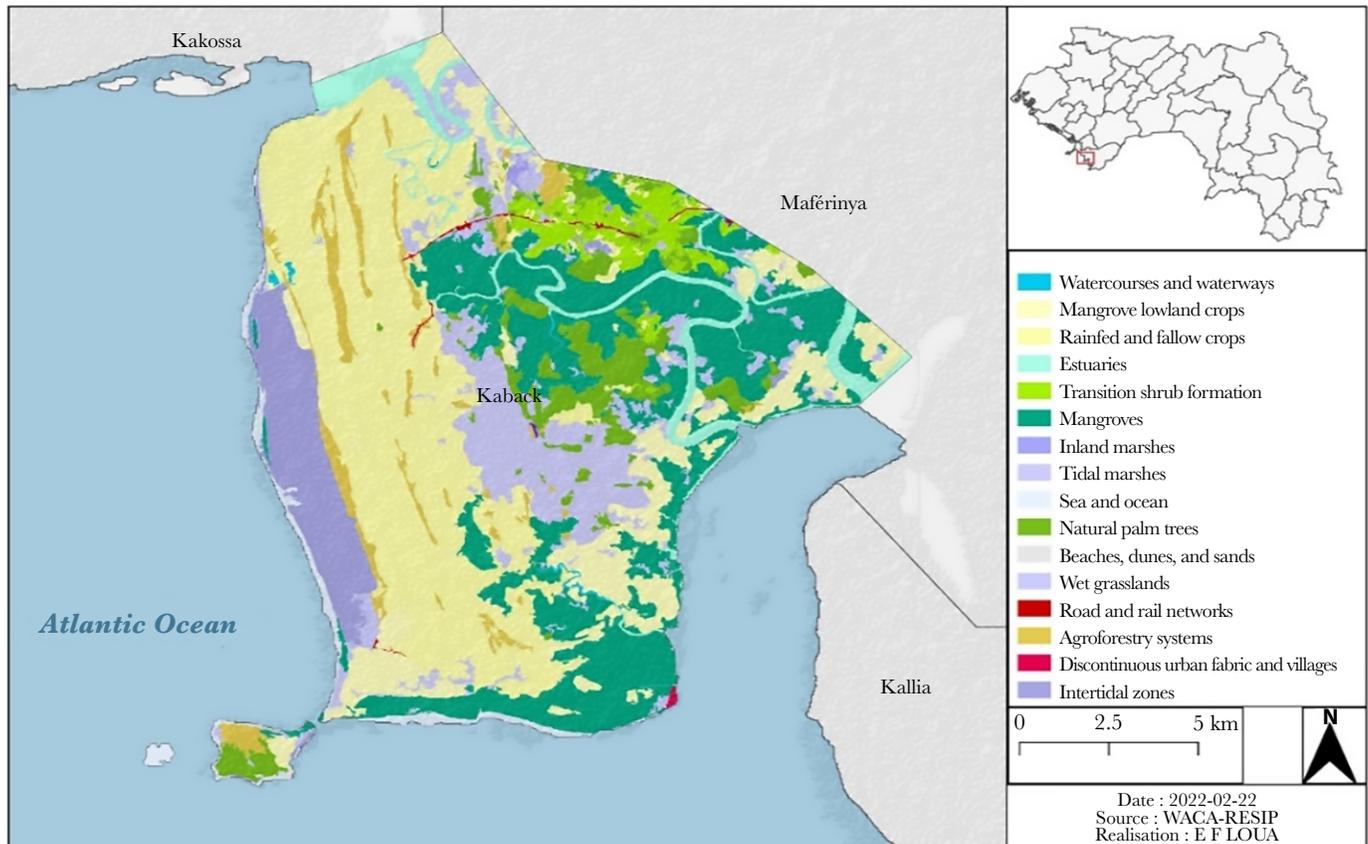


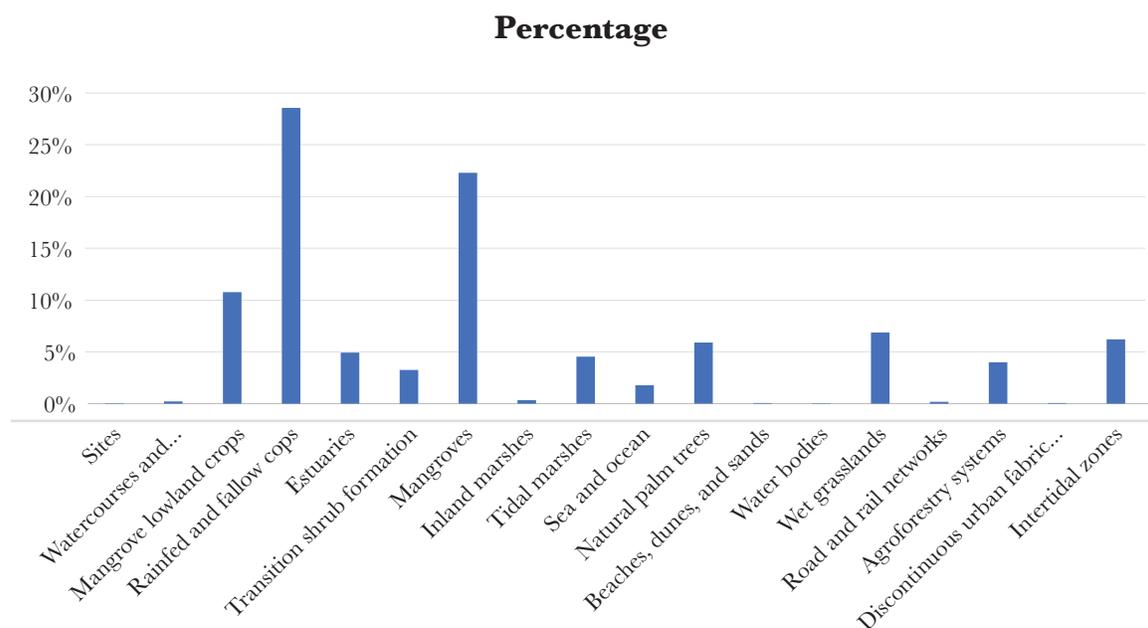
FIGURE 5: LAND USE (2022, KABACK)



Source: Sentinel Imagery 2A, 2022

TABLE 3: SURFACE AREA AS A PERCENTAGE (2022, KABACK)

Area	Surface area in ha (2022)	Percentage
Sites	1.81	0%
Watercourses and waterways	27.27	0%
Mangrove lowland crops	1,327.81	11%
Rainfed and fallow crops	3,518.83	29%
Estuaries	606.07	5%
Transition shrub formation	399.65	3%
Mangroves	2,745.41	22%
Inland marshes	43.36	0%
Tidal marshes	557.20	5%
Sea and ocean	216.40	2%
Natural palm trees	725.68	6%
Beaches, dunes, and sands	8.71	0%
Water bodies	2.34	0%
Wet grasslands	845.45	7%
Road and rail networks and associated spaces	24.33	0%
Agroforestry systems (combination of perennial crops and forest species)	491.42	4%
Discontinuous urban fabric and villages	8.91	0%
Intertidal zones	766.39	6%
Total	12,317.037	100%

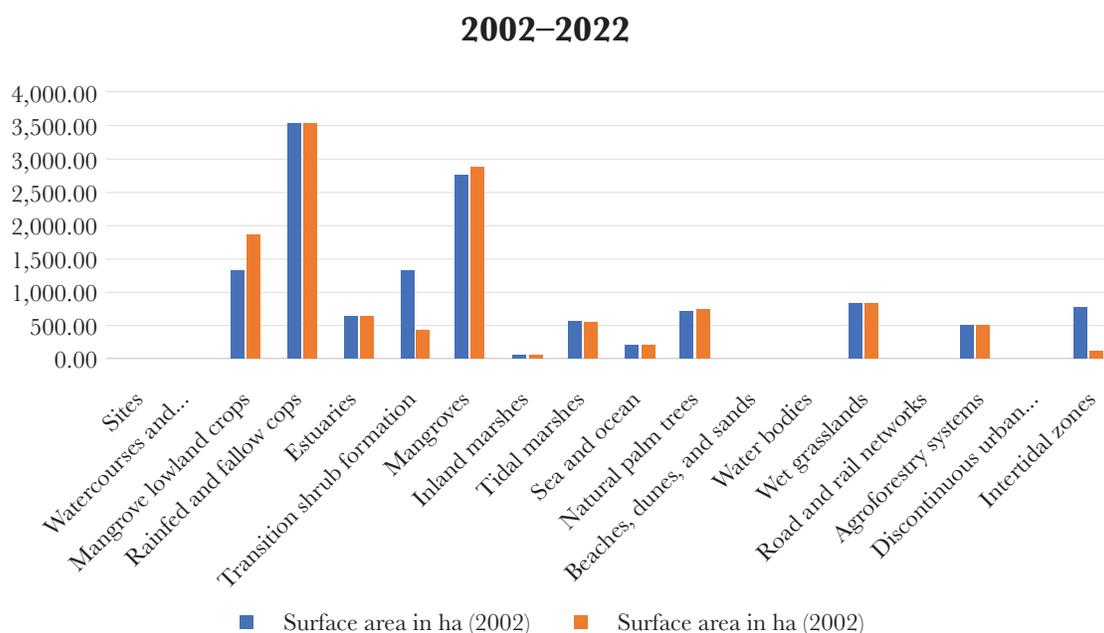
GRAPH 3: PERCENTAGES (2022, KABACK)

For more detail, see below the statistical table comparing the two maps for the Kaback area over the past 20 years.

TABLE 4: CHANGES BETWEEN 2002 AND 2022, KABACK

Area	Surface area in ha (2002)	% 2002	Surface area in ha (2022)	% 2022	Consumption and production flows
Sites	0.00	0%	1.81	0%	-1.81
Watercourses and waterways	27.27	0%	27.27	0%	0.00
Mangrove lowland crops	1,852.10	15%	1,327.81	11%	524.29
Rainfed and fallow crops	3,520.52	29%	3,518.83	29%	1.70
Estuaries	606.07	5%	606.07	5%	0.00
Transition shrub formation	386.38	3%	399.65	3%	-13.27
Mangroves	2,880.31	23%	2,745.41	22%	134.89
Inland marshes	43.36	0%	43.36	0%	0.00
Tidal marshes	550.77	4%	557.20	5%	-6.44
Sea and ocean	216.40	2%	216.40	2%	0.00
Natural palm trees	739.07	6%	725.68	6%	13.39
Beaches, dunes, and sands	8.71	0%	8.71	0%	0.00
Water bodies	2.34	0%	2.34	0%	0.00
Wet grasslands	845.45	7%	845.45	7%	0.00
Road and rail networks and associated spaces	24.33	0%	24.33	0%	0.00
Agroforestry systems (combination of perennial crops and forest species)	491.42	4%	491.42	4%	0.00
Discontinuous urban fabric and villages	8.91	0%	8.91	0%	0.00
Intertidal zones	113.64	1%	766.39	6%	-652.75
Total	12,317.04	100%	12,317.04	100%	0.00

GRAPH 4: COMPARISON BETWEEN 2002–2002, KABACK



SITE 2: KANFARANDÉ

1. Mangrove-centered activities in Kanfarandé

Mangrove-centered activities in the Kanfarandé area include fishing, fish smoking, market gardening, soap making, salt extraction, rice cultivation, mangrove honey production, and red oil extraction. Both men and women were engaged in the activities to varying degrees, depending on the product and the area inhabited. While men are typically more engaged in fishing, mangrove honey production, and rice farming than women, harvesting of mangrove products is generally dominated by women.

