

# TECHNICAL REPORT

## UNDERSTANDING THE NEXUS OF MANGROVES AND WOMEN IN GHANA

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*Photo credit: N. A. Anokye*

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This report was prepared by Nana Amma Anokye and Harriet M. D. Potakey (Consultants) under the supervision of Susmita Dasgupta (Lead Environment Economist), and Juan Jose Miranda (Senior Environmental Economist), under the guidance of Maria Sarraf (Practice Manager) and Sanjay Srivastava (Practice Manager). The report was prepared under the World Bank's West Africa Coastal Areas (WACA) management program. The team would like to acknowledge the financial support provided by the Global Program on Sustainability (GPS) and Wealth Accounting and the Valuation of Ecosystem Services (WAVES), and PROBLUE Trust Funds. PROBLUE is an umbrella trust fund that supports a sustainable and integrated development of marine and coastal resources in healthy oceans.

# ABBREVIATIONS AND ACRONYMS



CBO	Community Based Organization
CSLP	Coastal Sustainable Land Project
CWMC	Coastal and Wetlands Management Committee
DAA	Development Action Association
DOPA	Densu Oyster Picking Association
EPA	Environmental Protection Agency
FC	Forestry Commission
FGD	Focus group discussion
IUCN	International Union of Conservation of Nature
NGO	Nongovernmental organization
REDO	Resource and Environmental Development Organization
ResIP	Resilience Investment Project
SFMP	Sustainable Fisheries Management Project
SwS	Seawater Solutions Ghana
TDI	The Development Institute
ToR	Terms of Reference
UNEP	United Nations Environmental Programme
USAID	United States Agency for International Development
WACA	West Africa Coastal Areas
WLD	Wildlife Division





# EXECUTIVE SUMMARY

The main objective of this study was to assist understanding of the nexus between mangrove cultivation and restoration, and women in coastal Ghana by covering two broad areas:

1. Women's use of mangroves; and
2. Women's role in conservation and restoration of mangroves.

Both desk and field studies were conducted. The field study used purposive sampling technique to select two localities: one in the Densu Delta Wetland (Tsokomey and Bortianor) in the Greater Accra region, the other in the Anloga district (Anloga, Anyanui, Gblipke and Atorkor) in the Volta region. **Densu Delta was chosen for study because of the presence of a women's group that is involved in mangrove-centric activities, as well as a conservation/restoration project. Anloga district was chosen because it has a vast expanse of mangrove forest, and a major mangrove wood market at Anyanui.**

The people we interviewed were selected using purposive and snowball sampling techniques. They included relevant mangrove-centric stakeholders such as women's groups; key local and institutional informants; opinion leaders; nongovernmental organizations (NGOs); and community-based organizations (CBOs), as well as individuals from the communities.

Face-to-face interviews with individuals and key informants; two consultations with experts; and focus group discussions (FGDs) were used to gather the data. Observations of some of the mangroves and mangrove-centric activities around the Densu Delta, and around Angor Lagoon were made via boat trips.

**The data collected were analyzed descriptively according to themes based on the scope and content of the study. These themes included the state of the mangroves; mangrove-centric activities engaged in by women; mangrove-centric products; and women's dependency on those products for primary, secondary, subsistence, and commercial uses.** The demographic and socioeconomic characteristics of women engaged in mangrove-centric activities and conservation and restoration projects, were also covered. Membership in women's groups and CBOs; the seasonality of the mangrove-centric activities; the willingness of women to consider changing to alternative sources of income; and issues concerning the conservation and restoration of mangroves were also studied.

The main findings of this study indicate that mangroves in Ghana are very limited in distribution and area: they occur in estuaries and lagoons across the Volta, Greater Accra, Central, and Western regions. The Western and Volta regions have extensive mangroves; between the Western and Volta regions, patchy mangroves associated with lagoons and estuaries are found in a few places.

Mangrove-centric activities and products include: the cultivation of mangroves; timber logging for construction; mangrove fuelwood harvesting for fish-smoking and domestic purposes; and the harvesting of mollusks and oysters, fish (tilapia), crab, periwinkles, and herbs. The Volta region, where mangrove is the dominant species of harvested fuelwood, has a commercial mangrove market center.

Most of the literature on mangrove-centric activities in Ghana does not separate the tasks of women from men. Both genders were engaged in mangrove-centric activities to varying degrees, depending on the specific product and the location. Women engaged more than men in oyster harvesting, however, at Anyanui, the women were involved in full-time harvesting and selling of fuelwood.

Most mangrove users depend on the mangroves for both subsistence and commercial purposes. However, in Anyanui, the use of mangrove is purely commercial, and is the people's primary source of income.

A high percentage of women in mangrove-centric activities are within the ages of the active labor force (i.e. 20 to 60 years of age). The elderly women (those above forty) are more involved in fish smoking. The marital status of the women varied: married, single, widowed, and women with or without children were all included. The household income of women involved in mangrove-centric activities is generally low, as is their level of education; the majority have had only basic education.<sup>1</sup> Mangrove resource users who live outside the Volta region are mainly migrants originating from the Volta region, while those who live within the region are indigenes.

Mangrove harvesting is a year-round activity but both fish smoking and wood harvesting peak when the fishing picks up during the bumper season. There are only limited opportunities for alternative livelihoods for the majority of women involved in mangrove-centric activities. Some were willing to consider alternative means of livelihood but others were hard-core mangrove users, particularly in the Volta region, where they perceive the mangroves to be in abundance.

There is no legislation on sustainable mangrove use and conservation; however, there were some bylaws enacted by the Anloga District Assembly. Previous conservation/restoration interventions have been spearheaded by NGOs. In the Densu Delta a restoration project was initiated at the local level by Development Action Association (DAA), an NGO. In the Anloga district NGOs collaborate with the Anloga Wildlife Division (WLD) of the Forestry Commission (FC). Women have been involved in mangrove restoration projects, raising seedlings in nurseries and planting them on degraded lands.

Mangrove-centric activities in Ghana include the cultivation of mangroves; timber logging for construction; mangrove fuelwood harvesting for fish-smoking and domestic purposes; and the harvesting of mollusks and oysters, fish (tilapia), crabs, periwinkles, and herbs. Within the study areas the main activities were oyster picking and harvesting, fishing, and mangrove harvesting. These activities were engaged in by both women and men but women dominate in oyster picking and harvesting, and mangrove harvesting. These activities serve as both commercial and subsistence resource, as well as a primary source of income; hence they form a major source of livelihood for these communities.

### **Mangroves are under threat of being degraded.**

In the Anloga district the depletion has been gradual; it is more degraded in the Densu Delta. In spite of the general dwindling of mangrove products in the Anloga district, the dependency of the women on this resource is still high because they have limited alternatives; also,

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<sup>1</sup> Basic education is from first to ninth grade. It is for children between 6 and 15 years old (primary and junior high).

mangrove-centric related activities are their only known occupation. The women in the Densu Delta are more willing to consider other livelihood alternatives than in the Anloga district. There have been some conservation/restoration interventions involving women who are involved in mangrove-centric activities. In general, the participation of women in mangrove restoration projects in the study areas (Densu Delta and Anloga district) is location-specific. Land acquisition has been a major challenge for the district assembly and NGO restoration projects.

This study recommends that:

- » The use of mangrove-centric products be regulated through sensitization and public education on the importance of sustainable use.
- » The rules and regulations concerning sustainable mangrove use should be widely promulgated and enforced.
- » To reduce the dependency on mangrove-related products, the people need alternative livelihoods. There is an urgent need for training, and the provision of start-up capital.
- » Rather than just focusing on activities that have immediate economic benefits, sustainable, beneficial roles for the communities, including women in mangrove restoration projects, should be identified.

In order to capture holistic dynamics of the women-mangrove nexus in Ghana, further research covering the remaining coastal regions (Central and Western) is needed.



# CHAPTER 1.

## INTRODUCTION

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### 1.1. BACKGROUND

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This report was done in fulfillment of a major requirement detailed in the terms of reference (ToR) of the consultancy agreement between the authors<sup>2</sup> and the Resilience Investment Project (ResIP) of the World Bank. ResIP Part II aims to strengthen the resilience of targeted communities and areas in coastal West Africa. In Ghana, part of the purpose is to support, among other activities, the protection and restoration of mangrove habitats that serve as a protective asset against coastal floods, as well as other nature-based solutions that support the project objectives.

There seems to be a scarcity of organized knowledge of how women benefit from mangroves, and what role they play in the conservation and restoration of them in West African coastal areas. The ToR specifying the scope and content of this study charged us with undertaking a desk study; an empirical study that included developing and field testing of research instruments; and drawing connections between the learnings gained from the desk study as well as from the empirical studies.

The scope and content of the study, as spelled out in the ToR, was to:

1. Compile a comprehensive list of mangrove-centric activities of women in the coastal areas of Ghana;
2. Determine whether women are using mangrove products for household consumption, or are selling the products in the market;
3. If women are using mangrove products for household consumption, understanding whether the household demand for the product(s) is being fully met;
4. If women are using mangrove products for selling in the market, understanding the role of mangroves as their primary or secondary source of income;
5. Understand the characteristics of women who rely on mangroves for their livelihood;
6. Understand the time activity patterns of women who rely on mangroves;
7. Understand the willingness of women to switch to alternatives for mangrove products;
8. Understand the roles of women in the conservation, afforestation, and rehabilitation of mangroves;

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<sup>2</sup> N. A. Anokye and H. M. D. Potakey (researchers).

9. Understand the specific activities women undertake to conserve mangroves;
10. Understand whether their engagement in the conservation of mangroves is full-time or part-time;
11. Understand the characteristics of women who take part in the conservation of mangroves;
12. Understand any problems or issues women face in the conservation of mangroves;
13. Understand whether women have any formal representation in women self-help groups and community based groups.

The main objective of the study was to assist in understanding the nexus of mangroves and women in Ghana, by examining how women benefit from mangroves and what role they play in the conservation and restoration of mangroves in coastal Ghana.

The report presented here is based on both desk and empirical (field) studies on how women relate to mangroves in terms of their reliance on mangroves and mangrove-centric activities and products, as well as the role they play in conserving and restoring mangroves to ensure their sustainability. As part of the consultancy, research instruments were developed and tested in the field for future use to solicit information from stakeholders in the use, conservation, and restoration of mangroves.

The report is divided into four main sections. **Section 1** provides the background and methods used to carry out the study. **Section 2** presents the situation in Ghana at the national level, and is drawn mainly

from the literature review and from consultations with experts. Section 3 focuses on learnings and findings from the field at the local level, and relates them to learnings from the national level. Section 4 concludes the study and provides recommendations.

## 1.2. METHODS

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The empirical study, including the field testing of research instruments, was preceded by a literature review.

### 1.2.1. STUDY AREAS

The fieldwork was carried out in two main locations, which were chosen for their particular dynamics and time constraints. The areas were the Densu Delta Wetland (Tsokomey and Bortianor), in the Ga South municipality of the Greater Accra region<sup>3</sup>; and the Anloga district (Anloga, Anyanui, Gblikpe, and Atorkor) in the Volta region. Densu Delta was chosen because of the presence of a women's group that is involved in mangrove-centric activities, as well as a conservation/restoration project.

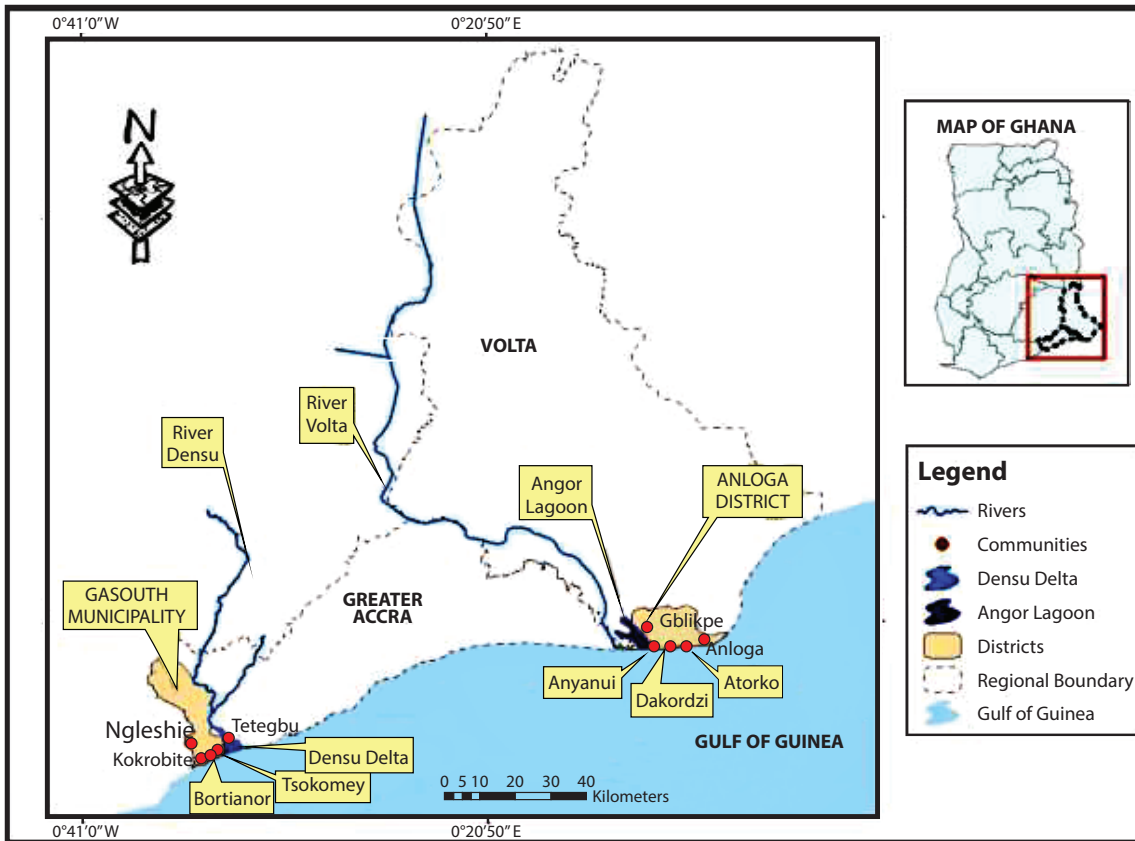
The Anloga district<sup>4</sup> has a vast expanse of mangrove forest, and a major mangrove wood market at Anyanui. The district is located east of the Volta estuary. Anyanui, around where the second field-testing took place, is a coastal town in the newly formed Anloga district, along the east coast of Ghana. Anyanui borders the eastern side of the Volta estuary and shares part of the Angor Lagoon (see Figure 1).

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<sup>3</sup> The Municipal Assembly is one of the newly created assemblies in the Greater Accra region. It was inaugurated in March 2018.

<sup>4</sup> The Anloga district was carved out of the Keta Municipal Assembly in 2018 and established in February 2019.

**FIGURE 1: MAP OF SOUTHEAST GHANA SHOWING GA SOUTH MUNICIPALITY AND THE ANLOGA DISTRICT**



Source: Department of Geography and Regional Planning, University of Cape Coast (January 2022)

### 1.2.2. SELECTION OF RESPONDENTS

The study targeted relevant mangrove-centric stakeholders like women’s groups, individuals, key local and institutional informants, opinion leaders, nongovernmental organizations (NGOs), and community-based organizations (CBOs). Qualitative sampling procedures were employed, using nonprobability sampling techniques. Respondents were selected using purposive sampling technique,<sup>5</sup> and interviewed because they had direct and/or indirect bearing on the subject matter and could provide relevant information. Snowball sampling technique was used in some circumstances.<sup>6</sup>

**Key informants from institutions** that have bearing on mangrove-centric activities and products, and/or mangrove conservation and restoration, and that are involved with women were selected.

- » The **development planning officers of the district assemblies** of the study areas were selected because they are in charge of all development issues and planning in the districts.
- » The **executive director and the manager of the Fisheries Training Center** of the only nongovernmental organization (NGO) in the Densu Delta — the Development Action Association

<sup>5</sup> Purposive sampling technique is a “nonprobability sampling technique in which [people or] units are selected because they have characteristics that are needed in the sample.” (Nikolopoulou, K. 2022).

<sup>6</sup> “Snowball sampling technique is a nonprobability sampling technique where new ... [respondents are recommended or selected by other respondents] to form part of the sample.” (Nikolopoulou, K. 2022).

(DAA) — which spearheaded a mangrove restoration program and also has a women’s group involved in mangrove-centric activities.

