



## **ENHANCING RESILIENCE OF VULNERABLE COASTAL AREAS & COMMUNITIES TO CLIMATE CHANGE PROJECT**

### **ENHANCING THE INCOME GENERATION POTENTIAL AND ENVIRONMENTAL SUSTAINABILITY OF FISHERIES ACTIVITIES IN BAO BOLONG AND TANBI WETLANDS**



September 2014

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**DISCLAIMER:**

The findings, conclusions and interpretations expressed in this document are those of Sahel Invest Management International, the Consulting firm, and should in no way be taken to reflect the policies or opinions of the national Environment Agency, UND-CO of the Global Environment Facility.

## Table of Contents

### Contents

<u>Acknowledgements</u> .....	3
<u>DISCLAIMER:</u> .....	4
<u>Acronyms and Abbreviations</u> .....	6
<u>1.0</u> .....	<u>PART I: INTRODUCTION AND BACKGROUND</u>
.....	7
<u>1.1 Context of the Report</u> .....	7
<u>1.2 Gambia's Wetland Areas</u> .....	7
<u>1.3 Importance of Wetlands to Fisheries</u> .....	7
<u>1.4 Approach and Methodology</u> .....	8
<u>1.5 The Policy Environment</u> .....	8
<u>1.6 Constraints and Challenges in the Management of Wetland Fisheries</u> .....	10
<u>PART 2: MAIN STUDY FINDINGS</u> .....	12
<u>2.1</u> .....	<u>Bao bolong Wetland Reserve</u>
.....	12
<u>2.1.1 Description and location (include data, maps, etc.)</u> .....	12
<u>2.1.2 Current Situational Analysis</u> .....	15
<u>2.1.3 Major Problems Identified in the BWR</u> .....	13
<u>2.1.4 Major Environmental and Social Issues of Current Fishing Activities</u> .....	15
<u>2.1.5 Improving Current Fishing Conditions for Socioeconomic and Environmental Gains</u> ..	22
<u>2.1.6 Major Issues Affecting the Exploitation of the Full Potential of BWR</u> .....	23
<u>2.2 Tanbi Wetland National Park</u> .....	25
<u>2.2.1 Description and Location</u> .....	25
<u>2.2.2 Current Situational Analysis</u> .....	26
<u>2.2.3 Current Fishing Activities in the TWNP</u> .....	29
<u>2.2.4 Major Problems Identified in the Fin and Shell Fish Fisheries</u> .....	36
<u>2.2.5 Major Environmental and Social Issues of Current Fishing Activities</u> .....	38
<u>2.2.6 Improving Current Fishing Conditions for Socio-economic and Environmental Gains</u> ..	39
<u>2.2.7 Major Issues Affecting the Exploitation of the Full Potential of Tanbi Wetland National Park</u> .....	40
<u>Part 3:</u> .....	<u>CONCLUSIONS AND RECOMMENDATIONS</u>
.....	42
ANNEX 1 Proposed Support For The Fishermen's Associations In Bao Bolong Wetland Reserve	
ANNEX 2: Proposed Projects For Implementation At Tanbi Wetland National Park .....	70
ANNEX 3: One Year Implementation Program	
Annex 4: Long Term Self-Financing Plan for The Trials Focused on the Fisher Folks in Bao Bolong Wetland Reserve and Tanbi Wetland National Park .....	100

<u>ANNEX 5: Persons Met</u> .....	103
<u>References and Bibliography</u> .....	105

## Acronyms and Abbreviations

ANR	Agriculture and Natural Resources
BA NAFAA	USAID Funded Gambia and Senegal Sustainable Fisheries Project
BWR	Bao bolong Wetland Reserve
CBD	Convention on Biological Diversity
CITES	Convention of Trade in Endangered Species
DOF	Department of Fisheries
DPWM	Department of Parks and Wildlife of Parks and Wildlife Management
EU	European Union
FGD	Focus Group Discussions
GEAP	Gambia Environment Action Plan
GEF	Global Environment Fund
ICAM	Integrated Coastal Management
IDRC	Canadian International Development and Research Cooperation
LRR	Lower River Region
MOU	Memorandum of Understanding
NBSAP	National Biodiversity Strategy Action Pan
NEA	National Environment Agency
NEMA	National Environment Management Act
PAGE	Program for Accelerated Growth and Employment
PRCM	Regional Coastal and Marine Conservation Program
SIMI	Sahel Invest Management International
TWNP	Tanbi Wetland National Park
UNDP	United Nation Development Program
USAID	United States Agency for International Development