The main activity carried out by women in Kanfarandé is fish smoking, which is practiced by 28 percent of the women interviewed, followed by market gardening (21 percent), soap making (17 percent), salt extraction (14 percent), rice cultivation (14 percent), and oyster picking (6 percent) from the defined sample. Kanfarandé is located in the Marine Protected Areas (MPAs) of the Tristao/Alcatraz islands. It is therefore an excellent location for fishery resources, and attracts a large

number of fishers to the area. For this reason, the main activity carried out by the women in Kanfarandé women is fish smoking. Trees are indiscriminately felled to provide fuel and service wood in Kanfarandé: users cut whatever, wherever and whenever they want, resulting in a real overexploitation of *Rhizophora* throughout the mangrove. Mangrove wood is also used for beams in building construction.

2. Activities carried out by women in the Kanfarandé mangrove

Women who harvest mangrove products in Kanfarandé are also fish smokers. During our study, we visited the smoking centers in Kanfarandé Centre and learned that traditional stoves use large quantities of wood. In addition, women in the forest area of Kanof district harvest the wood in this district, including significant harvesting of fresh mangrove wood. Upon our arrival in Kanof district, we saw the piles of freshly cut mangrove wood and realized that the group of poachers was actually made up of women. The harvest is often intended for sale to women who smoke fish. The main source of livelihood and income in the area is the mangrove. The harvest is often a full-time activity during peak season.

Women control the entire mangrove economy. The Kankouf district president said that women process fish products, collect oysters and shellfish, and cut fuelwood

for cooking. This pressure on fuelwood and wood for fish smoking has led to the degradation of the areas.



Photos 32, 33. Landing bay for freshly cut mangrove wood in Kanof.

In Tesken district, salt production and oyster picking are more developed, but are less profitable secondary and seasonal activities practiced solely by women. A basin of freshly picked oysters can yield three kilograms of dried oysters. Oysters are often consumed in households

and when the harvest is flourishing, they can get up to 10 kilograms of dried oysters and earn GF 25,000 for one kilogram and/or make and sell oyster cakes for GF 500 each. Profits earned are often insignificant.



Photo 34. Oysters hanging from their habitat in Tesken. *Photo 35.* Oysters extracted from mangrove stands.

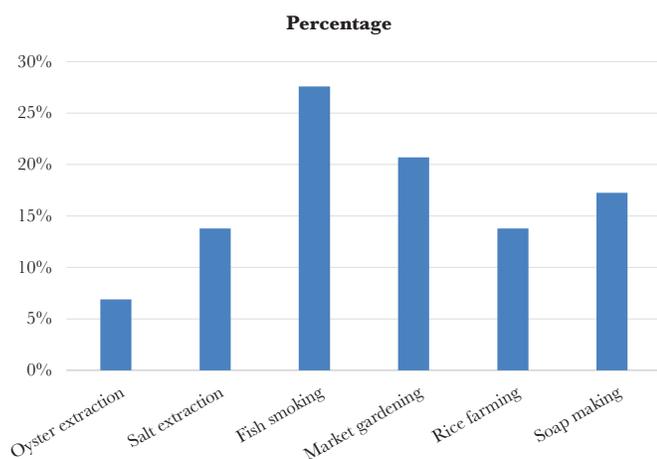
However, women are extremely interested in salt production. This activity is labor intensive and physically demanding for those who practice it. It provides income

for women salt producers in Kanfarandé and mangrove salt is widely consumed and sold in all markets in Guinea and in neighboring countries.

TABLE 5: MANGROVE-CENTERED ACTIVITIES IN KANFARANDÉ

Activity	Percentage
Oyster extraction	6%
Salt extraction	14%
Fish smoking	28%
Market gardening	21%
Rice farming	14%
Soap making	17%
Total	100%

GRAPH 5: MANGROVE-CENTERED ACTIVITIES



3. Mangrove products for domestic/commercial consumption or primary or secondary sources of income

Although women face problems when harvesting mangrove products, 80 percent of the crops are for commercial purposes, while only 20 percent are for domestic consumption. Most women are engaged in mangrove activities to meet the primary needs of the family; the mangrove is their main source of livelihood. Access to mangrove products remains open despite being controlled by forestry officers, and women who are often organized in groups, have access to these products throughout the day.

Participation in and dependence on mangrove-centered activities are no coincidence; these activities meet the essential needs of families.

The field study showed that women engaged in harvesting mangrove products are willing to switch to alternatives. However, owing to a lack of support and financial resources, they are forced to engage in mangrove activities.

4. Socioeconomic and demographic characteristics of women engaged in mangrove-centered activities in the Kanfarandé sample

Twelve percent of the women interviewed were between the ages of 20 and 35, 28 percent were between the ages of 35 and 45, and 60 percent were 45 and over. Despite this age diversity, all of the women interviewed had more than 20 years of experience in mangrove-centered activities and were all natives of the village and of the Nalu, Baga, and Susu ethnic groups; there was also a minority of ethnic Peulhs married to natives of the village.

The overwhelming majority of women interviewed in the Kanof, Kankouf, and Tesken districts have no education. Of a total of 28 women interviewed, 24 said they had never attended school, that is, 89 percent had no education. Only 11 percent report having a basic level of education.

All of the women engaged in mangrove product harvesting at the three sites visited were married; we also met a number of widows. Typically, in villages, women marry at a young age, between the ages of 15 and 18.

Women engaged in mangrove product harvesting are between the ages of 20 and 45. The youngest (between 20 and 35) pick the oysters and cut the mangrove wood, while the women in their 40s smoke the fish with assistance from the youngest women. Household income is currently low, whereas in the past the income earned by women engaged in mangrove-related activities could meet all basic family needs. According to one woman interviewed in Tesken, “their income used to cover 90 to 100 percent of household needs in the past, but because of the increase in the population, the number of persons dependent on the mangroves has also increased. Now low-income households can only cover 30 percent of their needs while middle-income households are meeting 50 percent of their needs. We also have hectares of farmland, we just need the business capital to start market gardening activities.” Today, 80 percent of the women interviewed have an average income that covers between

50 and 60 percent of needs, while 20 percent of women earn a low income that covers between 30 and 40 percent of needs.

Seventy-eight percent of mangrove-centered activities are carried out by indigenes, the majority of whom are Nalu, who indicated that no mangrove restoration project had been implemented in their locality. And in the three districts visited in Kanfarandé, oyster picking and the production of red oil and black soap are secondary sources of income, while salt production, wood harvesting, and fish smoking are the main sources of income.

5. Seasonal nature of the mangrove-centered activities of women in Kanfarandé

Salt production, oil collection, and palm oil and black soap production are seasonal activities that are practiced during the dry season (until February, when the first rains fall), while fish smoking and mangrove wood harvesting are year-round activities. The lean or dry seasons are devoted to salt production. During this period, women spend all day working full time late into the evening. The salt production process can take months— between three and four months.

Fish smoking decreases during the peak season but never stops; however, mangrove wood is more expensive in the market.



Photos 36, 37. Fast-growing tree nurseries in Kanfarandé.

Source: NGO TRISTAO

It should be noted that women who cut mangrove wood are not the same women who engage in fish smoking, but the wood and smoking complement each other. When fishing is flourishing, demand for wood to preserve fish is high and vice versa.

6. Women's willingness to switch to alternatives to mangrove products

Most women expressed a willingness to switch to alternatives such as financing to start microprojects, entrepreneurship training, etc., especially women engaged in wood harvesting and oyster pickers, if the resources are made available to them. However, women who smoke fish and produce salt, soap, and oil want to modernize and continue their activity.

They have requested the construction of modern stoves that use less wood, training in solar salt production, small business, etc. They see mangrove resources as a source of livelihood until they find alternative livelihoods and can leave the mangroves.

During the field visit we interviewed the supervisor of the NGO Tristao based in Kanfarandé Centre, who confirmed to us that he is involved in providing support to women with IEGs by helping them to better organize themselves and by financing their microprojects. The NGO is also involved in the reforestation of degraded areas through the planting of fast-growing trees and even mangrove restoration.

Women belonging to accredited groups often benefit from support and funding from the NGO Tristao. To date, the NGO has identified 33 registered women's groups working with them on the reforestation of endangered species and mangrove nurseries. The NGO also finances training in solar salt production for women salt producers and provides inputs to women. These groups are found in Kanfarandé Centre and on the islands.

An interview in Conakry with the Executive Director of the NGO Guinée Ecologie revealed that, in collaboration with the PRCM and PREM, mangrove conservation projects on the Tristao islands are being implemented.

In the Kanfarandé area, the study found that there are two NGOs working to restore mangroves.

7. Conservation and restoration of mangroves in the Kanfarandé area

The executive director of the NGO Guinée Ecologie told us about a project to mobilize local biodiversity conservation efforts in Touguissouri, which was implemented three years ago when women were engaged and represented in mangrove conservation. The NGO has been working for a year with its partners on another project “**Mangrove Conservation on the Tristao Islands.**” This project was close to the site and women were involved in the reforestation of mangroves and received training in solar salt production, fish smoking, and oyster picking. Degraded

areas have been replanted with the help of women from Touguissouri and local authorities. Today, mangrove wood harvesting is prohibited on all Tristao islands and reforested areas are monitored by women and local authorities.

However, none of the three districts visited (Kanof, Kankouf and Tesken) had hosted a mangrove restoration project. Thanks solely to the NGO TRISTAO, the 33 women's groups in Kanfarandé Centre benefited from support through inputs for market gardening, fish smoking, and mangrove reforestation in degraded areas in Kanfarandé Centre.

During our interview with the Executive Director of the NGO Guinée Ecologie, he told us that the only way to get women to conserve mangroves is to help them adopt a new approach to save the mangrove ecosystem. He noted: “*They can't give up the mangroves, so we just need new technical approaches to convince them through awareness raising about the importance of this ecosystem.*”

8. Activities of women in the conservation, rehabilitation, and/or restoration of mangroves

Women were engaged in all the activities along the chain, right up to the reforestation of seedlings—from the preparation of terrain to the planting of seedlings. They also put seedlings in the holes and covered the base of the seedlings during transplanting, as shown in the images below.



Photos 38, 39. Women engaged in mangrove reforestation in Touguissouri, Kanfarandé.



Photo 40. Reforested mangrove area in Touguissori.

Source: NGO Guinée écologie

Women in accredited groups were trained in smoking techniques, shellfish harvesting, market gardening, and oyster picking on the Tristao Islands. Oyster picking was practiced by more than 500 women belonging to a group all year round. Average catches are estimated at 25 kilograms per woman. The bulk of these catches is dried and intended for household consumption (80 percent) and commercial purposes (the remaining 20 percent).

9. Demographic and socioeconomic characteristics of women in mangrove conservation

Women engaged in mangrove conservation have a low educational level and are between 35 and 45 years old. They are usually married women and mothers. Most have always lived in the village while others who moved there because of marriage have been living in the localities for more than 15 years.

However, one woman in Tesken told us that women salt producers are often in debt. They obtain loans from associations known as “*sèrè*,” or from merchants (youlè in the Susu language), which are used to prefinance the activity in the early stages of each salt production period. Loans are repaid after the sale of the products (salt), and they are often left with nothing.

10. Challenges faced by women in mangrove conservation

Coastal erosion and loss of arable land are challenges faced in mangrove conservation. Other challenges faced by women include:

- » The presence of mining companies and their negative impacts on the islands caused by embankments that are moving the sea toward the mainland.
- » Lack of financing or alternative sources of income to halt mangrove harvesting activities;
- » Lack or inadequacy of mangrove restoration projects in the area;
- » Insufficient government contribution to the conservation of coastal areas through its forestry officers.

11. Composition of the women’s group

There is a plethora of women’s associations in the Kanfarandé area. However, while membership in these women’s associations means that you are free to develop on your own in your field of activity, when there are grants or types of support, women belonging to the same group work in synergy to achieve the fixed objective.