- » The **project officer for Seawater Solutions Ghana (SwS)**, a company with the largest mangrove nursery, which also engages women in managing the nursery and mangrove restoration, who is also the director of a local NGO (Keta Ramsar Centre) that engages women and young people in the planting of mangroves.
- » **The principal manager of the Wildlife Division (WLD) of the Forestry Commission (FC) was also selected.** (He is also the manager in charge of the Keta Lagoon Complex Ramsar Site.) The WLD of the FC has habitat restoration as one of its core mandates, and one of its management practices is the restoration of mangroves; it also engages community members, including women, in restoration programs. All NGOs involved in the conservation and restoration of mangroves must collaborate with the WLD.

The **key local informants** were also selected using purposive sampling technique; they were leaders of CBOs that have bearing on mangrove-centric activities and products, mangrove conservation and restoration, and the involvement of women. These informants were:

- » The local president of Densu Oyster Picking Association (DOPA);
- » The chairperson of the Mangrove Planters Association;

- » The district chairperson of the Coastal and Wetlands Management Committee (CWMC) for Anloga;
- » The local (Anyanui) chairperson of the CWMC;
- » A member of the CWMC; and
- » The chief (traditional leader) of Anyanui. (Anyanui is known for its extensive mangrove forest and is a commercial town for mangroves and the mangrove wood market).

**The participants for the focus group discussions (FGDs) and the individual respondents selected were all women in mangrove-centric activities.**<sup>7</sup>

### 1.2.3. FIELDWORK /DATA COLLECTION

Our fieldwork started with reconnaissance visits to some key experts at the University of Ghana and the University of Cape Coast, to gain firsthand information and an overview of the problem under study. This also gave us some guidance (complemented by the literature we had reviewed) as to where to carry out the fieldwork.

The reconnaissance was done in four days in July and September 2021. Fieldwork and testing were done in the months of September, October, and November 2021: three days in the Densu Delta and three days in the Anloga district. Another two days in November 2021 were spent in Anloga district to mop up the data we had gathered, since some respondents could not be reached on the earlier trip. This also helped us to triangulate the data we had gathered.

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<sup>7</sup> The members of DOPA were mainly women oyster pickers in the Densu Delta; 12 of them (per the FGD requirement of 6-12 participants) were selected as participants of one FGD. Four others were selected as individual respondents. Eleven women engaged by SwS in raising mangrove seedlings were selected as FGD participants in the Anloga district. Those who had established their own mangrove nurseries were selected as individual respondents. A woman involved in mangrove fuelwood harvesting and selling, and who was prepared to cooperate was selected at the mangrove market. With the assistance of WLD, other women involved in mangrove-centric activities were selected using Snowball. Six of them were grouped for an FGD, and two were interviewed as individual respondents.



Face-to-face interviews with individuals and key informants, and FGDs with the groups were used to gather the data. The interactions involved were:

- » Consultation with two (2) experts;
- » Interviews with five (5) institutional key informants — three (3) from Ga South municipal/Densu Delta and two (2) from Anloga district;
- » Interviews with seven (7) local key informants — one (1) from Ga South municipal/Densu Delta and six (6) from Anloga district;

- » Interviews with ten (10) individuals engaged in mangrove-centric activities — four (4) from Ga South municipal/Densu Delta, and six (6) from Anloga district; three (3) FGDs — one (1) from Ga South municipal/Densu Delta and two (2) from Anloga district.

In all, 24 interviews using interview guides and three FGDs, using FGD discussion guide, were held,<sup>8</sup> as well as two consultations with experts.

Two boat trips were made to observe some of the mangroves and mangrove-centric activities in the Densu Delta, and Angor Lagoon. Some of the communities we visited could most easily be reached by boat (see Photos 1–2).



**PHOTO 1: SETTING OFF IN A CANOE WITH DOPA MEMBERS, TO OBSERVE DOPA'S REPLANTED MANGROVE AND OTHER ACTIVITIES, DENSU DELTA**

Source: Fieldwork September 2021. (Photo credit: N. A. Anokye)

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<sup>8</sup> The interview guides and FGD guide were the research instruments used to collect data during the fieldwork from individuals and FGDs respectively and also guide the interview and discussion respectively. These research instruments were developed by us (the researchers).



**PHOTO 2:** RESEARCHERS BOARDING CANOE AT ANYANUI LANDING BAY

*Source:* Fieldwork October 2021. (Photo credit: E. Quaye)

The interviews were recorded, and field notes taken, to augment the data gathering. In some cases interviews and FDGs were done through an interpreter (Photos 3 and 4).



**PHOTO 3:** RESEARCHERS INTERVIEWING INDIVIDUAL RESPONDENTS AT ANLOGA

*Source:* Fieldwork November 2021. (Photo credit: E. Quaye)

Where possible, pictures were also taken to confirm the accuracy of the information that was gathered.



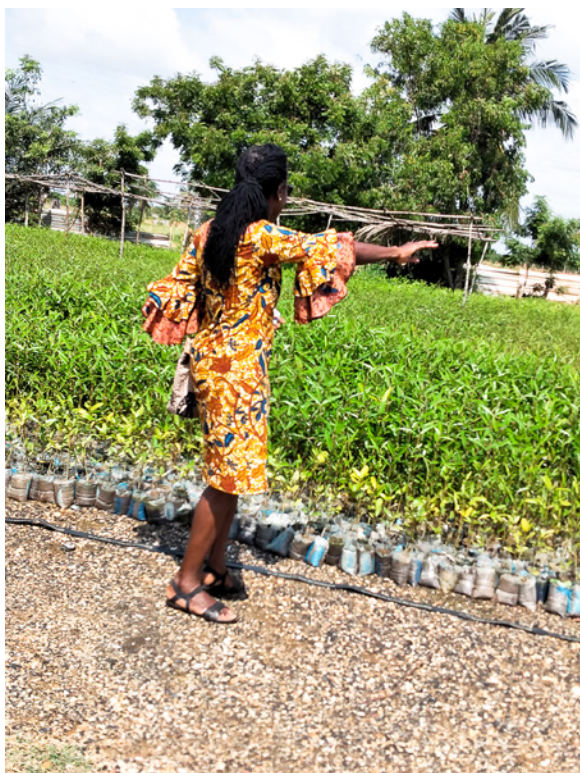
**PHOTO 4:** RESEARCHER TAKING PICTURES OF DIFFERENT MANGROVE SPECIES

*Source:* Fieldwork October 2021. (Photo credit: N. A. Anokye)



**PHOTO 5:** RESEARCHERS OBSERVE THE MANGROVE NURSERY OF THE WILDLIFE DIVISION WITH THE STAFF OF GHANA WILDLIFE DIVISION, ANLOGA

*Source:* Fieldwork October 2021. (Photo credit: E. Quaye)



**PHOTO 6: RESEARCHERS OBSERVING SECTIONS OF THE SwS MANGROVE NURSERY AT ATORKOR**

*Source:* Fieldwork November 2021. (Photo credit: E. Quaye)

#### 1.2.4. DATA ANALYSIS

The data we gathered was then transcribed and analyzed according to seven specific themes (see Section 3 for details). The results were discussed in relation to the themes covered under literature review at the national level that is detailed in Section 2.

#### 1.2.5. ETHICAL ISSUES

Consent and permission were sought from the participants and their leaders. In the Densu Delta, permission was also sought from the executive director of the DAA and DOPA to interview the members of their women's group. The consent of the individuals was also sought, after explaining the purpose of the interview and making it clear that the interviewees were free to stop the interview if they felt uncomfortable about the issues under discussion.

In Anyanui, following traditional custom, permission had to be sought from the Chief before access into the community could be allowed. Permission from the Ramsar Site Manager/Principal Manager of the Wildlife Division (WLD) of the Forestry Commission (FC) also had to be given before access onto the Ankor Lagoon was allowed. Special codes were used to identify the respondents, to allow for anonymity of their responses. Recording and photographs were taken by us only with consent.

#### 1.2.6. LIMITATIONS

The timing of the fieldwork coincided with the rainy season, and the opening of the Weija Dam, which empties into the Densu Delta. Therefore, we were unable to witness many of the typical activities in action.

## CHAPTER 2.

# OVERVIEW: NATIONAL LEVEL

This section provides an overview of women in mangroves at the national level, beginning with the state of the mangroves.

## 2.1. STATE OF THE MANGROVES IN GHANA

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Mangroves in Ghana are very limited in distribution and area, occurring in estuaries and lagoons (Agyeman, Akpalu and Kyereh 2007). The total mangrove area is somewhere between 100 square kilometers (km<sup>2</sup>) (Ntyam 2014) and 140 km<sup>2</sup> (Ajonina, Agardy, Lau, Agbogah and Gormey 2014). About 550 km of the coastline has lagoons and estuaries that are associated with narrow and patchy mangrove vegetation (Armah et al. 2016).

Mangroves are found around large lagoons on the coast of the Western region between Cote d'Ivoire and Cape Three Points (Sackey, Kpikpi, and Imoro 2011; UNEP 2007; Aheto, Owusu, & Obodai 2011; Ntyam 2014; Armah et al. 2016). Specifically within the Greater Amanzule region.<sup>9</sup> The Greater Amanzule covers wetlands from the Cote d'Ivoire border to Ankobra River (that is, Half Assini in the Jomoro district to halfway into the Ellembelle district). Other locations are found in Axim in the Nzema East, and Princess Town in the Ahanta West districts (Ajonina et al. 2014) and the Shama district.

The second place where extensive mangroves can be found is the lower reaches and the “main” estuary of the Volta River (UNEP 2007; Ntyam 2014; Ajonina et al. 2014), and around Anyanui, where a new estuary was created in the middle of 2021 when the sea washed away a piece of land between the sea and the Angor Lagoon (see details in Section 3.1). Anyanui even has a mangrove wood market on Tuesdays and Wednesdays.

Anyanui engages in mangrove farming: according to conversations with Experts 1 and 2, the trees take twelve to fifteen years to mature and be harvested for sale. The Keta and Anloga districts in the Volta region are the districts with the greatest amount of mangrove coverage in Ghana (see Section 3.1). Between the Western and Volta regions there are patchy mangroves associated with lagoons and estuaries, dotted at a few places such as Apam, Muni Lagoon, and Winneba in the Central Region; Sakumo Lagoon; and Bortianor, Ada, and Sroegbe along the east coast (Nunoo and Agyekumhene 2014; Dali 2020)<sup>10</sup> (see Figure 2). According to Nunoo and Agyekumhene (2014), however, the

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<sup>9</sup> Conversations with Expert 1 (Cape Coast) and Expert 2 (Accra) July 2021.

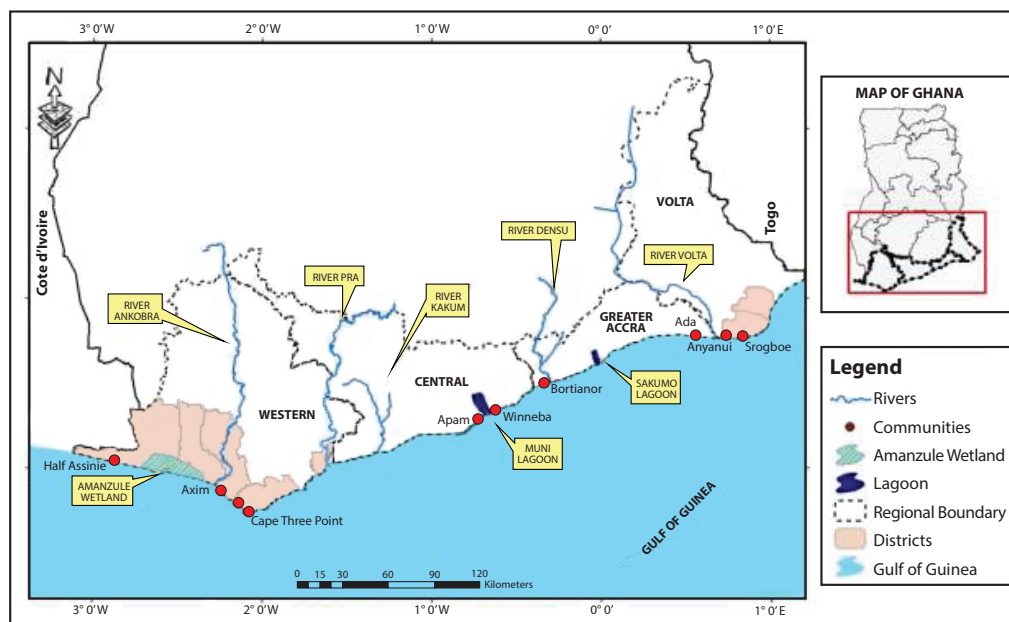
<sup>10</sup> See also conversation with Expert 2 (Accra) July 2021.

Volta region, in terms of spatial distribution, has the most extensive and numerous stands of mangroves, followed by the Western, Greater Accra, and Central regions (see Section 3.1).

There are three main genera of mangrove vegetation in Ghana, belonging to three families: they are the *Rhizophora* (*Rhizophoraceae*), *Avicennia* (*Avicenniaceae*), and

*Laguncularia* (*Combretaceae*) (see Section 3.1). The existing species are *Rhizophora racemosa*, *R. mangle*, *R. harrisonii*, *Avicennia germinans*, and *Laguncularia racemosa* (Nunoo and Agyekumhene, 2014).

**FIGURE 2: MAP OF COASTAL GHANA**



Source: Department of Geography and Regional Planning, University of Cape Coast (January 2022)

## 2.2. MANGROVE-CENTRIC ACTIVITIES IN GHANA

Mangrove-centric activities in Ghana include: the cultivation of mangroves, timber logging for construction purposes, the harvesting of mangrove fuelwood for fish smoking and domestic purposes, the harvesting of mollusks and oysters, fish (tilapia), and crab, periwinkles, and herbs (Armah et al. 2016; USFS-IP 2018; Dali 2020).<sup>11</sup> These activities are also engaged in at the local level in the study areas (see Sections 3.4.1 and 3.4.3).

According to Darko Obiri, Owusu-Afriyie, Kwarteng and Nutakor (2015), fuelwood producers usually harvest more than one type of tree species for sale, except in the Volta region, where mangrove is the dominant species harvested. This was confirmed at the local level around the Anzor Lagoon, where harvested mangrove wood is sorted out into fuelwood (see Section 3.4.3). The *Rhizophora mangle* and *Laguncularia racemosa* species (locally called Atra and Amuti respectively) ranked third, after *Albizia zygia* and *Celtis mildbraedii* (locally referred to as Okoro and Esa) among the types of fuelwood harvested for sale across the Greater Accra, Central, Volta, Western, and Eastern regions. The study by Darko Obiri et al. (2015), which was done along

<sup>11</sup> Expert 1(Cape Coast) and Expert 2 (Accra) July 2021.

the coast of Ghana, indicated that fuelwood is the main source of fuel used by almost all fish smokers along the coast. Mangrove fuelwood is preferable to other types of fuelwood because it enhances the color and taste of the fish; lasts long in the fire; dries and hardens fish faster; preserves fish for long; is easily available; and is easy to light (Darko Obiri et al. 2015). In the Western region, in the Amanzule mangrove complex, mangrove-centric activities are shellfish (such as oysters), tilapia, and crab harvesting. There is also harvesting of honey from beehives. Freshly cut mangroves are used for smoking fish.<sup>12</sup> In the Kakum mangrove forest more people were involved in fishery than tree harvesting; however, at the Pra mangrove forest more people exploited forest products than fish products, while a small proportion exploited both (Dali 2020).

Due to its water-resistant nature, mangrove roots are used to build houses in some places along the coast, for example Anyanui in the Volta region and Adakope in the Western region. *Rhizophora* is the most durable mangrove species for construction, hence it is a preferred choice. The mangrove roots are also used to produce charcoal in Winneba, in the Central region (Nunoo and Agyekumhene 2014; Dali 2020).

## 2.3. MANGROVE-CENTRIC ACTIVITIES OF WOMEN IN GHANA

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Most of the literature on mangrove-centric activities in Ghana does not separate the tasks of women and men. Both genders are engaged in mangrove-centric activities to varying degrees, depending on the specific mangrove product and location. The Densu Delta has a purely women-dominated activity of oyster harvesting.<sup>13</sup> In the Kakum mangrove forest area, a study by Dali (2020) revealed that a greater number of men harvested fish than women, while more women harvested forest resources.

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<sup>12</sup> Conversation with Expert 1 (Cape Coast) July 2021.

<sup>13</sup> Conversation with Expert 2 (Accra) July 2021.

<sup>14</sup> Ibid.

<sup>15</sup> Ibid.

Hence, in terms of forest resources women dominated. However, at the Pra mangrove area, the opposite was observed. Men mostly harvested forest resources, while women mostly harvested fish.

More females harvested *Avicennia* mangrove fuelwood than males; however, males dominated the harvesting of *Rhizophora*. When compared to *Rhizophora*, *Avicennia* is readily available, easy to harvest, and does not cause any bodily injury to the harvester. Hence, *Avicennia* is the preferred choice for women in the Kakum and Pra mangrove forest (Dali 2020).

