



# ANKOBRA ESTUARY COMMUNITY- BASED FISHERIES MANAGEMENT PLAN

## WESTERN REGION, GHANA



MINISTRY OF FISHERIES AND  
AQUACULTURE DEVELOPMENT (MOFAD)  
FISHERIES COMMISSION

## **ACKNOWLEDGEMENTS**

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### **Cover Photos:**

Upper Left: Bagrid catfish (*Chrysichthys nigrodidtatus*) harvested in the Ankobra River

Upper Right: Fishermen fishing with seine net in the Ankobra River.

Bottom Right: Mangrove replanting in Ankobra wetland by Sanwoma community.

Bottom Left: Nile tilapia (*Oreochromis niloticus*) harvested in the Ankobra River.

**Photo credit:** Hen Mpoano

## **LIST OF ACRONYMS**

CSLP	USAID Coastal Sustainable Landscape Project
EPA	Environmental Protection Agency
FASDP	Fisheries and Aquaculture Sector Development Plan
FC	Fisheries Commission
IUCN	International Union for Conservation of Nature
MoFAD	Ministry of Fisheries and Aquaculture Development
NAFPTA	National Fish Processors and Traders Association
NMFMP	National Marine Fisheries Management Plan
USAID	United States Agency for International Development
VSLA	Village Savings and Loan Association
WRC	Water Resources Commission

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## **CO-MANAGEMENT AGREEMENT**

WHEREAS, the Ankobra River estuary is a significant small-scale artisanal fishery utilized by several communities living adjacent to its shoreline and provides significant food security and income for fisherfolk from these communities.

WHEREAS, the Fisheries Act, 2002 (Act 625), section 2 (a), provides for the Fisheries Commission to prepare and keep under continual review plans for the management and development of fisheries in waters under the jurisdiction of Ghana.

WHEREAS, the Fisheries Act, 2002 (Act 625), section 2 (g), provides for promotion of cooperation among local fishermen to advance development of artisanal fishing.

WHEREAS, the Fisheries Act, 2002 (Act 625), section 9 (1), authorizes the Commission to appoint committees it considers necessary for the effective implementation of its functions.

WHEREAS, the Fisheries Act, 2002 (Act 625), section 38, provides for application of a portion of the Fisheries Development Fund towards the development of small scale fisheries in the country.

WHEREAS, this Community Based Fisheries Management Plan prepared by the Commission is consistent with provisions in section 42 (1) of the Fisheries Act, 2002 (Act 625).

WHEREAS, the Commission can develop a fishery plan that relates to a specific water area and specified species of fish, consistent with section 42 (2) of the Fisheries Act, 2002 (Act 625).

WHEREAS, Section 42 (3) of the Fisheries Act, 2002 (Act 625) provides for the Commission to collaborate with such State agencies as the Commission considers appropriate for the implementation of each fishery plan and consistent with section 10 (5) of the Local Government Act, 1993 (Act 462) and section 12 (5) of the Local Governance Act, 2016 (Act 936).

WHEREAS, the contents of this management plan are consistent with section 43 of the Fisheries Act, 2002 (Act 625).

WHEREAS, the preparation of this fishery management plan was undertaken following consultations with appropriate organisations, authorities, and persons affected by the fishery plan as stipulated in Section 44 of the Fisheries Act, 2002 (Act 625).

THEREFORE, I HEREBY

Declare the area consisting of the tributaries of the Ankobra River from the closing line along the mouth where it enters the Atlantic Ocean, up North to 22.9 km along the river and its associated mangrove and wetland habitats, with special attention to the following key species; the bagrid catfish, *Chrysichthys nigrodidatus*, cassava croaker,

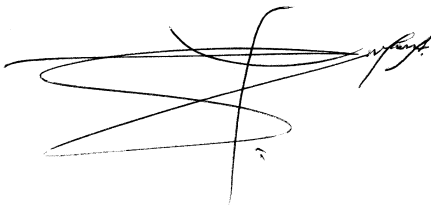
*Pseudolithus elongatus*, and the Nile tilapia *Oreochromis niloticus*, a Fisheries Management Area solely for the purposes of fisheries management.

Delegate the Ankobra Community Based Fisheries Management Association, representing all the fisherfolks in the Sanwoma, Adelekezo, Eziome, Kukuaville and Ajomoro Eshiem, including fishermen, processors and marketers, a duly registered association, the authority for the responsible and sustained management and conservation of the fisheries resources in this area, and granted the exclusive use rights to the fishery resources in this area.

Authorize the Fisheries Commission to make allocations annually from the Fisheries Development Fund or other budget lines, to support the Community Based Fisheries Management Association in the implementation of this plan.

Delegate responsibility for the oversight of this association and its Co-Management Committee to effectively carry out its delegated functions, to the Regional Director, Fisheries Commission, Western Region.

Approved by:

A handwritten signature in black ink, appearing to read 'Michael Arthur-Dadzie', written over a large, stylized scribble.

Date: December 22, 2020

Michael Arthur-Dadzie Esq.  
The Executive Director, Fisheries Commission, Ghana



## **1.0 INTRODUCTION**

The objective of this Community-Based Fisheries Management Plan is to provide for sustainable management of the Ankobra River estuarine fishery and improve food security and livelihood benefits, especially for participating estuarine fishing communities as well as those involved in the fishery value chain. Consistent with the Fisheries and Aquaculture Sector Development Plan (FASDP) and the national Co-Management Policy framework, exclusive use rights are granted to Ankobra Community-Based Fisheries Management Association, a duly registered association of fisherfolk in the five communities. (see Annex 1 for Nzema East registration and Annex 2 for Ellembelle registration) to manage the fisheries resource in the Ankobra Estuary, particularly for the three priority species covered by this plan.

This management plan was prepared through participatory processes involving all relevant stakeholders. A series of training workshops, meetings and technical assessments were carried out (see Figures 1-5). The Ankobra Community Based Fisheries Management Association, comprising representatives elected by fishers from all participating communities was formed and led the preparation of this plan, with Hen Mpoano (an NGO) facilitating the processes. The preparation of this plan also involved active engagement of focal persons from the Western Region Fisheries Commission (FC), Wildlife Department, Environmental Protection Agency (EPA), Ellembelle District Assembly, Nzema East Municipal Assembly and Water Resources Commission (WRC).

Recognizing the urgency to respond to some of the issues in the management plan, preparatory actions were carried out which provided the opportunity for trust building among stakeholders; a study tour was organized for selected community leaders to the Volta estuary at Ada where mangrove restoration and a clam fishery has been supported for decades through traditional institutions, Village Savings and Loans Associations (VSLAs) were initiated to improve savings culture and encourage continuous investments in natural resource-based livelihoods, a small boat was built and donated by USAID SFMP to improve transportation on the river especially during flooding, a nursery towards mangrove restoration was established and orientation in nursery management was provided to develop a culture of afforestation among harvesters of mangrove fuelwood.



**Figure 1: Participatory rural appraisal session with fishermen and fish mongers in the Ankobra**



**Figure 2: Study tour to Volta estuary mangrove restoration site**



**Figure 3: Study tour participants experiencing clam processing at Ada**



**Figure 4: Village Savings and Loan Association established in Adelekezo as part of initial actions**



**Figure 5: Launch of a boat to enhance community mobilization and transport on the lower Ankobra River**

### **1.1 Conformity with Existing Legal Frameworks and Plans**

The Community-Based Fishery Management Plan for the Ankobra River estuary follows the requirements provided in Fisheries Act, 2002 (Act 625) for the development of fishery management plans and is also consistent with the objectives set forth in the Fisheries and Aquaculture Sector Development Plan. In addition, the strategies and actions in the management plan have taken due cognizance of the programme of action outlined in the Ankobra Basin Integrated Water Resources Management Plan which takes a basin-wide approach to planning and management of water resources in the river's catchment. The plan aligns with the spatial development frameworks of the Ellebelle District and Nzema East Municipal Assemblies. These Assemblies recognize the lower Ankobra basin catchment as a conservation zone.

The management plan is divided into six sections as follows. Section 1 is the introduction that outlines the purpose of the plan and establishes the linkages and conformity with existing legal frameworks plans. Section 2 characterizes the fisheries management area including the biophysical and ecological attributes of the ecosystem of which it forms part. In section 3, a description of the estuarine fishery is provided with a focus on priority species for management, harvesting methods, post-harvest processing and marketing methods. Section 4 outlines the vision, management objectives and measures required to attain the objectives of the plan. Section 5 includes institutional arrangements for implementation of the plan while Section 6 sets out a monitoring and evaluation framework for measuring progress towards achieving

key targets during the implementation period. Section 7 describes means by which the plan will be implemented.

## **2.0 THE FISHERY MANAGEMENT AREA**

The fishery management area lies within the southern downstream section of the Ankobra River Basin. The area has a rich biodiversity and in terms of flora, it is characterized by tropical/terrestrial forests, swamp forests, bamboo and mangrove forests comprising white (*Avicennia*) and red (*Rhizophora*) mangroves. Over 5,000 hectares of the management plan area is forested. Mangrove forests dominate the banks of the river up to the farthest point of tidal influence. The fauna composition includes species of global conservation interest; the cassava croaker (*Pseudolithus elongatus*) and West Africa Dwarf crocodile (*Osteolaemus tetraspis*) are listed as endangered on the International Union for Conservation of Nature (IUCN) red list of threatened species. In addition, there are 27 estuarine fish species, comprising sixteen marine, four brackish and seven freshwater fish species including unidentified species of shellfish (see Annex 4). Fishing activities take place in the main river and its network of tributaries, namely, Mamawure, Eburnli Ekye, Eyehu, Ehema Solo and Fenvi. The banks of the river experience flooding at high tides and during rainy seasons. Sanwoma is the community located at the point where the river enters the ocean. This community is vulnerable to flooding exacerbated by sea level rise as a result of climate change.

Residents of communities in the management plan area have for centuries depended on the estuarine fishery and associated natural resources as primary sources of food and livelihood security. These residents belong to the Nzema ethnicity. Their main occupations are farming and fishing, which employ over 90% of the entire population. Cash crops, such as rubber and oil palm have recently been taken-up by some residents as additional livelihood activities.

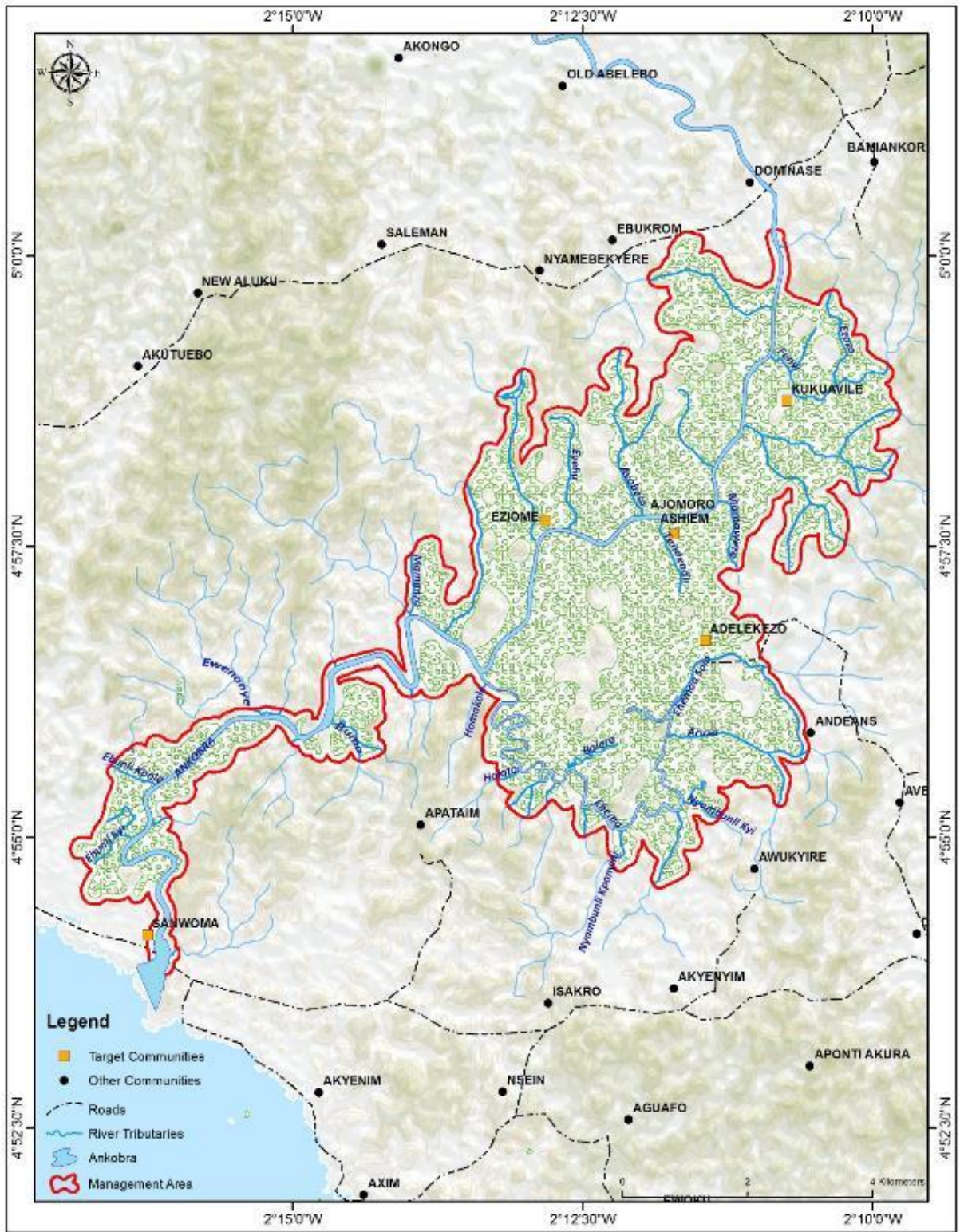
The population of the settlements in the management area have been relatively stable between the last two censal periods (i.e. 2000 and 2010). As of 2016, the populations of residents in the communities were as follows; Sanwoma (approximately 3500 people); Eziome (approximately 120 people); Ajomoro Eshiem (approximately 500 people); Adelekezo (approximately 700 people) and Kukuavile (approximately 1200 people). None of the settlements in the management area has reached a population threshold of 5,000 hence all fall within the rural settlement category. The number of fishermen in the five communities represent a small proportion of the total population, approximately 370 individuals, mostly males (see Table 1)

**Table 1: Estimated number of fishers per community**

Community	Estimated number of fishers
Adelekezo	50
Ajomoro Eshiem	25
Eziome	15
Kukuavile	80
Sanwoma	200

## **2.1 Boundaries of the Fishery Management Area**

The management area covers approximately 5,078 hectares of land and a total of 68 linear nautical miles (126 km) length of the river combined with its tributaries in the southern downstream section of the Ankobra Basin (Figure 6). In this area, cropland constitutes 28 percent of the land cover while forestland and wetland areas constitute 49 percent and 15 percent respectively. The area traverses two administrative boundaries – Ellembelle District and Nzema East Municipal - and also falls under the jurisdiction of three traditional areas, namely Ajomoro, Eastern Nzema and Gwira Traditional areas.