Often these women’s associations are informal, commonly referred to as “*sèrè*” in the local language, which is an association of women of the same generation or age whose main objective is to help each other financially and socially in case of need.

In addition, women understood that in order to obtain financing or assistance, membership in a formal group is required. This is why women’s groups and associations in Kanfarandé began to introduce administrative documents to formalize these organizations. They often need support and monitoring to structure their organization. In Kanfarandé, according to the supervisor of the NGO Tristao, [there are more than] 50 women’s associations, but only 33 have been formally established. They join a group to obtain financial assistance, which is commonly referred to as tontine or a revolving fund.

12. Threat of mangrove-centered activities in Kanfarandé

Logging (cutting mangrove wood), oyster extraction, salt production, and soap making are clear threats (severe threat (50-100 percent) can be clearly observed on the map). The logging and sale of mangrove wood are practiced on all the islands visited, despite measures adopted by the authorities; this attests to the high percentage of women fish smokers and soap producers. These abovementioned activities use large quantities of wood, which demonstrates that a large number of people are dependent on mangrove products in the Kanfarandé area.

Traditional smoking techniques rely on intense and prolonged heat that dehydrates fish by about 70 percent of the weight of fresh fish. This operation fills the fish with antiseptic substances contained in the smoke and gives it a likeable taste. This activity is often carried out by women and 90 percent of the wood needed for smoking is taken from mangroves. Wood consumption at this rate is likely to accelerate the loss of mangrove wood capital.

Added to this is the presence of these mining companies that construct embankments that push the sea toward these islands. During our visit, we observed a large number of ships belonging to mining companies along the coast between Kanfarandé and Kamsar.



Photos 41, 42. Period of brine collection in mangrove lowlands.



Photo 43. Market gardening in the lowlands.



Photo 44. Traditional smoking.



Photo 45. Fields in fallow.

The harvesting of mangrove wood that is used to smoke fish remains the greatest threat to the mangrove habitat in Kanfarandé. It remains the flagship activity that has a greater impact on the health of mangroves and is widely practiced by both men and women.

13. Comparative land use map (2002–2022)

The comparison map for the period 2002 to 2022 shows a change in the current conditions in the Kanfarandé area and provides us with a broader picture of changes over this 20-year period in human activities conducted in its environment.

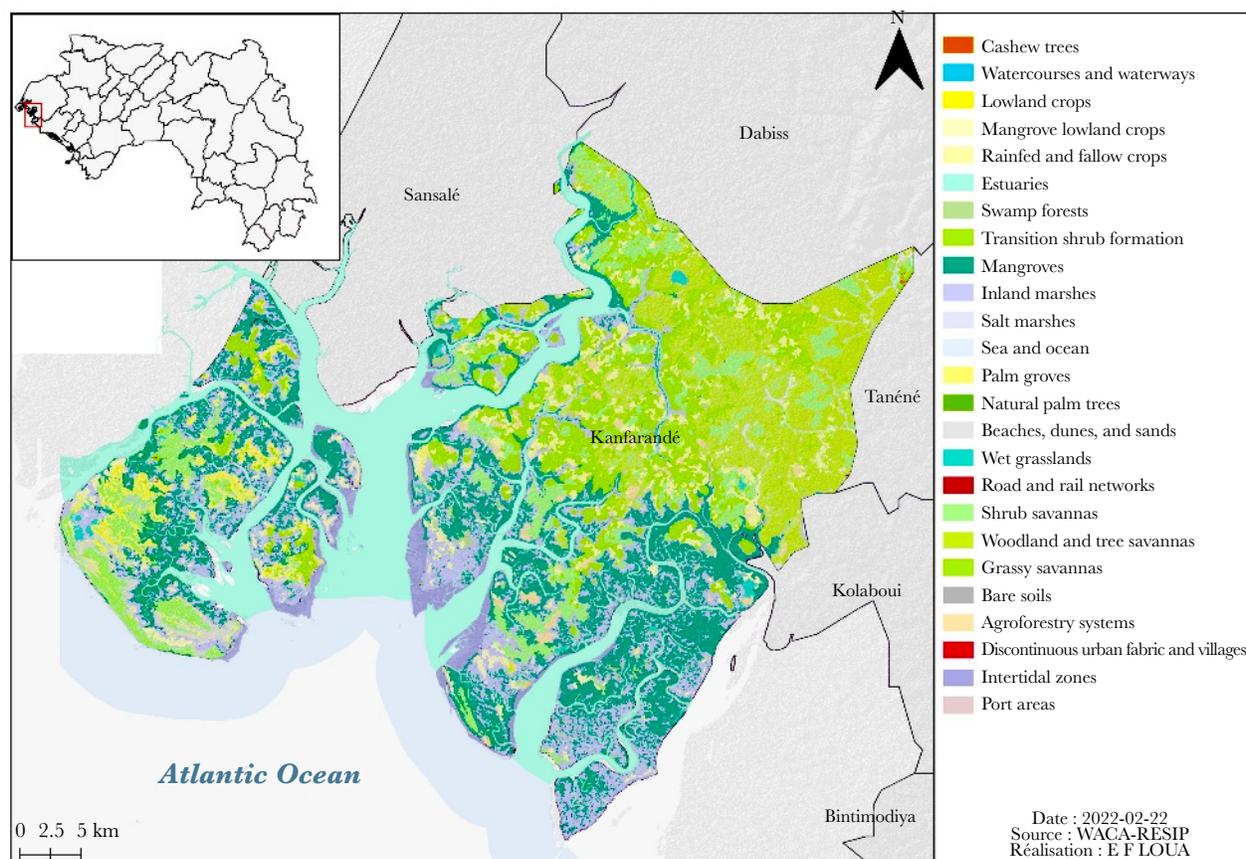
In 2002, the map shows cashew trees, water bodies, natural palm trees, and the road network. By 2022, these elements had almost disappeared and have been replaced by beaches, dunes, wet grassland, and shrub savannas. The mangrove forest continues to decline significantly in some places. If steps are not taken in time, the degradation caused by human activities will continue.

FIGURE 6: RISK MAP - KANFARANDÉ



Source of the field study

FIGURE 7: LAND USE (2002, KANFARANDÉ)



Source: Spot héritage 2002

TABLE 6: SURFACE AREA AS A PERCENTAGE (2002)

Area	Surface area in ha (2002)	Percentage
Cashew trees	23.682	0%
Watercourses and waterways	9,297.085	4%
Lowland crops	49.745	0%
Mangrove lowland crops	3,052.414	1%
Rainfed and fallow crops	6,562.678	3%
Estuaries	39,098.654	16%
Gallery forests	532.209	0%
Swamp forests	724.959	0%
Transition shrub formation	20,613.276	9%
Mangroves	45,770.734	19%
Tidal marshes	24,465.101	10%
Salt marshes	697.217	0%

Area	Surface area in ha (2002)	Percentage
Sea and ocean	32,434.321	13%
Palm groves	4,543.012	2%
Natural palm trees	7.013	0%
Beaches, dunes, and sands	1,281.260	1%
Water bodies	198.896	0%
Wet grasslands	1,577.724	1%
Road and rail networks and associated spaces	4.373	0%
Shrub savannas	17,386.573	7%
Woodland and tree savannas	22,400.409	9%
Grassy savannas	1,027.170	0%
Bare soils	4.551	0%
Agroforestry systems (combination of perennial crops and forest species)	1,730.711	1%
Continuous urban fabric	47.211	0%
Discontinuous urban fabric and villages	14.864	0%
Intertidal zones	6,903.008	3%
Port areas	6.777	0%
Total	240,455.627	100%

GRAPH 6: PERCENTAGES (2002)

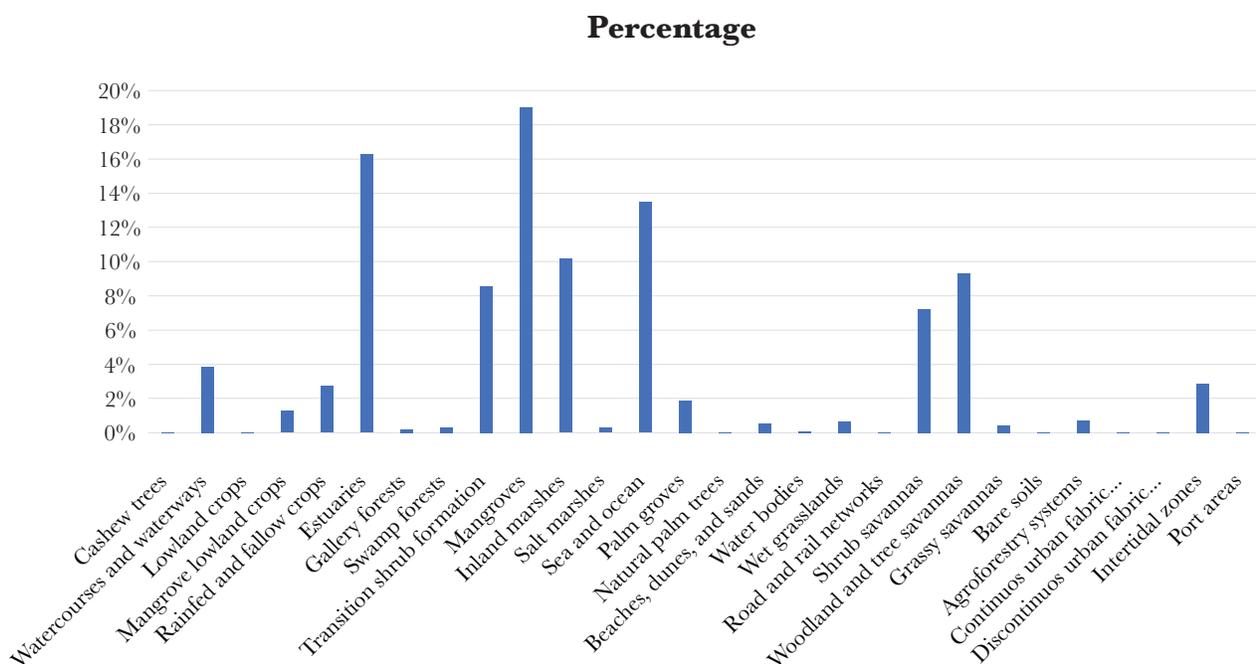
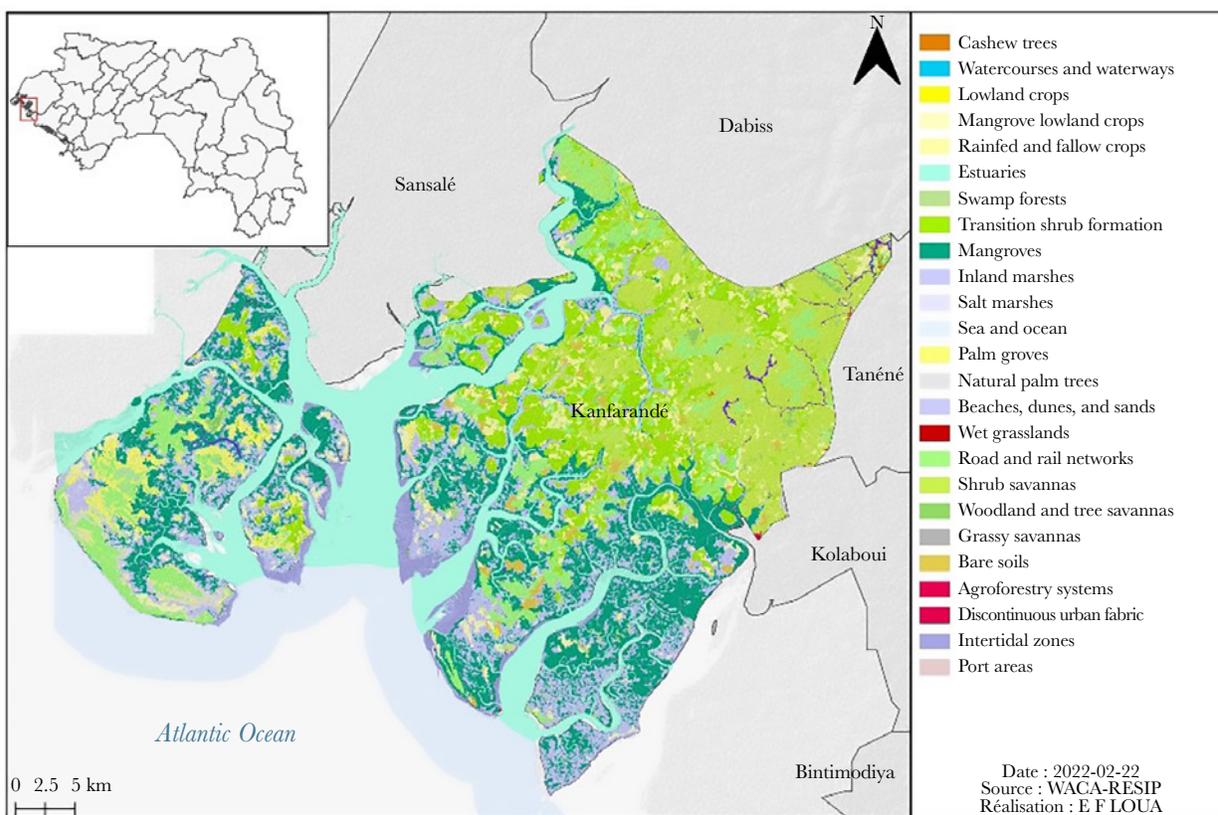