At Anyanui, there seems to be a division of roles by gender. The men harvest the mangrove, and their spouses (women) gather and arrange them in canoes for onward transportation and sale in the market.<sup>14</sup> If the women are new to the mangrove business, both the men and women determine the price, after which the women engage in the selling. After the women have gained experience in pricing, they are able to determine the price by themselves. Generally, across the nation, fuelwood harvesting is done on a part-time basis, in addition to fish smoking. At Anyanui, however, the women are involved in full-time harvesting and selling of fuelwood.<sup>15</sup>

## 2.4. MANGROVE PRODUCTS (DOMESTIC/COMMERCIAL PURPOSES; PRIMARY/SECONDARY SOURCES OF INCOME)

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Most mangrove users depend on mangroves for both subsistence and commercial purposes. Usually the small branches of fuelwood that will not bring a good price

are used for home consumption.<sup>16</sup> However, in Anyanui, mangrove products are purely commercial, and are the primary source of income for the people. Mangrove wood is cultivated by families who own land along the Volta River and is sold mainly for income. Both women and men are involved along the mangrove market chain.<sup>17</sup> Those who do not own their own land lease land from landowners. Others buy mangrove plantations, harvest, and sell.

Mangrove farming has been the only source of income for some families for years (Nunoo and Agyekumhene 2014). In our research, dependency on mangroves as a primary source of income was revealed at the local level as well in the Anloga district (see Sections 3.4.4 and 3.5). Shellfish harvesting and farming are their secondary sources of income.

In other places, mangrove-centric activities are secondary sources of income.<sup>18</sup> In the Kakum and Pra mangrove area, people of all ages depend on mangrove products as a source of income: most of these users were engaged in schooling, farming, and trading, and they used mangrove resource harvesting as a part-time occupation (Dali 2020).

Along the coast it is generally believed that fish smoked with mangrove fuelwood (especially *Rhizophora*) tasted better than fish smoked with other kinds of fuelwood. The fish smoked with mangrove fuelwood fetches more money because it tastes better and can be preserved for a longer time.<sup>19</sup> In the past, fishermen strengthened their fishing nets by soaking the nets in the sap of the mangroves. After delivering babies, women also use the steam from boiled mangrove leaves for postnatal healing — for home consumption.<sup>20</sup>

## 2.5. DEMOGRAPHIC AND SOCIOECONOMIC CHARACTERISTICS OF WOMEN ENGAGED IN MANGROVE-CENTRIC ACTIVITIES

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Women with livelihoods tied to fishing are involved with mangrove-centric activities. These include fishmongers, who are mainly fish smokers. The elderly women (those above 40) are more involved in fish smoking, with younger ones assisting them.<sup>21</sup> However, a study by Agbekporu, Ennin, Issah, Pappoe and Yeboah (2021) showed that women who were involved in oyster harvesting along the Densu Delta ranged from 18 to 68 years.<sup>22</sup> Our study at the local level (see Section 3.3) showed that the age of the women in oyster picking ranged from 21 to 44 years.

The marital status of women involved in mangrove-centric activities is varied. Some are married, some are single, and others are widowed.<sup>23</sup> According to Agbekporu et al., (2021) most of the women oyster harvesters at the Densu Delta were married. A key informant in the Densu Delta confirmed that most of the women oyster harvesters are married (see Section 3.3).

The household income of women in mangrove-centric activities is generally low.<sup>24</sup> The low household income of the women was also observed at the local level in the two study areas (see Section 3.3). The study by Agbekporu et al. (2021) at the Densu Delta revealed

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<sup>16</sup> Ibid.

<sup>17</sup> Conversations with Experts 1 (Cape Coast) and 2 (Accra) July 2021.

<sup>18</sup> Conversation with Expert 1 (Cape Coast) July 2021.

<sup>19</sup> Conversations with Experts 1 (Cape Coast) and 2 (Accra) July 2021.

<sup>20</sup> Conversation with Expert 2 (Accra) July 2021.

<sup>21</sup> Conversation with Expert 1 (Cape Coast) July 2020.

<sup>22</sup> The study showed that a high percentage of women oyster harvesters from Bortianor were within the ages of the active labor force (from 20 to 60 years). Those in Tsokomey were from 21 to 50 years old. In Tetegu they were from 21 to 30 years.

<sup>23</sup> Conversation with Expert 2 (Accra) July 2021.

<sup>24</sup> Ibid



that the proportion of income the women made from oyster harvesting, out of the total household income for the seven-month harvesting period, ranged from 2–100 percent. Oyster harvesting was not the major employment: most of these women were involved in petty trading and fish processing.

The level of education of women in mangrove-centric activities is very low; however, some of them are very intelligent and are able to do water quality analysis.<sup>25</sup> A greater proportion of the respondents of the study by Agbekpornu et al. (2021) (69 percent) have had only basic-level education, while 27 percent of them have had no formal education at all. The local-level study showed similar findings where most of the respondents had just a basic-level education (see Section 3.3).

A study by Dali (2020) revealed that mangrove resource users were mainly migrants. Agbekpornu et al. (2021) also indicated that about 79 percent of the oyster harvester respondents were migrants, and that the natives were not much involved in oyster harvesting. This is different from what occurs in the Anloga district. There, the local-level study indicated that almost all of those engaged in mangrove-centric activities were Ewes who were natives of the Volta region (see Section 3.3). At the Densu Delta, however, the women are mostly Ewe migrants, who have lived in the communities for a long time: 40 years or more.<sup>26</sup>

The work of Agbekpornu et al. (2021) showed that women benefit from restoration projects. For example, oyster harvesters and the oyster pickers association benefited from receiving training in mangrove restoration through replanting and nursery management to improve oyster habitats, as well as training in areas such as processing and hygienic packaging of oysters. Other areas of training included testing of water quality, salinity, temperature, turbidity, and pH.

## 2.6. SEASONALITY OF MANGROVE-CENTRIC ACTIVITIES BY WOMEN

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Wood harvesting is done all year round on a part-time basis, along with fish smoking; and generally in Ghana, this is done by women. However, bumper fuelwood harvesting is linked to a bumper fishing season because mangrove fuelwood is used to smoke the fish. Both fish smoking and wood harvesting peak when fishing picks up during the bumper season (July to September), and then they go down in the lean fishing season. In Anyanui, people buy plenty of mangrove fuelwood and store it in the lean season: then they sell it during the bumper fishing season because the price of mangrove shoots up during the bumper season. Since the mangroves are planted at different times during the year from plot to plot on rotational basis at Anyanui, the mangroves also mature at different times throughout the year. Therefore, year-round mangrove farmers are able to harvest from plot to plot.<sup>27</sup> The year-round harvesting of mangroves was confirmed during the fieldwork we conducted in the Anloga district (see Section 3.4.5).

## 2.7. WILLINGNESS OF WOMEN TO SWITCH TO ALTERNATIVE PRODUCTS OR LIVELIHOODS

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There are only limited opportunities for alternative livelihoods for the majority of women currently engaged in mangrove-centric activities. Some women would be willing to stop if they could secure other means of livelihood but

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<sup>25</sup> Ibid.

<sup>26</sup> Conversation with Expert 2 (Accra), July 2021.

<sup>27</sup> Conversations with Experts 1 (Cape Coast) & 2 (Accra), July 2021.

others are “hard-core” mangrove users. In the Kakum and Pra mangrove areas in the Central and Western regions, most women resisted the idea of alternative use of the mangrove forest area stating that alternative use of the forests would lead to loss of their livelihoods (Dali 2020). They wanted the continuous existence of the mangrove forests as well as its use. A similar finding was revealed at the local level in the Anloga district (see Section 3.5).

Some users have switched to alternative sources of livelihood, supported by various NGOs. One of the experts we consulted regarding a project in Winneba in the Central region indicated that women would be willing to switch from mangrove-centric activities if and when they have alternatives.

*To assist them switch from mangrove-centric activities we first built their capacities to enhance their livelihoods. We provided alternative livelihoods such as soapmaking, animal (grasscutter) rearing. They were also provided with a revolving fund at low interest rate to sustain their alternative livelihoods. In the past, we trained them on tree planting on their lands. Then we engaged the communities to protect the mangroves. Once they had alternatives their attitudes changed.*<sup>28</sup>

## 2.8. CONSERVATION AND RESTORATION OF MANGROVES

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Several divisions and organizations are responsible for the management and conservation of mangroves in Ghana (Armah et al. 2016). However, efforts made for conservation and sustainable use are usually championed by development and civil society organizations (Asante, Acheampong, Boateng and Adda 2017). Hence, NGOs and community-based organizations (CBOs) are the main initiators of reforestation projects in Ghana (Armah et al. 2016). In the Densu Delta, at the local level the restoration project was initiated by the Development

Action Association (DAA), an NGO. And in the Anloga district NGOs have started to collaborate with the Anloga Wildlife Division (WLD) of the Forestry Commission (FC) (see Section 3.6.1 and 3.6.2). Generally the communities and individuals that own the land control the resource.

According to Derkyi (2007) there seems to be a generally poor understanding of the values and functions of mangroves and wetland ecosystems in Ghana. Therefore, mangrove forests are often considered as degraded and worthless areas that have to be exploited for productive uses. This has been the conventional view of mangroves. Seven years after Derkyi’s 2007 finding, Sustainable Fisheries Management Project (SFMP) (2014) wrote:

*Under a US government presidential Feed the Future Initiative, the USAID/Ghana Sustainable Fisheries Management Project — SFMP — supported Sanwoma to embark on a study tour to another local community where sustainable mangrove harvesting is practiced. Before the study tour, some community members did not even know that mangroves could be replanted after harvesting. Aside from the direct economic benefit from wood harvests, the community was unaware of other benefits of the mangrove forests — especially for a community that was battling with erosion of the shoreline, made worse by the loss of mangroves.*

The chief of Sanwoma was reported to have said the following:

*I had good resource at my disposal and didn’t know its worth. I now have a high sense of pride, knowing that this management activity will provide for posterity. (SFMP 2014: 1).*

The Sanwoma story was also confirmed by Oppong-Ansah (2018). He showed that a local NGO, Hen Mpoano, was supported by the USAID-Ghana SFMP to educate the community about the benefits of the mangrove forests (see Section 3.6.1).

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<sup>28</sup> Expert 2 (Accra) July 2021.

Though the conventional view of mangroves is gradually changing due to education and sensitization by NGOs, it still exists in some areas in Ghana. A study by Nunoo and Agyekumhene (2014) revealed that fuelwood harvesting for fish smoking is the number-one threat to the mangroves along the entire coast of Ghana. It is only in the Volta region that harvested mangroves are replanted after 12–15 years, for economic reasons (Armah et al. 2016).

There have been several mangrove conservation projects and programs undertaken in the coastal regions of Ghana through the efforts of NGOs and local initiatives. The following are some of them:

**Central Region:** Community Restoration in Ghana Project sponsored by Resource and Environmental Development Organization (REDO), located in Winneba, 1997–2000. (Armah et al. 2016).<sup>29</sup> Winneba has bylaws to protect trees along rivers. The project-trained beneficiaries were given wood seedlings, participated in woodlot establishment and practised rotational harvesting.<sup>30</sup>

**Volta Region:** The Lower Volta Mangrove Project Phase 1 focused on assessing environmental, economic, and social factors with the Ghana Wildlife Division (GWD) and the Environmental Protection Agency (EPA) 1996–1997 at Ada and Anyanui (Armah et al. 2016).

**Western Region:** Community Restoration in Ghana project by REDO from 1997 to 2000, located at Shama Princess Town (Armah et al. 2016). There is also the Greater Amanzule management project.<sup>31</sup> In the Western Region all chiefs were in support of protecting the mangroves. And the NGO Hen Mpoano was involved with Coastal Sustainable Land Project.<sup>32</sup>

With assistance from the USAID/Ghana SFMP, Sanwoma, led by their chief, embarked on a restoration project. The community is using bylaws to check indiscriminate mangrove harvesting. (SFMP 2014).

The Coastal Sustainable Land Project, together with key stakeholders, has initiated mangrove restoration projects at Yabiw, Anlo Beach, and Krobo in the Shama district, and Akwidai in the Ahanta-West district (SFMP 2014). Members of a volunteer group were trained to oversee and manage the restored mangrove areas (SFMP 2014).

**Greater Accra Region:** At Tsokomey there was a mangrove restoration project from 2016 to 2018 implemented by an NGO, the Development Action Association (DAA), which was sponsored by SFMP and USAID. The project involved oyster habitat manipulation.<sup>33</sup> The members of the Densu Oyster Pickers Association (DOPA), who are mainly women, nursed and transplanted the mangroves. They also manage the replanted mangroves (see Section 3.6.1).

Aheto, Kankam, Okyere, Mensah, Osman, Jonah, and Mensah (2017) observed in a study at the catchment area of the Volta that livelihoods and economic benefits are the main factors that encourage local stakeholders to participate in mangrove restoration programs. The study also showed that if customary laws are imposed and institutional arrangements are put in place to deal with mangrove destruction and rejuvenation rates, mangrove products can be used sustainably, rehabilitated, and managed. These researchers also mentioned the fact that the few livelihood alternatives are the major reason for the exploitation of mangrove products.

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<sup>29</sup> Conversation with Expert 2 (Accra), July 2021.

<sup>30</sup> Ibid.

<sup>31</sup> Ibid.

<sup>32</sup> Ibid.

<sup>33</sup> Ibid.

## 2.9. ACTIVITIES OF WOMEN IN THE CONSERVATION, REHABILITATION, AND/OR RESTORATION OF MANGROVES

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Women have been involved in mangrove restoration projects like the planting of seedlings.<sup>34</sup> Specifically, women collected seeds for establishing the mangrove nursery in Sanwoma. Oppong-Ansah (2018) observed that in Sanwoma, women who were involved in mangrove restoration saw the effect that the clean air that resulted had in reducing airborne diseases in the community. The women were happy doing this because they knew that it would give them more fuelwood for home consumption (Oppong-Ansah 2018). The women also put seedlings in the holes dug by their husbands, and covered the sides with soil during transplanting. This happened at the two study areas (local level) as well, where men dug the holes and the women put in the seedlings and covered the sides with soil (see Section 3.6.1).

Other mangrove restoration projects that women were involved in included a project at Muni Lagoon in Winneba. In this project women brought food to the men as the men planted the mangroves. The women also brought seedlings for the men to plant.<sup>35</sup>

In the Densu Delta, Tsokomey, under a project called the Sustainable Fisheries Management Project funded by USAID and spearheaded by DAA, a women's group

involved in oyster harvesting have also been engaged in mangrove restoration. The DAA has branches in all the coastal communities (for example, Apam) helping women in fisheries. The branch at Tsokomey is peculiar because of the relationship these women have with mangroves. They restored mangroves as part of their project. However, the main project was to enhance oyster production; because the oysters are associated with the mangroves, restoration of the mangroves was necessary in order to ensure the sustenance of the oysters. The mangroves there are very young, and restoration is picking up.<sup>36</sup>

## 2.10. DEMOGRAPHIC AND SOCIOECONOMIC CHARACTERISTICS OF WOMEN INVOLVED IN THE CONSERVATION OF MANGROVES

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On average, the women engaged in mangrove restoration activities are younger than women in mangrove-centric activities in general (usually 30–40 years old).<sup>37</sup> Their marital status is varied; they are single, married, widowed, and/or divorced, with or without children. Most of them have lived in their communities for a long time; 40 years or more. The household income of these women is low. Their level of education is also very low. However, some of them are very intelligent.<sup>38</sup> For example, Expert 2 offered that they had been able to train the Tsokomey women to analyze their own water samples.

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<sup>34</sup> Ibid.

<sup>35</sup> Ibid.

<sup>36</sup> Conversation with Expert 2 (Accra) July 2021.

<sup>37</sup> Ibid.

<sup>38</sup> Ibid.

## 2.11. CHALLENGES FACED BY WOMEN IN THE CONSERVATION OF MANGROVES

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The first two challenges were found to be faced specifically by women, while the others are challenges experienced by both genders.

### 2.11.1. CHALLENGES FOR WOMEN

- » Financing becomes a challenge for the women when they stop harvesting mangroves (which is an income-making activity).
- » When mangrove nurseries are sited at a distance from where replanting is done, it becomes difficult to convey the seedlings by wading through the mud to the site of replanting. (USFS-IP 2018). Usually it is women who are transporting the seedlings to the men, who then do the planting.

### 2.11.2. CHALLENGES FOR EVERYONE

- » The institutions responsible for the management of wetlands are weak (USFS-IP 2018).