**Figure 6: Boundaries of the fisheries management area showing network of tributaries**

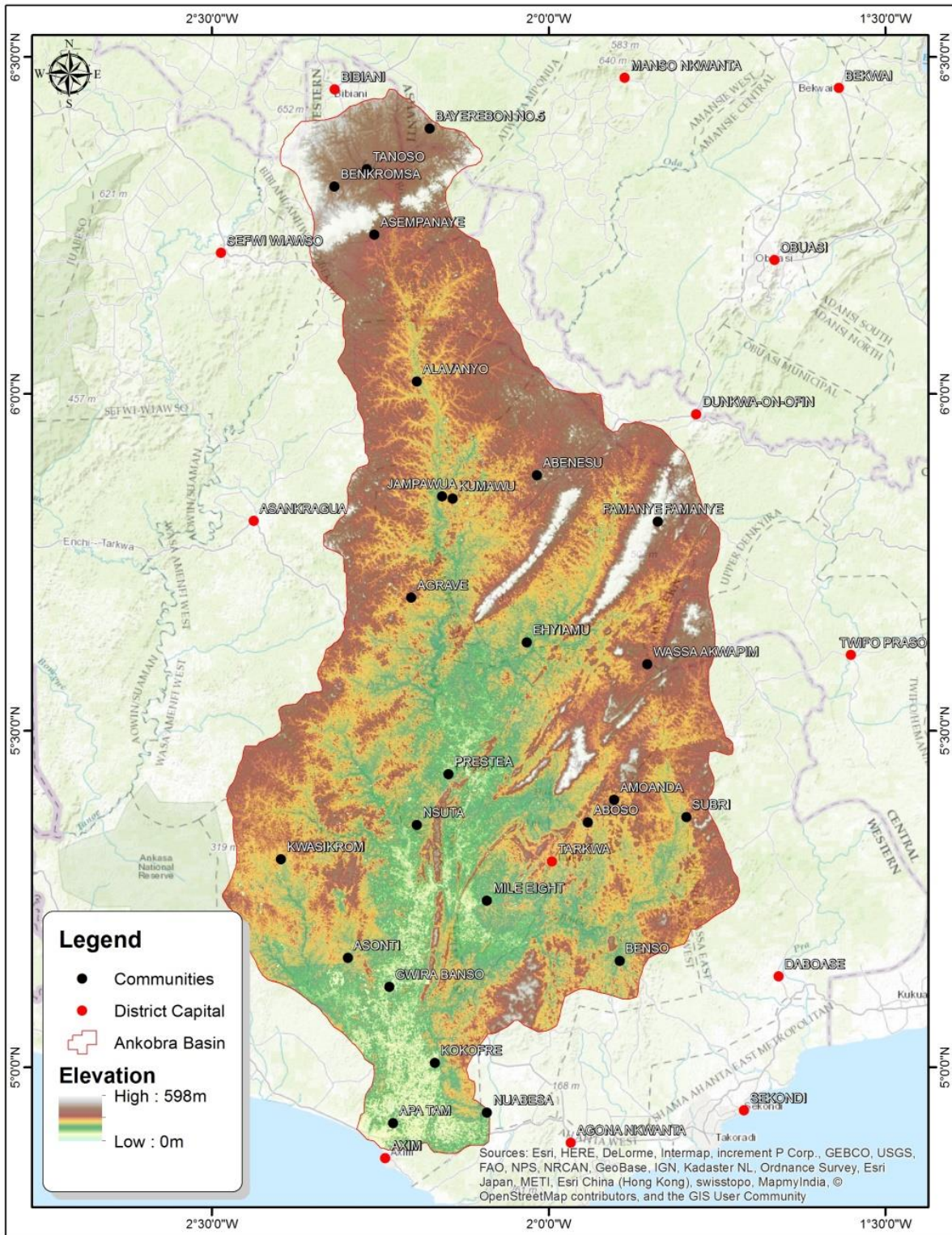
## **2.2 Description of the Ankobra Basin Ecosystem**

The fishery management area depicted in Figure 6 is part of the Ankobra River Basin ecosystem which covers an approximate area of 8,460 km<sup>2</sup> (Figure 7). The river takes its source from the hills north of Basindare (near Bibiani) and flows for about 260 km mostly due south before it enters the Gulf of Guinea at Sanwoma, a few kilometres west of Axim. The basin is bounded to the east by the Pra Basin, to the north and west by the Tano Basin and in the south-east by the small coastal Butre Basin. Nearly 95% of the Ankobra River Basin is located within the Western Region with more than 80% of this land area contributed by six districts in the region: Wassa Amenfi Central, Wassa Amenfi East, Tarkwa-Nsuaem Municipal, Prestea-Huni-Valley, Ellembelle and Nzema East.

The Ankobra basin belongs to the physiographic region called the Forest-dissected Plateau. Many years of extensive erosion has reduced the area to a rather uniformly appearing plateau, generally at an elevation of 250-300 meters above sea level. Although the basin experiences heavy rainfall, the forest vegetation cover prevents sheet erosion. Therefore, the pronounced dissected nature of the plateau can be attributed to the gully erosion. The topography of the basin is characterized in the southern half by relatively flat land, which gives way in the mid to northern sections of the basin to characteristic rounded hills, which are occasionally steep-sided. The hilly terrain reaches an altitude of close to 600 m above sea level.

The Ankobra Basin is characterized by a bi-modal rainfall regime with the first rainfall season extending from April to June and the second season from September to November. The mean annual rainfall is 1,700mm. Available meteorological data also shows that the Ankobra Basin is characterized by uniformly high temperatures throughout the year with a mean annual temperature of about 26°C. March is the hottest month in the basin with a mean monthly temperature of about 27-29°C. August is the coolest month with a mean temperature of 24-25°C. The Ankobra Basin traverses three vegetation sub-types of the high rainforest zone, namely, moist semi-deciduous, moist evergreen and the wet evergreen forests.





**Figure 7: Boundaries of Ankobra river basin showing elevation**

### 3.0 CHARACTERIZATION OF THE FISHERY

The Ankobra estuarine fishery is a multi-species fishery characterized by harvesting of finfish and shellfish from freshwater, brackish water and marine sources. A total of 27 fish species belonging to 21 families were recorded during an inventory of fish (see Annex 3). These included coastal pelagic carangid species such as *Caranx hippos* and *Chloroscombrus chrysurus*, coastal demersal fish such as the cassava croakers *Pseudolithus spp.* and snappers *Lutjanus sp.*, brackish water species including the black-chin tilapia, *Sarotherodon melanotheron*, tilapias from freshwater sources mainly the Nile tilapia, *Oreochromis niloticus*, catfishes mostly the bagrid catfish *Chrysichthys nigrodigitatus*, mudfish *Clarias sp.*, and shellfish such as the brackishwater periwinkles *Tympanotonus fuscatus* as well as shrimps and crabs.

Despite the variety of species targeted for harvesting, estuarine fishers and processors prioritized three species to be the main focus of this management plan according to the following criteria; availability for harvesting throughout the year, high abundance and high post-harvest price. In order of priority, these species are the bagrid catfish, *Chrysichthys nigrodigitatus*, cassava croaker, *Pseudolithus elongatus*, and the Nile tilapia *Oreochromis niloticus*.

Generally, fishermen enjoy open access fishing in the estuary. Nonetheless, each participating community has historically restricted fishing activities to identifiable tributaries of the estuary and in doing so, is perceived by other communities as possessing de-facto use rights to fishing grounds in the respective tributaries. A major tributary which serves as a fishing area for fishermen in Sanwoma is *Ebunli Ekye* and this is where catfish is mostly harvested; fishermen from Eziome harvest tilapia and catfish from *Eyehu* while those from Eshiem harvest catfish and tilapia from *Mamawure*. For fishermen in Adelekazo and Kukuavelli, the main tributaries of the Ankobra from which they harvest catfish, tilapia and cassava fish are *Ehema Solo* and *Fenvi* (see Figure 6).

### 3.1 Biology of priority estuarine fish species

#### 3.1.1 Bagrid catfish (*Chrysichthys nigrodigitatus*)

The Bagrid catfish (Figure 8) is widely distributed and known from most basins within western Africa. It is native to Angola, Benin, Burkina Faso, Cameroon, Congo, Côte d'Ivoire, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Mali, Mauritania, Niger, Nigeria, Senegal, Sierra Leone, and Togo. *Chrysichthys nigrodigitatus* is a demersal potamodromous species. It occurs in shallow waters of lakes (less than 4 m), over mud and fine sandy bottom, in rivers and in swamps. It is an omnivorous fish that feeds on seeds, insects, bivalves and detritus. Feeding becomes specialized with age and size. Larger fish may feed on decapods and fish. Maturity sizes of 11.5 cm TL (male) and 16.7 cm TL (female) have been reported in Nigeria. The peak of their breeding and other reproductive activities occurs in the rainy period, mainly between April and August. Mean fecundity is reported between 2,000 – 2,500 eggs and this is highly dependent on the body size.



**Figure 8: Bagrid catfish: *Chrysichthys nigrodigitatus***

### 3.1.2 Cassava croaker (*Pseudolithus elongatus*)

*Pseudolithus elongatus* also known as cassava croaker (Figure 9), is a demersal species found at a depth range of 0 to 70 m in coastal waters over muddy, sandy or rocky bottoms of the west coast of Africa, from Morocco to Namibia. Smaller individuals are found in shallow waters, but rarely entering estuaries. It is carnivorous, feeding on fish, shrimps and crabs. They spawn outside of estuaries from November to March in waters of 22 to 25°C in the Gulf of Guinea. Age at first maturity and longevity is not well known, but individuals may live up to 15 years. Some studies have shown the absolute fecundity to range from about 80,000 – 150,000 eggs. It is considered one of the most economically important demersal fish in West African waters. *Pseudolithus elongatus* species is listed as endangered on the IUCN red list of threatened species.



**Figure 9: Cassava croaker: *Pseudolithus elongatus***

### **3.1.3 Nile tilapia (*Oreochromis niloticus*)**

The Nile tilapia - *Oreochromis niloticus* (Figure 10), is a cichlid fish native to Africa. Adults may reach 60 cm (24 in) in length and up to 4.3 kg and can live up to nine years. It tolerates brackish water and survives temperatures between 8 and 42 °C. It is an omnivore, feeding on plankton as well as on higher plants. It generally feeds in shallow waters, as harmful gases (such as carbon dioxide, hydrogen sulfide, and ammonia) and temperature fluctuations found in deep waters tend to create problems for the physiology of the fish. The Nile tilapia thrives in the warmer temperatures commonly found in shallow waters. The fecundity of the Nile tilapia has been determined in monoculture or polyculture ponds to range from 600 - 2,000 eggs.

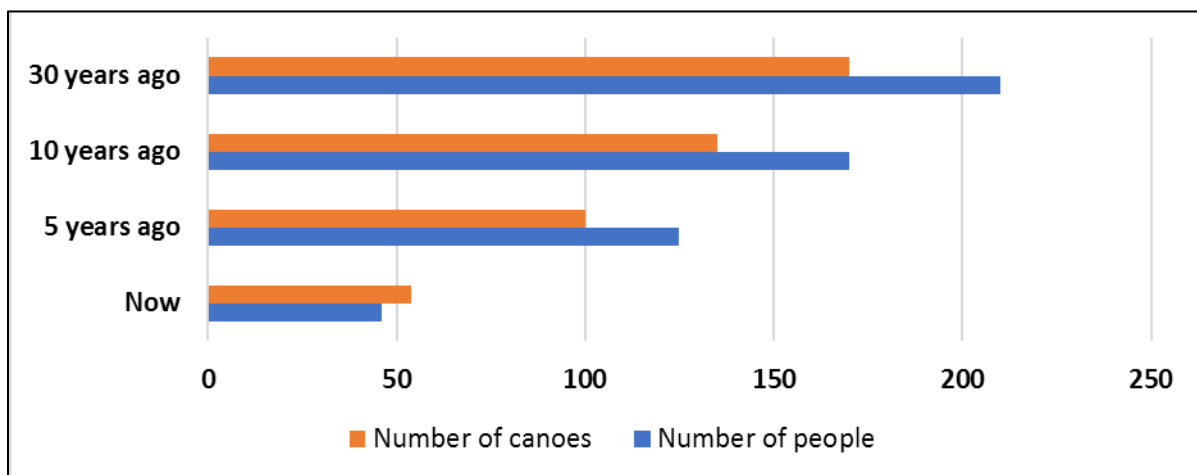


**Figure 10: Nile tilapia: *Oreochromis niloticus***

### 3.2 Status of Ankobra River Estuarine Fishery Resources and Issues in the Fishery

Several technical assessments and participatory rapid appraisals were conducted during the preparation of this plan. These revealed that the fishery has gone through significant changes over the past 30 years relative to fishing effort, size of catch, fuelwood for fish smoking and prices of fish.