FIGURE 8: LAND USE (2022, KANFARANDÉ)



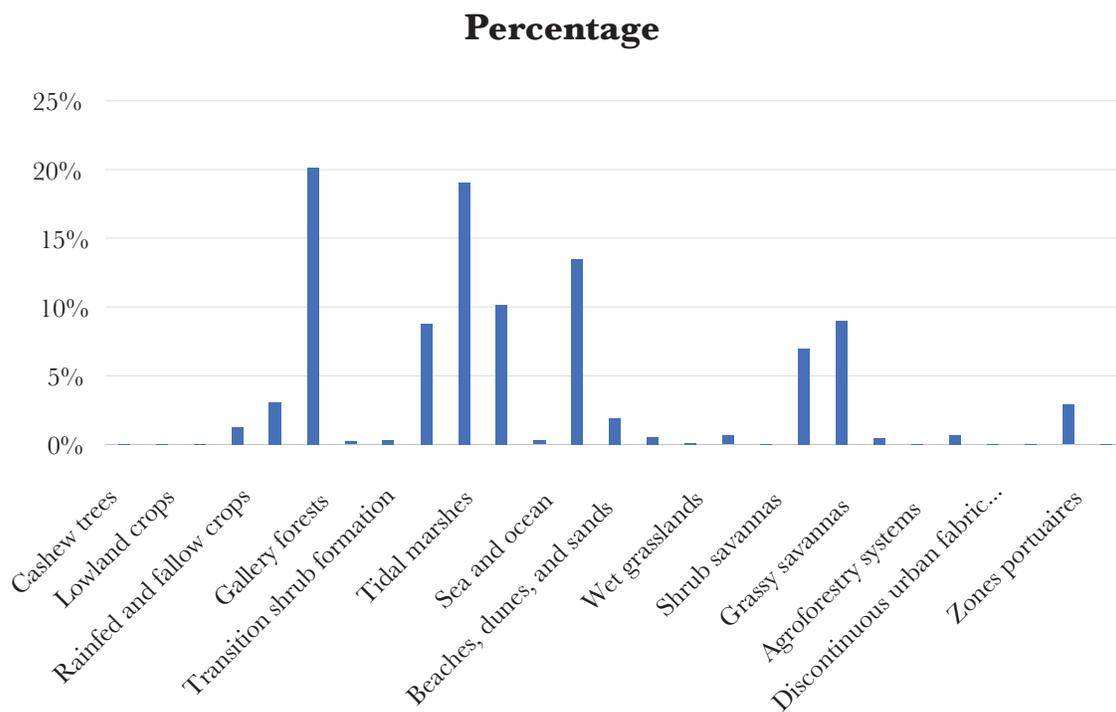
Source: Sentinel Imagery 2A, 2022

TABLE 7: SURFACE AREA AS A PERCENTAGE (2022, KANFARANDÉ)

Area	Surface area in ha (2022)	Percentage
Cashew trees	60.683	0%
Watercourses and waterways	37.428	0%
Lowland crops	49.745	0%
Mangrove lowland crops	3,064.308	1%
Rainfed and fallow crops	7,444.241	3%
Estuaries	48,358.311	20%
Gallery forests	532.209	0%
Swamp forests	724.959	0%
Transition shrub formation	21,138.275	9%
Mangroves	45,758.840	19%
Tidal marshes	24,465.101	10%
Salt marshes	697.217	0%
Sea and ocean	32,434.321	13%

Area	Surface area in ha (2022)	Percentage
Palm groves	4,543.012	2%
Beaches, dunes, and sands	1,281.260	1%
Water bodies	198.896	0%
Wet grasslands	1,577.724	1%
Road and rail networks and associated spaces	4.373	0%
Shrub savannas	16,764.452	7%
Woodland and tree savannas	21,587.858	9%
Grassy savannas	1,025.292	0%
Bare soils	4.551	0%
Agroforestry systems (combination of perennial crops and forest species)	1,730.711	1%
Continuous urban fabric	47.211	0%
Discontinuous urban fabric and villages	14.864	0%
Intertidal zones	6,903.008	3%
Port areas	6.777	0%
Total	240,455.627	100%

GRAPH 7: PERCENTAGES (2022)

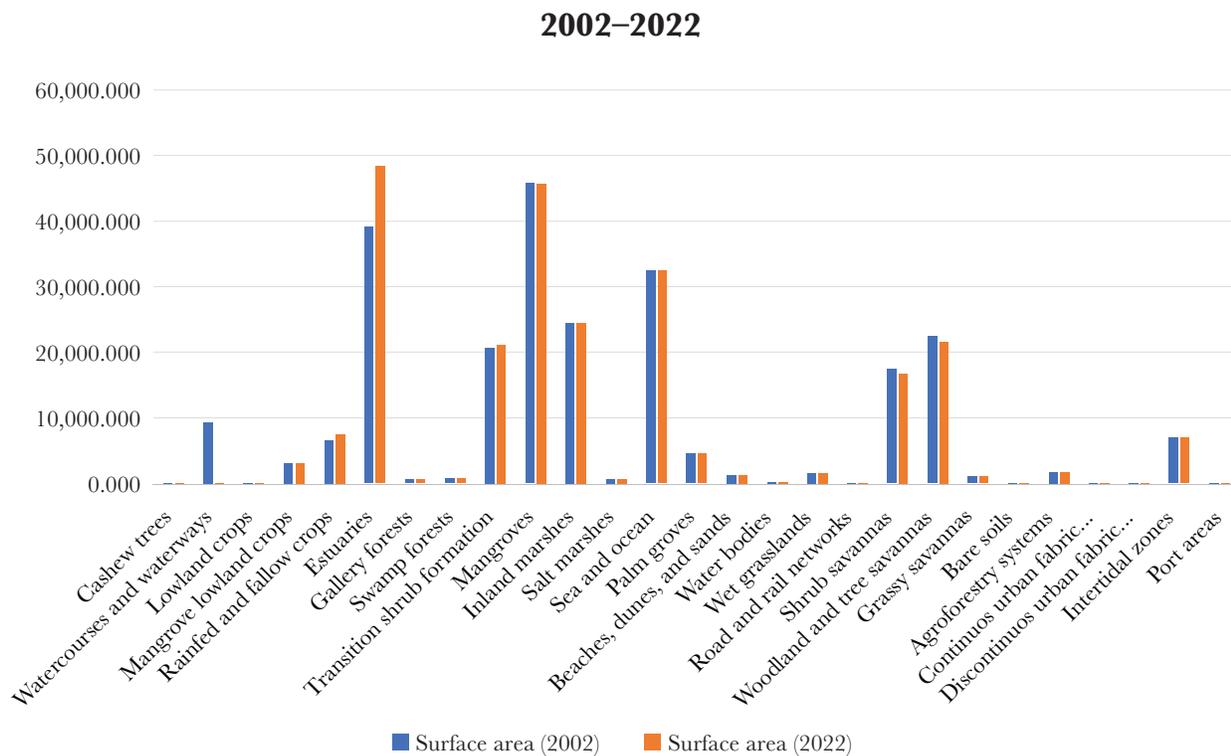


More specifically, the statistical table comparing the two maps provides a clearer and more precise picture of the changes over the past 20 years in the Kanfarandé area.

TABLE 8: CHANGES BETWEEN 2002 AND 2022, KANFARANDÉ

Area	Surface area (2002)	Surface area (2022)	Consumption and production flows
Cashew trees	23.682	60.683	-37.00
Watercourses and waterways	9,297.085	37.428	9,259.66
Lowland crops	49.745	49.745	0.00
Mangrove lowland crops	3,052.414	3,064.308	-11.89
Rainfed and fallow crops	6,562.678	7,444.241	-881.56
Estuaries	39,098.654	48,358.311	-9,259.66
Gallery forests	532.209	532.209	0.00
Swamp forests	724.959	724.959	0.00
Transition shrub formation	20,613.276	21,138.275	Δ25.00
Mangroves	45,770.734	45,758.840	11.89
Tidal marshes	24,465.101	24,465.101	0.00
Salt marshes	697.217	697.217	0.00
Sea and ocean	32,434.321	32,434.321	0.00
Palm groves	4,550.025	4,543.012	7.01
Beaches, dunes, and sands	1,281.260	1,281.260	0.00
Water bodies	198.896	198.896	0.00
Wet grasslands	1,577.724	1,577.724	0.00
Road and rail networks and associated spaces	4.373	4.373	0.00
Shrub savannas	17,386.573	16,764.452	622.12
Woodland and tree savannas	22,400.409	21,587.858	812.55
Grassy savannas	1,027.170	1,025.292	1.88
Bare soils	4.551	4.551	0.00
Agroforestry systems (combination of perennial crops and forest species)	1,730.711	1,730.711	0.00
Continuous urban fabric	47.211	47.211	0.00
Discontinuous urban fabric and villages	14.864	14.864	0.00
Intertidal zones	6,903.008	6,903.008	0.00
Port areas	6.777	6.777	0.00
Total	240,455.627	240,455.627	0.00

GRAPH 8: COMPARISON BETWEEN 2002 AND 2022



SITE 3: KAMSAR

1. Mangrove-centered activities in Kamsar

Mangrove-centered activities in the Kamsar area include salt production, fish smoking, rice farming, fishing, and oyster picking. While mangrove firewood harvesting for smoking and domestic use is established, harvesting of mangroves for sale is no longer being carried out on the two sites visited. The mangroves in the Kamsar area have deteriorated over the past 20 years, primarily as a result of anthropogenic pressure from excessive wood harvesting, the influx of migrants in search of well-being, and the advancement of the sea toward the mainland caused by embankments constructed by mining companies. Kamsar is an industrial port city.

Salt extraction areas were previously mangrove forests. As the sea advanced, the mangroves degraded, providing room for mangrove lowlands where women scrape the soil to obtain a brine powder when the tide is low. This powder is processed to obtain the salt. As traditional places are still in place in the islands, salt production requires large quantities of mangrove wood.