- » There are bylaws governing the wetland areas in Shama and Akwidai area but they are not being enforced. The observation is that community members are not aware of the bylaws (USFS-IP 2018). This was also observed in the Anloga district (see Section 3.9).
- » Difficulty in predicting high tidal water can lead to planted mangroves being destroyed if they are covered with water for more than three days (USFS-IP 2018).
- » In Winneba, Woarabeba, and Ensuaqyiri, the lack of alternative livelihoods was a big problem.<sup>39</sup>
- » It has been argued that governance issues regarding land rights in mangrove conservation and rehabilitation are often overlooked, resulting in failure to enhance the conservation and sustainable usage of mangroves. This happened in the Songor Ramsar site, where mangrove ownership is organized by community, clan, or family, and in the Keta Lagoon Complex Ramsar site (Asante et al. 2017; USFS-IP 2018).

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<sup>39</sup> Conservation with Expert 2 (Accra) July 2021.



## CHAPTER 3.

# WOMEN IN MANGROVES AT THE LOCAL LEVEL

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This section discusses findings from the field on women involved in mangrove-centric activities and products; and mangrove conservation and restoration at the local level from two coastal wetland districts.<sup>40</sup> It also draws connections between the local findings and the findings on the national level.

This section of the report is divided into ten subsections, based on the tasks involved.

### 3.1. STATE OF MANGROVES

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Generally the state of mangroves in the Densu Delta wetland is degraded but it has shown some improvement over the past five years due to an intervention by the Development Action Association (DAA). According to Densu Delta institutional key informant 2 (September 2021), the mangroves in the Densu Delta wetland were depleting because people were harvesting them without knowing their importance. However, Densu Delta institutional key informant 1 (September 2021) believed that the state of mangroves within the Ga South municipality, specifically in the Densu Delta wetland, has improved since 2016. Before 2016 the mangroves in the district had degraded (see Photo 7). The mangroves were becoming depleted as a result of cutting the trees for *atidja* (see Photo 8), which is a practice by fishermen in which they leave tree branches and leaves in the lakes or lagoons as bait to attract fish (Anokye 2013).

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<sup>40</sup> Ga South municipality and Anloga district.



**PHOTO 7: PORTION OF DEPLETED MANGROVE AT THE DENSU DELTA WETLAND**

Source: Fieldwork September 2021. (Photo credit: E. Quaye)

*Fishermen from the surrounding communities cut the mangroves for ‘atidja’ to trap fish. This in turn depleted the oysters in the Densu Delta wetland. There*

*used to be oysters in the lagoon but got depleted. The fish is also getting depleted.<sup>41</sup>*



**PHOTO 8: ATIDJA IN THE DENSU RIVER**

Source: Fieldwork September 2021. (Photo credit: E. Quaye)

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<sup>41</sup> Densu Delta institutional key informant 1 (Kokrobite) September 2021.



With the support of the Sustainable Fisheries Management Project (SFMP), DAA restored the mangroves by replanting them with the help of oyster pickers, who wanted to boost oyster production (see Photo 9). There were also unrestored portions of the Densu Delta wetland, which is community-owned. Other places had DAA and DOPA-replanted mangroves interspersed with community mangroves (Photo 10). They replanted red mangroves in such places to distinguish their mangroves from the community ones.

The Anloga district has a comparatively extensive stretch of mangrove swamps along the Anloga Lagoon. According to findings at the national level, the Anloga and Keta districts in the Volta region are the districts with the highest mangrove coverage in Ghana (see Section 2.1). The 530-square kilometer wetland was designated as a Ramsar site in 1992. Anloga institutional key informant 2 (October 2021) noted that there is a vast forest of mangroves stretching across several acres of land in the Anloga district.



### PHOTO 9: DAA AND DOPA-REPLANTED MANGROVES ALONG THE DENSU DELTA

Source: Fieldwork September 2021. (Photo credit: E. Quaye)

In fact Nunoo and Agyekumhene (2014) indicated that the Volta region, in terms of spatial distribution, has the most extensive and numerous stands of mangroves in Ghana (see Section 2.1). The amount of land planted in mangroves has been reduced in the past two years, since the district was established. There used to be a large area of mangroves on the left, going from Dzita township towards Anyanui, however, sections of the mangrove forest had to be cut down for security reasons: it was on record that people were taking advantage of the thick mangrove forest to kill, rape, and kidnap, so the security services came in to cut down all the mangroves in that area.

There has been a gradual degradation of the mangrove in the Anloga district.

*The mangrove in the district has degraded over the past 20 years due to the high rate of harvesting. The sizes of mangrove stems are becoming smaller and smaller. There is overdependence, they do not allow the products to fully mature before harvesting. For the mangroves, the sediments or original soils after cutting do not properly support the regrowth unless they are planted on fresh lands.<sup>42</sup>*

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<sup>42</sup> Anloga district institutional key informant 1 (Anloga) October 2021.



**PHOTO 10: DAA AND DOPA-REPLANTED MANGROVES INTERSPERSED WITH COMMUNITY MANGROVES ALONG THE DENSU DELTA**

Source: Fieldwork September 2021. (Photo credit: E. Quaye)

This interviewee also confirmed that the mangroves are being reduced due to regular harvesting; this is depleting as well as the oysters. There seems to be no strong consensus among individual observers as to whether or not the mangroves are depleting.<sup>43</sup>

Individual respondent 1 (October 2021) also reported that:

*There is more harvesting and more planting of mangrove for fuelwood and construction now than some years back.*

However, Anloga district institutional key informant 2 (October 2021) commented:

*They don't plant the mangroves; they (the mangroves) spring up by themselves.*

The reasons given for the degradation are that people are harvesting but are not planting,<sup>44</sup> and even for those who are planting, the soil has become hard, so the mangroves are not able to grow well. According to

<sup>43</sup> Individual respondents agreed that the size (diameter) of the mangroves they are harvesting is smaller than what they were harvesting ten to twenty years ago. Anloga district individual respondent 2 stated that for the 30 years during which she has been harvesting and planting mangroves she has realized that the mangrove is depleting; however, Anloga district individual respondent 3 disagreed. She said it has not been depleting over the 35 years that she has been harvesting and planting. According to two other Anloga district individual respondents, 4 and 5 the mangrove is depleting; and two other Anloga individual respondents 1 and 6 were of the view that it is not depleting because they plant as they harvest, since it is their source of income. (October and November 2021).

<sup>44</sup> Anloga district individual respondent 4 (Atorkor) November 2021.

Anloga district local key informant 5 (October 2021), the overexploitation of mangroves is mostly within the buffer zones. He complained:

*Within the buffer zone, laws do not work because communities are interspersed or are embedded within the areas...Even though the areas are supposed to be under protection and of a 'no-go area'.*



**PHOTO 11: MANGROVE TREES BORDERING THE ANGOR LAGOON**

*Source:* Fieldwork October 2021. (Photo credits: N. A. Anokye and H. M. D. Potakey)

In general the district has a very good stand of mangroves that includes all three genera found in Ghana — red (*Rhizophora*), white (*Laguncularia*), and black (*Avicennia*) — but the red dominates (see Section 2.1, and Photo 11). However, there are also portions of depleted mangroves (Photo 12).

According to Anloga district local key informant 2 (October 2021), mangroves thrive better in soft mud than in loamy soils.<sup>45</sup> One forestry assistant, and also Anloga district individual respondent 2, explained that

the mangroves do well in soft soils. However, after several cycles of harvesting and replanting, the soil gets hardened and no longer supports growth. The mangroves that manage to grow on such hardened soil cannot grow very big, no matter how many years they are left to grow.

Portions of the land that has hardened have been taken over by *Acrostichum danaeifolium*, commonly known as the giant leather fern, which is a grass from the fern family (see Photo 13). This fern competes with the mangrove and eventually takes over.



**PHOTO 12: DEPLETED MANGROVE LAND ALONG ANGOR LAGOON**

Source: Fieldwork October 2021. (Photo credit: N. A. Anokye)

*Somewhere in June-July 2021 the sea washed away the land between the sea and the Angor Lagoon, creating another estuary. The lagoon had been a closed lagoon then. This has changed the hydrology of the lagoon (see Photo 14).<sup>46</sup>*

*...the sea now flows into the lagoon, creating shocks for the freshwater fish in the lagoon. This has reduced the quantity of big freshwater fish. Most freshwater*

*fish died when the sea joined the lagoon. The inflow of the sea water increases the salinity of the lagoon water which is not so good for the freshwater fish.<sup>47</sup>*

Most of the freshwater fish died when the sea joined the lagoon; the dead fish were seen floating in the lagoon for days afterward.

<sup>45</sup> This was confirmed by Anloga district local key informant 3 (Gblinke) October 2022, and individual respondents 2 (Anloga) and 6 (Atorkor) November 2022.

<sup>46</sup> Anloga district institutional key informant 1 (Anloga) October 2021.

<sup>47</sup> Anloga district local key informant 3 (Gblinke) October 2021.



**PHOTO 13:** THE LEATHER FERN HAS TAKEN OVER MANGROVE LAND BETWEEN ANYANUI AND GBLIKPE ALONG THE ANGOR LAGOON

*Source:* Fieldwork October 2021. (Photo credit: H. M. D. Potakey)



**PHOTO 14:** THE NEW ESTUARY, WHERE THE SEA HAS WASHED OFF THE LAND AND JOINED THE ANGOR LAGOON

*Source:* Fieldwork October 2021. (Photo credit: N. A. Anokye)

The inflow of the sea brought in a lot of sand/silt and therefore reduced the quantity of fish in the lagoon. The spillage of the dam at Akosombo and Sogakope upstream brings in freshwater, which is good for the fish. However, the lagoon needs dredging to give way to fishing.<sup>48</sup>

## 3.2. MANGROVE OWNERSHIP REGIME

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The Densu Delta wetland is a stool land, owned by the Ga stool.<sup>49</sup> Clans and families are the real owners but the Densu Focus Group Discussion (September 2021) revealed that some lands are owned by individuals. The wild mangroves (not the replanted ones) are available for community use, however, access and exploitation is controlled by the traditional authorities. Some portions serve as sacred groves for the chiefs and the elders of the traditional authorities. Access to and exploitation of the replanted mangroves is controlled by the Densu Oyster Pickers Association (DOPA). The Development Action Association (DAA) sought permission from the traditional authorities, the landlords, before land was released to them for their restoration project. Access to the oysters is open; the pickers hire boats or canoes and go and collect the oysters from the riverbed.

Unlike in the Densu Delta, in the Anloga district, the land belongs to individuals, families, and clans. The owners allow the harvesters to plant the mangroves and then sell them back to them when they have matured, on various agreement terms of sharecropping. In some instances individual landowners hire other individuals to cultivate the mangroves and sell them to the people who cultivated them. One staff member of the Wildlife Division explained that the majority of landowners do not have the skills for cultivating and harvesting the mangroves. Others do cultivate the mangroves on their family

lands. One respondent plants and harvests mangroves on her grandfather's land, which belongs to her and the other grandchildren.<sup>50</sup>

## 3.3. DEMOGRAPHIC AND SOCIOECONOMIC CHARACTERISTICS OF WOMEN IN MANGROVE-CENTRIC ACTIVITIES

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This subsection of the report focuses on the demographic and socioeconomic characteristics of women in mangrove-centric activities at the local level (see summary in Table 1).

The women engaged in mangrove-related activities in the Densu Delta at Tsokomey and Bortianor in the Greater Accra region range between 21 and 70 years old. Those involved in oyster picking are between the ages of 21 and 44 years.<sup>51</sup> The individuals interviewed were between 31 and 37 years. An earlier study by Agbekpornu et al. (2021) showed that women who were into oyster harvesting along the Densu Delta ranged from 18 to 68 years. A high percentage of women oyster harvesters from Bortianor, Tsokomey and Tetegbu were between 21 and 50 (see Section 2.5).

The range in the ages of fuelwood harvesters is from less than 14 to 60 years along the Anloga Lagoon. Anloga district individual respondent 1 is a 66 year-old woman who is involved in almost all the activities along the fuelwood value chain (planting mangroves, harvesting, sorting, arranging, and selling) at the Anyanui market.

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<sup>48</sup> According to Anloga district local key informant 3 (Gblinke). October 2021.

<sup>49</sup> The stool is the seat of the chief. Ownership of some lands in Ghana is vested in stools and the chief is the custodian of stool lands. (Anokye 2013).

<sup>50</sup> Anloga district individual respondent 2 (Anloga). November 2021.

<sup>51</sup> Densu Delta FGD (Tsokomey) September 2021. (However, Densu Delta local key informant 1 (Tsokomey September 2021) puts their ages between 20 and 60).

Two other respondents who are also mangrove harvesters are 50 and 57 years old.<sup>52</sup> The other individual respondents who have been raising mangrove seedlings (nurseries) are 30, 41, and 42 years respectively.<sup>53</sup> Most of the women respondents are in their late 40s. Children are also involved

in crab harvesting in the Anloga district. They normally go to the lagoon to set the crab traps. Children less than 10 years old are engaged in making crab traps<sup>54</sup> (see Photo 15, See Table 1).



### PHOTO 15: DRYING OF CRAB TRAPS ON THE ANGOR LAGOON

Source: Fieldwork October 2021. (Photo credit: N. A. Anokye)

The highest level of formal education attained by the oyster pickers at the Densu Delta is the secondary level (twelfth grade). Others have up to the basic level (ninth grade), while some have not had any formal education at all.<sup>55</sup> The four oyster pickers interviewed at the Densu Delta have up to the secondary level of education. This corroborates the study of Agbekpornu et al. (2021), which showed that a greater proportion of their respondents (69 percent) have had basic level education, while 27 percent have had no formal education (see

Section 2.5). The formal educational level of the women in mangrove-centric activities along the Angor Lagoon ranges from primary to secondary.<sup>56</sup> All the respondents from the Anloga district have at least primary education. Even the oldest, the 66-year-old woman has had a basic education. Some are school dropouts.

*Due to financial difficulties some drop out of school and go into mangrove harvesting, which they are paid GHC30 (US\$4.95) a day.<sup>57</sup>*

<sup>52</sup> Anloga district individual respondents 2 and 3 (Anloga) November 2021.

<sup>53</sup> Anloga district individual respondents 4, 5 and 6 (Atorkor) November 2021.

<sup>54</sup> Anloga district institutional key informant 1 (Anloga October 2021). Anloga district institutional key informant 2 (Anloga October 2021) explained that those involved in the planting and harvesting of mangroves are between 40 and 60.

<sup>55</sup> Basic education is from first to ninth grade. Primary education is from first to sixth grade, while secondary education is from seventh to twelfth grade.

<sup>56</sup> Ibid.

<sup>57</sup> According to Anloga district local key informant 2 (Anyanui) October 2021.

**TABLE 1: DEMOGRAPHIC AND SOCIOECONOMIC CHARACTERISTICS OF WOMEN IN MANGROVE-CENTRIC ACTIVITIES**

Characteristicst	Densu Delta	Anloga district
<b>Age (years)</b>	21–70	
Oyster & periwinkle picking	21–44	More than 10
Fuelwood harvesting		Less than 14–60
Making & setting of crab traps		Less than 10 and above
Mangrove planters and harvesters		40–60
Raising mangrove seedlings (nurseries)		30–42
<b>Level of Formal Education</b>	No formal education to Secondary (High school) level	Primary to secondary
<b>Ethnic Group</b>	Gas, Ewes, Fantes	Ewes
<b>Indigenes</b>	Gas	Ewes
<b>Migrants</b>	Ewes (majority)	None
<b>Marital Status</b>	Single, married, widowed	Single, married
<b>Religion</b>	Christians & Muslims (majority), traditionalists	Traditionalists (majority), Christians, Muslims
<b>Income Level</b>	Low	Low
<b>Number of Children</b>	3–7	1–5
<b>Number of Children in School</b>	3–4	3 on the average
<b>Household Size (includes dependents)</b>	5–17; 6 on the average	4–12

Source: Interviews and FGDs (Densu Delta and Anloga district September, October and November 2021)

The Densu oyster pickers are Gas, Ewes, and Fantes. The Fantes are in the minority. The land is Ga land, so the Gas are indigenes and the Ewes are settlers, though the Ewes have been there for many years; their great grandparents came to settle there from the Volta region. The current generation, both indigenes and settlers, were born and bred there. This was confirmed by the local president of DOPA.

The Ga oyster pickers are at Bortianor, while the Ewes are at Tsokomey. There are more Ewes (migrant) than native (Ga) oyster pickers. This finding supports Agbekpornu et al. (2021), who indicated that about 79 percent of their oyster harvester respondents along the Densu Delta were migrants, and that the natives were not

very involved in oyster harvesting (see Section 2.5). One has to bear in mind that the DOPA group, is a mixture of Ga indigenes and Ewe settlers. The Densu oyster pickers have lived in their current community since birth.