**Effort:** Some 30 years ago, there were about 210 individuals fishing in the Ankobra with about 170 canoes (Figure 11). Currently, this number has reduced to about 50 fishermen and 60 canoes. In Sanwoma, some of the canoes are only used for harvesting and transporting mangrove. The number of canoes on the Ankobra presently outstrips the number of fishermen fishing in the river. Communities further upstream of Sanwoma have seen a large reduction in number of fishermen and canoes in the past 30 years. This was attributed to the rural-urban migration. Youth from these communities continue to migrate to urban and cosmopolitan areas like Tarkwa, Sekondi-Takoradi and Axim in search of better life. Fishermen travelled shorter distances to fish and spent less time harvesting about 40 times the quantity of fish that is harvested today. Fish was abundant and was relatively easy to catch. The communities attributed the current decline in catch or fish harvested to the use of undersized mesh in fishing and illegal mining activities upstream and sometimes in the river bed leading to pollution and degradation of the spawning grounds of the fish.



**Figure 11: Estimated number of canoes and people fishing in the Ankobra 30 years ago to present**

**Fish size and catch:** Using a scale of 1 to 5 (1 being the worst and 5 the best), community members ranked the decline in catch and size from 5 (thirty years ago) to 1 (present). The community members ascribed the decline in catches to various factors including illegal small-scale mining, cutting of riparian vegetation for fuel-wood and the use of pesticides and small mesh size in fishing. During the dry season, fishermen adopt the practice of pumping water from the tributary and scooping out fish

with baskets. This practice results in indiscriminate harvest of juveniles and destruction to fish habitats.

**Price of fish:** Fish harvested from the Ankobra river 30 years ago was not sold. It was consumed by members of the household of the fisherman and the excess was given out for free. This changed some 10 to 20 years ago. As more and more people began to depend on fish as a cheap source of protein, fishermen began selling their catches (Table 2). A *bashing rubber*<sup>1</sup> of fish was sold for GHc50 (2017) compared to GHc10 in 2007. There is seasonal fluctuation in price and landing of fish within the Ankobra estuarine communities. More fish are harvested in the rainy season and the glut leads to a reduction in price of fish. In the dry season, the reverse happens as reduction in fish landed leads to increase in the price of fish.

**Table 2: Changes in fishing activities in the Ankobra estuary within the past 30 years**

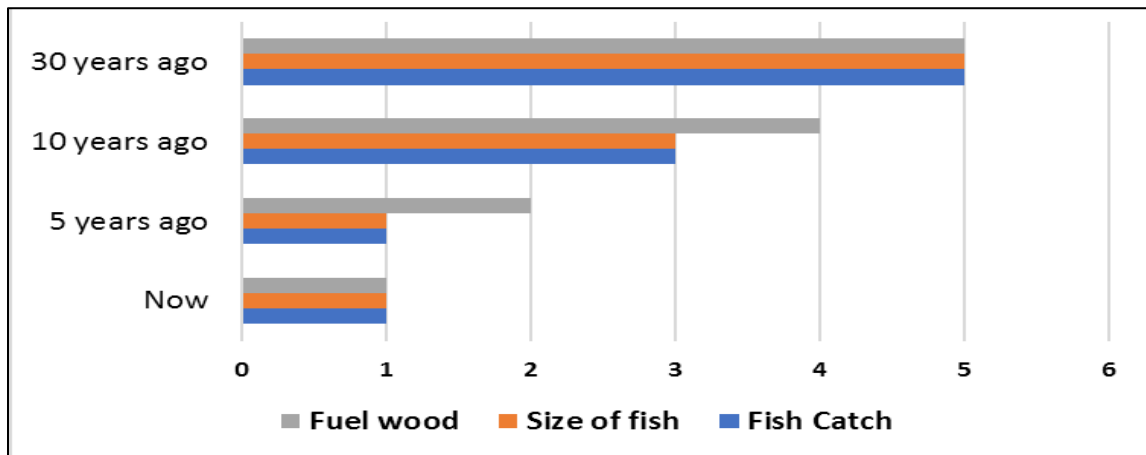
Activity	Present day	5 years ago	10 years ago	30 years ago
Duration	24hrs	12hrs	30min	10min
Distance	5km	5km	4km	1/3 km
Quantity of fish harvested	¼ Bashing rubber	½ Bashing rubber	1 Bashing Rubber	10 bashing rubber
Price of fish <sup>2</sup>	GHc50/ bashing rubber	GHc50/ bashing rubber	GHc10/ bashing rubber	N/A

In the Ankobra estuary, fishers reported a decline in harvest of the bagrid catfish and attributed this to the degradation of the mangroves along the banks of the estuary which they believe provided breeding areas for the species. The illegal mining activities upstream gradually led to increase in the level of siltation and turbidity of the Ankobra River. It is not known what impacts the siltation and turbidity might have on the population of the bagrid catfish and other species. The use of drag nets and nets of small mesh sizes for fishing in the estuary, were identified among the other issues of concern as these nets capture and destroy juvenile fish. The Fisheries Regulations (LI 1968) prohibit the use of these gears for fishing. Monofilament net with a mesh size of 3 inches or 75 mm and above is legal for use in freshwater systems but illegal in marine waters. This situation poses regulatory enforcement challenges because at certain times of the year, for example, during the rainy season, the entire estuary down to the mouth of the river is fresh water, however, during dry seasons, the salt water wedge extends far upstream.

<sup>1</sup> Bashing rubber is the name given the plastic container used by fishermen to measure their fish catch

<sup>2</sup> The cost of fish here is an estimated average given by fishermen

**Mangrove as fuelwood:** The harvesting of mangrove, the main fuelwood for fish smoking and cooking, has led to degradation of the mangrove forests within the fishery management area. However, Sanwoma initiated a mangrove restoration project to rehabilitate degraded mangrove wetlands with fund from the USAID Ghana Sustainable Fisheries Management Project. The mangrove restoration program was facilitated by Hen Mpoano.

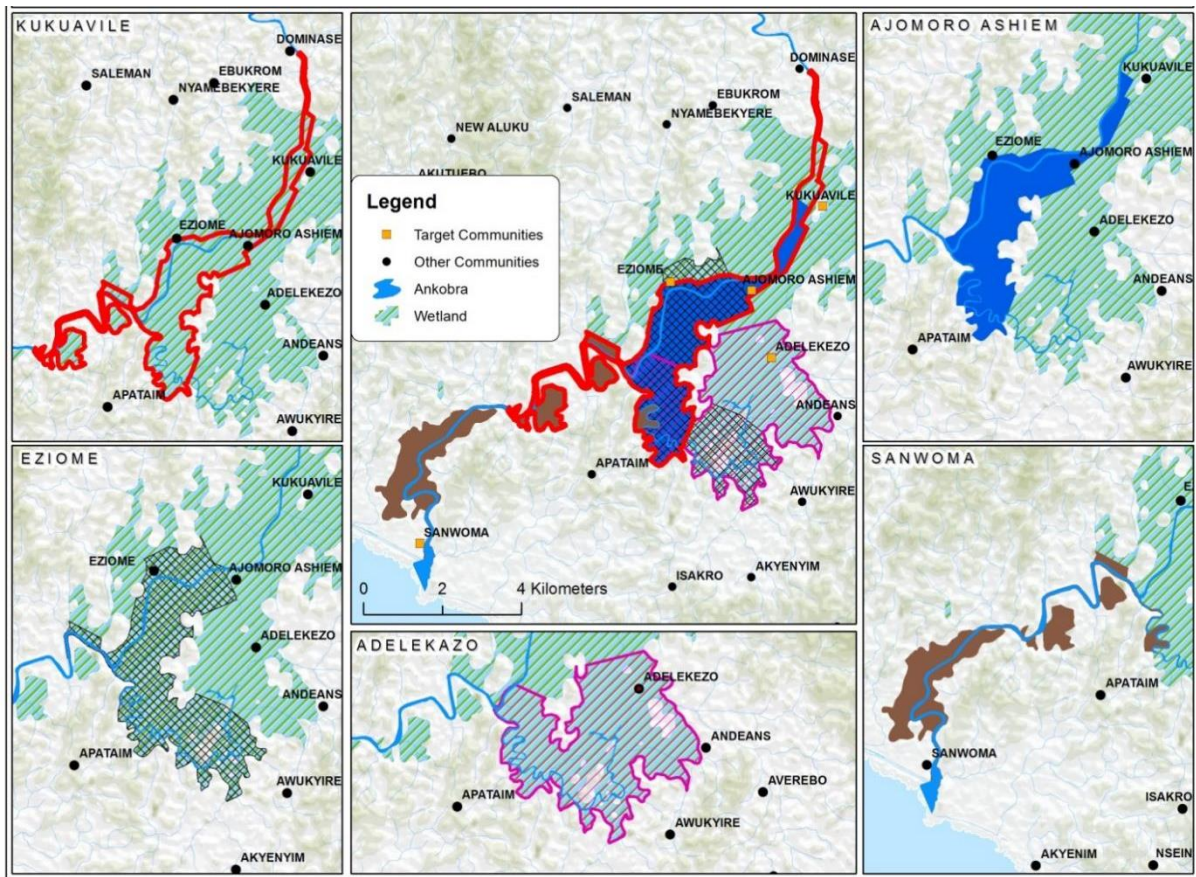


**Figure 12: Perceived changes in resource conditions by the communities**

### 3.3 Harvesting Methods

Fishing is done all year round but peaks in the rainy season when there is relative fish abundance in the estuary. Fishing is predominantly carried out by men using canoes. The canoes are either owned by the fisherman or rented at a daily rate of GHC20. Fishing activity lasts between three to five hours depending on the fishing ground. Fish is caught using set nets, traps, hook and line and seine nets. Fishermen from all the communities enjoy open access fishing and are not restricted by boundaries. Nonetheless, each community has preferred fishing grounds based on proximity. These fishing grounds overlap in some cases, as shown in Figure 6 (see Annex 4 for larger full-page maps). Conflicts are rare among the fishermen and are addressed through laid down traditional-norms and practices when they occur.





**Figure 13: Fishing grounds of estuarine communities and combined overlay showing overlapping fishing areas and exclusive fishing areas**

The most commonly used gear for fishing the above-mentioned priority species are monofilament gill nets, hook and line, seine nets (locally called *daaso*) and pots constructed with raffia (locally called *tuma*) (see Figures 14-18). See also, Annex 3 for a list of other species caught in the Ankobra river with these gears. Mesh sizes of the monofilament gill nets ranges from 8 cm to 11 cm stretched mesh depending on the sizes of fish targeted by the fishers. The seine nets, however, have a battery of meshes with some less than 1 cm stretched mesh. The fishermen record mesh sizes in inches and measure the mesh sizes by slotting their fingers horizontally into the mesh; the number of fingers that can horizontally fill the mesh determines the mesh size. Mesh sizes below 7.5 cm or 3 inches (or approximately three fingers) are illegal under current regulations.



**Figure 14: Monofilament gill net used in the Ankobra estuary**



**Figure 15: Fishermen deploying monofilament gill net in the Ankobra estuary**



**Figure 16: A fishermen demonstrating how fingers are used to measure mesh size**



**Figure 17: Fishermen deploying a seine net in the Ankobra estuary**



**Figure 18: Raffia trap pots used for fishing in the Ankobra estuary**

### **3.4 Processing**

The fish species targeted for management from the Ankobra are either sold fresh at the Ankobra bridge or to hotels and restaurants or processed using traditional methods of smoking, frying, salting and drying.

**Smoking:** Smoking is done on open earthen ovens constructed locally using mangrove, old rubber trees and other forest trees as fuelwood. However, mangrove is the preferred fuelwood in the estuarine communities because it is readily available and is also believed to add some antibacterial properties to the fish which helps in its preservation. The fish is cleaned and arranged on wire mesh grills either coiled or in cut pieces on the open oven. The bagrid catfish is usually processed using this method.

**Frying:** This is a common method used in processing fish and does not preserve the fish for a long time compared to smoking and salting or drying. All the fish species of interest are processed this way for household consumption and commercial purposes.

**Salting and drying:** This is another method used in processing fish; the fish is gutted and saturated with salt and left in the sun to dry. The salt provides anti-bacterial properties and also helps with dehydration. The salt also helps preserve the fish over a long period. The Nile tilapia processed using this method is locally referred to as *kobi*<sup>3</sup>.

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<sup>3</sup> Salted and dried tilapia

### 3.5 Marketing

Fish caught is sold to women in the communities who process them by smoking. The smoked fish are sent to market centres in baskets for sale. It takes between two to five hours for the fishmongers to reach their various market destinations. Women from Sanwoma mostly sell their fish at the Ankobra Bridge, Anyinase, Agona Nkwanta and Dominase, while those from Adelekezo, Kukuaville, Eshiem and Eziome sell their fish mostly in Prestia, Axim, Dominase, Bamianko, Simpa, Tarkwa and Akango. Tilapia and the Bagrid catfish are delicacies and are sold mostly fresh at the Ankobra Bridge to passengers in passing vehicles. Marketing is hindered by poor road network, especially during the raining season when communities become inaccessible, hindering the transport of fish to market centres. Commercial transport on the river and its tributaries is limited to a few communities.

### 3.6 Annual calendar of activities in estuarine communities

Although fishing in the Ankobra estuary is an all-year-round activity, it becomes more intensive from July to December. According to the fishermen, it is around this time that fish is abundant because there is more food available for fish to eat. When they are not fishing, inhabitants of the estuarine communities are engaged in other livelihood activities as shown in Table 3.