## **1.0 PART I: INTRODUCTION AND BACKGROUND**

### **1.1 Context of the Report**

This Study Report has been prepared for the NEA/UNDP within the context of the GEF funded *Enhancing Resilience of Vulnerable Coastal Areas and Communities to Climate Change Project*, which essentially aims to support coastal and wetland communities to develop coping strategies, and to build their resilience to address climate induced changes within their environment. Specifically, the Report will develop approaches to organize and support the trial of fisheries activities, and monitor the trialing over a year's period in selected wetland communities within the coastal zone of the Gambia.

The definition of "coastal areas" in Gambia consists of not only those areas that border the Atlantic Ocean, but also those with brackish water environments that border the River Gambia, extending as far as Bamba Tenda in the Lower River Region (LRR) (according to the national adopted definition of Gambia's coastal zone, 1997).

For "Wetlands", Article 1 of the Wetland (Ramsar) Convention defines wetlands as *"areas of marsh, fen, peatland or water, whether natural or artificial, permanent or temporary, with water that is static or flowing, fresh, brackish or salt, including areas of marine water the depth of which at low tide does not exceed six metres"*.

### **1.2 Gambia's Wetland Areas**

Given this broad definition of wetlands, the Gambia has abundant wetland type environments in numerous parts of the country, (some are found within the boundaries of national parks and reserves such as the Nuimi National Park, Tanji Bird Reserve, and Kiang West National Park).

The wetlands of the country cover almost 20 per cent of the total land area. This includes 6.4 per cent of mangrove forest, 7.8 per cent of uncultivated swamps and 3.2 per cent of cultivated swamps. They are increasingly being used for rice cultivation and for dry season vegetable gardening as well as grazing for livestock.

Two of the most important wetlands, especially in relation to fish and fish production are the Bao bolong Wetland Reserve (BWR) and Tanbi Wetland National Park (TWNP) both declared Ramsar Sites in 1997 and 2000 respectively, and consequently are the focus of this study.

### **1.3 Importance of Wetlands to Fisheries**

Wetlands are vital to fish populations because fish depend on certain wetland processes; they serve as a food base, shelter, spawning and nursery areas, and for water filtration. They contain large volumes of food that attract many animal species. Plants and other organic matter provide food for small aquatic insects, fish, and shellfish. In turn, the smaller insects and fish become food for larger predatory fish, reptiles, amphibians, birds, and mammals. Wetlands not only provide food for aquatic and non-aquatic animal and fish species, they also provide vegetated areas where fish can reproduce, hide from predators, and take refuge from inclement weather or other changes in the physical environment. Wetlands also filter out sediments and pollutants, providing the clean water that fish need. Thus, a network of abundant and healthy wetlands is vital to the survival of most fish species.

In certain parts of the TWNP increased development and continued conversion of the area is degrading or destroying the area. As a result, it becomes more difficult for fish to find the habitats they need, and this loss and declining fish populations affect not only natural ecosystem functions but commercial fishing, which accounts for several million dalasi per year to the Gambian economy.

In addition, fish eggs and young fish have different needs than adult fish, which is why many adult fish live in other habitats and then lay eggs in wetlands. Defenseless and immobile eggs can be hidden from predators among wetland edges and underwater grasses. Wetland plants, dead plant material, and detritus provide a surface for fish to attach their eggs. When the eggs hatch, the vegetation becomes both a protective cover and a food source.

Adult and juvenile fish alike use wetlands to hide from predators. Thick plant growth can visually confuse predators and camouflage small fish. Dense vegetation and shallow water prevent many predators from entering coastal marshes and other wetlands. The root systems of trees and shrubs in floodplain wetlands allow stream banks to hang over the water, providing protective habitat for certain species of fish.