*Though migrants, the women have lived in their communities for a long time - as long as 40 years or more.<sup>58</sup>*

The oyster pickers along the Densu Delta are in just three communities: Bortianor, Tsokomey, and Tetegbu. However, there are oyster harvesters in all of the communities bordering the Angor Lagoon.

<sup>58</sup> Conversation with Expert 2 (Accra) July 2021.



The women involved in mangrove-centric activities along the Ankor Lagoon are mostly Ewes and indigenes who have resided in their communities for a long time, more than 20 years. All of the participants in the two FGDs, as well as the six individuals interviewed in the Anloga district are Ewes: there are hardly any migrants engaged in any of the mangrove-centric activities in the Volta region. The studies of Dali (2020) and Agbekporu et al. (2021) revealed that the mangrove resource users are mainly migrants, however, this does not hold true in the Volta region (see Section 2.5). This could be due to the fact that those previous studies were conducted outside of the Volta region, which seems to be a source of people with mangrove-centric activity know-hows. Unlike in the Densu Delta, the women in mangrove-centric activities in the Anloga district are indigenes of their localities. Some of them have lived in their present localities since birth.<sup>59</sup> The other three individual respondents have lived in their present localities for 6, 21, and 30 years.

Densu Delta FGD revealed that the majority of the women were single parents but there were also married women and widows among them.<sup>60</sup> However, the local president of DOPA said most of them were married. This conforms to the findings of Agbekporu et al. (2021), which also revealed that the women oyster harvesters at the Densu Delta were married (see Section 2.5). The four individual oyster pickers we interviewed were all married. The women in mangrove-centric activities along the Ankor Lagoon had varied marital status but most were single parents.<sup>61</sup> All six participants of Anloga district FGD 1 were single except one;<sup>62</sup> and three out of the eleven Anloga district FGD 2 participants were single; the rest were married.<sup>63</sup>

The religious affiliation of the women oyster pickers in the Densu Delta varied. There were Christians, Muslims, and traditionalists but Muslims and Christians dominated, according to the local president of DOPA. The religious affiliation of the women in mangrove-centric activities along the Ankor Lagoon also varied but the majority of them were traditionalists. A few were Christians and Muslims.<sup>64</sup> However, the individual respondents and Anloga district FGD 1 participants were all Christians, except two who were traditionalists.

The women in mangrove-related activities along the Densu Delta were of the lower income class. According to Densu Delta institutional key informant 1, these women struggle to make ends meet: there have been times she has had to intervene in their private lives in order to help them. The situation was the same along the Ankor Lagoon; the low income level of the women there was also confirmed in our conversation with Expert 2 (July 2021) (see Section 2.5). Only two of the FGD participants (one each from the two FGDs in the Anloga district) were of the medium-income class, and they were fishmongers.

The household size of the women oyster pickers along the Densu Delta ranged between five and seventeen<sup>65</sup> but the local president of DOPA said their average household size was around five or six. The number of children the women had was between three and seven. This means that the women were living with not only their nuclear families but with other relatives as well. The number of children in school was between three and four. The younger women had almost all of their children in school. Some of them indicated during the FGD that some of their children had finished school and were on their own.

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<sup>59</sup> Anloga district individual respondents 1 (Anyanui October 2021), 2 (Anloga), and 5 (Atorkor), and all the participants of Anloga district FGD 1 (Anloga) except two. November 2021.

<sup>60</sup> Densu Delta FGD (Tsokomey) September 2021.

<sup>61</sup> According to Anloga district institutional key informant 1 (Anloga October 2021), however, five of the six individual respondents were married; the other was divorced.

<sup>62</sup> Anloga district FGD 1 (Anloga) November 2021.

<sup>63</sup> Anloga district FGD 2 (Atorkor) November 2021.

<sup>64</sup> According to Anloga district institutional key informant 1, Anloga district local key informant 4 and Anloga district institutional key informant 6.

<sup>65</sup> Densu delta FGD (Tsokomey) September, 2021.

In the Anloga district the average household size, was four; and some of the women also have other dependents.<sup>66</sup> There seemed to be a lot of variation in the household sizes. Household size ranged between four and nine for the participants of Anloga district FGD 1. The interview with Anloga district local key informant 2 revealed that members of the Mangrove Planters Association have a household size ranging between four and eight. For the individual respondents, the household size ranged between five and twelve.

The number of children and dependents also varied. The number of children of the FGD participants and the individual respondents ranged from one to five; on the average three were in school. The number of dependents averaged seven. Household size ranged from 2–12. With the children of the members of the Mangrove Planters Association, some were in school, some had completed school, and due to the limited financial resources of their parents some were not in school, even though they were of school-going age.

## 3.4. MANGROVE-CENTRIC PRODUCTS AND ACTIVITIES

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The mangrove-centric activities in the study areas include oyster picking, basket fishing (for tilapia and shrimp), crab harvesting, raising mangrove seedlings in nurseries, and mangrove harvesting for fuelwood, construction purposes, and *atidja* (see Photo 8).

### 3.4.1. OYSTER, PERIWINKLE, AND CRAB HARVESTING AND FISHING

Oysters in the Densu Delta are picked from the river or lagoon bed. Oyster picking is the main livelihood of the oyster pickers.

*Oyster picking and fishing are their main source of livelihood. The environment provided by the mangrove allows for the growth of the oyster and they make their livelihood out of that.*<sup>67</sup>

The women are engaged more than men in oyster picking and basket fishing. Photo 16 is a picture of oyster shells from the Densu River. Photo 17 is a picture of fish harvested by basket fishing. Photos 18 and 19 portray crab harvesting.

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<sup>66</sup> According to Anloga district institutional key informant 1 (Anloga) October 2021.

<sup>67</sup> Densu Delta institutional key informant 2 (Ngleshie) September 2021.



**PHOTO 16: OYSTER SHELLS AT TSOKOMEY**

*Source:* Fieldwork September 2021. (Photo credit: N. A. Anokye)

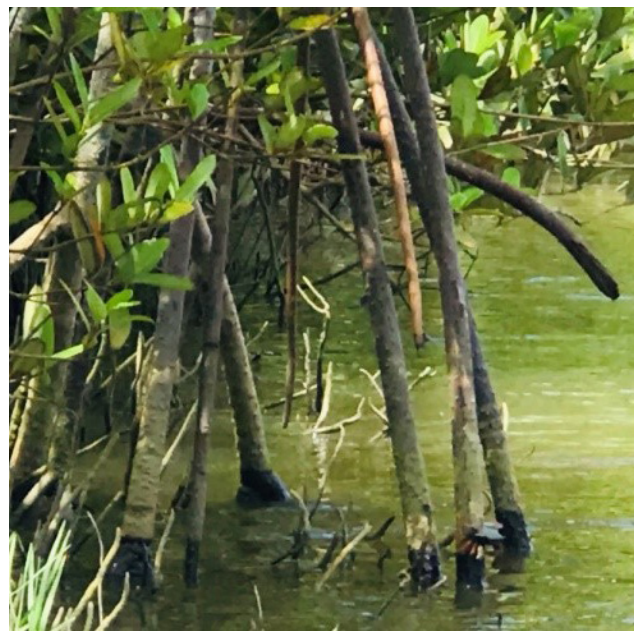


**PHOTO 17: WOMEN CLEANING FISH HARVESTED BY BASKET FISHING AT TSOKOMEY**



**PHOTO 18: FISH TRAP IN THE DENSU RIVER**

*Source:* Fieldwork September 2021. (Photo credit: E. Quaye)



**PHOTO 19: CRAB STICKING TO MANGROVE, DENSU RIVER**

Along the Angor Lagoon the mangrove-centric activities include oyster, periwinkle, and crab harvesting and fishing. Photos 20 and 21 are pictures of the periwinkles and oyster shells that are used to strengthen the foundations of mud houses. In the Angor Lagoon, unlike in the Densu Delta, the oysters stick to the roots of the mangroves (see Photos 22 and 23). They are harvested by cutting the mangrove roots on which they are stuck. Both women and men engage in these activities but the oyster picking is mainly done by the women (see Photo 24). Some children are also involved, especially with crab harvesting in the Anloga district. They normally go to the lagoon to set the crab traps.

*Mangrove-related activities are done by men, women and children, so you see men, you see women and you see children under 18 engaged in the activity either crab harvesting or picking of oysters, fishing and all that.*<sup>68</sup>

Their engagement in these activities has been over ten years.



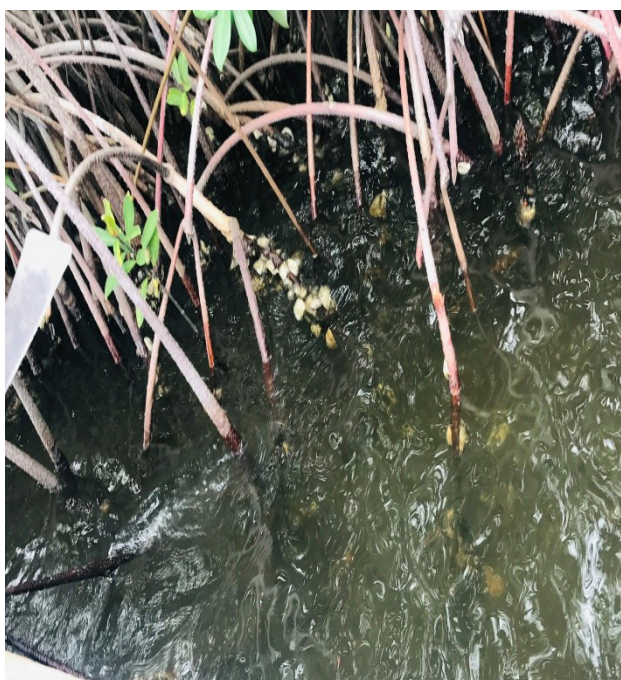
**PHOTO 20: PERIWINKLES HARVESTED AT GBLIKPE**

Source: Fieldwork October 2021. (Photo credit: N. A. Anokye)



**PHOTO 21: OYSTER SHELLS AS PART OF THE FOUNDATION OF A MUD HOUSE AT GBLIKPE**

<sup>68</sup> Anloga district institutional key informant 1 (Anloga) October 2021.



**PHOTO 22:** OYSTERS STICKING TO MANGROVE ROOT

*Source:* Fieldwork October 2021. (Photo credit: E. Quaye)



**PHOTO 23:** FRESHLY HARVESTED OYSTERS FROM ANGOR LAGOON



**PHOTO 24:** WOMAN HARVESTING OYSTERS FROM ANGOR LAGOON

*Source:* Fieldwork October 2021. (Photo credit: E. Quaye)



For processing, the oysters are steamed or boiled; then they are sold both in the Densu Delta and in the communities around the Angor Lagoon. They are cooked until the shells open up; then the processors use knives to remove the oysters from the shells. The women arrange them on trays for the children to sell within the communities. In the Densu Delta some also sell them on market days and along the roadside. Some of the respondents provided additional insight:

*We boil part. Due to the time and energy consuming nature of the processing of oysters, we only do the initial boiling*<sup>69</sup>

*... Some re-cook them by frying after boiling; others too eat them without further cooking*<sup>70</sup>

Some of the products are sold on the market:

*As tomorrow is market day, we have run out of stock because some sellers have come for all our harvested oysters to sell at the Anyanui market tomorrow.*<sup>71</sup>

Periwinkles can be sold and exported to other regions without being processed because of their long shelf life:

*Periwinkles are sold directly to buyers without processing .... they are in higher demand than oysters, they are sent to the Eastern region (which is far away) due to their longer shelf life.*<sup>72</sup>

### 3.4.2. RAISING MANGROVE SEEDLINGS IN NURSERIES

Picking mangrove seeds and seedlings, and establishing mangrove nurseries are also activities engaged in by individuals, as well as one group in the Anloga district. They were trained by Seawater Solutions Ghana (SwS) on how to raise mangrove seedlings at its premises at Atorkor, near Anloga. The group, which consists of 48 women and men, with women outnumbering the men, collects mangrove seeds and seedlings for SwS. SwS engages the group in preparing seedling bags, filling them with soil, sowing the mangrove seeds, and caring for the seedlings by watering them before and after germination. The group also picks weeds around the seedlings, replaces the dead ones, and generally nurtures the seeds to the point where they are mature enough for replanting in the fields (Photos 25 to 28).

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<sup>69</sup> Densu Delta individual respondent 2 (Tsokomey) September 2021.

<sup>70</sup> Densu Delta individual respondent 1 (Tsokomey) September 2021).

<sup>71</sup> Anloga district local key informant 2 (Gblikpe) October 2021).

<sup>72</sup> Ibid.



**PHOTO 25:** WOMEN FILLING SEEDLING BAGS WITH SOIL

*Source:* Fieldwork November 2021. (Photo credit: H. M. D. Potakey)

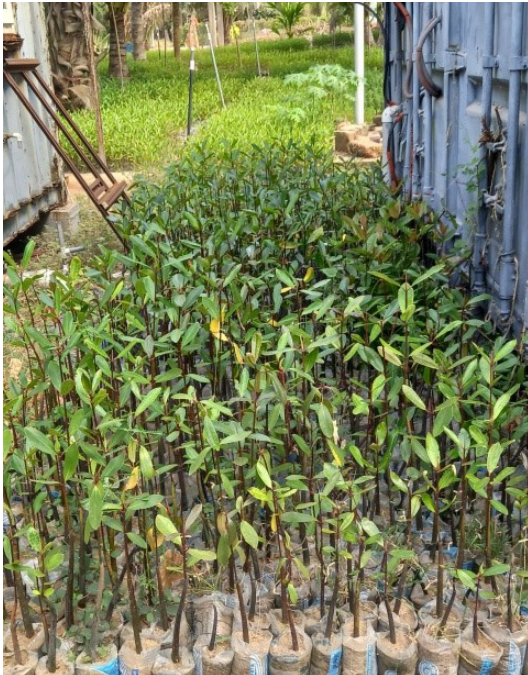


**PHOTO 26:** WOMAN PICKING UP FILLED SEEDLING BAGS



**PHOTO 27:** WOMAN SOWING MANGROVE SEEDS AT SwS PREMISES

*Source:* Fieldwork November 2021. (Photo credit: H. M. D. Potakey)



**PHOTO 28:** GROWING MANGROVE SEEDLINGS AT SwS PREMISES

At the time of data collection, SwS had about 250,000 seedlings.<sup>73</sup> (Photo 29). SwS encouraged the group members to raise their own (white) mangrove seedlings in their community, Dakordzi. SwS in turn buys the seedlings for replanting onto the field. There are some

women in Anloga district that the Wildlife Division (WLD) of the Forestry Commission (FC) sometimes engages to pick seeds and young seedlings, and also to help with the planting.<sup>74</sup>



**PHOTO 29:** SECTION OF SwS MANGROVE NURSERY, ATORKOR

*Source:* Fieldwork November 2021. (Photo credit: N. A. Anokye)

### 3.4.3. MANGROVE HARVESTING

Mangrove harvesting seems to be the most dominant activity, especially along the Ankor Lagoon. It is done by both men and women (see Photos 30 and 31). Some

individuals buy mangrove plantations from land/mangrove owners and harvest them. Others are hired to harvest, while still others harvest the mangroves on their own, or on family land.

<sup>73</sup> Anloga district local key informant 5 (Atorkor) November 2021.

<sup>74</sup> Anloga district institutional key informant 1; and Anloga district individual respondent 2 (Anloga) November 2021.





**PHOTO 30: WOMAN AND MAN HARVESTING MANGROVES ALONG THE ANGOR LAGOON**

*Source:* Fieldwork November 2021. (Photo credit: N. A. Anokye)



**PHOTO 31: HARVESTED MANGROVES BY ANGOR LAGOON WAITING TO BE TRANSPORTED BY BOAT TO THE MARKET**

*Source:* Fieldwork October 2021. (Photo credit: N. A. Anokye)

After harvesting the mangroves, initial sorting is done at the harvesting site; then they are transported to the landing bay, which doubles as a market at Anyanui. The transportation of mangroves is dominated by men. At the

landing bay/market several activities along the mangrove value chain take place. Further sorting into different sizes is carried out at the landing bay by women (Photos 32 to 37).

*Mangrove harvesting is a process. After harvesting you have to sort; women also take part in the harvesting but sorting into various categories is done by the women. About 70 percent of those who do the sorting are women.*<sup>75</sup>

Anloga district institutional key informants 1 and 2 (October 2021) indicated that people harvest mangrove for fuelwood and construction. The bigger ones are sorted out for building purposes, and the small ones for fuelwood. This finding confirms Darko Obiri et al.'s (2015) assertion that in the Volta region mangrove is the dominant species that is harvested for fuelwood (see Section 2.2).