**Table 3: Seasonality of economic activities in estuarine communities**

Activity	J	F	M	A	M	J	J	A	S	O	N	D
Fishing†	x	x	x	x	X	x	x	x	x	x	x	x
Bamboo Harvesting†	x	x	x	x	X	x	x	x	x	x	x	x
Mangrove Harvesting†	x	x	x	x	X			x	x	x	x	x
Fish processing*	x	x	x	x	X	x	x	x	x	x	x	x
Trading*	x	x	x	x	X	x	x	x	x	x	x	x
Farming†	x	x	x	x	X			x	x	x	x	x
Mushroom harvesting*				x	X	x	x					
Crabs harvesting†	x	x	x	x	X			x	x	x	x	x
Snail harvesting					X	x	x	x	x	x		
Palm wine tapping†	x	x	x	x	X	x	x	x	x	x	x	x
Rubber farming†	x	x	x	x	X	x	x	x	x	x	x	x
Periwinkle harvesting*						x	x					
Commercial Transport† (boat, taxi, motor bikes)	x	x	x	x	x	x	x	x	x	x	x	x
Lumbering (Timber) †	x	x	x	x	x	x	x	x	x	x	x	

† Male dominated economic activities.

\* female dominated economic activities.

## **4.0 VISION, OBJECTIVES AND MANAGEMENT MEASURES**

The vision and objectives for the Ankobra estuarine fishery was initially developed by the Ankobra Community-Based Fisheries Management Association and was later refined and endorsed at a meeting of over 70 fishermen and fish processors from the five participating communities.

The vision statement developed is as depicted in the graphics in Figure 19 and 20, drawn by Kevin Nessere, a student of Ampain primary school.

The vision statement:

**“The five Ankobra river estuarine communities collectively working and partnering with other stakeholders to ensure that the estuarine fishery which has been the heritage of the local communities is managed and sustained for future generations.”**

### **4.1 Objectives**

The management objectives for the community-based fisheries plan were formulated through participatory meetings which involved members of the Ankobra Community-Based Fisheries Management Association, traditional authorities and other resources users. They address issues of biological, ecological, socio-cultural and economic concerns that pertain to the fishery. The objectives of the management plan as developed by the communities are summarised below.

#### **Biological**

- Harvest large sized fish using large mesh sized nets.

#### **Ecological**

- Maintain biological diversity through protection of estuarine fish habitats and nursery grounds.
- Protect estuarine fish habitats and nursery grounds through, restoration and sustainable harvesting of mangrove fuelwood and bamboo.

#### **Socio-cultural**

- Re-instate traditional norms and practices for managing Ankobra estuarine fisheries and mangrove ecosystem.
- Intensify education and enforce traditional norms applied to management of estuarine fisheries and mangrove ecosystem.

#### **Economic**

- Enhance commercial value of estuarine fish, build resilient livelihoods, improve food security and economic status of fisheries-dependent households.



**Figure 19: Graphical representation of the current state of the Ankobra**



**Figure 20: Graphical representation of the envisioned state of the Ankobra**



## 4.2 Management Measures to Achieve Objectives

Table 4 below outlines key management measures to achieve the objectives of the fishery management plan.

Fishermen and fish processors from the five participating communities were engaged in a series of meetings and workshops where specific management measures to achieve set biological, ecological, socio-cultural and economic objectives were developed. This was followed by a meeting with traditional authorities who have jurisdiction over the management area as well as government stakeholders including: Fisheries Commission (FC), Environmental Protection Agency, Nzema East Municipal Assembly, Ellebelle District Assembly and Water Resources Commission, where the management measures earlier developed by fishers were refined and consolidated. The management measures took into account initial actions that have been taken by the communities to restore ecological balance. For example, the mangrove replanting embarked on by the Volta Estuary study tour beneficiaries from Sanwoma - about 18 hectares of degraded mangrove forest in the Ankobra basin have been replanted to date.

Other initial actions undertaken include establishment of Village Savings and Loan Associations in Adelekezo and Ajomoro Eshiem to improve the financial resilience of community members while embarking on management interventions to restore habits and fish resources, provision of a boat to enhance transportation on the Ankobra river and support mangrove replanting actions, formation of a Community-Based Fisheries Management Association comprising of fishermen and fish mongers from the five estuarine communities to lead fisheries management activities, and training of the community-based fisheries management association on fisheries management, advocacy and leadership.

Stakeholders collectively agreed to implement the following management measures. The communities also agreed to establish a taskforce for implementation and monitoring of management measures (see Annex 5 for detail implementation plan).

**Table 4: Management measures and responsible institutions**

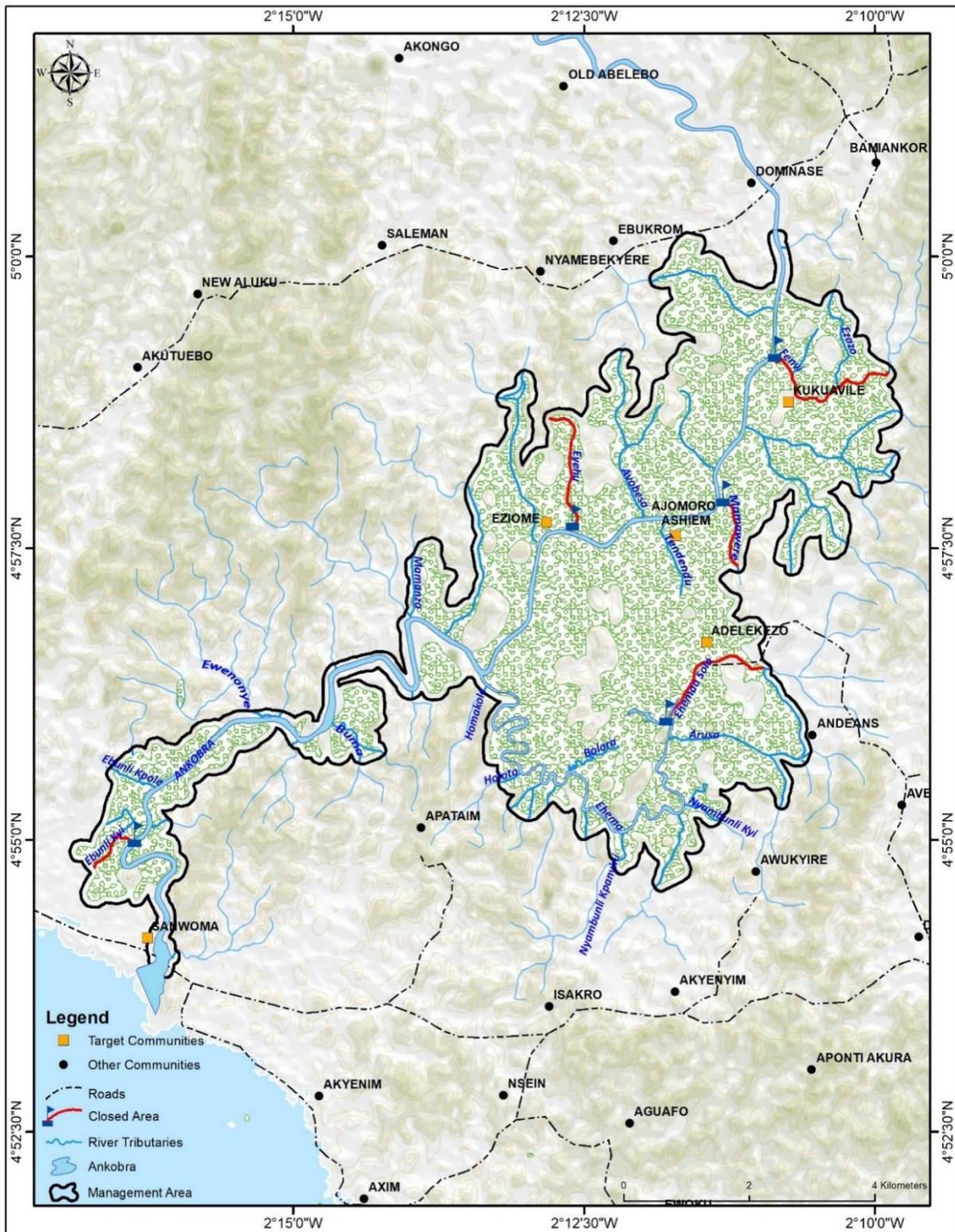
Management Objectives	Measures	Specific Actions	Responsible Institution
<b>Socio-cultural</b>	1. Outreach events / promotion of good practices	1.1 Design and produce posters on good estuarine fishing practices (mesh sizes of 3 inches and above; no pumping of water during fishing; no chemicals, closed seasons, etc).	Lead: <b>Hen Mpoano</b> Ankobra Community-Based Fisheries Management Association members, EPA, WRC

Management Objectives	Measures	Specific Actions	Responsible Institution
		1.2 Organize annual durbars to involve traditional authorities in promoting good estuarine fishing practices	Lead: <b>Ankobra Community-Based Fisheries Management Association</b> Traditional authorities, media, Hen Mpoano
		1.3 Periodic briefings with traditional authorities on status of implementation of measures and discuss challenges	Lead: <b>Ankobra Community-Based Fisheries Management Association</b>
<b>Ecological</b>	2. Closed seasons for breeding grounds	<p>2.1 Each community will implement closed seasons in major tributaries during different periods of the year as follows;</p> <p>2.1.1 <b>Adelekazo</b> - <i>Ehema Solo</i> will be closed to fishing for <b>one month</b> in every quarter of the year. Areas locally identified as breeding grounds on <i>Ehema Solo</i> will be subject to all <b>year-round closure</b> in conformity with traditional norms.</p> <p>2.1.2 <b>Eziom- Eyehu</b> will be closed to fishing between <b>January – February</b></p> <p>2.1.3 <b>Eshiem</b> – <i>Mamawure</i> will be closed to fishing between <b>January – March</b></p> <p>2.1.4 <b>Kukuaveli</b> - <i>Fenvi</i> will be closed to</p>	<p>Lead: <b>Community Chiefs and their taskforce made up of traditional council of elders from the chief's palace</b></p> <p>Ankobra Community-Based Fisheries Management Association members; fishermen; Fisheries Commission</p>

Management Objectives	Measures	Specific Actions	Responsible Institution
		fishing between <b>January - March</b> 2.1.5 <b>Sanwoma - Eburnli Ekye</b> will be closed to fishing between <b>May – July</b> .	
	3. Mangrove and bamboo conservation	3.1 Mangrove and bamboo harvesting and farming activities are prohibited within 30m buffer along the river	Lead: <b>Ankobra Community Conservation Committee</b> ; Ankobra Community-Based Fisheries Management Association, Wildlife Division, Hen Mpoano
		3.2 Explore bamboo replanting by replicating mangrove nursery	Lead: <b>Ankobra Community-Based Fisheries Management Association</b> Hen Mpoano, Wildlife Division, Coastal Sustainable Landscape Project and other NGOs
		3.3 Expand mangrove restoration to degraded sites upriver and include <i>saba</i> and palm tree	Lead: <b>Ankobra Community Conservation Committee</b> Ankobra Community-Based Fisheries Management Association, Wildlife Division, NGOs
		3.4 Regulate mangrove harvesting by establishing harvesting quotas	Lead: <b>Community Chief and Ankobra Community Conservation Committee</b> Community-Based Fisheries Management association, Wildlife Division, NGOs, Nzema East Municipal Assembly and Ellembelle District Assembly

Management Objectives	Measures	Specific Actions	Responsible Institution
<b>Biological</b>	4. Harvesting of catfish, tilapia and cassava croaker	4.1 Mesh sizes of 3 inches and above will be used for fish harvesting	Lead: <b>Community chiefs</b> Fishermen; Ankobra Community-Based Fisheries Management Association members, Fisheries Commission
		4.2 Landings of cassava croaker will be subject to minimum size (18 cm) restrictions in conformity with Fisheries Regulations (L.I. 1968). No harvesting of undersized fish is permitted	Lead: <b>Ankobra Community-Based Fisheries Management Association</b> Fishermen; Fisheries Commission
	5. Research	5.1 Life cycle of Bagrid catfish and Nile tilapia	Lead: <b>University of Cape Coast</b> Fisheries Commission
		5.2 Growth assessment of Bagrid catfish and Nile tilapia	Lead: <b>University of Cape Coast</b> Fisheries Commission
	6. Improve processing of priority estuarine fish species	6.1 Explore fish processing using Ahotor ovens	Lead: <b>NAFPTA</b> Hen Mpoano, other NGOs
<b>Economic</b>	7. Limiting and managing access to fishing	7.1 Keep a registry of members of the community-based management association including members removed due to death or for violations of plan rules and payment of fines and penalties	<b>Ankobra Community-Based Fisheries Management Association</b>
		7.2 Set criteria and then restrict and limit membership so that	<b>Ankobra Community-Based Fisheries Management Association and Fisheries Commission</b>

Management Objectives	Measures	Specific Actions	Responsible Institution
		fishery benefits are not fully dissipated to open access levels and so that fishing incomes can be adequate for those engaged in fishing in the area.	



**Figure 21: Area and seasonal closure sites**

### Managing access to the fishery

As the collective membership of the Community Based Management Association is granted the exclusive rights to fishing the species contained in this plan and within the fishery management area designated, the association reserves the right to establish

rules as to limiting membership to exiting and duly registered members within their communities. The association can establish rules on when and how new members can be admitted (e.g. on retirement from fishing of an existing member, allowing a son or son-in-law or daughter or daughter in-law to join on nomination by a direct relative) and demonstrating that they meet the criteria of membership contained in the Association's constitution. The Association will keep a written registry of members in good standing and note members who may have been expelled due to non-compliance with rules as well as members on retirement from active fisheries related activity (fisher, processor, or trader). The association may establish rules on excluding from fishing from the management area people who are not residents of the five communities. The Association may also establish rules on allowing fisherfolk from outside the five communities to fish in designated areas which fall within the jurisdiction of this management plan. The management arrangements may include conditions or lease fees and duration of lease for fishing in the management area.