Furthermore, the degradation of Kamsar’s mangroves could be explained by the non-rational exploitation of coastal areas by local communities and by the various economic operators (uncontrolled urbanization, tourism activities, and oil mining). Demographic pressure and the development of the tourism industry in the Kamsar area have led to the disappearance of certain species from the coastal forest of this area.

2. Mangrove-centered activities of women in Kamsar

Forty-two percent of the women interviewed in Kamsar engage in salt extraction, while 33 percent are involved in fish smoking, and 25 percent in rice farming. In general, activities are essentially gender-based, with the exception of fishing and sometimes rice farming, which requires a lot of physical strength and courage. Women are involved in all activities in the mangrove area.

The number of persons who are dependent on mangrove products increased to 58.33 percent, up from 41.67 percent.

There is no more wood to be harvested in Kamsar, as mining companies are operating in the area and there is a port area for bauxite extraction. Kamsar is extremely popular among migrants who come from the four regions of Guinea. Most Kamsar youth work with the mining companies while others practice fishing. Women who depend on mangrove products are more involved in fish farming, fish smoking, and rice cultivation.

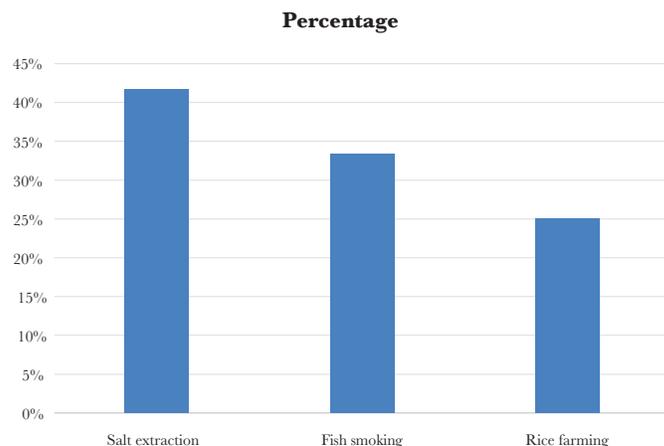
However, in the case of rice cultivation, men prepare the land by plowing and allowing water to flow between the dikes, while the women take the young rice plants from the rice nurseries and help the husbands with the marking out of the fields. Beside their husbands' fields, they develop the market garden fields where products are planted for sale and domestic consumption. At harvest time, men and women perform complementary tasks. Men cut the rice while women beat it. Women parboil the final product, 80 percent of which is sold on the weekly market, while households consume the rest. A small amount is kept and used as seed stock for the following year. Fuelwood harvesting is done on a part-time basis. Modern smoking centers equipped with FAO's FTT ovens are being built in Kamsar Centre and other subprefectures. The importance of this smoking activity is reflected in the establishment of several groups and associations of women fish smokers by the NGO "Charente Maritimee."

In the Kamsar districts visited (Taigbé and Taidi sector), smoking is practiced at home by many women.

TABLE 9: MANGROVE-CENTERED ACTIVITIES OF WOMEN IN KAMSAR

Activity	Percentage
Salt extraction	42%
Fish smoking	33%
Rice farming	25%
Total	100%

GRAPH 9: PERCENTAGE OF MANGROVE-CENTERED ACTIVITIES IN KAMSAR



3. Mangrove products for domestic/ commercial consumption to earn income

Products derived from mangrove-centered activities in Kamsar are primarily for commercial consumption: 90 percent of the products are for commercial purposes while 10 percent are consumed by households, which depend on these products for subsistence. Fish smoking and rice cultivation are highly developed in the Kamsar area and are primary sources of income. Oyster harvesting, soap making, and oil production are considered secondary sources of income.

According to the sector chief, in the Taidi area closer to Kamsar, "the embankments constructed by mining companies block the free flow of water, which no longer irrigates the other side of the saltflats (tannes), thereby leading to acidification and an increase in the normal salinity rate."

However, he indicated as well that natural factors such as climate change and reduced rainfall were also at play. In this large swampy area, *Rhizophora* has disappeared, unlike *Avicennia*, which thrives in some sections.



Photos 46, 47. Avicennia forest in Taigbé.

4. Socioeconomic and demographic characteristics of women engaged in mangrove-centered activities in the Kamsar sample

Women engaged in mangrove conservation are mostly Indigenous residents of the village, and range in age from 35 to 45 years old. Some 87 percent of the women interviewed earn a low income that covers 30 percent of their needs, while 10 percent of the respondents earn an average income that covers 50 percent of needs. Only 3 percent indicated that they earn a high income and these women are often fish smokers and salt producers.

Forty-two percent of the women interviewed were between the ages of 20 and 35, 33 percent were between 35 and 45, and 25 percent were 45 years and over. The majority of respondents had more than 20 years' experience in mangrove-centered activities and were all native to the village (100 percent Baga ethnic group). The study found that the women who engaged in mangrove activities were indigenes, while migrants, who were concentrated in the Kamsar Centre area, engage in small trade and buy processed fish for resale in the capital's major towns.

The main activity is salt extraction from the mangrove lowlands, which is practiced by 42 percent of the women interviewed, followed by fish smoking (33 percent), and rice cultivation (25 percent). As long as there is fishing, the need for smoking increases over time. Women depend first

and foremost on mangroves to meet household subsistence needs. Women aged 45 and over often engage in fish smoking. The youngest are involved in salt production and oyster picking. The marital status of the women engaged in mangrove-centered activities varies: in general, they are all married, and some are widowed with dependent children. A household may have more than 15 to 20 persons. Ninety-nine percent of the sample of women interviewed have no education and only one percent indicated that they have a basic level.

According to an elder in Taigbé, *“when the rice harvest is poor, women turn to small trade in Kamsar Centre or purchase fish processed by their peers, which they often resell in the weekly market.”*

5. Seasonal nature of the activities of women engaged in mangrove activities

While smoking is done all year (or almost all year) round, slowing down only during the rainy season either because of bad weather or field work, salt is produced exclusively during the dry season. Wood for domestic consumption and fish smoking at home is harvested all year round. In Kamsar, women buy mangrove wood for smoking, but thanks to the FTT ovens, less wood is used for this process.

Farming in rice-growing areas throughout the year was confirmed during field studies in the two districts.

6. Women's willingness to switch to alternatives to mangrove products

In the Taigbé district and the Taidi sector, women who are dependent on mangrove products have expressed no interest in switching from smoking and salt production. They request support and capacity building in their fields of activity, while others request financial support to start a general trade business in Kamsar.

7. Conservation and restoration of mangroves in the Kamsar area

During the field visit, as part of the mangrove conservation and restoration effort, the two mining companies operating in the Kamsar area were identified: The Bauxite Company of Guinea (CBG) project [launched] two years ago, and another project by the Global Alumina Corporation (GAC) [launched] three years ago. According to the MEDD Department Head, the objective of these two projects was the implementation of the program of reforestation and rehabilitation of degraded areas of Taidi by the GAC.

8. Activities of women in the conservation, rehabilitation and/or restoration of mangroves

Specifically, women have been directly and indirectly involved in mangrove reforestation activities. According to the Prefectural Director of the Environment, women are at the center of all activities to be carried out in mangroves.

9. Demographic and socioeconomic characteristics of women engaged in mangrove conservation

Women engaged in mangrove conservation activities are married indigenes between the ages of 35 and 45 and often volunteer to participate in the activities.

10. Challenges faced by women in the conservation of mangroves

The challenges in Kamsar include:

- » Advancement of the sea toward the mainland;
- » Influx of migrants to Kamsar Centre;

- » Lack of alternative financing for activities such as market gardening and rice farming;
- » Lack of financing for women for IGAs.

11. Women's groups

There are women's self-help groups, as is the case in the other two areas studied.

12. Threat posed by mangrove-centered activities in Kamsar:

The map shows that salt extraction poses clear threats (severe threat (50-100 percent) can be clearly observed on the map). This activity is practiced everywhere on the Taigbé and Taidi islands, attesting to the high percentage of salt producers in the area. Wood harvesting in *Avicennia* mangroves is often triggered major land clearings for the creation of new salt ponds.

The field study period did not coincide with the salt production period; it did, however, coincide with the scraping of the land to obtain brine. This activity is expected to start in late February, but one woman explained the process to us, including how traditional salts are obtained.

Because of the high temperatures, the dry season promotes the formation of brine powder on the land surface. The strip of land that covers mangrove saltflats (tannes) has an extremely high salinity level. This land is scraped and stored in piles. The men build a funnel-shaped filter (tanké) using just dried mud, tall soft grass, and branches that form the frame. The soil is deposited in the filter and covered with water. The water absorbs the salt and is collected downstream of the funnel in a small ditch that is also made of dried mud.

Using a calabash, the brine is transferred into a flat-bottomed pot called a tank or "keg." It is brought to a boil and evaporates slowly, revealing the salt. Deposited on a drying area for a few days, the salt is then stored in "50kg bags" and sold in major markets in the city.

In addition, these companies also have negative impacts on the islands because of the embankments that have been constructed and have led to the advancement of the sea toward the continent.

PHOTOS 48–52: MANGROVE-CENTERED ACTIVITIES IN KAMSAR



Photo 48. Brine filtering.



Photo 49. Mangrove lowlands in Taigbé.

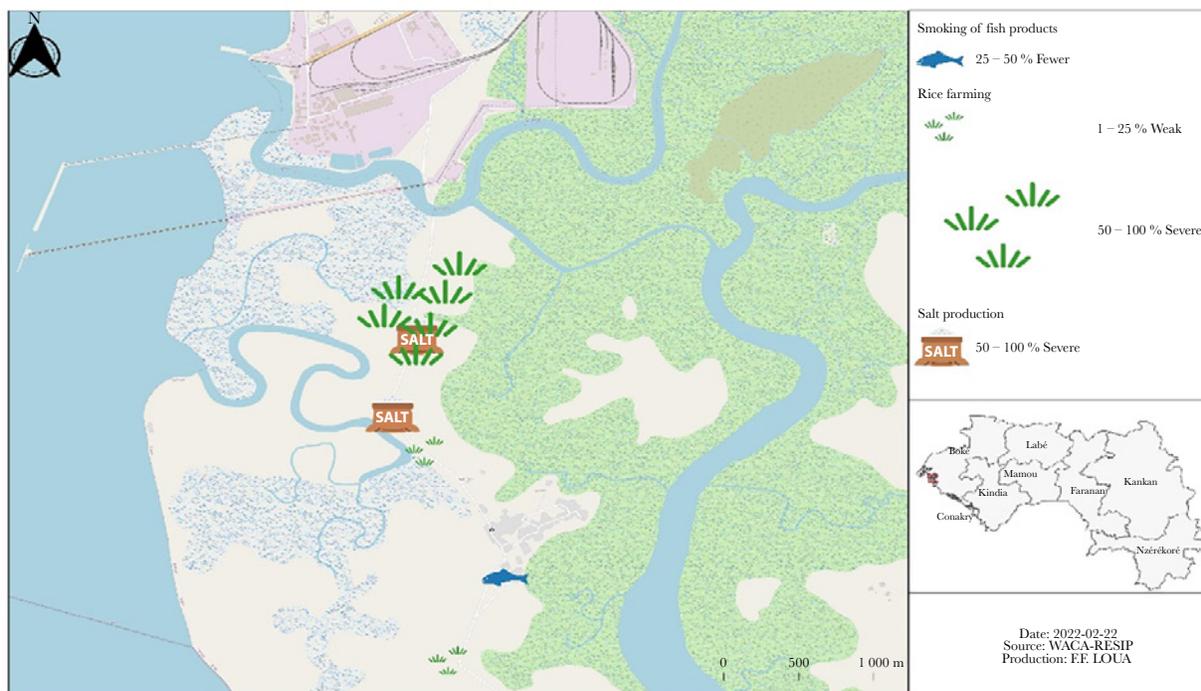


Photos 50, 51. Traditional Banda for fish smoking.