It is in view of these functions, values and attributes of wetland areas that the Government of the Gambia signed and adopted the Convention on Wetlands of International Importance Especially as Water Fowl Habitat (Ramsar) in 1997, to maintain their ecological processes to continue functioning.

#### **1.4 Approach and Methodology**

To carry out the study the approach involved both desk reviews of available and relevant literature, and extensive field visits to sites within the two wetland areas. Specifically, the team consulted with (among others), government Ministries and Departments, and of course the various stakeholders who are the potential beneficiaries of the study recommendations.

During the field visits, survey instruments were administered to the various fishing communities and where necessary, Focus Group Discussions (FGD) were held, in addition to key informant discussions and observations to acquire information.

#### **1.5 The Policy Environment**

##### **a. National Policies**

Following the adoption of the Vision 2020, a series of major sector policies and strategies were developed, designed to have direct and indirect impact on the performance of the national economy. Key among these policies (with direct bearing on this study) include the Gambia Environment Action Plan (GEAP), the Agriculture and Natural Resources (ANR) policy, the National Biodiversity Strategy and Action Plan (NBSAP), the Fisheries Policy, and the Forestry Policy all of which feed into the Program for Accelerated Growth and Employment (PAGE).

These policies have the overall objective of improving and sustaining measurable levels of food and nutrition security, and the effective management of the environment and the natural resource base. Of particular significance is the natural linkage between the NBASP and the Fisheries Policy; they converge within the sphere of protected area management and sustainable utilization of fish and fishery resources within protect areas such as the TWNP and BWR. Consequently, this has created the basis for an MoU between these two Departments to



collaborate closely in the implementation of the Convention on Biological Diversity (CBD) both within and outside protected areas particularly when it involves management of fish resources.

It is therefore in view of this that whereas this study will look at the fish and fishery resources within the two wetland areas, the implementation of the study recommendations should be a joint effort between these two government institutions. The simple reason is that even though the TWNP and BWR are directly within the purview of Department of Parks and Wildlife Management (DPWM), the management of the country's fish and fishery resources (including those in the two wetland areas) fall within the sphere of the Department of Fisheries (DOF).

#### **b. International Conventions and Treaties**

The Gambia is signatory to various regional and international agreements and processes which are related to, or affect biodiversity. In addition to the CBD, others include the Ramsar Convention and the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

Regional agreements and processes to which the country is signatory include the Convention for the Cooperation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region (Abidjan Convention), and the PRCM<sup>1</sup> process under both of which the country received assistance to build its capacity in protected area management. Within the context of the PRCM support was provided through the Integrated Coastal and Marine (ICAM) II Project which has contributed to the building of capacities of stakeholders within the two wetland areas under this study.

#### **c. Legislation (Laws and Regulations)**

The above-mentioned policy measures are supported by various biodiversity-related sector laws; for example, the National Environment Management Act, (NEMA) 1994 ensures the integration of environmental considerations in all development strategies and related activities; the Fisheries Act, 2007 and its attendant Regulations (2008) have provisions covering efficient management of national fish resources, as well as the development of aquaculture; the Biodiversity and Wildlife Act, 2000 under the purview of the DPWM is to enhance the implementation of the NBSAP.

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<sup>1</sup>The PRCM is French acronym for Regional Coastal and Marine Conservation Program. It is a sub-regional process aimed at sustainable management of marine and coastal areas in West Africa. The process involves the Gambia, Senegal, Mauritania, Guinea Bissau, Republic of Guinea, and Sierra Leone whose Ministries of Environment and Fisheries signed an MOU for cooperation with four international NGOs based in Dakar, Senegal (IUCN-International Union for the Conservation of Nature, FIBA- Fondation International de Banc d'Arguin, World Wildlife Fund (WWF), and Wetlands International) all of whose operational mandate involves sustainable management of coastal resources.