## 5.0 IMPLEMENTATION ARRANGEMENTS

The major policy and legal frameworks for fisheries management in Ghana are stipulated in the Fisheries and Aquaculture Sector Development Plan (FASDP), National Marine Fisheries Management Plan (NMFMP) 2015-2020, Fisheries Act 2002 (Act 625) and Fisheries (Amendment) Act, 2014 Act 880 and Fisheries Regulations (LI 1968) and Fisheries Amendment Regulation 2015, Act 2217. While these plans and legal frameworks incorporate co-management statements and provisions, they provide little guidance on practical implementation of co-management in the country's fisheries sector. However, the National Fisheries Co-Management Policy prepared under the auspices of Ministry of Fisheries and Aquaculture Development (MoFAD) and the Fisheries Commission (FC) provides sufficient and detailed guidance on implementation of co-management including application to all types of fisheries ecosystems found in Ghana, such as the Ankobra river estuary.

Critical to the successful implementation of this community-based fisheries management plan is the need for institutional collaboration, devolution of authority, assignment of responsibilities and finally, allocation of financial and material resources for implementation.

**Institutional collaboration** among stakeholders during implementation of this plan will occur at the regional, district and community levels. The regional FC will coordinate with regional governmental institutions such as the Wildlife Division of the Forestry Commission, Environmental Protection Agency (EPA) and Water Resources Commission (Ankobra Basin Board) in the provision of technical advice and services for the sustainable management of estuarine fisheries and associated natural resources. The FC will also collaborate with the Ajomoro, Eastern Nzema and Gwira Traditional Councils as well as relevant non-governmental and private sector organizations operating at the district level to share information and build synergies towards implementation of related activities. The Nzema East and Ellembelle District Assemblies will provide operational permit in recognition of the activities of the Ankobra Community-Based Fisheries Management Association. The District Assemblies through collaboration with FC's zonal focal persons will monitor implementation progress and activities of the Ankobra Community-Based Fisheries Management Association.

**Authority** for management of Ankobra estuarine fisheries is hereby delegated by the FC to the Ankobra Community-Based Fisheries Management Association. Members of the Association (see Annex 6 for a list of officers as of February 2018) are elected by resident fishermen, fishmongers, fish processors and the elected members endorsed by the traditional authorities in the five estuarine communities adjoining the management area (Adelekazo, Eshiem, Eziome, Kukuaville and Sanwoma) and have interest in the sustainability of the estuarine fisheries resources. The Association is registered and recognized by both Nzema East (Annex 1) and Ellembelle (Annex 2) district assemblies. The Association is governed by a constitution (see Annex 7) which



stipulates the objectives of the Association, roles and responsibilities as well as tenure of office of executive members and defines membership of the group, among others. The fisherfolk of the five communities are granted the exclusive use right to harvest the resource in these areas. The Association, in consultation with traditional authorities shall have the authority to set and modify management measures, enforce rules and impose sanctions throughout the entire fisheries management area. Rules will be formulated with all the fisherfolk from the five communities involved and presented for endorsement by the traditional authorities. Final rules must be communicated in writing to the regional Director of the Fisheries Commission within 14 days for review to ensure consistency with national laws and policies. The rules must also be disseminated to all estuarine communities through the executives to members and communicated in writing to the District Assemblies and Wildlife Division of the Forestry Commission for assistance in enforcement.

### **5.1 Institutional Roles and Responsibilities**

The roles and responsibilities for plan implementation include the following;

#### **Fisheries Commission, Western Region:**

- Recommends approval of the community-based fisheries management plan by the Executive Director of the Fisheries Commission.
- Approval of major changes to the plan goal or objectives in consultation with Wildlife Division of the Forestry Commission and Water Resources Commission.
- Support enforcement of rules to strengthen voluntary compliance actions by the Ankobra Community-Based Fisheries Management Association.
- Provide technical support and services to the association for sustainable management of estuarine fisheries resources.
- Ensure consistency of plan with national fisheries policies and laws.
- Facilitate annual review of implementation and performance of the plan in meeting its goals and objectives, with the Association.

#### **Nzema East Municipal Assembly and Ellembelle District Assembly**

- Allocate budget for implementation of this plan through the District Medium-Term Development Plan.
- Provide technical support and services for implementation.
- Monitor implementation progress and provide feedback to enhance activities of estuarine management association.
- Support implementation of management plan with appropriate by-laws when necessary.
- Provide operating permit for the estuarine management association.

**Wildlife Division of Forestry Commission, Water Resources Commission and other agencies:**

- Support enforcement of laws against illegal mining activities within the Ankobra basin.
- Provide technical and advisory services to ensure effective land/water use and land cover management in the management plan area.
- Assist with mangrove reforestation and community-based management of mangrove resources.

**Traditional Authorities including sub chiefs in Adelekezo, Eziome, Sanwoma, Ajomoro Eshiem and Kukuaville**

- Establish penalties including fines for violation of rules in consultation with council of elders.
- Set up taskforce and ad-hoc committees to enforce sanctions against offenders.
- Review, advise and endorse management measures and rules adopted by the Ankobra Community-Based Fisheries Management Association.

**Ankobra Community-Based Fisheries Management Association:**

- Set management measures including seasonal and area closures, rules on gear restriction and harvest size in consultation with resources users (fishermen, fish processors, fishmongers) and other stakeholders affected by the management plan.
- Periodically patrol management area to monitor compliance with set rules and management measures by resource users.
- Lead awareness raising and outreach activities associated with implementation of this plan.
- Undertake annual review of plan implementation in consultation key stakeholders.
- Enforce the rules and administer penalties for violators.

**Civil Society and Private Sector Organizations:**

- Support ongoing training and capacity building of estuarine management association.
- Facilitate stakeholder engagement and planning activities associated with implementation of this plan.
- Provide additional logistics, human and financial resources in support of implementation of this plan.

**Universities and Research Institutions:**

- Conduct research to inform age and size limits for harvesting priority species.
- Undertake stock assessments.
- Conduct other related biological, ecological, social and economic research.

## **5.2 Financial Proposals**

Potential sources of funds for implementation of this plan include the Fisheries Development Fund, District Assemblies' Common Fund, international organizations, non-governmental organizations, donations from individuals and private companies as part of corporate social responsibility arrangements, license or fees from members granted access to harvest the resources. User fees from the boat donated by USAID/Sustainable Fisheries Management Project to the Ankobra estuarine communities are also a potential source of funding for implementing this plan.

## **6.0 MONITORING AND EVALUATION**

The Ankobra Community-Based Fisheries Management Association will undertake annual review of progress made in meeting the objectives of this community-based plan. The reviews will be conducted with representatives of the Fisheries Commission, District Assemblies, Wildlife Division of Forestry Commission, civil society, traditional authorities, and private sector. Such periodic reviews will focus on the following:

- Issues concerning degree of compliance with management measures and rules, including closed seasons, closed areas, and minimum sizes.
- Status of stocks of the fish species targeted for management and whether fish catches are stable or increasing.
- Difficulties, if any, in implementing enforcement actions, sanctions and penalties.
- Status of funds obtained from licenses and fines – amount collected and if any disbursed or expensed.
- Issues, if any, concerning operations of the Ankobra Community-Based Fisheries Management Association.
- Degree to which biological, ecological, social, and economic management objectives outlined in the plan are being met.
- Impacts of mangrove and other forest conservation activities.
- Status of illegal mining activities in the management area and impacts on plan implementation.

The monitoring and evaluation plan is included as Annex 8.

## **7.0 ENFORCEMENT OF MANAGEMENT MEASURES, SANCTIONS AND PENALTIES FOR INFRACTIONS**

The communities through community forums have collectively agreed on the following approach to enforce management measure outlined in the plan, apply sanctions and penalty for infractions. The sanctions are in agreement with the existing Fisheries Act, Local Governance Act and other related Legislative Instruments. .

### **7.1 Enforcement of Management Measures**

Monitoring and surveillance and reporting of offenders shall be the collective responsibility of the community members and the executives of the Ankobra Community-Based Fisheries Management Association. In matters of adjudication of cases of alleged offences, the executives of the Ankobra Community-Based Fisheries Management Association, the assemblyman of the area, the chief and his council of elders shall preside over such cases. The chief and his council of elders shall enforce sanctions imposed on guilty parties from adjudication processes. In instances where the chief is unable to enforce sanctions, the case shall then be referred to the Police and district court for prosecution.

### **7.2 Sanctions and Penalties for Infractions**

Through community participatory process, sanctions were discussed and agreed on by the communities and their chiefs as punishment for offenders. A lower limit of GHc50, a bottle of schnapps and a sheep, and an upper limit of GHc700, two bottles of schnapps and a sheep, was set by the communities.

The chief and his council shall use their discretion to assign fines within these limits for repeat offenders. However, first time offenders shall be issued a warning by the chief and his council and be made to pay the minimum penalty. All unapproved meshes, i.e., mesh size below three inches shall be confiscated and destroyed. Failure to pay fines within the stipulated payment period shall automatically cancel one's membership of the Ankobra Community-Based Fisheries Association and shall forfeit all rights and benefits as a member to harvest the fisheries managed under this plan.

The sanctions shall apply to both community members and outsiders alike who violate the following rules or management measures described in Section 4.2:

- No harvesting of small sized fish.
- No fishing with mesh size below three inches.
- No pumping of water from river as a means of harvesting fish.
- No fishing during closed season
- No fishing in closed area.

- No fishing with chemical.
- No harvesting of mangrove beyond the 50-meter buffer and outside the designated cutting area.
- No fishing on non-fishing days

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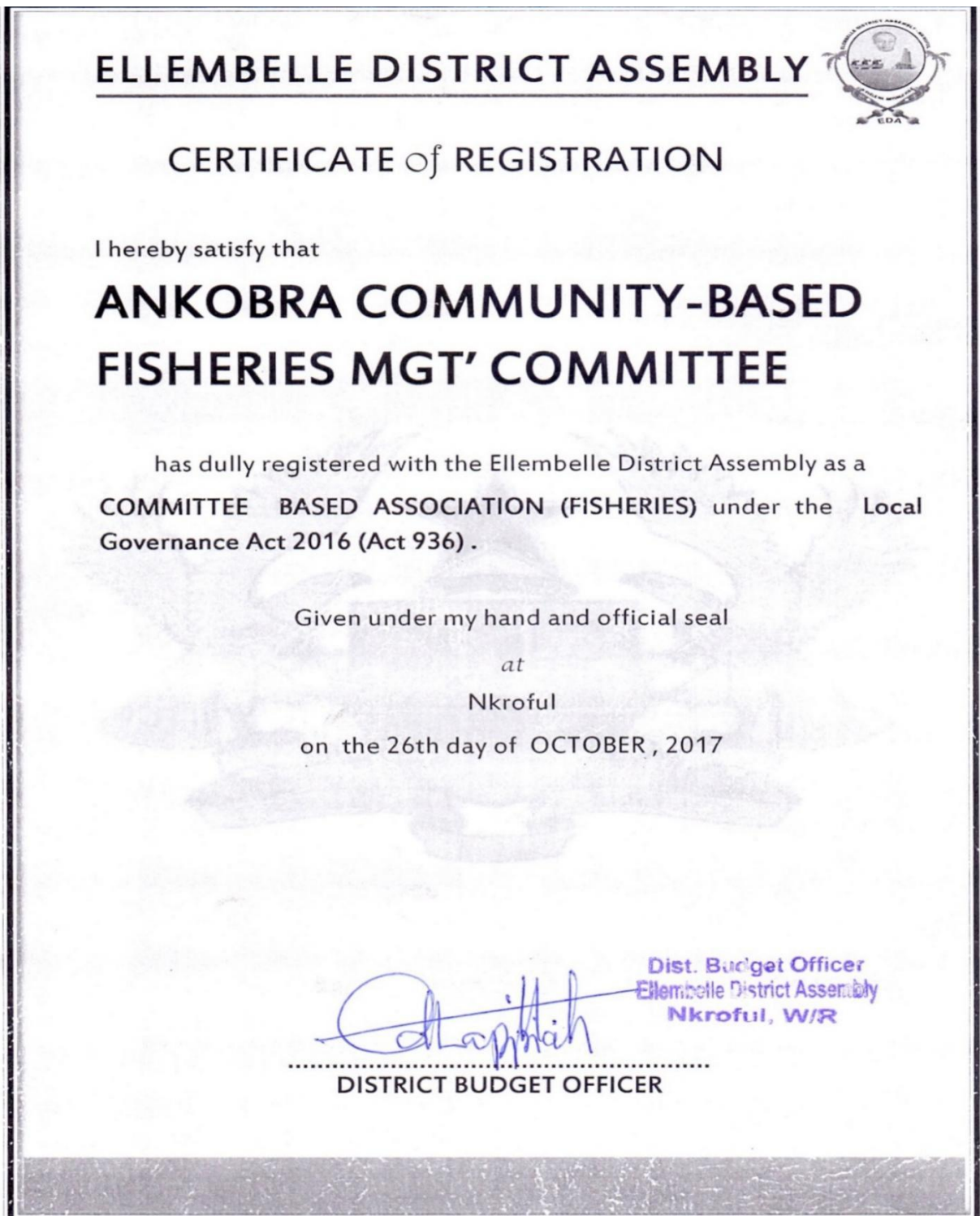
**ANNEX 1: CERTIFICATE OF REGISTRATION FROM NZEMA EAST MUNICIPAL ASSEMBLY**