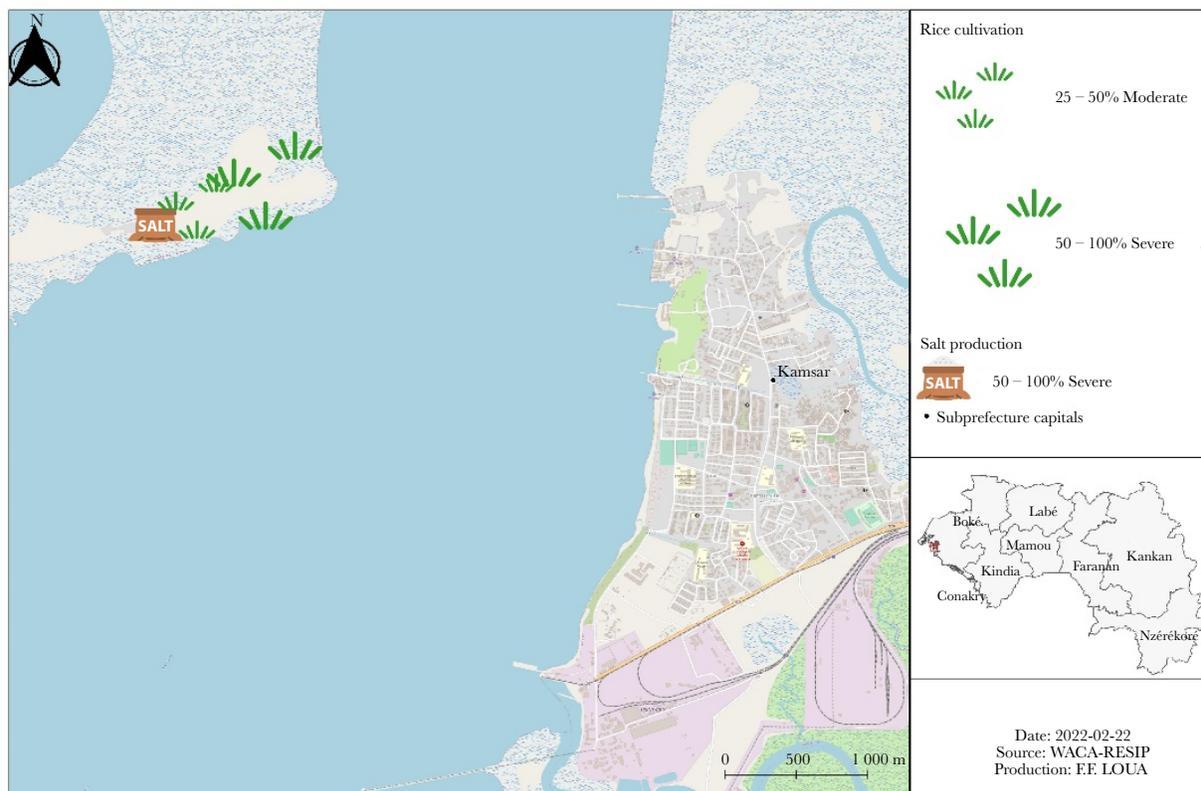
Photo 52. Rice paddy in Taigbé.

FIGURE 9: RISK MAP - TAIGBÉ



Source of field study

FIGURE 10: RISK MAP - TAIDI



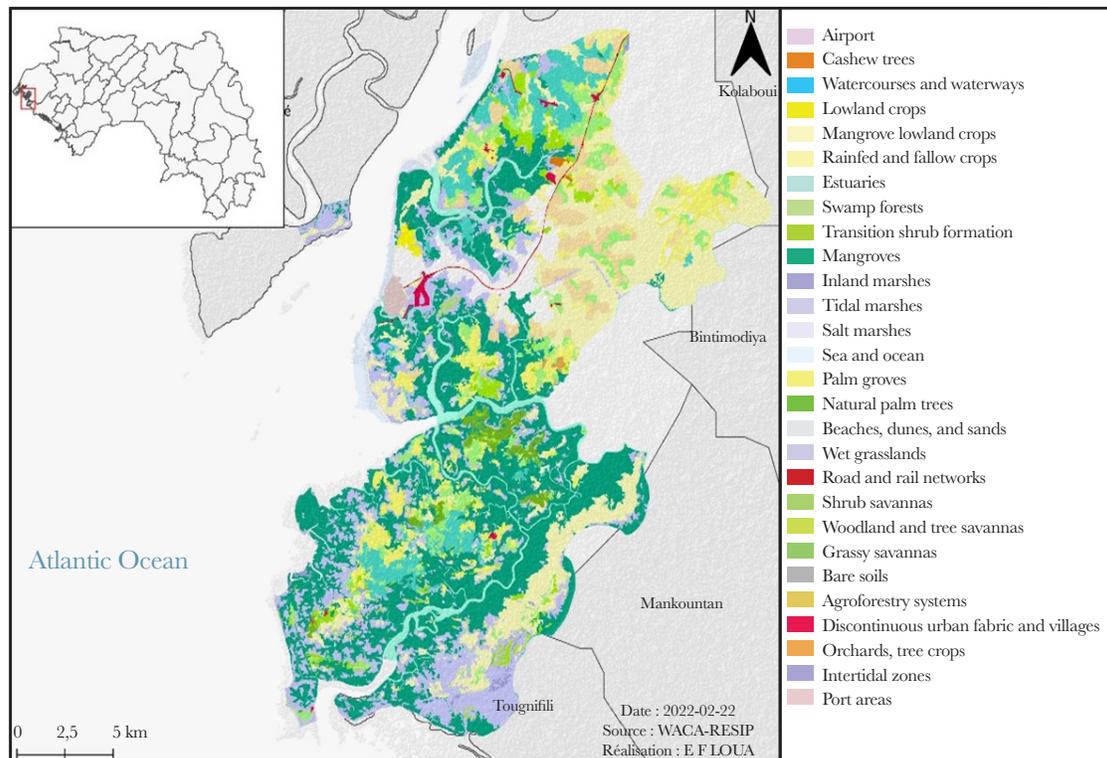
Source of field study

13. Comparative land use map 2002–2022

The comparison map for the period 2002 to 2022 shows a change in the current condition in the area over

this 20-year period: the wet grassland changed, and by 2022 the landscape had been completely altered by human economic activity.

FIGURE 11: LAND USE (2002, KAMSAR)



Source: spot inheritance 2002

TABLE 10: SURFACE AREA AS A PERCENTAGE (2002)

Area	Surface area in ha 2022	Percentage
Airports	25.808	0%
Cashew trees	39.069	0%
Watercourses and waterways	59.378	0%
Lowland crops	131.030	0%
Mangrove lowland crops	6,867.579	12%
Rainfed and fallow crops	482.950	1%
Estuaries	1,635.684	3%
Swamp forests	57.110	0%
Transition shrub training	986.791	2%
Mangroves	13,272.433	24%
Inland marshes	24.482	0%

Area	Surface area in ha 2022	Percentage
Tidal marshes	6,049.425	11%
Salt marshes	20.996	0%
Sea and ocean	12,805.664	23%
Palm groves	3,022.588	5%
Natural palm trees	546.510	1%
Beaches, dunes, and sands	40.992	0%
Wet grasslands	2,400.846	4%
Road and rail networks and associated spaces	83.074	0%
Shrub savannas	2,705.157	5%
Woodland and tree savannas	3.235	0%
Grassy savannas	51.784	0%
Bare soils	5.365	0%
Agroforestry systems (combination of perennial crops and forest species)	1,694.086	3%
Continuous urban fabric	1,634.545	3%
Discontinuous urban fabric and villages	184.188	0%
Orchards, tree crops	35.300	0%
Intertidal zones	272.095	0%
Port areas	180.970	0%
Total	55,319.134	100%

GRAPH 10: SURFACE AREA AS A PERCENTAGE (2002)

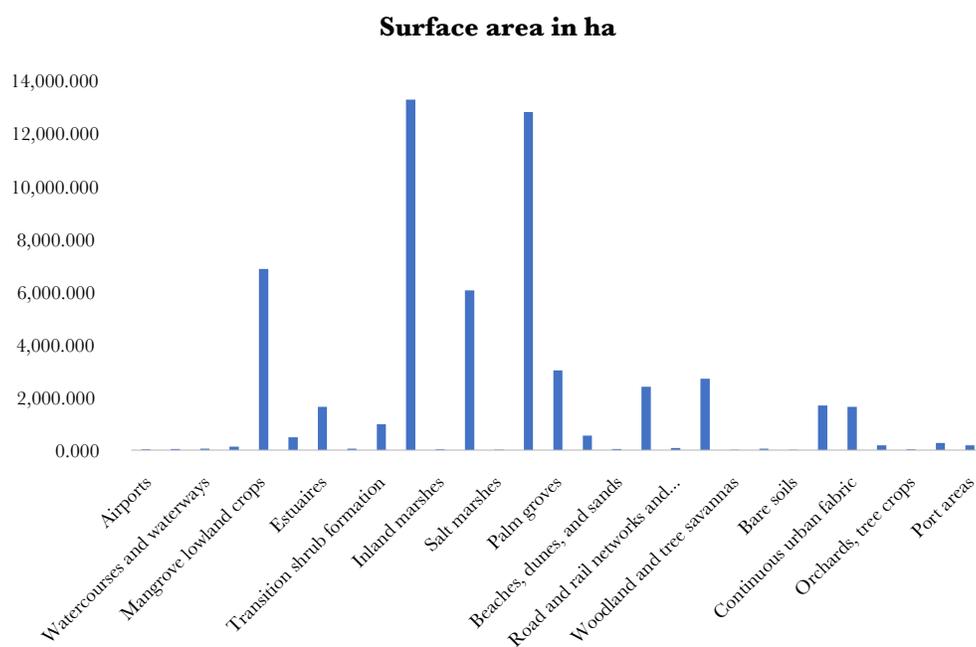
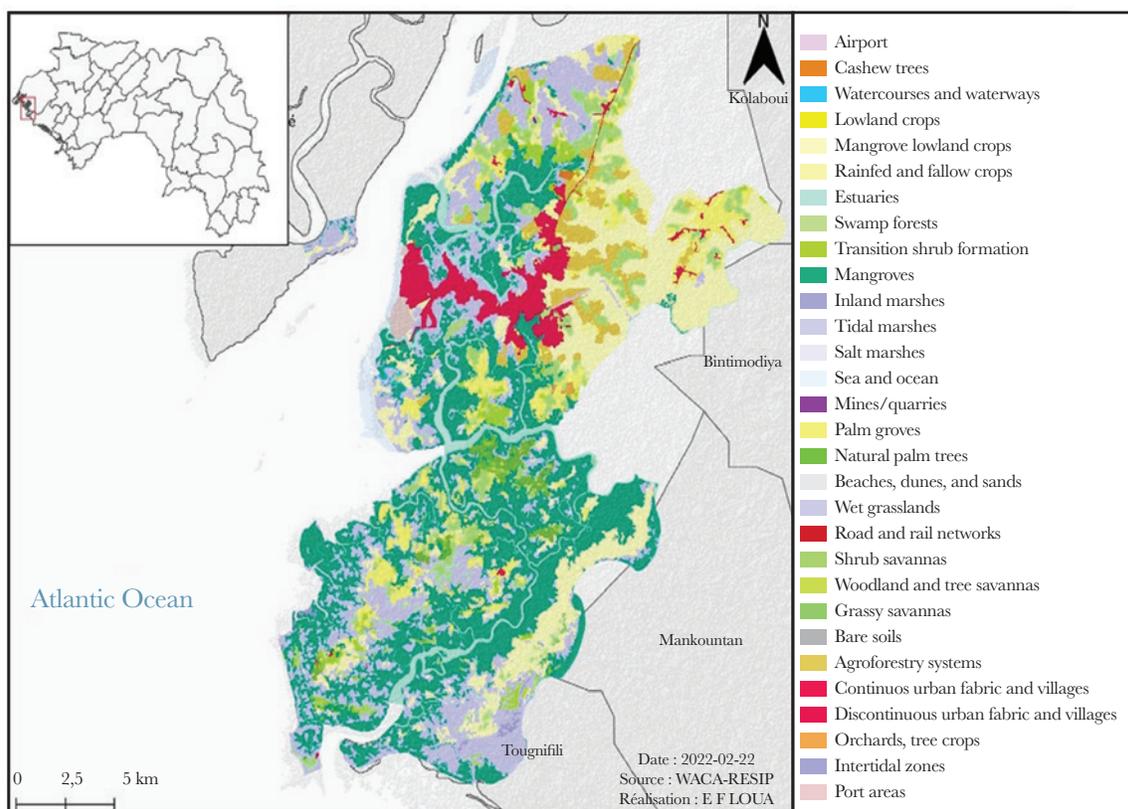