The comparative strength of these NGOs is used to assist the member countries to implement an agreed sub regional work program, and in the process build the capacity of national experts in protected area management including Marine Protected Areas.

## **1.6 Constraints and Challenges in the Management of Wetland Fisheries**

### **a) Poverty**

This is one of the biggest indirect threats to wetland biodiversity and protected area management in the country because the majority of the population depends entirely on natural resources for their basic requirements which are often exploited irrationally. Such high demands, coupled with unsustainable harvesting practices have placed undue pressure on the natural resource base.

### **b) Unsustainable Resource Utilization**

The loss and fragmentation of the natural habitat due to deforestation, wetland drainage and unregulated infrastructural development, overgrazing, and bush fires are major threats to wetland areas. About 80 percent of the standing bio-mass is usually consumed by bush fires every year. In addition to destruction of the vegetation, bush fires have led to death of several wild animal species resulting in impoverishment of the habitat in terms of species composition and density.

### **c) Low and Weak Human Resource**

Another important challenge that DOF and DPWM are confronted with is the weak capacity of staff; staff has limited scientific and technical knowledge and skills necessary to formulate and implement sound and comprehensive management of wetland areas. Important skills for using participatory methods and processes to develop dialogue and partnerships with diverse stakeholders are also lacking. Because these partnerships are crucial for effective implementation of conservation policies and actions, the support of the local stakeholders is necessary for the success of policy implementation

It will be noted that whilst the DPWM has developed a well-defined program of work for implementation within the TWNP and the BWR, the DOF does not seem to have any form of coordinated strategy or activity plan in relation to fisheries management to be implemented within these two wetland areas. This is in spite of the fact that the current fisheries policy and strategy have made the pronouncement (although in broad terms only) concerning the management of fish and fishery resources nationally, which will clearly include wetland fisheries management.

Whilst the DPWM has deployed personnel to the TWNP and the BWR, the DOF has no presence in either of the wetland areas; DOF therefore cannot enforce existing laws for the sustainable utilization of the fisheries resources in these two sites.

### **d) Limited Financial Resources**

Perhaps the single most important constraint that the DOF and DPWM face is the very little budget that they operate with to implement their work programs. This translates into few qualified and experienced staff on the ground, and few resources to implement conservation management activities. At present the annual budget provided by the government for these two institutions, barely covers their recurrent costs. Thus, while the salaries and wages of departmental staff are supported, there are only little resources with which to implement departmental work programs

**e) Lack of Public/Private Sector/Community Partnership**

Conservation of natural resources in the wetlands is a fundamental responsibility of the state, and consequently, the traditional reliance on support from the government. Even though relatively low, the cost of conservation represents a significant amount for the government (there are other priority sectors such as health, education, etc.). The Government has realized that other partners need to be involved.

In this regard it would seem that the concept of public/private partnership is becoming a reality following the government's recent change in policy to allow private sector participation in nature conservation with the case of concession at the River Gambia National Park, and the newly created partnership between the private sector and government at the Tanji Bird Reserve. This should be further encouraged

With regards to community involvement, it is generally inadequate in conservation and management of wetlands, especially at the decision-making level. With deepening poverty, (the Gambia Integrated Household Survey (2003) revealed that 70 per cent of rural households are poor), and failure of agricultural production systems), involving communities in the sustainable utilization of the wetland areas can provide an opportunity to arrest illegal exploitation of the resources. Therefore, there is need for the involvement of peripheral communities to these areas for their empowerment.