**PHOTO 32: MANGROVE FUELWOOD SORTED, GROUPED, AND TIED, WAITING FOR THE NEXT DAY'S MARKET**

Source: Fieldwork October 2021. (Photo credit: N. A. Anokye)

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<sup>75</sup> Anloga district local key informant 1 (Anyanui) October 2021.



**PHOTO 33:** WOMEN SORTING AND ARRANGING MANGROVE INTO DIFFERENT SIZES AND TYING IT AT LANDING BAY/MARKET, ANYANUI

*Source:* Fieldwork October 2021. (Photo credit: N. A. Anokye)



**PHOTO 34:** WOMEN SORTING MANGROVE INTO DIFFERENT SIZES, ARRANGING, AND TYING AT LANDING BAY/MARKET, ANYANUI

*Source:* Fieldwork October 2021. (Photo credit: N. A. Anokye)



**PHOTO 35: BUNDLES OF YOUNG MANGROVE ROOTS USED FOR ROPES**

*Source:* Fieldwork October 2021. (Photo credit: N. A. Anokye)



**PHOTO 36: SPLIT MANGROVE ROPES FOR TYING**



**PHOTO 37: DIFFERENT SIZES OF MANGROVES**

*Source:* Fieldwork October 2021. (Photo credit: N. A. Anokye)



Buyers come with trucks to the Anyanui mangrove market; then they buy the mangrove wood and transport them to



other places in the country (see Photo 38). The loading of the wood onto the trucks is done by men.



### PHOTO 38: LOADING OF MANGROVE WOOD ONTO VARIOUS VEHICLES AT ANYANUI MANGROVE MARKET

Source: Fieldwork October 2021. (Photo credit: N. A. Anokye)

Some of the allied activities, for example transport and tourism, are also associated with the mangroves. Some of the indigenes organize tours for tourists to travel by boat around the extensive mangroves on the Angor Lagoon.

*You'll also see some hotels on the bank of the lagoon, so that's where the tourism comes in. You see some tour operators as well.*<sup>76</sup>

The findings on the types of mangrove-centric activities at the local level in our two study areas are consistent with the findings of Armah et al. 2016; USFS-IP 2018; Dali 2020; and Experts 1 and 2 2021 in Ghana (see Section 2.2). Women are engaged in all of the activities along the mangrove value chain (planting, harvesting, transporting, processing, and selling); and these activities have been going on for over 10 years.

#### 3.4.4. PURPOSES FOR ENGAGING IN MANGROVE-CENTRIC ACTIVITIES

The main purpose for engaging in mangrove-centric activities is for income (commercial) and also for at-home consumption, to improve diet:

*... for over 10 years now, we've been harvesting the oysters and selling them. We also keep some at home since it is delicious.*<sup>77</sup>

*I have been selling for over 10 years and we also keep some at home and consume.*<sup>78</sup>

*They (community members) have been doing it for over 30 years for both household consumption and commercial purposes ... there are people who earn all*

<sup>76</sup> Anloga institutional key informant 1 (Anloga) October 2021.

<sup>77</sup> Densu Delta FGD (Tsokomey) September 2021.

<sup>78</sup> Densu Delta individual respondent 3 (Tsokomey) September 2021.

*their money from it and what they do is to harvest mangroves for sale. Others also earn money by being hired by the owners of the mangroves and get paid at 30 cedis per day.*<sup>79</sup>

In the past the oysters were mainly used for household consumption, and they fully met household demands but in recent times most of the demand is not being met. The harvested oysters contribute to only between 10 and 40 percent of household demand. One respondent explained:

*It does not meet our household demand ... but better during peak season.*<sup>80</sup>

People sometimes have to augment their diets with other things, such as backyard poultry, to meet their nutritional need for protein.

Most of the respondents indicated that the mangrove-centric activities have been their primary source of income for over ten years. A few, especially the men, have oyster harvesting as their secondary source of income but it is the primary source of income for women in the Densu Delta. However, they do not fully depend on the oyster picking. They also engage in basket fishing as a secondary source of income; this is done during the lean and closed oyster seasons, and during the rainy season, or when the Weija Dam is open and the lagoon gets flooded. Some of the women sell processed foods, and others go into the processing of sea fish. Others do portage: carrying loads of fish from the beach to the processing sites for a fee.

In the Anloga district, mangrove harvesting is women's primary source of income, and harvesting oysters and periwinkles is their secondary source. Since the mangroves take a long time (10 to 15 years) to mature, they fill in the period of waiting with harvesting oysters

and periwinkles. These findings are consistent with Nunoo and Agyekumhene's (2014) findings that mangroves are a primary source of income (see Section 2.4).

However, in Dakordzi, fishing seems to be the primary source of income. Engagement in raising mangrove seedlings in nurseries is quite recent; it only began in June 2021 through the intervention of SwS. Women prefer raising mangrove seedlings in nurseries to fishing, even though their main work is fishing because they are able to generate more income that way. Vegetable farming is their secondary source of income, along with backyard poultry and fish farming to supplement their income.

### 3.4.5. SEASONALITY AND TIME ACTIVITY PATTERNS

Oyster harvesting in the Densu Delta is performed seasonally: the peak season is between April and August, and the lean season is from September to October. Over the past three to four years a closed season from November to April has been introduced by DAA in the Densu Delta.

*The seasons changed over the years. The lean season was replaced by the closed season about three years ago. Five years ago there was no closed season. The closed season is linked to the opening of the Weija Dam. The closed season has been official since about 3–4 years.*<sup>81</sup>

A local key informant added that:

*..... the activity (oyster harvesting) was performed all year round in the past years but it is seasonal now, not all year round because there is a closed season. Previously there were no closed seasons but now we have it.*<sup>82</sup>

DAA informs the Municipal Planning Coordinating Committee of the Ga South Municipal Assembly, which includes a DAA staff member, about the closed season for

<sup>79</sup> Anloga district institutional key informant 1 (Anloga) October 2021.

<sup>80</sup> Densu Delta individual respondent 2 (Tsokomey) September 2021.

<sup>81</sup> Densu Delta individual respondent 2 (Tsokomey) September 2021.

<sup>82</sup> Densu Delta local key informant 1 (Tsokomey) September 2021.

oyster picking. The end of the closed season is marked by the opening of the Densu Delta for the harvesting of oysters; there is a celebration to which DAA invites the Ga South Municipal Assembly, traditional leaders (chiefs and fetish priests),<sup>83</sup> and others.<sup>84</sup>

The time of day the activities are engaged in varies but they mainly take place during the day, for safety reasons. In the Densu Delta oyster picking is done every other day because of its tedious nature. The activities are engaged in all day but not in the evenings. The time of the day depends on the tide: low tide is preferable. The harvesters go out very early in the morning, between 6 and 9 am; then they return and go again at 2 pm. Basket fishing is often done at night.

In the Anloga district, mangrove, oyster, and fish harvesting is done throughout the year but seasonally for periwinkles. Experts 1 and 2 (July 2021) have confirmed the year-round harvesting of mangroves in Anyanui (see Section 2.6). The periwinkles cannot be picked during the rainy season when the lagoon is full. The oysters used to be seasonal but due to the recently created estuary by the erosion of sea sand, more seawater has been entering the lagoon, making the water more conducive for oysters; so now they are always available and they are getting much bigger. One respondent noted:

*Oysters are always there. The oysters here attach themselves to the branched roots of the mangrove... and now that the sea has created an estuary, more saline water is entering the lagoon, making it more favorable for the oysters, so they are always there.*<sup>85</sup>

Another interviewee commented:

*The oyster picking is usually seasonal but now that we have climate change, there is some change in the season. We expect fish around this time in abundance and now that the sea has merged with the lagoon, the hydrology*

*of the whole place has changed. The kinds of fish we expect now are not present but the oysters are available. As for the harvesting of mangroves, it is throughout the year. The fishing too is throughout the year.*<sup>86</sup>

Oyster harvesting is done every day during low tide, and during daytime hours. The planting of mangroves is done only when there are degraded areas.

### 3.5. MANGROVE DEPENDENCY AND WILLINGNESS TO SWITCH TO LIVELIHOOD ALTERNATIVES

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Dependency on mangrove-centric products over the years has varied. For some users, it has been reduced; for others it has remained the same, or even increased. In Anyanui and its environs, dependency on the mangroves is high. Anloga district institutional key informant 1 commented that the people feed basically on the resources from the lagoon such as crab, fish, and fuelwood. This comment supports Nunoo and Agyekumhene's (2014) observation that mangroves have been a major source of income for families over the years (see Section 2.4). Anloga district institutional key informant 1 added that because the communities are overexploiting the resources, they are quickly becoming depleted. According to him, some people believe that because the mangroves regrow themselves, they can never become extinct but the reality is that the soils are becoming harder, and is compromising the ability of the new mangroves to grow tall.<sup>87</sup>

In the Densu Delta, the population has been increasing due to inflows of migrants and high birth rates; according to one interviewee, this does not affect mangrove-centric activities:

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<sup>83</sup> Fetish priest is traditional religious leader.

<sup>84</sup> According to Densu Delta institutional key informant 3 (on phone) December 2021.

<sup>85</sup> Anloga district local key informant 2 (Gblikpe) October 2021.

<sup>86</sup> Anloga district institutional key informant 1 (Anloga) October 2021.

<sup>87</sup> Ibid

*Mangrove-centric activities are not being affected that much. Not all the people are in mangrove-centric activities; again the younger ones are going to school, more of the youth too are getting into craftsmanship apprenticeship rather than mangrove-related activities.*<sup>88</sup>

Other respondents feel that dependency on mangrove-centric products has increased due to the high birth rate and migration; still others believe that dependency has increased because there are no livelihood alternatives.

*There is no other livelihood, it's our ancestral profession handed down to us through generations as our source of livelihood. We cannot deprive others who depend on it for their livelihoods.*<sup>89</sup>

In the Densu Delta there have been changes in the quantities and volume of mangrove products being harvested or sold over the years. While some have experienced decreases in the harvest over the years, others have reported increases over the past five years but a decrease within the past six to ten years.

*Before then, there were lots of mangroves but they have been cut so the oysters no longer attach to the mangrove roots but in the mud. Now there is a lot of mud in the lagoon, making the cultivation and harvesting of mangrove difficult and painstaking.*<sup>90</sup>

Another responded commented:

*The sizes of oysters are no longer increasing due to the depletion; I spend so much time, about 6 hours in the water but pick only small ones which I eventually throw back into the water. Men have other activities to augment their livelihood, so they don't waste time on this tedious process.*<sup>91</sup>

Those who observed a positive change attributed it to greater awareness of how to manage the environment for oysters, and also the DAA/DOPA reforestation project.

In Anyanui and its environs, those engaged in mangrove-centric products have experienced increased quantities in the amount of products harvested. The demand for periwinkles is high. For mangroves, supply outweighs demand, so to avoid a glut, the Anlo and Tongu women who engage in selling mangroves take turns on market days.

*Currently the supply of mangrove is so much that we the sellers have split ourselves into two groups and take turns on market days. The Anlos come on Wednesdays and we the Tongus come on Tuesdays.*<sup>92</sup>

Some of the women are willing to change from mangrove-centric livelihoods to others that are not mangrove-centric, or to add other alternatives to their mangrove-centric activities. The Anloga district FGD 1 participants are all willing to change to other livelihoods, because the quantity of fish smoked has gone down with the associated decline in the demand for mangrove fuel. They attribute the low fish catch to disregard for certain taboos within their communities, such as no child delivery and abortion.<sup>93</sup> This has led to the tidal waves becoming very rough and wiping communities away. Some people believe that this is a case of divine retribution.

*Most of the inhabitants of the land have become Christians, hence traditionalists have drastically reduced in number; therefore the regular sacrifice done to appease the gods has also been reduced. Due to the inconsistency of the annual sacrifice the sea gods have decided to punish the people through low catch of fish.*<sup>94</sup>

<sup>88</sup> Densu Delta individual respondent 1 (Tsokomey) September 2021.

<sup>89</sup> Densu Delta individual respondent 2 (Tsokomey) September 2021.

<sup>90</sup> Densu Delta individual respondent 1 (Tsokomey) September 2021.

<sup>91</sup> Densu Delta individual respondent 3 (Tsokomey) September 2021.

<sup>92</sup> Anloga district individual respondent 1 (Anyanui) October 2021.

<sup>93</sup> Women are supposed to move out of the community to deliver their babies and come back after delivery.

<sup>94</sup> Anloga district FGD 1 (Anloga) November 2021.



Those who are willing to change to other livelihood alternatives have indicated that they would be interested in anything that will fetch them money; for example start-up capital to go into minor investments such as soapmaking, pastries, vegetable farming, fish processing, and artisanal jobs such as auto mechanic. Some suggested livelihood alternatives such as tie-dye, fabric making, dressmaking, baking, and beekeeping, among others. Anloga district FGD 1 and 2 suggested alternatives that included petty trading in clothes, footwear, plasticware, sachet drinking water<sup>95</sup> and foodstuffs; poultry farming; animal husbandry; and auto spraying.

The Densu Delta FGD participants also mentioned start-up capital:

*Oyster picking is a difficult job. We need start-up capital to change to other alternatives. One of us is a traditional birth attendant but needs recognition because she doesn't have any formal education.*

Densu Delta Institutional key informant 2 seconded this opinion:

*Oyster picking is not an easy job therefore they may be willing to move to other jobs if the need be.*

The Anloga district FGD 2 members prefer mangrove nursery work to their fishing activities since it generates more income according to them.

While some are willing to change to other livelihood alternatives due to dwindling products over the years, a few are not willing to change, particularly in Anyanui, where they perceive the mangroves as never going extinct. They say that this is the profession they were born into, and the only job for which they have the skills. One respondent said:

*...we are not willing to change to alternative livelihoods; we are okay with the fuelwood harvesting. We get sales from it and we keep replanting so it's always available and hence no need to change to other livelihoods. The mangroves will never finish.*<sup>96</sup>

For one respondent in Anloga, diverting from mangrove-centric activity was not likely because the mangrove plantation belongs to her and her husband: she said that if she wanted to stop and her husband did not permit it she would not be able to divert. However, if he agreed then she would be able to change to another alternative.<sup>97</sup>

The unwillingness to change to alternative livelihoods is similar to what Dali (2020) found; her findings revealed that mangrove users in Kakum and Pra were unwilling to change to other alternatives (see Section 2.7).

In the short term, the Anloga District Assembly plans to train people on alternative livelihoods such as beekeeping, soapmaking, dressmaking, and aquaculture. Anloga district institutional key informant 2 (October 2021) commented that:

*It will be a disaster if we take away their livelihoods without replacing them with other livelihoods.*

The Anloga District Assembly is partnering with the Agriculture Department to introduce the use of low energy stoves for fish smoking to the community. According to the district development planning officer, this would reduce the amount of wood that is harvested. The Assembly also wants to scale up aquaculture in the district as this could provide an alternative livelihood for the people.

Anloga district institutional key informant 1 (October 2021) reported what WLD of FC is doing to ensure sustainability of the mangroves:

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<sup>95</sup> Sachet drinking water is pre-filtered water or sanitized water in plastic, heat sealed bags.

<sup>96</sup> Anloga district individual respondent 1 (Anyanui) October 2021.

<sup>97</sup> Anloga district individual respondent 3 (Atokor) November 2021.

*We are now trying to liaise with some NGOs to come to the aid of the people. They can get a few locals and put them into apprenticeships and also get them some sources of income like soapmaking, tie-dye; something that can get them money; and also to establish woodlots.*

WLD of FC is also trying to plant other trees (for example, acacia) so that the people can harvest them instead of the mangroves. According to Anloga district institutional key informant 1 (October 2021), the mangroves are mostly used by the fishmongers. Most of them are not near the assembling places of the mangrove fuelwood. They are at Keta and Anloga. Some also go to Anyanui, to buy and transport the fuelwood to places like Brekuso, toward Aflao, and use them.

## 3.6. CONSERVATION AND RESTORATION OF MANGROVES

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### 3.6.1. NGO INTERVENTIONS, AND ACTIVITIES OF WOMEN IN CONSERVATION AND RESTORATION

Mangrove conservation and restoration interventions have been spearheaded by NGOs in Ghana (Armah et al. 2016) (see Section 2.8). A similar observation was made from the field. The Densu Delta benefited from an intervention by an NGO, the Development Action Association (DAA). DAA is a farmer-based NGO involved in fish processing, livestock rearing, cassava processing, vegetable production, and advocacy. Its objectives are to promote food security; reduce hunger and poverty; and encourage women to be independent. DAA has both farmer and fishery groups. In all it had 74 groups in the Central, Eastern, Oti, Volta, and Greater Accra regions. Most of the group (about 98 percent) is women. The few men are also doing fish processing with their wives.