FIGURE 12: LAND USE (2022. KAMSAR)



Source: Sentinel Imagery 2A 2022

TABLE 11: SURFACE AREA AS A PERCENTAGE (2022)

Entity	Surface area in ha 2022	Percentage
Airports	25.808	0%
Cashew trees	39.069	0%
Watercourses and waterways	59.378	0%
Lowland crops	31.198	0%
Mangrove lowland crops	6,867.579	12%
Rainfed and fallow crops	556.895	1%
Estuaries	1,634.347	3%
Swamp forests	57.110	0%
Transition shrub training	914.284	2%
Mangroves	13,263.787	24%
Inland marshes	24.482	0%
Tidal marshes	6,049.425	11%
Salt marshes	20.996	0%

Entity	Surface area in ha 2022	Percentage
Sea and ocean	12,805.664	23%
Mines/quarries, extraction of materials	3.856	0%
Palm groves	3,018.195	5%
Natural palm trees	546.510	1%
Beaches, dunes, and sands	40.992	0%
Wet grasslands	2,400.846	4%
Road and rail networks and associated spaces	83.074	0%
Shrub savannas	2,686.911	5%
Woodland and tree savannas	3.235	0%
Grassy savannas	51.784	0%
Bare soils	5.365	0%
Agroforestry systems (combination of perennial crops and forest species)	1,694.086	3%
Continuous urban fabric	1,734.377	3%
Discontinuous urban fabric and villages	201.533	0%
Orchards, tree crops	35.300	0%
Intertidal zones	272.095	0%
Port areas	190.953	0%
Total	55,319.134	100%

GRAPH 11: SURFACE AREA AS A PERCENTAGE (2022)

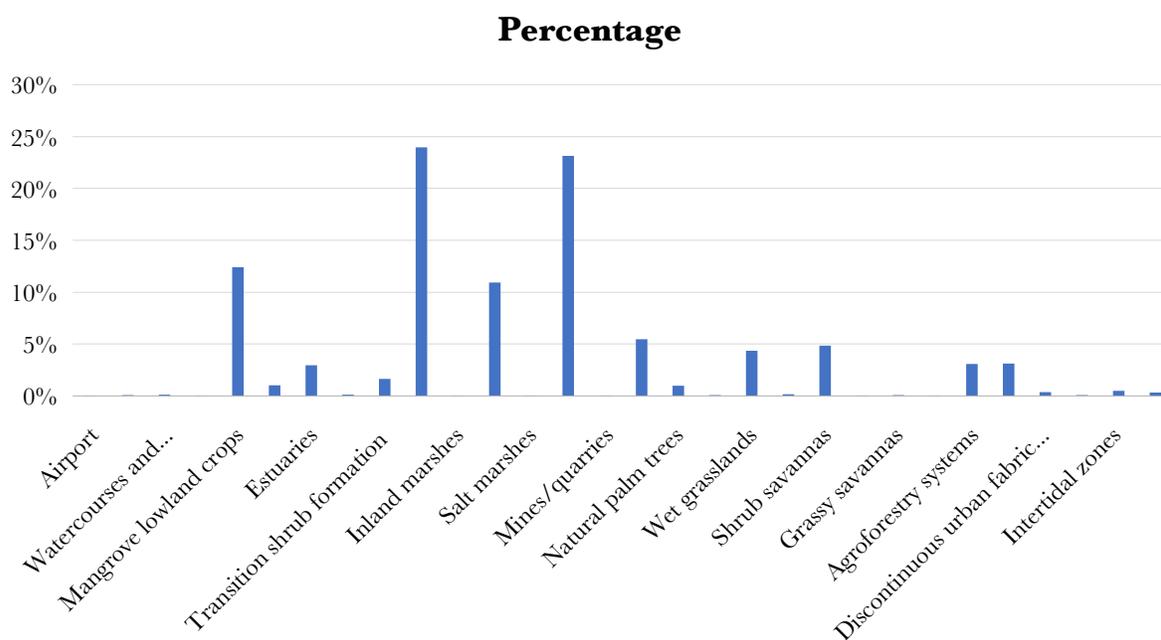
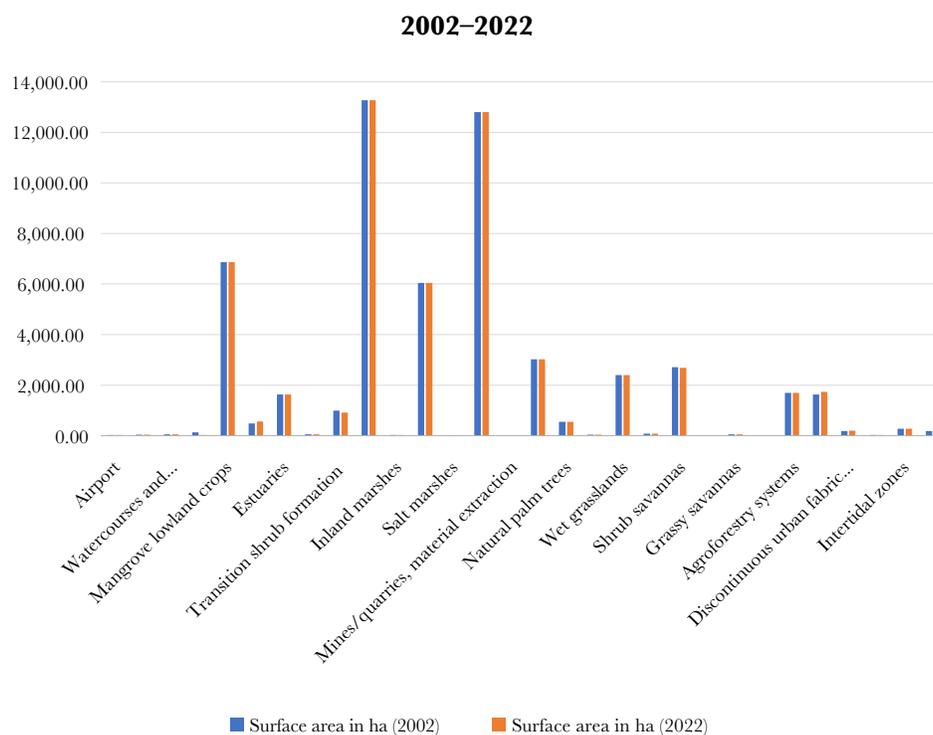


TABLE 12: COMPARISON BETWEEN 2002 AND 2022

Area	Surface area in ha (2002)	Surface area in ha (2022)	Consumption and production flows
Airports	25.81	25.81	0.00
Cashew trees	39.07	39.07	0.00
Watercourses and waterways	59.38	59.38	0.00
Lowland crops	131.03	31.20	99.83
Mangrove lowland crops	6,867.58	6,867.58	0.00
Rainfed and fallow crops	482.95	556.90	-73.95
Estuaries	1,635.68	1,634.35	1.34
Swamp forests	57.11	57.11	0.00
Transition shrub training	986.79	914.28	72.51
Mangroves	13,272.43	13,263.79	8.65
Inland marshes	24.48	24.48	0.00
Tidal marshes	6,049.43	6,049.43	0.00
Salt marshes	21.00	21.00	0.00
Sea and ocean	12,805.66	12,805.66	0.00
Mines/quarries, extraction of materials	0.00	3.86	-3.86
Palm groves	3,022.59	3,018.20	4.39
Natural palm trees	546.51	546.51	0.00
Beaches, dunes, and sands	40.99	40.99	0.00
Wet grasslands	2,400.85	2,400.85	0.00
Road and rail networks and associated spaces	83.07	83.07	0.00
Shrub savannas	2,705.16	2,686.91	18.25
Woodland and tree savannas	3.24	3.24	0.00
Grassy savannahs	51.78	51.78	0.00
Bare soils	5.37	5.37	0.00
Agroforestry systems (combination of perennial crops and forest species)	1,694.09	1,694.09	0.00
Continuous urban fabric	1,634.55	1,734.38	-99.83
Discontinuous urban fabric and villages	184.19	201.53	-17.35
Orchards, tree crops	35.30	35.30	0.00
Intertidal zones	272.10	272.10	0.00
Port areas	180.97	190.95	-9.98
Total	55,319.13	55,319.13	0.00

GRAPH 12: COMPARISON BETWEEN 2002 AND 2022



❖ COMPONENT ON THE SEMISTRUCTURED INDIVIDUAL INTERVIEW OF LOCAL INFORMANTS

This qualitative component was based primarily on the combination of three research tools: interviews with local informants, the focus group, and interviews with the institutional stakeholders and deconcentrated services of the Ministry of the Environment. The semistructured individual interviews of local informants were conducted to complement the household survey to further discuss the links between mangroves and women, based on the perceptions and perspectives of the local populations, while ensuring a diversity of profiles among the respondents: district chiefs, elders, presidents of youth groups, etc. Twenty semistructured individual interviews were conducted in the districts of the three study areas using an interview guide structured around a number of categories, including: profile, mangrove activities and products, socioeconomic characteristics of women engaged in mangrove-centered activities, the conservation,

restoration, and/or rehabilitation of mangroves, the demographic characteristics of women, and policy rules and regulations.

TABLE 13: INTERVIEW OF KEY LOCAL INFORMANTS IN THE THREE STUDY AREAS

Study area	Individual interviews with local informants		
	Sites	Number of interviewers	Total interviewed
Local informants	Kaback	5	9
	Kanfarandé	5	6
	Kamsar	5	5

These interviews revealed that women who depend on mangrove-centered activities have no other sources of income and have almost never benefited from a mangrove restoration project or received support through income-generating activities. Mangrove sites face a

number of challenges in these environments. The general public nonetheless has free and unregulated access for personal use to 90 percent of these sites.

However, some sites have benefited from mangrove restoration projects such as the Kamsar area where the Global Alumina Corporation had in the past planted mangrove nurseries that never yielded good results because of the dumping of waste into the sea. In addition, 90 percent of the interviewees in Kamsar acknowledge that the establishment of mining companies had negative impacts on the islands, because of the construction of roadsteads to facilitate the transport of bauxite to large shipping vessels. For example, areas that served as rice paddies were flooded by sea water and remained unsustainable because of high salinity.

The NGO Tristao continues to finance reforestation projects for degraded sites in the Kanfarandé area with the establishment of fast-growing tree nurseries and provides training and coaching to women's groups, as well as support with income-generating activities. Support is also provided by the NGO Guinée Ecologie, which has been financing mangrove conservation projects on the Tristao islands for the past three to five years.