## PART 2: MAIN STUDY FINDINGS

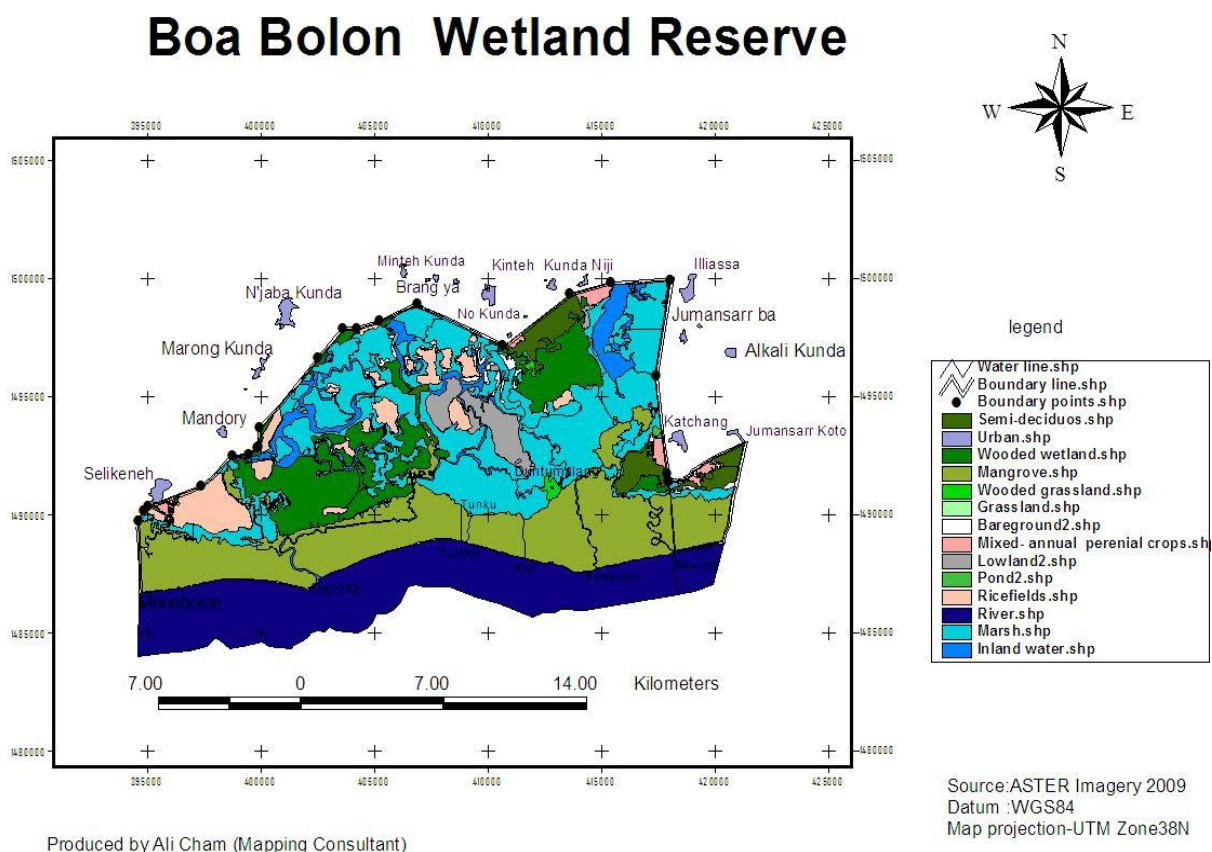
### 2.1 Bao bolong Wetland Reserve

#### 2.1.1 Description and location (include data, maps, etc.)

The Bao bolong Wetland Reserve (BWR) (Figure 1) is located on the north bank of the River Gambia, approximately 100 km from the river mouth. The Reserve takes its name from the Bao bolong tributary. This tributary is one of six that have branched off from the main river system to form a mosaic of smaller tributaries which have become major areas of economic activity for the populations that live around the Reserve. The other tributaries are the Moribolong, Kissi bolong, Manioka bolong, Kuyerr bolong, and Tunku bolong.

Declared a Ramsar Site in 2000, BWR is approximately 21,900 ha, and is fringed by 25 peripheral villages. Until a few years ago a further one that existed within the Reserve boundaries (Duntumalang) but has now been abandoned due to problems of accessibility and climate induced environmental destruction.

Figure 1:



The BWR is currently defined as the area encompassed by seasonal flooding and, administratively spans the two Districts of Central and Upper Badibbu.

The Reserve includes the dry forest south and east of Alhaji Bajonkoto, and the boundary runs north from the River Gambia to the east of Salikene, curves northeast towards Noo Kunda and

then southeast to Alhaji Bajonkoto where it runs due east to the Bao bolong River. From here it tracks north to the Senegalese border encompassing the floodplain of the river before running almost due south by Illiassa to Katchang and thus south east to Katchang Point.