At the Densu Delta wetlands, DAA, with the support of the Sustainable Fisheries Management Project (SFMP), restored the mangroves by replanting them, working with the oyster pickers. This restoration project was sponsored by SFMP and USAID for three years (2016–2018). Through this project individual oyster pickers who were beneficiaries of the project came together to form the association called Densu Oyster Pickers Association (DOPA), to manage the replanted mangroves. There are five communities in the Densu Delta wetland: Oblogo, Aplaku, Tsokomey, Bortianor, and Tetegbu. The oyster group members are from three of those communities — Tsokomey, Bortianor, and Tetegbu — which are not far from the project site. They nursed and planted 50 acres of red mangroves (see Photos 39 to 41). There is still more land for planting, and DAA is searching for funds to do the planting. The focus group discussion held at Tsokomey in September 2021 confirmed all of these. The DOPA members, mainly women, did the transplanting.

All of the young DOPA members who are involved in oyster picking and basket fishing were also involved in a mangrove restoration project. These women, together with the few men in the group, raised a mangrove nursery in 2016. They transported the mangrove seedlings in a boat to the planting sites and planted them. They put the seedlings in holes they themselves had dug, and covered the sides with soil. According to a male respondent the men raised the fencing. The planting was done all day long but only occasionally. It took about 10 minutes by boat to get to the project/planting sites.

As part of this project, the DOPA members were trained in oyster ecology and biology about suitable habitats for oysters (salinity, pH, etc.). According to Densu Delta institutional key informant 3 (September 2021), the members applied the knowledge they had gained. Some of the members were picked and trained to collect data on water quality for three months to know whether the water was conducive for oysters.



**PHOTO 39: PORTION OF DOPA PLANTED MANGROVES ALONG THE DENSU DELTA**

*Source:* Fieldwork September 2021. (Photo credit: E. Quaye)

This intervention has been sustained through comanagement with DOPA, the traditional authorities, and the Ga South Municipal Assembly.<sup>98</sup> Both Densu Delta local key informant 1 and Densu Delta institutional key informant 2 confirmed this, and added that the municipal assembly always participates in DAA's meetings. Densu Delta local key informant 1 did express regret that the assembly does not play any significant role in the conservation of the mangroves. He added, though, that there is a committee, which a staff of DAA is a member of.

In the Anloga district a few NGOs have started collaborating with the Wildlife Division (WLD) of the Forestry Commission (FC) on restoration programs and projects. The Development Institute (TDI) is

one of these collaborative NGOs. It has established a community-based organization (CBO) called the Mangrove Planters Association. The members are women and men along the Ankor Lagoon near Gblikpe whose aim is to plant mangroves both as a group and as individuals. The chairperson of the group is a woman, and the women in the group perform the same activities as the men. The WLD of FC supplies TDI with mangrove seedlings and also partners with it in undertaking restoration programs. Photos 42 and 43 show members of the Mangrove Planters Association in a restoration program that was sponsored and organized by TDI in collaboration with WLD of FC in November, 2021. Our finding agrees with the finding at the national level: women conveyed the seedlings and planted them as the men dug the holes (see Section 2.9).

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<sup>98</sup> Densu Delta institutional key informant 1 (Kokrobite) September 2021.



**PHOTO 40:** ANOTHER PORTION OF DOPA PLANTED MANGROVES ALONG THE DENSU DELTA

*Source:* Fieldwork September 2021. (Photo credit: E. Quaye)



**PHOTO 41:** AANOTHER PORTION OF DOPA PLANTED MANGROVES ALONG THE DENSU DELTAELTA

*Source:* Fieldwork September 2021. (Photo credit: E. Quaye)



**PHOTO 42:** WOMEN PUTTING SEEDLINGS IN DUG HOLES

*Source and photo credit:* Ocloo-Tetteh, WLD of FC November 2021



**PHOTO 43:** MAN DIGGING HOLES, WOMEN PUTTING SEEDLINGS IN DUG HOLES

*Source and photo credit:* Ocloo-Tetteh, WLD of FC November 2021

Seawater Solutions Ghana (SwS) collaborates with WLD of FC in mangrove restoration programs. Photos 69 and 70 show some of the restoration activities SwS organized and sponsored in September, 2021, working with WLD of FC. They engaged Fiakor community members in planting mangrove seedlings. SwS engages some of the members of the group that it had trained in raising nursery in the mangrove replanting or restoration programs. Arocha, an NGO, has also started collaborating with WLD of FC.

The International Union of Conservation of Nature (IUCN) has awarded two projects in the Anloga district; one to Arocha, for the creation of alternative livelihoods

for the fringe communities that have been depending on the mangroves. The other has been awarded to Kwame Nkrumah University of Science and Technology, to study the hydrological condition of the mangroves.

World Mangrove Day, July 26, 2021, was launched in Anyanui. The WLD of FC, in collaboration with TDI and IUCN, organized and commemorated the day at Anyanui to sensitize the communities to the importance of mangroves (see Photo 44). The day was focused on advocacy and education on replanting and sustainable harvesting. As one of the core practices, the people were asked to leave some buffer habitat restoration.<sup>99</sup>



#### PHOTO 44: COMMEMORATION OF WORLD MANGROVE DAY, ANYANUI

Source and photo credit: Ocloo-Tetteh, WLD of FC September 2021

There is also a community group formed by a local NGO, Keta Ramsar Centre. Members are women and young people, and they engage in planting mangroves. The Keta Ramsar Centre also educates the people and chiefs on the importance of mangroves in the ecosystem, so as to allow planting within their communities. This happens at the national level as well (see Section 2.8 Conservation and Restoration of Mangroves), where Oppong-Ansah (2018) reported that a local NGO, Hen Mpoano, was supported by the USAID-Ghana SFMP to educate communities about the benefits of the mangrove forests.

#### 3.6.2. CONSERVATION PRACTICES

Conservation culture among the people of Anloga district is laudable because harvesting of mangroves is their primary source of income. Some have taken the replanting so seriously that they are even going beyond the regulations on tree planting. Anloga district institutional key informant 2 (October 2021) remarked that there is a bylaw that says when you cut one tree you plant one tree, and the communities are doing well with this practice. He emphasized:

<sup>99</sup> The communities were asked to replant mangroves in the degraded buffer zones to protect the replanted mangroves from negative external pressures..

*Having gone round to the various communities during an impact assessment, they have even gone beyond the bylaw by not replacing with one but replacing with two when they cut one tree. The people at Dzita and Aynanui Area council, to be specific, have placed measures that when they cut one, they would plant two.*

Anloga district individual respondent 1 (October 2021) also affirmed that when they harvest the trees, they also replant. However, according to Anloga district institutional key informant 1, some people claim they have planted mangroves after harvesting but have not actually done it. Some of the mangrove plants grow naturally but according to some of the respondents, they do not grow well because they are not properly spaced. They usually clump together, hence the stems are very small.

WLD of FC in Anloga educates the public periodically and advises them that they should always leave some mangroves during harvesting as a buffer so that the fishes can breed there. Habitat restoration is one of the core mandates of WLD of FC; because one of its management practices is restoration of the mangroves. The WLD of FC provides the communities with seedlings to plant, and it embarks on restoration projects when it obtains funds. It occasionally undertakes afforestation projects and involves community members, including women. Anloga district individual respondent 2 indicated that she

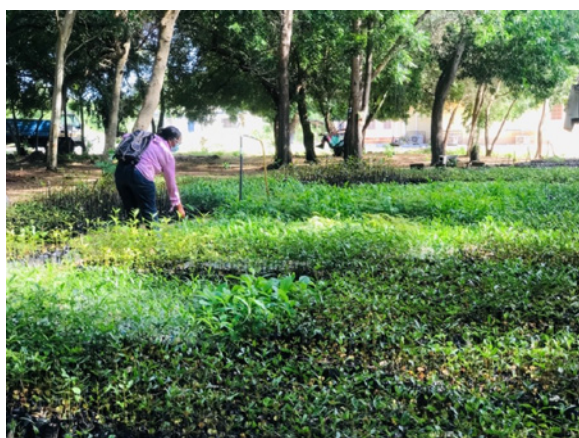
had been engaged in WLD of FC restoration projects for about four years. Some of these restored mangroves are at Dornogbor near Anloga, and Salo in the Anloga district. The WLD of FC sought consent of the landowners prior to any replanting that it did.

WLD of FC plans to establish more woodlots, for example with acacia trees, so that acacia can be used as fuelwood instead of mangrove. To encourage community members to establish woodlots, WLD of FC gives them fruit tree seedlings. WLD of FC has nurseries for red, white and black mangroves (see Photos 45 and 46), as well as woodlots.

The Anloga District Assembly has a high stake in the restoration of mangroves. In their development plan they have concerns about mangrove restoration.

*We have a four-year plan of mangrove restoration. We have in the plan, the need to educate the public about the importance of mangroves.*

In the medium term the Assembly hopes to acquire land banks so that they can go into mangrove plantation and ensure proper monitoring and sustainability of the mangroves within those areas. In this regard the land will not be in the hands of individuals who will harvest the trees unsustainably.



**PHOTO 45:** PORTION OF MANGROVE AND OTHER WOODLOT NURSERY OF THE WILDLIFE DIVISION IN ANLOGA

Source: Fieldwork October 2021. (Photo credit: N. A. Anokye)



**PHOTO 46:** PORTION OF NURSERY SHOWING RED MANGROVE AND PAWPAW SEEDLINGS, ANLOGA

Source: Fieldwork October 2021. (Photo credit H. M. D. Potakey)

### 3.6.3. CHALLENGES WITH THE CONSERVATION AND RESTORATION OF MANGROVES

The challenges facing restoration programs and projects in our two study areas are listed below:

- » One of the main challenges the DAA/DOPA faced with the restoration project in the Densu Delta was with fishermen, who were difficult to work with because of their *atidja*.<sup>100</sup> The group initially faced some stiff opposition from local fishermen because they feared that the restoration project could deprive them of the *atidja* that they use in trapping the fish.<sup>101</sup>
- » In the Densu Delta, DAA/DOPA has land available to plant more mangroves but they lack funding. The following quotes also indicate lack of funds for restoration projects and for training people in alternative livelihoods in the Volta region:

*The Wildlife Division lacks funds to hire planters. These planters have to be paid before they do the planting. Most funds meant for restoration go to NGOs. State funds allocated to Forestry Commission are used for other activities, such as ecological monitoring of birds and turtles.*<sup>102</sup>

*There is a lack of funds to train people in alternative livelihoods for them to stop depending on mangroves. The Anloga District Assembly is in debt already.*<sup>103</sup>

- » The Anloga District Assembly faces the challenge of accessing land for mangrove plantation because of the ownership regime in this area, where lands are owned by individuals and families. The landowners are not ready to release land.

*On access to land, for instance, there is a settlement that had to be relocated because the sea had taken over the settlement. The resettlement land that we had too; there are plans to even take the land from us.*<sup>104</sup>

- » Nonadherence to bylaws is also a challenge in the Anloga district.

*There are challenges with enforcement as some of the community members do not adhere to the bylaw of cut-one-plant-one tree. They don't respect the bylaw so they go in the night and cut down the mangrove trees and they do not plant.*<sup>105</sup>

- » The Wildlife Division in Anloga has insufficient staff. It has only six staff managing 530 km<sup>2</sup> of the wetland.
- » Logistical constraints are among the other challenges regarding mangrove restoration programs and projects. The Wildlife Division in Anloga has to rent boats for their monitoring activities. In the Densu Delta, DAA/DOPA also had difficulties in getting boats to go to the project sites. They had to hire boats all the time.
- » The Mangrove Planters Association in Gblikpe has the challenge of low patronage of their members in their mangrove planting activity. Most of the time the members are in a hurry to go back to their selling business to earn their daily income.

*The planting exercise takes time, almost the entire day ... the members therefore are reluctant to spend the whole day without any earnings ... what will they use to feed their families if they spend the whole day on planting?*<sup>106</sup>

<sup>100</sup> Densu Delta institutional key informant 1 (Kokrobite) September 2021.

<sup>101</sup> The fishermen continue to have access to the community owned mangroves for the *atidja* and not the DAA/DOPA planted mangroves.

<sup>102</sup> Anloga district institutional key informant 1 (Anloga) October, 2021.

<sup>103</sup> Anloga district institutional key informant 2 (Anloga) October 2021.

<sup>104</sup> Ibid.

<sup>105</sup> Ibid.

<sup>106</sup> Anloga district local key informant 2 (Gblikpe) October 2021.



» In Dakordzi, initially individual mangrove nursery owners had strong interest in the nursery but their enthusiasm has weakened, because the monies that were supposed to be paid to them by the NGO have not been paid. The seedlings are ready for transplanting but they are not being bought by the NGO as arranged. The owners feel they are wasting their resources as they have to nurse the seedlings until they are bought by the NGO. The NGO is searching for fields where it can transplant the seedlings before it buys the seedlings. The land issues go with a lot of delay due to the long process of gaining permission for use of the land. The heads of the clans are not easily accessible.

### 3.6.4. DEMOGRAPHIC AND SOCIOECONOMIC CHARACTERISTICS OF WOMEN ENGAGED IN MANGROVE CONSERVATION AND RESTORATION

The women engaged in mangrove conservation/restoration along the Densu Delta are the DOPA women. Their characteristics are discussed in Section 3.3. However, the women in conservation/restoration planting mangroves

along the Angor Lagoon are women who belong to the Mangrove Planters Association. They are Ewes, and natives of the area who have resided in their current communities since their birth. Their highest level of formal education attained is the basic level. Some of them are married and others are single. They are traditionalists and Christians and belong to the low-income class. This corroborates with what Expert 2 attested:

*... most of them have lived in their communities for a long time - as long as 40 years or more. Household income of these women is low. Their level of education is also very low and they have varied marital status.*<sup>107</sup>

Other individual respondents who indicated that they have been involved in restoration programs along the Angor Lagoon are aged 41, 42 and 57 years; they have a basic level of education; two are married and the other is divorced. They are Ewes and indigenes; Christians; and are from low-income households. They have an average of three children, typically with all three in school; the average household size is five, with four dependents (see Table 2 for summary).

**TABLE 2: DEMOGRAPHIC AND SOCIOECONOMIC CHARACTERISTICS OF WOMEN IN MANGROVE CONSERVATION AND RESTORATION**

Characteristics	Densu Delta	Anloga district
<b>Age (years)</b>	21–44	41–57
<b>Level of Formal Education</b>	No formal education to Secondary (High school) level	Basic level (primary and junior high)
<b>Ethnic Group</b>	Gas, Ewes	Ewes
<b>Indigenes</b>	Gas	Ewes
<b>Migrants</b>	Ewes (majority)	None
<b>Marital Status</b>	Single, married, widowed	Single, married, divorced
<b>Religion</b>	Christians & Muslims (majority), traditionalists	Christians, traditionalists
<b>Income Level</b>	Low	Low

<sup>107</sup> Conversation with Expert 2 (Accra) July 2021.

Characteristics	Densu Delta	Anloga district
Number of Children	3–7	3 on the average
Number of Children in School	3–4	3 on the average
Household Size (includes dependents)	5–17; 6 on the average	5 on the average

Source: Interviews and FGDs (Densu Delta and Anloga district September, October and November 2021)

## 3.7. MEMBERSHIP IN COMMUNITY GROUPS

### 3.7.1. GROUP DYNAMICS

Some of the DOPA women oyster pickers along the Densu Delta are members of other community groups, such as those described in this subsection.

One example is **Village Savings and Loans**. The treasurer and secretary of this group, and the other members, are women oyster pickers and members of DOPA. The aim of this group is to promote savings among the members; make loans available to them; and support members, particularly in times of bereavement. The aim of the women in joining the group is to be able to save money and also to access loans.

One individual respondent (an oyster picker) was a member of a community group called **Dughaza Self Help** for two years. The group was in existence for over ten years. It collapsed and was revived. She joined the group for welfare purposes, and for savings and loans. She was able to voice her interests and concerns, and to mobilize members to send their grievances to the group leaders while she was with the group.

There are few community-based groups in the communities in the Anloga district: this is because the people like to do things individually.<sup>108</sup> The Mangrove Planters Association is a group of both men and women. Though the men outnumber the women, the chairperson is a woman. Asked how she became the chairperson, she responded:

*I was chosen as the leader of the group because during the sensitization and training by the NGO (TDI), I was identified as being assertive and having the knowledge and a lot of experience with the oyster and mangroves.*<sup>109</sup>

The aim of this group is to plant mangroves as a group and as individuals. The women are able to voice their interests and concerns. The women are free to speak, as the chairperson explained:

*Everybody is free to express his or her concerns. Imagine I, a female, being the leader of a group that has some males, means a lot, no intimidation, yes, the women are free to express themselves.*<sup>110</sup>

However, the group's voice is limited to being heard only at the community level.