**Figure 22: Certificate of Registration from Nzema East Municipal Assembly**



**ANNEX 2: CERTIFICATE OF REGISTRATION FROM  
ELLEMBELLE DISTRICT ASSEMBLY**



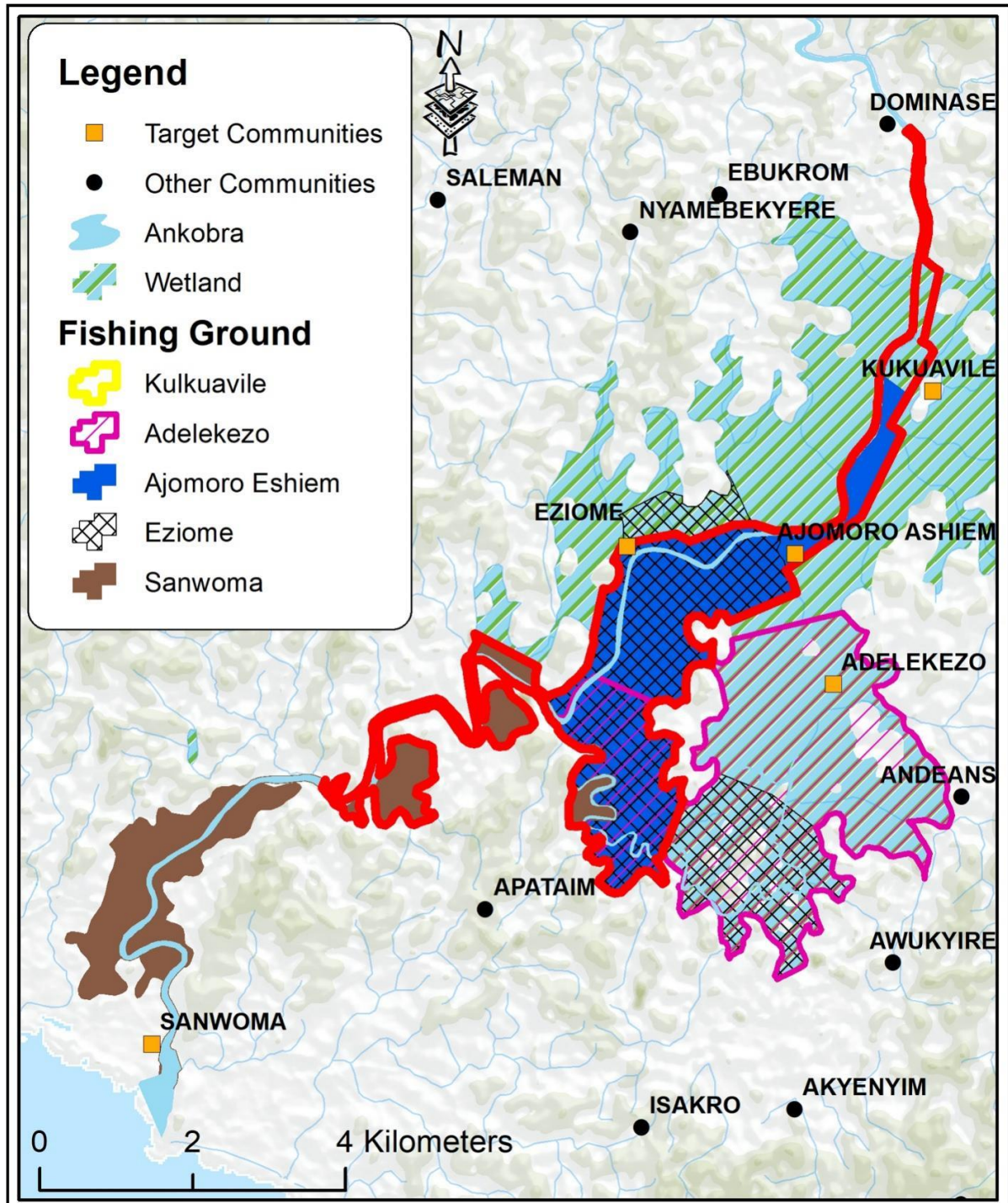
**Figure 23: Certificate of Registration from Ellembele District Assembly**

### **ANNEX 3: LIST OF FISH SPECIES IN THE ANKOBRA ESTUARY AND GEARS USED FOR THEIR HARVESTING**

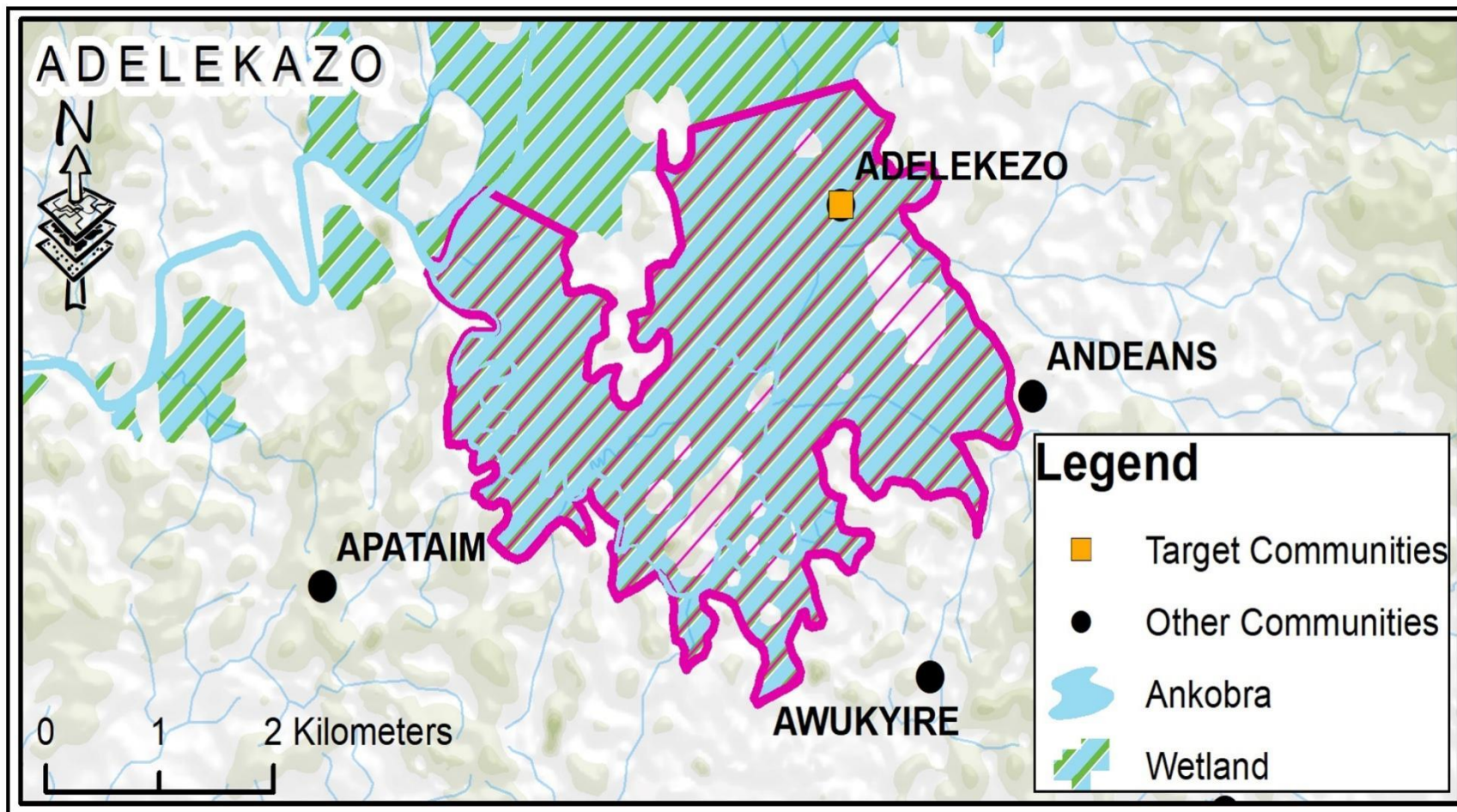
Family	Species	Common Name	Gear used for Harvesting
1. Eleotridae	<i>Eleotris senegalensis</i>	Senegalese Sleeper fish	Trap, seine net
2. Gobiidae	<i>Gobioides sagitta</i>	Mudskipper	Not hunted
3. Clupeidae	<i>Pellonula leonensis</i>	Small-toothed pellonula	Seine net
4. Cyprinidae	<i>Barbus sp</i>	Barbs	Trap, hook and line
5. Channidae	<i>Parachanna obscura</i>	Snakehead fish	Seine net, trap
6. Clariidae	<i>Clarias species</i>	Catfish	Trap, hook and line
7. Claroteidae	<i>Chrysichthyes nigrodigitatus</i>	Bagrid catfish	Trap, hook and line, set net
8. Ariidae	<i>Arius sp</i>	Catfish	Trap
9. Sciaenidae	<i>Pseudolithus senegalensis</i>	Cassava croaker	Monofilament set net, hook and line
	<i>Pseudolithus elongatus</i>	Cassava fish	Monofilament set net, hook and line
10. Cichlidae	<i>Sarotherodon melanotheron</i>	Black-chinned tilapia	Monofilament set net, hook and line
	<i>Oreochromis niloticus</i>	Nile tilapia	Monofilament set net, hook and line, seine net
	<i>Tilapia zilli</i>	Red belly tilapia	Monofilament set net, hook and line, seine net
11. Hapsetidae	<i>Hepsetus odoe</i>	African pike	Monofilament set net, hook and line, seine net
12. Carangidae	<i>Chloroscombrus chrysurus</i>	Atlantic bumper	Monofilament set net, hook and line, seine net
	<i>Caranx hippos</i>	Horse mackerel	Monofilament set net, hook and line, seine net
13. Lutjanidae	<i>Lutjanus endecacanthus</i>	Guinea Snapper	Monofilament set net, seine net
	<i>Lutjanus goreensis</i>	Gorean Snapper	Monofilament set net, seine net
	<i>Lutjanus species</i>	Snappers	Monofilament set net, seine net
14. Polynemidae	<i>Galeodes decadactylus</i>	Lesser African Threadfin	Monofilament set net, seine net

Family	Species	Common Name	Gear used for Harvesting
	<i>Polydactylus quadrifilis</i>	Giant African Threadfin	Monofilament set net, seine net
15. Cynoglossidae	<i>Cynoglossus senegalensis</i>	Senegalese tongue sole	Monofilament set net, seine net, trap
16. Bothidae	<i>Syacium micrurum</i>	Channel flounder	Monofilament set net, seine net, trap
17. Mugilidae	<i>Liza species</i>	Grey mullets	Monofilament set net, seine net, trap
18. Ehippididae	<i>Chaetodipterus species</i>	Spadefish	Monofilament set net, seine net, trap
19. Potamididae	<i>Tympanotonus fuscatus</i>	Mud-flat periwinkle	Hand picking
20. Portunidae	<i>Callinectes amnicola</i>	Brackishwater crab	Trap and hand picking
21. Parapenaeus	<i>Penaeus species</i>	shrimps	Traps