Photo 53. Interview in Bolimanda, Kaback.

❖ INTERVIEWS WITH KEY INFORMANTS FROM THE DECONCENTRATED GOVERNMENT SERVICES

Ten individual interviews of informants from the following deconcentrated services of the Ministry of the Environment and Sustainable Development (MEDD) were conducted in the three subprefectures in the study zone: Guinean Parks and Reserve Office (OGPR), Guinean Timber Board (OGUIB), Forest and Wildlife Prefectural Division (SPFF), the Prefectural Directorate of the Environment and Sustainable Development (DPEDD). The results of the interviews supplemented the results of the household surveys and provided information on the management of mangroves by the government.

These informants, who were targeted within and outside of Conakry, provided baseline information on the causes of the decline in mangrove areas, one of which is the lack of monitoring of the areas. Forestry officers based in these areas do not have adequate monitoring tools to effectively carry out their mission.

A forestry officer told me that he would not dare venture into the mangrove forest dressed in military attire, as he could be killed and dumped in the water by mangrove wood harvesters.

Furthermore, according to the information obtained from the survey of the deconcentrated government services, there were mangrove restoration and conservation projects in which women were involved and played an important role in the survival of the ecosystem. However, these same women are also engaged in salt production, smoking, and oyster picking on the same sites.

One hundred percent of the services surveyed confirm that mangroves are the sole source of income for women in these coastal areas and that they practice these activities for two reasons: to provide for their family and to earn a business income.

TABLE 14: INDIVIDUAL INTERVIEWS WITH DECONCENTRATED GOVERNMENT SERVICES

Study Area	Individual interviews with deconcentrated government services			
	Sites	Number of interviewers	Target	Total interviewed
Conakry		2		2
Kaback		5	Deconcentrated services	2
Kanfarandé and Kamsar		5		6

These individual interviews were supplemented by focus groups and observation studies.



Photo 54. Focus group in Bossimiyah.



Photo 55. Observation in Taigbé.

❖ COMPONENT ON MANGROVE CONDITIONS IN THE THREE STUDY AREAS

The comparison tables for each study area clearly show that mangroves have decreased in area in some places and less so in others. The surface area in the Kaback area in 2002 was 2,880.31 hectares (23 percent), while in 2022 it decreased to 2,745.41 hectares (22 percent); consumption and production flows declined by 134.89 (Source: Sentinel Imagery 2A, 2022).

The mangrove surface area in the Kanfarandé area in 2002 was 45,770.734 hectares (19 percent), while in 2022 it had almost the same dimensions (45,758.840 hectares, still 19 percent); the consumption flow was 11.89 (Source: Sentinel Imagery 2A, 2022).

In Kamsar in 2002, the surface area of the mangroves was 13,272.433 hectares (24 percent); after 20 years it was 13,263.787 hectares (still 24 percent). The consumption flow is 8.65 percent (Source: Sentinel Imagery 2A, 2022).

In general, mangroves in the Kaback area have deteriorated over the past 20 years, while in Kanfarandé and Kamsar mangroves have shown some improvement over the same period, staying the course despite moderate harvesting. This was made possible through awareness raising among NGOs and mining companies.

Based on field findings and an analysis of the interview results, mangrove forests are gradually recovering in the Kanfarandé area, thanks to steps taken by the State and the

community to safeguard the mangrove forest. However, despite the rules and measures in place, harvesting is still being carried out within mangrove forests.

According to one respondent in Kanof, the authorities have been monitoring the coasts and banned mangrove wood harvesting more than three years ago. As a result, the regeneration of mangrove forests has been under way for some time.

Excessive harvesting has depleted mangrove forests in Kaback over the past 10 years and there are very few reforestation activities in the area. Given the current state of the area, communities have understood that if mangroves disappear, all vested interests will be lost. They have therefore understood the need to get involved in participatory, dynamic, and functional consultations that promote the introduction of community laws and rules that prohibit the destruction of mangroves and are validated by all users of mangrove products, the majority of whom are women who derive their income from these mangroves.

❖ COMPONENT ON THE MANGROVE OWNERSHIP REGIME IN THE THREE STUDY AREAS

The majority of respondents stated that mangrove ownership is community-based, with only a minority indicating that it was family-based. This is the case in the Bolimande district in Kaback subprefecture, where residential areas near mangroves are considered to be family property by landowners.

❖ RULES AND REGULATIONS

The rules and regulations are set out in the MEDD Environmental Code, the Forest Code, and the Fisheries Code, the articles of which govern the formal prohibition of logging in mangrove areas. These laws are defined by the State and implemented by its representatives in the deconcentrated services. Forestry and nature conservation officers are stationed in all subprefectures, but equipment and training are regrettably lacking.

Now, in light of the scarcity of fish in some areas and the decrease of mangroves, communities in coastal areas have understood the importance of this ecosystem. In the Matakang, Bolimanda, and Bossimiyah districts in Kaback, local authorities and presidents of youth groups formally prohibit mangrove wood harvesting. This is also the case in the Kanfarandé and Kamsar subprefectures. However, the illegal harvesting of mangrove and domestic wood for fish smoking at home continues.

In addition, women in the Kanfarandé and Kaback areas have introduced a rule prohibiting the cutting of mangrove roots for oyster picking. Now, the oyster are scraped off the roots. This is one way of conserving the mangroves.

❖ SUGGESTIONS FROM RESPONDENTS IN THE THREE STUDY AREAS

Suggestions for improving mangrove health in the three study areas were divided into two groups: the deconcentrated government services and key local informants as well as the women interviewed in the three study areas.

1. Deconcentrated government services
 - » Develop tools for mangrove management;
 - » Take into account the master plans for the implementation of laws and rules for coastal areas that will take into account mangroves;
 - » Support mangrove restoration and conservation initiatives;
 - » Inform and raise awareness among coastal communities about the importance of mangroves and the danger of its degradation;
 - » Reforest degraded mangrove sites;
 - » Involve administrative and commune-level authorities in the mangrove management process;
 - » Finance mangrove restoration projects;
 - » Strengthen surveillance by providing forest rangers with the appropriate resources.

2. Women engaged in mangrove activities:
 - » Reforest denuded areas;
 - » Finance income-generating activities and other alternative activities such as market gardening and oil and soap production;
 - » Provide assistance and support to women in implementing formal EIGs;
 - » Train oyster pickers and salt producers in the new modern techniques for oyster picking and solar salt production;
 - » Build shorkor stoves that use less fuelwood and train women in the use of this stove;
 - » Include women in the decision-making process for mangrove restoration and entrust them with the management of these mangroves;
 - » Train female leaders to raise awareness about the dangers of mangrove harvesting;
 - » Encourage the reforestation of fast-growing trees;
 - » Create community forests to meet fuelwood needs for domestic consumption.

VI. MANGROVE TYPOLOGY AND IDENTIFICATION OF POTENTIAL

Mangroves are halophytes that have developed special biological characteristics that enable them to tolerate the specific conditions in this environment (muddy soils, salt water, high amplitude tides). The *Avicennia germinans* species is found primarily along the coastline and in the mangrove hinterland. It has high salinity tolerance. On the banks of estuaries and marsh creeks, *Rhizophora mangle* (Tristao Islands), *Rhizophora mucronata*, and *Rhizophora mangle* (all along the coast) have developed a root system that forms arched stilts to ensure proper anchoring on the banks and good submersion conditions and lower salinity.

The *Laguncularia racemosa* sometimes shares the banks with *Rhizophora*. In the back of these forest formations, an area with halophytic grasses (salt marsh or grassy *tanne*) that are flooded only by high tide transitions to salt barrens (*tannes vifs*) that are occasionally inundated by freshwater high tides and vegetation from the plateau or freshwater flood areas (OGM, 2006).

In the Kanfarandé area, only the tallest stands that can be exploited on a large scale are threatened. This important operation is offset by the rapid formation of new stands in the numerous accretion areas. In the estuary of the Rio Nunez, the rising mudflats contribute to the sound growth of *Rhizophora* stands. This regeneration is evident in young, unexploited stands. It is therefore the logging activity, and not the stands, which is threatened in the medium term.

VII. DIFFICULTIES ENCOUNTERED DURING THE FIELD MISSION

Several challenges were encountered during the course of the field survey and the reduced time for consultation.

The first challenge was gaining access to the various sites, particularly Kanof, because of the lack of a quality canoe for the crossing from Kanfarandé Centre to Kanof.

Another challenge was the reluctance and refusal of the various persons we met to respond to our questions. They indicated that they had been interviewed several times by previous missions and that there had been no coordinated follow-up action. This was the case despite promises that have remained unfulfilled on the ground. They also indicated to us that they would rather have concrete action now than be subjected to series of questions.



Photos 56, 57. Canoe sunk in the mud at low tide.

VIII. CONCLUSION AND RECOMMENDATIONS

Most households and local government officials interviewed in the localities visited as well as the deconcentrated government services recognize that the mangroves in their locality have deteriorated over the past six to 10 years. Some attribute this deterioration to global climate change, while others point to the establishment of mining companies in areas conducive to the construction of ports for maritime transport that has triggered the advancement of the sea toward the mainland; and still others cite human activities. Survey data have highlighted the role of human activities in the disruption of mangrove health.

The islanders' circumstances, or even the marginalized living conditions on the islands caused by extreme poverty, necessitate a combination of activities to enable households to be self-sufficient and provide for their family. This is due in part to the fact that they are unable to meet their needs elsewhere because of a lack of means of transportation. It is a combination of all types of activities, producing all that is necessary to live in these areas; hence the different mangrove-centered activities.

All the women engaged in harvesting mangrove products in the three study areas expressed a willingness to shift to income-generating alternatives. They cited general trade (chafing gear, sale of fishing equipment, sales of telephones, clothing), training in income-generating trades, entrepreneurship, establishment of modern smoking centers as well as training in new smoking techniques, solar salt production, and dyeing, the establishment of community centers for women's empowerment (associations, women's groups, cooperatives, etc.).

RECOMMENDATIONS

- » Strengthen NGO efforts to combat mangrove ecosystem degradation, particularly those led by women and young people through the development of economic interest groups to balance economic profitability with ecological sustainability through, for example, the afforestation of fast-growing trees, agroecological practices, gardening, village nurseries, community market gardening areas with technical support;
- » Use other fuel sources such as butane or cooking gas for modern fish smoking to reduce wood consumption in traditional smoking;

- » Build women's capacities in solar salt production, a non-labor intensive activity that does not require wood.
- » Promote the emergence of IGAs among women and young people in the study areas relating to the promotion of green jobs or creation of green initiatives. Projects pertaining to plastic waste recycling, the development of soap making, the incorporation of training of dyers, the establishment of sewing training centers, and the social economy could thus serve as a model to demonstrate to women and young people the locally available potential and the socioeconomic opportunities that they can pursue without affecting the health of the mangroves.
- » Implement programs and projects to combat the environmental degradation of mangrove ecosystems. Guinea has codes and legislation, strategic documents, and action plans pertaining to the environment and fisheries, but effective implementation is often the main obstacle.
- » Strengthen the capacity of environmental actors and agents at the grassroots level and provide them with the tools needed equipment for strict enforcement of the laws and codes.
- » With respect to human activities, more specifically the development of rice cultivation, the rehabilitation of mangrove rice paddies could be continued, by focusing on UNIVERSEL/ADAMA-type small-scale developments, in order to salvage abandoned rice ponds and improve the management of irrigation of plots, guaranteeing good harvests and sustainable harvesting practices.
- » Create village forests such as fast-growing trees that will be used as production wood to replace mangrove wood, thereby protecting mangroves from excessive logging.

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1818 H Street, NW

Washington, D.C. 20433 USA

Telephone: 202-473-1000

Internet: www.worldbank.org/environment