<sup>108</sup> Anloga district institutional key informant 2 (Anloga) October 2021.

<sup>109</sup> Anloga district local key informant 2 (Gblinke) October 2021.

<sup>110</sup> Ibid.

The community members that SwS engages to work in its mangrove nursery at Atorkor, are involved in the collection of mangrove seeds and seedlings, making seedling bags, raising seedlings, and planting them in degraded areas.

Anloga district individual respondent 4 has been a member of the **Agbadza dancing group**, which consists of both men and women, for three years. Her aim of joining the group is to have a befitting burial when she dies; the group performs dances at the funerals of its members. Members contribute GH¢1.00 each per gathering. She is able to present her interests and concerns in the group.

One respondent is a **choir leader in her church group**. Two individuals and participants of the Anloga district FGDs belong to church groups that consist of both women and men in their respective churches. Their aim is to worship God. One respondent added that it is also to receive support in a time of bereavement. Only one participant of Anloga district FGD 2 belongs to a social group; the rest do not due to financial constraints.<sup>111</sup> However, participants of Anloga district FGD 1 are also members of various social groups; these are **Kugbeta, Vovoli, Wonder Welfare Group, and Control Welfare Society**. Some have been members for over 20 years; others have been members for just one or two years. Their aim in joining the social groups is to have befitting burials and funerals when they die. One participant said:

*The group will have funeral cloths branded in the dead member's name and a very beautiful coffin.*<sup>112</sup>

They are able to voice their concerns and interests in the church groups. However, they are not able to do so in the social groups that they join. This is because the church welcomes everyone, no matter ones socioeconomic status but they feel intimidated in the social groups because of their low economic status. The church groups are able to influence decisions in the church and also promote their interests. The social groups are also able to influence decisions at the community and district levels.<sup>113</sup>

<sup>111</sup> One has to make financial contributions as a group member.

<sup>112</sup> Anloga district FGD 1 (Anloga), November 2021.

<sup>113</sup> Community level is the local level. District level is higher than the local or community level but lower than national level.

## 3.7.2. CHALLENGES FACED IN THE GROUPS

**Village Savings and Loans Group** The main challenge that confronts the women in this group is that they find it difficult to save any money, since their income level is so low. Their situation is worse during the closed season of oyster picking. Some women have dropped out of the group as a result. Another challenge is the difficulty in mobilizing members because they demand money to replace their time spent at meetings.

**Mangrove Planters Association** The main challenge for these members is transportation; difficulty in getting boats for them to go around picking seeds, and taking seedlings to the planting sites.

**Agbadza group** Here the challenge is the lateness of members to group meetings. Their reason for the lateness is that they have to look for funds to pay their contribution at the meetings. The social groups generally face the problem of lateness among members.

The **church groups** are not able to commit to the decisions that have been made, and some church group members are not able to contribute to support members' welfare. There are also petty quarrels in some of the church groups.

## 3.8. WOMEN'S GROUP AND MEMBERSHIP

As mentioned above, the Densu Oyster Pickers Association (DOPA), is one of the DAA groups who were beneficiaries of a restoration project that came together to manage the replanted mangrove along the Densu Delta (see Section 3.6.1). The DOPA members are mainly women, with a few men. The group had been in existence for four years at the time of data collection in September 2021. The aim of DOPA is to sustain oyster harvesting by protecting and building the Densu Delta. One individual

respondent said that she had joined DOPA, like some of the others, to learn how to manage the oysters. This individual respondent said that she feels free to say whatever she wants to say. Densu Delta institutional key informant 1 also confirmed that the women are able to voice their interests and concerns in the group. She added that:

*... they push their ideas at meetings and claim what is theirs. The group is able to influence decisions at high levels, as high as the national level. They once faced the Minister of Fisheries.*<sup>114</sup>

Some women's groups are church groups. One participant of the Densu FGD has joined a women's self-help group called **Tsokomey Deawowo**, which is a church group. One respondent in the Anloga district has been a member of church women's welfare group for 18 years. Her reason for joining was to have support when bereaved. According to Anloga district institutional key informant 2, there are a few women's groups but they are involved in other things that are not related to mangroves.

### 3.9. RULES AND REGULATIONS

According to Densu Delta institutional key informant 2 (September 2021), the Ga South Municipal Assembly seems to have no bylaws on the use of mangroves, since the mangroves are not considered to be important. In the Densu Delta wetland there seem to be some rules and regulations concerning mangrove-centric activities, and the harvesting of mangrove products under their restoration project. The rules are set by DAA and DOPA, and are implemented and enforced by the management committee, which consists of DOPA members from the three oyster-picking communities (Bortianor, Tsokomey and Tetegbu).<sup>115</sup> These rules ban the harvesting of mangroves that have been planted or restored by DAA/DOPA. They may be harvested after

ten years from 2016 since they serve as attachment for the oysters.<sup>116</sup> Densu Delta institutional key informant 1 (September 2021) explained that:

*... the community realized that we planted the mangroves and that they are not theirs so they can't harvest them. They do not cut it because we have gone into comanagement with the community.*

The Densu FGD revealed that the community has adapted the DOPA rules; they now harvest the community-owned mangrove every other six months. One individual respondent confirmed this:

*.... the communities in the Densu Delta wetland, upon seeing how healthy the DAA/DOPA restored mangroves are have adapted the DAA/DOPA rules and they harvest the community-owned mangroves every other six months.*

DAA/DOPA has also instituted a closed season for oyster harvesting, from November to April. They also have bylaws that ban the harvesting of small oysters.

There are bylaws regarding the collection of periwinkle within the Anloga district. Collection is prohibited on certain days — for example a day before Anlo market days. Anlo market days are rotational, so the prohibited days are not fixed.<sup>117</sup> These are set and enforced by the traditional authorities. Anloga district institutional key informant 1 (October 2021) indicated that there are neither rules, regulations nor bylaws that protect the mangroves, nor that govern the harvesting of mangroves.

*There is no bylaw, but since mangrove harvesting is a major business the harvesters replant so they will have some to harvest in the future.*<sup>118</sup>

However, Anloga district institutional key informant 2 (October 2021) indicated that:

<sup>114</sup> Densu Delta institutional key informant 1 (Kokrobite) September 2021.

<sup>115</sup> Densu Delta institutional key informant 3 (on phone) December 2021.

<sup>116</sup> Densu Delta FGD; Densu Delta local key informant 1; Densu Delta individual respondent 1 (Tsokomey) September 2021.

<sup>117</sup> Anloga district local key informant 2 (Gblikpe) October 2021.

<sup>118</sup> Anloga district local key informant 5 (Anyanui) October 2021.

*The Assembly has a bylaw that regulates human activities in space. As part of issues in the bylaw, there is an element on cutting of trees. There is a clause that says that when you cut one tree you have to plant one tree ... this could be stretched to include mangrove trees.*

There are some bylaws but it seems that some of the people are not aware of them. A similar observation was made by USFS-IP (2018) when they realized that community members were not aware of the bylaws governing wetland areas in the Shama and Akwidai areas (see Section 2.11).

## 3.10. SUGGESTIONS BY RESPONDENTS

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The respondents made several suggestions that would improve the health of the mangroves, they are listed here:

### **Suggestions from the Densu Delta:**

- » To reduce the dependency on mangrove-related products there should be training of oyster pickers in alternative livelihoods like soapmaking, baking (bread, biscuits). There could be training of trainers who in turn could train the pickers in these alternate trades.
- » The respondents suggested planting more mangroves, since there is land available for that. They are asking for mangrove seedlings to plant.
- » A member of DOPA suggested intensive guarding of the mangroves.
- » Densu Delta institutional key informant 1 (September 2021), and a member of DOPA suggested comanagement between the communities, the district assembly and the NGO (DAA).
- » Densu Delta institutional key informant 2 (September 2021) suggested educating community members so that they will stop cutting the mangrove for fuelwood.

» Densu Delta institutional key informant 2 (September 2021) suggested that the Assembly's involvement should go beyond attending meetings of the DAA and support by funding. He added that the Assembly should invite some members of the women's group, the chairperson or any other person from the group, to the Environmental Health Subcommittee meetings so that the Assembly will come to understand their challenges and what they could do to help. According to this interviewee, the Environmental Health Unit does community engagements, and could factor in the issues of mangrove conservation.

» The DOPA members need market outlets for processed and packaged oysters. They have acquired training in the processing and packaging of oysters but there are no market outlets for them.

### **Suggestions from Anloga District:**

- Mangroves should be planted in soft muddy areas, since they thrive better in muddy soil.
- » Mangroves should be planted with enough spacing between the seedlings.
- » Planters should be encouraged to plant black and white mangroves because they attract honey-making bees; also, the seeds of the black mangrove have a pleasant scent.
- » Setting fires in the mangrove forest should be avoided because bushfires burn the replanted mangroves.
- » There should be a way of controlling the caterpillars which invade the mangroves.
- » The fringes of the mangrove forest should not be harvested; they should be left as a buffer zone to serve as breeding grounds for fish.
- The government must implement buffer zone laws to ensure that the mangrove harvesting is sustainable.

- » Encourage fish smokers to use “smart stoves,” which use less fuelwood to smoke fish.
- The use of the neem tree as fuelwood should be encouraged, since it also enhances the taste of the smoked fish and has the same preservative attributes of mangrove fuelwood. Therefore we should have a neem tree woodlot.
- » Women should be trained into other ventures, like soapmaking and baking, to reduce dependency on the mangrove.
- » Preference should be given to vulnerable female single parents who pick mangrove seeds and seedlings for the Wildlife Division whenever there is training or support.
- » The people should be sensitized to the importance of planting after harvesting, and waiting until the new plants mature before harvesting them.

## CHAPTER 4.

# CONCLUSIONS AND RECOMMENDATIONS

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## 4.1. CONCLUSIONS

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The conclusions for this study emanate from the key findings from both the literature review and the empirical study. Mangrove-centric activities in Ghana include: the cultivation of mangroves; timber logging for construction; mangrove fuelwood harvesting for fish smoking and domestic purposes; and the harvesting of mollusks and oysters, fish (tilapia), crabs, periwinkles, and herbs.

Both genders are engaged in mangrove-centric activities to varying degrees, depending on the specific product and location. Therefore the type of mangrove-centric activity engaged in by women is product and location-specific. The main activities within the study areas are oyster picking and harvesting, fishing, and mangrove harvesting. The activities are engaged in by both women and men but women dominate in oyster picking and harvesting. The women in the Densu Delta are engaged mainly in oyster picking, while in the Anloga district they are involved in both oyster and mangrove wood harvesting. Mangrove as fuelwood is very important in the coastal regions of Ghana. The mangrove species, *Rhizophora mangle* and *Laguncularia racemosa* ranked third, after *Albizia zygia* and *Celtis mildbraedii*, among the types of fuelwood harvested for sale across the coastal regions.

Activities along the mangrove wood value chain (harvesting, sorting, arranging, tying and selling) are major livelihood activities in Anyanui and its environs. They serve as the primary source of income for the people, and hence form a major livelihood for the communities living in the mangrove areas along the coast of the Volta region. The oysters are used for both commercial and home consumption in both the Densu Delta and Anloga district.

The coastal areas of the Volta region are occupied by wetlands; the Ewes, who are the natives of these areas, are involved in wetland-related activities. They are born into them and thus they develop or acquire the skills needed to carry out mangrove-centric activities. They are very skilled in these activities; hence it is their main occupation. This explains why in the Volta region wetland, mangrove-centric activities are carried out by the natives (Ewes) but outside the Volta region (for example, in the Densu Delta) these activities are carried out mainly by Ewes who have migrated there.

Generally speaking, mangroves in both study areas have been degrading. In the Densu Delta they have been depleted even though the intervention of an NGO (DAA) has improved the state of the mangroves a bit. Degradation of the mangroves in the Anloga district has been gradual. In both places there is a need to increase the pace of restoration and conservation. The cycle of harvesting and replanting, which hardens the soil, has to be addressed.

In spite of the general dwindling of the mangrove products in the Anloga district, the dependency of the women on the mangroves is still high, because they have limited alternatives. Furthermore, mangrove-centric activities are their only known occupation. Comparatively, the women in the Densu Delta are more willing to adopt other livelihood alternatives. There have been some conservation/restoration interventions involving women who are involved in mangrove-centric activities. In general, the participation of women in mangrove restoration projects in the study areas is location-specific.

Chiefs and clans or families own land in the Ga South district, while individuals and families own land in the Anloga district; this has implications for acquiring land for restoration projects, since consent has to be sought from the landowners whether they are individuals, families, or chiefs. The main challenges with restoration projects have to do with the acquisition of land for planting by Anloga District Assembly and SwS; and resource constraint encountered by state institutions such as WLD of FC and the Anloga District Assembly.

## 4.2. RECOMMENDATIONS

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Our recommendations are based on the key findings from our literature review (at the national level) and our field studies (at the local level) on how to support the protection and restoration of mangrove habitats in Ghana.

- » The use of mangrove-centric products needs to be regulated through sensitization and education of the public regarding the importance of sustainability.
- » The rules and regulations concerning mangrove usage should be widely promulgated and enforced.
- » To reduce the dependency on mangrove-related products there is an urgent need to provide alternative livelihoods. This should be tied to training and the provision of start-up capital.
- » Sustainable, beneficial roles for whole communities, including women, in mangrove restoration projects should be identified; rather than roles with only immediate economic benefits.
- » Additional research should be carried out in the Western, and Central coastal regions in order to establish generally the nature of women's participation in mangrove-centric activities and mangrove restoration projects in Ghana.



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# GLOSSARY

<i>Accra</i>	Capital city of Greater Accra region and Ghana.
<i>Amuti</i>	Local name for <i>Laguncularia racemosa</i> .
<i>Angor Lagoon</i>	The Angor Lagoon connects the Keta Lagoon (a coastal Ramsar site) to the Volta River. It is at the coast of Volta region.
<i>Anloga</i>	Capital town of Anloga district.
<i>Anloga district</i>	It is in the Volta region.
<i>Anlos</i>	They are a group of Ewes in the Anloga district. They alternate with the Tongus in bringing their mangrove wood to the Anyanui market.
<i>Anyanui</i>	A town in the Anloga district in the Volta region. It has a big mangrove wood market
<i>Atidja</i>	A practice by fishermen in which they leave tree branches, twigs and leaves in the lakes or lagoons as bait to attract fish.
<i>Atorkor</i>	A community in Anloga district.
<i>Atra</i>	Local name for <i>Rhizophora mangle</i> .
<i>Basic education</i>	From first to ninth grade. It is for children between 6 and 15 years (primary and junior high).
<i>Bortianor</i>	A community located in the Densu Delta Wetland.
<i>Cape Coast</i>	Capital city of the Central region.
<i>Closed season</i>	Closure of the water body (Densu Delta) — Oyster picking is not allowed in the water.
<i>Dakordzi</i>	A community in Anloga district.
<i>Densu Delta</i>	It is at the west coast of the Greater Accra region.
<i>Esa</i>	Local name for <i>Celtis mildbraedii</i> .

<i>Ewe</i>	Ewe is a tribe in the Volta region. The Ewes originate from the Volta region.
<i>Fetish priest</i>	Traditional religious leader.
<i>Ga</i>	Ga is a tribe in the Greater Accra region. The Gas originate from the Greater Accra region.
<i>Gblipke</i>	A community in Anloga district.
<i>Greater Accra region</i>	It is one of the coastal administrative regions in eastern part of Ghana.
<i>Okoro</i>	Local name for <i>Albizia zygia</i> .
<i>Primary education</i>	From first to sixth grade. It is for children between 6 and 12 years. The first six years of basic education.
<i>Purposive sampling technique</i>	It is “a group of nonprobability sampling techniques in which [people or] units are selected because they have characteristics that are needed in the sample,... [i.e.] units are selected ‘on purpose’.” Nikolopoulou, K. 2022.
<i>Sachet drinking water</i>	Filtered water or sanitized water in plastic, heat sealed bags.
<i>Secondary education</i>	From seventh to twelfth grade. It is for children between 16 and 18 years (junior high and senior high).
<i>Snowball sampling technique</i>	“Snowball sampling is a nonprobability sampling technique where new ... [respondents are recommended or selected by other respondents] to form part of the sample.” Nikolopoulou, K. 2022.
<i>Stool</i>	The stool is the seat of the chief. Ownership of some lands in Ghana is vested in stools and the chief is the custodian of stool lands.
<i>Tongus</i>	They are another group of Ewes living on the other side of the Volta River. They alternate with the Anlos in bringing their mangrove wood to the Anyanui market.
<i>Tsokomey</i>	A community located in the Densu Delta Wetland.
<i>Volta region</i>	It is one of the coastal administrative regions in the extreme east of Ghana.





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