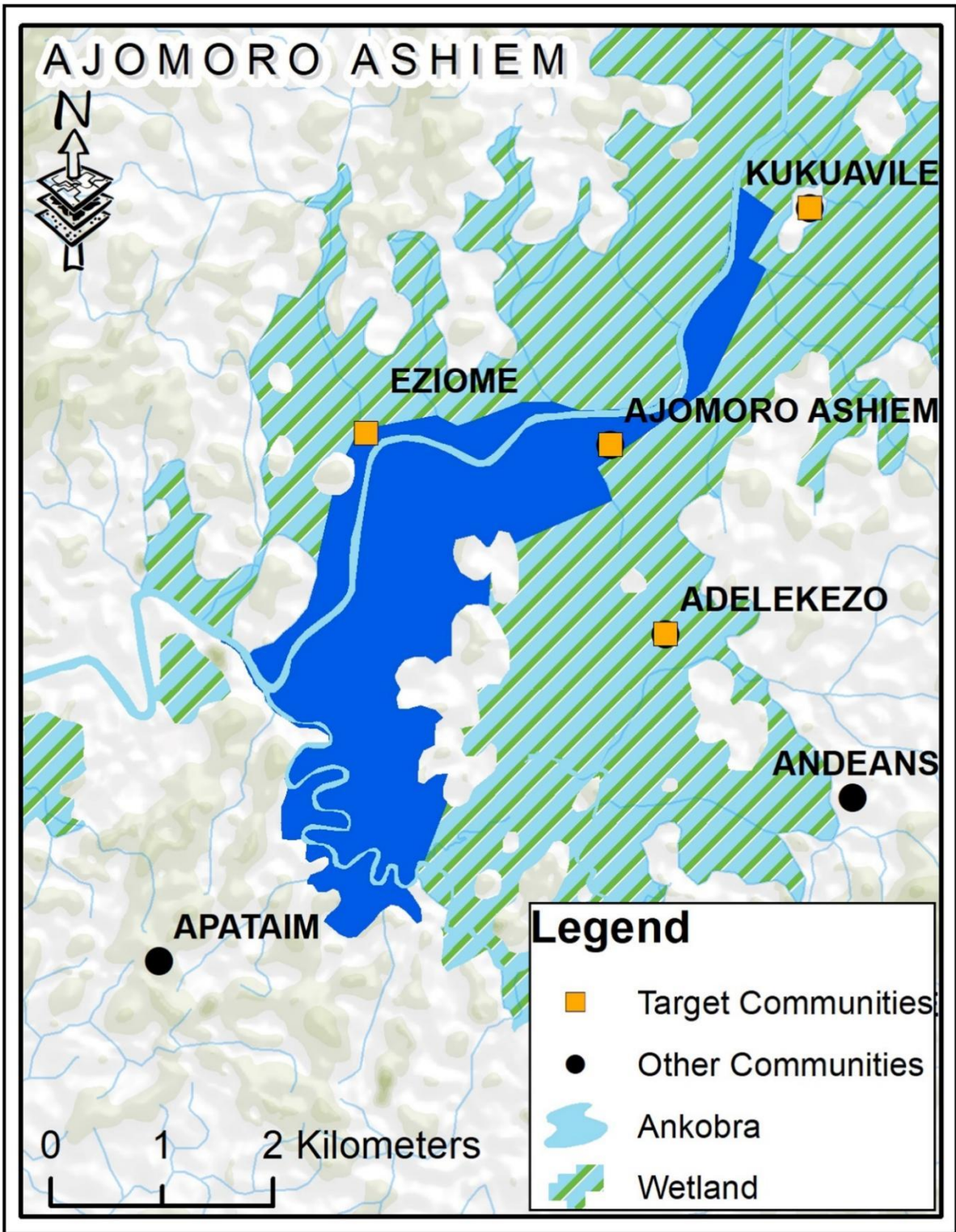
## ANNEX 4: FISHING AREAS OF COMMUNITIES IN THE ANKOBRA ESTUARY



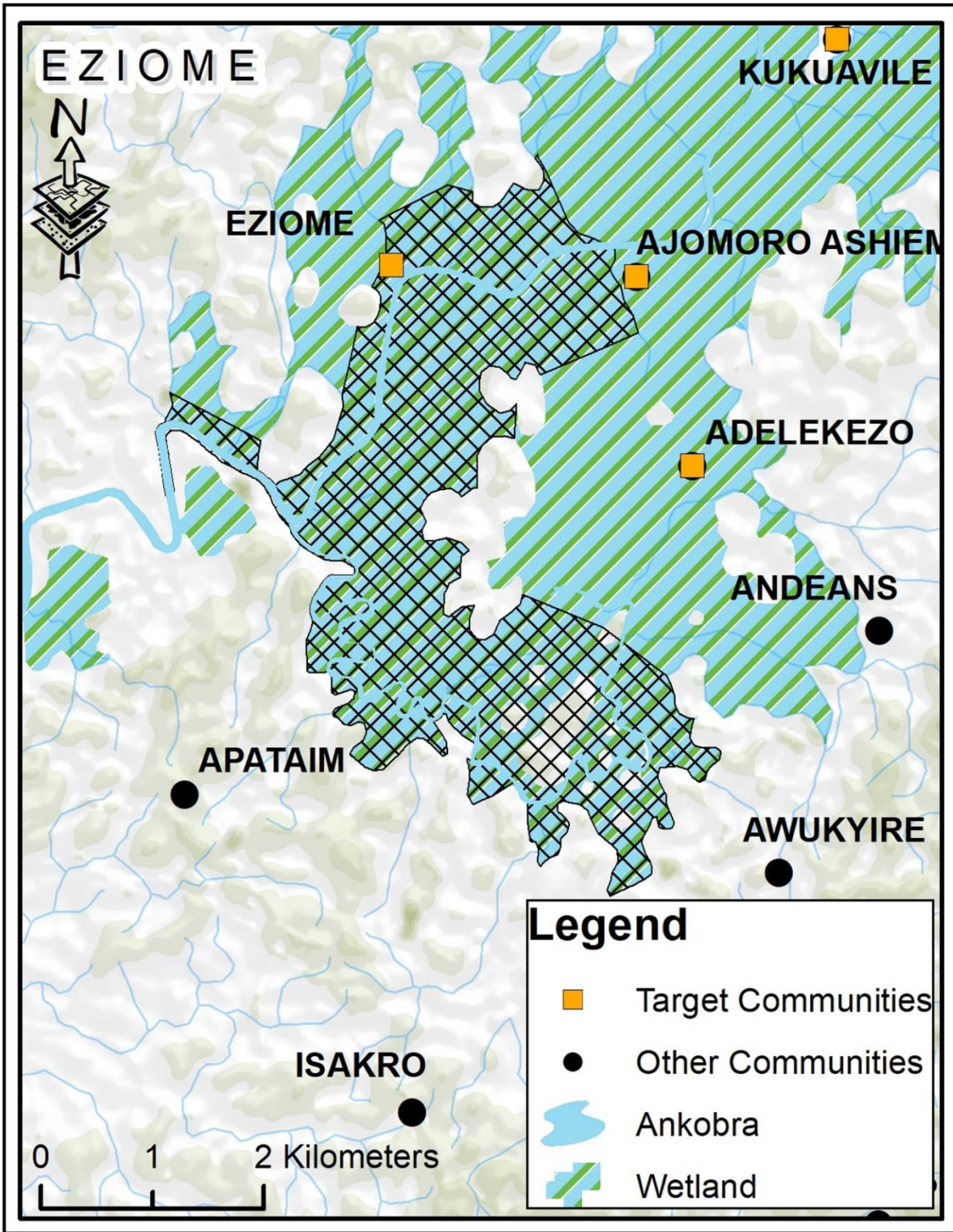
**Figure 24: Fishing areas of communities in the Ankobra Estuary**



**Figure 25: Fishing areas of Adelekazo community**



**Figure 26: Fishing areas of Ajomoro community**



**Figure 27: Fishing areas of Eziome community**

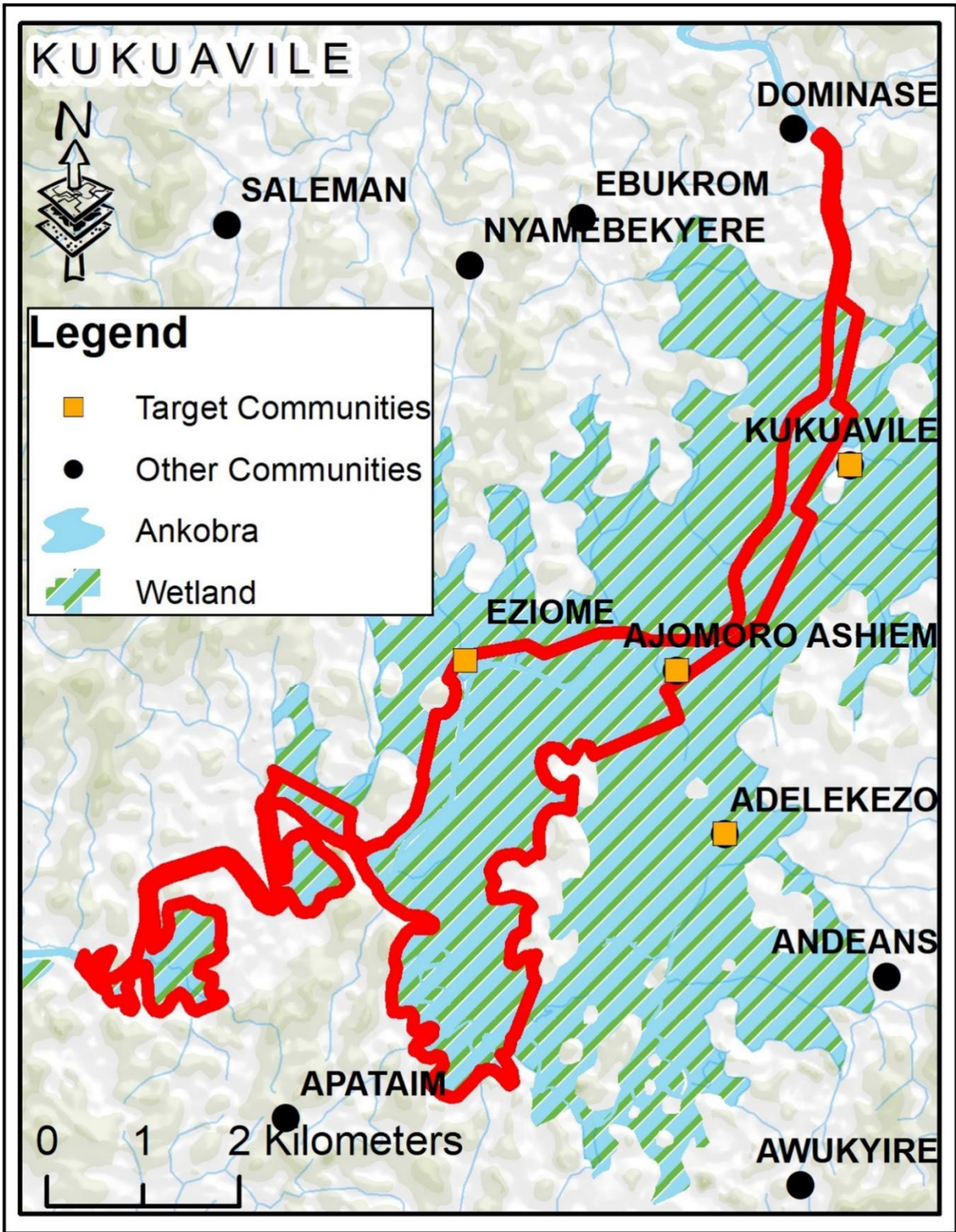
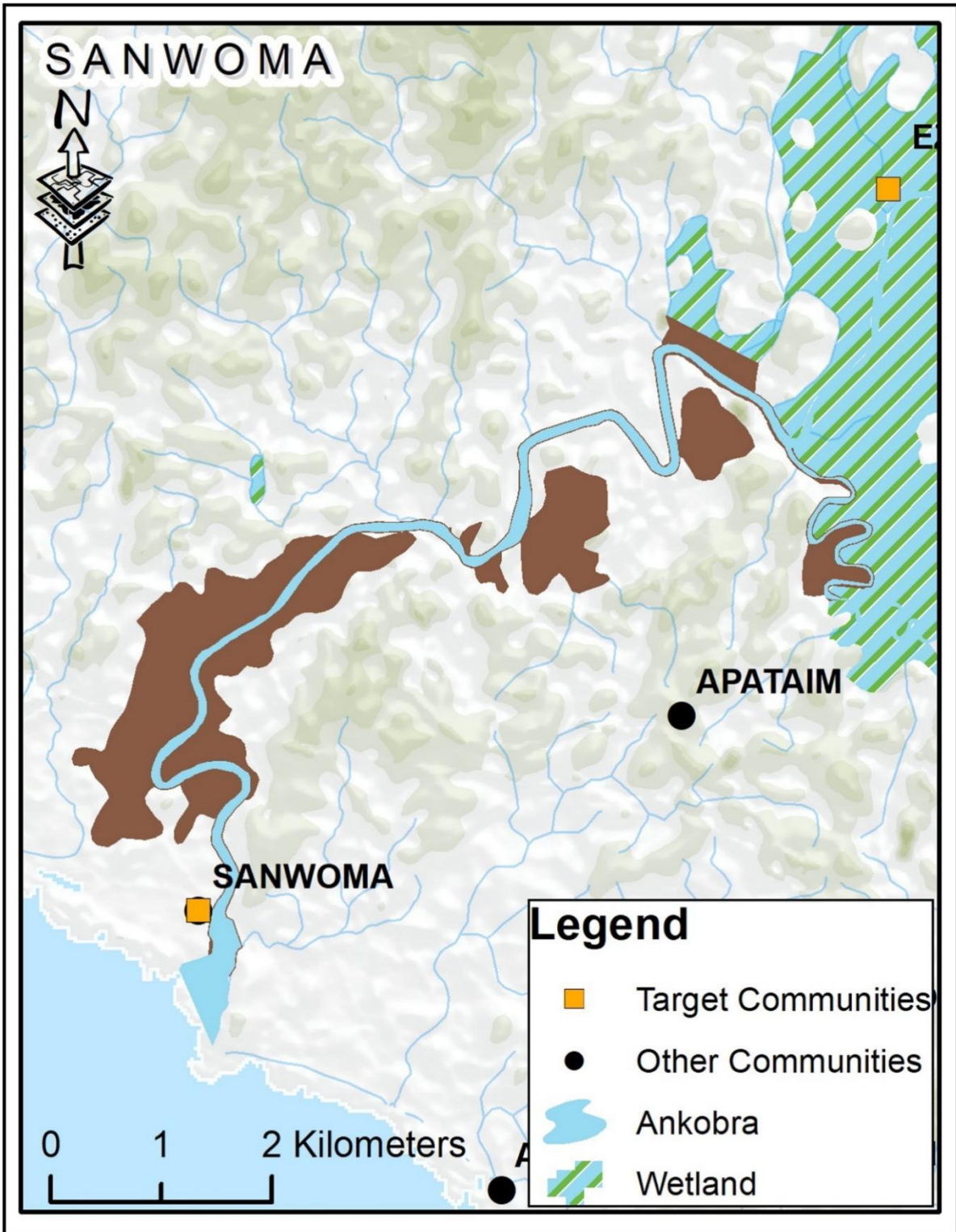


Figure 28: Fishing areas of Kukuavile community





**Figure 29: Fishing areas of Sanwoma Community**

## ANNEX 5: IMPLEMENTATION PLAN (2021-2024)

Measures	Specific Actions	Responsible Institution	Timeline
1. Outreach events / promotion of good practices	1.1 Design and produce posters on good estuarine fishing practices (mesh sizes of 3 inches and above; no pumping of water during fishing; no chemicals, closed seasons etc)	Lead: <b>Hen Mpoano</b> Ankobra Community-Based Fisheries Management Association members, EPA, WRC	2021 – 2022
	1.2 Organize annual durbars to involve traditional authorities in promoting good estuarine fishing practices	Lead: <b>Ankobra Community-Based Fisheries Management Association members</b> Traditional authorities, media, Hen Mpoano	2021 – 2024
	1.3 Periodic briefings with traditional authorities on status of implementation of measures and discuss challenges	Lead: <b>Ankobra Community-Based Fisheries Management Association members</b> with Hen Mpoano, Fisheries Commission, District Assemblies and Media	2021 – 2024
	1.4 Periodic advocacy meetings with duty bearers to discuss the impact of upstream artisanal mining on fisheries, livelihoods and the estuarine and marine environment.	Lead: <b>Ankobra Community-Based Fisheries Management Association members</b> with Hen Mpoano, EPA and WRC and media	2021 – 2024
2. Closed seasons for breeding grounds	2.1 Each community will implement closed seasons in major tributaries during different periods of the year as follows; 2.1.1 <b>Adelekazo - Ehem Solo</b> will be closed to fishing for <b>one month</b> in every quarter of the	Lead: <b>Community Chiefs and their taskforce made up of traditional council of elders from the chief's palace</b>	2021 – 2024

Measures	Specific Actions	Responsible Institution	Timeline
	<p>year. Areas locally identified as breeding grounds on <i>Ehema Solo</i> will be subject to all <b>year-round closure</b> in conformity with traditional norms.</p> <p>2.1.2 <b>Eziom- Eyehu</b> will be closed to fishing between <b>Jan –February</b></p> <p>2.1.3 <b>Eshiem – Mamawure</b> will be closed to fishing between <b>Jan–March</b></p> <p>2.1.4 <b>Kukuaveli - Fenvi</b> will be closed to fishing between <b>Jan - March</b></p> <p>2.1.5 <b>Sanwoma - Ebunli Ekye</b> will be closed to fishing between <b>May – July.</b></p>	Ankobra Community-Based Fisheries Management Association members; fishermen; FC	
3. Mangrove and bamboo conservation	3.1 Mangrove and bamboo harvesting and farming activities are prohibited within 30m buffer along the river	Lead: <b>Ankobra Community Conservation Committee</b> ; Ankobra Community-Based Fisheries Management Association, Wildlife Division, Hen Mpoano	2021 – 2024
	3.2 Explore bamboo replanting by replicating mangrove nursery	Lead: <b>Ankobra Community-Based Fisheries Management Association</b> Hen Mpoano, Wildlife Division, Coastal Sustainable Landscape Project and other NGOs	2021 – 2024
	3.3 Expand mangrove restoration to degraded sites upriver and include <i>saba</i> and palm tree	Lead: <b>Ankobra Community Conservation Committee</b> Ankobra Community-Based Fisheries Management Association, Wildlife Division, NGOs	2021 – 2024
	3.4 Regulate mangrove harvesting by establishing harvesting quotas	Lead: <b>Community Chief and Ankobra Community Conservation Committee</b>	2021 – 2024

Measures	Specific Actions	Responsible Institution	Timeline
		Community-Based Fisheries Management Association, Wildlife Division, NGOs, Nzema East Municipal Assembly and Ellembelle District Assembly	
4. Harvesting of catfish, tilapia and cassava croaker	4.1 mesh sizes of 3 inches and above will be used for fish harvesting	Lead: <b>Community chiefs</b> Fishermen; Ankobra Community-Based Fisheries Management Association members, FC	2021 – 2024
	4.2 Landings of cassava croaker will be subject to minimum size (18 cm) restrictions in conformity with Fisheries Regulations (L.I. 1968). No harvesting of small sizes of fish is permitted	Lead: <b>Ankobra Community-Based Fisheries Management Association members</b> Fishermen; FC	2021 – 2024
5. Research	5.1 Life cycle of Bagrid catfish and Nile tilapia	Lead: <b>University of Cape Coast</b> FC	2021 – 2024
	5.2 Growth assessment of Bagrid catfish and Nile tilapia	Lead: <b>University of Cape Coast</b> FC	2021 – 2024
6. Improve processing of priority estuarine fish species	6.1 Explore fish processing using Ahotor ovens	Lead: <b>National Fish Processors and Traders Association</b> , Hen Mpoano, other NGOs	2021 – 2024

**ANNEX 6: LIST OF THE ANKOBRA COMMUNITY-BASED  
MANAGEMENT OFFICERS AS OF FEBRUARY 2018**

District	Community	Name of member	Occupation	Gender	Position
Nzema East Municipal Assembly	Adelekezo	John K B Asiedu	Headmaster/ Fisherman	Male	Chairman
		Margaret Kwofie	Fish processor/ Farmer	Female	Treasurer
	Ajomoro Eshiem	Francis Ackah	Fishermen	Male	
		Dorothy Ackah	Fish processor	Female	
Ellembelle District Assembly	Eziome	Kojo Gyan	Fisherman/ Farmer	Male	Secretary/ Organizer
		Georgina Polley	Fish processor/ Farmer	Female	
Nzema East Municipal Assembly	Kukuavile	Lawrence Amuzuah Yesu	Farmer /motorbike transport operator	Male	
		Regina Amuzuah	Fish processor/ Petty trader	Female	
Ellembelle District Assembly	Sanwoma	Isaac Asare	Fishermen/ Farmer	Male	Vice- Chairman
		Rose Blay	Fish processor	Female	

# **ANNEX 7: CONSTITUTION OF THE ANKOBRA COMMUNITY-BASED FISHERIES MANAGEMENT ASSOCIATION**

## **1. ESTABLISHMENT**

The is hereby established an Association to be known as the ANKOBRA COMMUNITY-BASED FISHERIES MANAGEMENT ASSOCIATION.

## **2. NAME OF TRUST**

The Association shall be known as the ANKOBRA COMMUNITY -BASED FISHERIES MANAGEMENT ASSOCIATION (hereinafter in this constitution called 'the Association').

## **3. ADDRESS FOR SERVICE**

The address for service (for the Association) will be:

Ankobra Community-Based Fisheries Management Association.

Ankobra, Ellembelle District.

## **4. LOCATION**

The area of the Ankobra Community-Based Fisheries Management Association comprises five (5) communities along the Ankobra river listed in Appendix 1.

## **5. OBJECTIVES**

The objectives of the Association are:

- a) To conserve and manage in a sustainable manner in collaboration with the Traditional Authorities, the Government of Ghana, and other stakeholders, the fisheries resources of the Ankobra river and its tributaries on behalf of the citizens of all communities along the banks of the river, the Ellembelle and Nzema East District and Ghana as a whole.
- b) The fisheries of the river Ankobra shall be specifically managed for the conservation and maximum sustainable and economic of – Cassava fish, bagrid catfish and the Nile tilapia.
- c) To educate the people of the area and its catchment, on the conservation and management of the fisheries resources.

## **6. MEMBERSHIP**

To become a member a person is required to satisfy the following conditions:

- a) Subscribe to the objectives of the Association .
- b) Should be engaged in any aspect of the fishing industry associated with the Ankobra catchment area.
- c) Must be 18 years and above.
- d) Must comply with all bye-laws.

## 7. RIGHTS OF MEMBERS

- a) To sustainably utilize the fish resources of the Ankobra river.
- b) To elect executive officers of the Association to represent members.
- c) Right to attend and vote at the Annual General meeting or any Special General meeting.

## 8. OFFICERS

The following shall be officers of the Association .

- a) Chairperson and Vice-Chair Person.
- b) Secretary/ Organiser.
- c) Treasurer.

These officers shall constitute the management board of the Association and shall serve for a term off three years after which elections shall be organized.

## 9. ELECTION OFF OFFICERS

A person shall not qualify to be elected unless he/she

- a) Is a member of the Association .
- b) Has the support of two (2) registered members for nomination .

### 9.1. Procedure for elections

- a) The registered members of the Association shall elect the officers under the supervision of the District Fisheries Zonal Officer.
- b) A vacancy created in any office shall be filled by an election by the members of the Association

### 9.2. Expulsion from Association

- a) Any member may be expelled from the Association by a majority vote of the members at the Annual meeting.

- b) Any member who fails to attend four (4) successive meetings of the Association. It is the Chairperson's duty to warn the members accordingly after two successive absences.
- c) Any members who is convicted of a criminal offence or for non-compliance with the rules of the fishery management plan or failure to pay penalties imposed for violations.
- d) The Association may refer disciplinary problems to Traditional Authority.

## 10. DUTIES OF ELECTED OFFICIALS

10.1 The duties of the Chairperson are to:

- a) Chair meetings of the Association.
- b) Represent the Association at functions/meetings that it has been invited to.
- c) Act as spokesperson for the Association when necessary.

10.2 The duties of the Secretary are to:

- a) Take and keep minutes of meetings.
- b) Prepare the agenda for meetings of the Association in consultation with the Chairperson.
- c) Maintain the membership list.
- d) Deal with correspondence.
- e) Collect and circulate any relevant information within the Association.

10.3 The duties of the Treasurer are to:

- a) Supervise the financial affairs of the Association.
- b) Keep proper accounts that show all monies collected and paid out by the Association.

10.4 Duties of persons in vice positions

- a) All officers in vice positions are to act in the absence of the substantive officers.

## 11. PROCEEDINGS OF THE ASSOCIATION

- a) Association should meet at least once every month, on the first of the month. Meetings of the Association should also be convened at the request of at least 5 members of the Association.



- b) It is the duty of the Chairman to convene meetings, whether regular or special Association meetings. Members of the Association should be given at least 7 days' notice of the proposed meeting.
- c) The presence of half of registered Association members at a meeting shall constitute a quorum.
- d) Minutes of all meetings must be maintained by the Secretary and countersigned by the Chairperson.

## 12. DUTIES/FUNCTIONS OF THE ASSOCIATION

- a) The Association provides a forum for dialogue and debate within the fishing community, for identification of problems, formulation of solutions.
- b) The Association acts as a two-way channel of communication between the fishing community and the Fisheries Commission and other government and traditional authorities.
- c) The Association is committed to collaborating with the Fisheries Commission in the collection of data on the fishery for monitoring and better management.

## 13. COMMON SEAL

The Association shall have a common seal, which shall consist of an embossed stamp with the words "ANKOBRA COMMUNITY-BASED FISHERIES MANAGEMENT ASSOCIATION".

The common seal shall be kept in the custody of the Chairperson of the Association and shall not be affixed to any instrument except by authority of a majority of the members of the Association, and in the presence of such majority.

## 14. AMENDMENT OF THE CONSTITUTION

- a) This Constitution may be amended in whole or in part provided that any proposal for amendment is supported by a two-thirds (66%) majority vote in a General Meeting of the Association.
- b) No amendment of this Constitution shall have any binding effect unless and until notice of the same is sent to the Municipal and/or District Assembly, including a confirmed set of minutes of the meeting at which the resolution was made, and duly registered by him.

## 15. DISSOLUTION OF THE ASSOCIATION

- a) The Association may be dissolved if it becomes apparent that good and sufficient reasons exist for the dissolution thereof.

b) Should 5 members move a motion that the Association be dissolved, the Association shall call a Special General Meeting (SGM) at which it will lay before the members at such meeting the reasons for the proposed dissolution, and in the event that a two-thirds (66%) majority vote of the members present and voting approve such dissolution, the Association shall be dissolved.

c) Any funds or assets standing to the credit of the Association after dissolution thereof shall be paid and distributed as follows:

i. For payment of all outstanding debts or liabilities of the Association, and costs and expenses incurred in the dissolution thereof

ii. Any balance remaining thereafter shall be disposed in accordance with the decision of the majority of members present and voting at an AGM or SGM, whichever applies.

#### 16. LANGUAGE

The formal document of this Constitution shall be in the English language but copies of a Nzema version shall be produced for accessibility by members, provided that the English version shall take precedence over the vernacular version in case of disparities between them.

#### 17. EFFECTIVE DATE

This Constitution shall enter into force upon the registration thereof by the Municipal and/or District Assembly and forthwith the Association shall come into operation

#### 18. LAW APPLICABLE

The performance of Association and interpretation of its terms shall be governed by the Laws of Ghana

Signed by .....on ..... day of .....20.....

CHAIRMAN OF ANKOBRA COMMUNITY-BASED FISHERIES MANAGEMENT ASSOCIATION

#### APPENDIX 1

Communities forming the Ankobra Community-Based Fisheries Management Association

1. Ankobra.
2. Adelekazo.
3. Ajomoro Eshiem.
4. Eziome.
5. Kukuavile.

## ANNEX 8: MONITORING AND EVALUATION PLAN FOR THE ANKOBRA COMMUNITY-BASED FISHERIES MANAGEMENT

Objective	Indicators	Baseline	Annual Target	Means of Verification	Frequency	Organization/ Person Responsible
<b>Biological</b>						
Harvest large sized fish using large mesh sized nets.	The length of fish	n/a	Cassava croaker: 8cm Bagrid catfish: 14cm Tilapia: 10cm	Field records	Monthly	CBFM Association
	Size of mesh used in fish harvesting	n/a	≥ 3	Field records	Monthly	CBFM Association
<b>Ecological</b>						
Maintain biological diversity through protection of estuarine fish habitats and nursery grounds.	Number of closed seasons implemented each year per community	3	1	Report Photos	Annual	Hen Mpoano
Protect estuarine fish habitats and nursery grounds through protection, restoration and sustainable harvesting of mangrove wood and bamboo.	Avoided removal of vegetation within 30 meters buffer along river	0 Starting 2021	18,000 hectares	Maps	Semi-annual	Hen Mpoano
<b>Socio-cultural</b>						

Objective	Indicators	Baseline	Annual Target	Means of Verification	Frequency	Organization/ Person Responsible
Re-instate traditional norms and practices for managing Ankobra estuarine fisheries and mangrove ecosystem; intensify estuarine management practices.	Number of annual durbars organized with traditional authorities	3	1	Photos	Annual	CBFM Association
	Number of traditional norms and practices re-instated	n/a	1	Official ceremony	Bi-annual	CBFM Association
<b>Economic</b>						
Enhanced commercial value of estuarine fish; resilient livelihoods, improved food security and economic base of fisheries-dependent households.	Availability of updated database of registered members of the association.	n/a	1	List of association members	Quarterly	CBFM Association
	Average market price of fish	GHC 20 /unit of sale	GHC 30/unit of sale	Field records	Annual	CBFM Association
<b>Governance</b>						
Compliance	Number of patrols of management area	24 Starting 2021	12	Field records	Monthly	CBFM association

Objective	Indicators	Baseline	Annual Target	Means of Verification	Frequency	Organization/ Person Responsible
	Number of times sanctions are applied	5 Starting 2021	5	Field records	Quarterly	CBFM Association
Operations of the Ankobra Community-Based Fisheries Management Association	Number of times association members met	12	4	Attendance sheets and minutes of meetings	Quarterly	CBFM association

ANKOBRA ESTUARY COMMUNITY  
BASED FISHERIES MANAGEMENT PLAN  
**DECEMBER 2020**

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