### **2.1.3 Major Problems Identified in the BWR**

#### **i) Inappropriate Fishing Method**

The operators in BWR are mainly subsistence fishermen, many of who go to fish only when they are in need of some cash. Very often some would not go fishing in fact until they exhaust the money earned on a previous fishing trip, before they would set out again. Consequently, overfishing is not an issue at BWR. The major issue is employing inappropriate fishing methods, especially in the “kemedeto” fishery where the “kurutu jalo” is used.

Generally the use of most kinds of drag nets over the bottom has the potential to disturb and agitate the detritus, and in the process could destroy nests and fish eggs, and catch juvenile fish. This is particularly critical in view of the fact that the BWR is a breeding and nursery area for certain commercially important fish species, including migrating marine species.

#### **“Bolong Sorong”**

Another form of fishing in BWR (especially in Jammeh Kunda) is the “Bolong Sorong” (literally translated as “closing the Bolong”). This essentially means that a portion of the bolong is blocked with some form of weir after the high tide has brought in the fish into the bolong. When the water begins to recede the weir prevents the fish from returning to the river, and those that get stranded are collected by hand in pans and other receptacles. They catch species such as tilapia, “tambajang” and “koso”. Ostensibly juveniles could very well be prevented from reaching the river as well, in which case the method could be regarded as an inappropriate way of fishing.

#### **Illegal Fishing**

In the Sanjong bolong (the main tributary used by Jammeh Kunda to fish), itinerant fishermen from Banjul enter the bolong at night to fish. They set their nets in a manner that no other fisherman from the community can operate because the entire bolong is blocked off. This is illegal as fishing operations that involve obstructing other users is prohibited by law.

#### **ii) Restricted Water Flow**

The main Kerewan/Farafenni high way bisects the Bao bolong tributary creating two parts on the south and north of the road. The culverts that connected these two parts operated efficiently before the recent road works were carried out; the water flow from and to the wetland was uninterrupted and consequently both sides of the road were well watered; fish was plentiful, and fishermen’s catches were good especially during the rains. In addition during the rains (with fresh water available) the south side of the Bao bolong was an extensive rice paddy (dikes were built to control inflow of salt water when the rains stopped). There is no more rice farming here.

To create a typical scenario within the BWR to illustrate the importance of the culverts, it is as follows: at the height of the rains, or at high tided, when the main river would overflow its banks, the entire Bao bolong plains would be inundated, and fishes would move out into this and other tributaries to feed, spawn, or carry out some biological need and function for the survival of the species.

When the rains subside, or the tide drops, and the water starts to recede the fish would migrate back to the main river; some of the young and juveniles would migrate back, while others would

stay in the swamps to continue their development. To facilitate this movement of the fish the culverts were well placed and positioned to guide the water from either side of the road.

However, when the road was redone (5-6 years ago) some of the culverts were relocated, whilst the height of others was increased; the consequences of both actions have affected the water flow and exchange between the two parts of the bolong.

## 2.1.2 Current Situational Analysis

### i) Environment

BWR contains four main ecosystems, and has a rich mosaic of habitat types roughly following a zonation from the River Gambia which has high mangrove through permanent salt marsh, bare tannes, and seasonal freshwater marsh, grading into wooded grassland, all in close proximity at several locations.

The associated flora and fauna is extremely diverse. A significant component of the nation's wetland avifauna e.g. the White backed Night Heron, and Allen's Gallinule among others, utilize the Reserve. In addition a vast portion of Gambian marine and freshwater fish species depend on the mangrove ecosystem for successful reproduction.

According to the Ramsar Wetland Study 1997, the aquatic invertebrate fauna is composed predominantly of crustaceans and molluscs with very abundant species including the crabs, whelks and the mangrove oysters (*Grassostrea sp.*). A large number of the fish observed were in their early developmental stages, mostly as fry and juveniles, indicating that the waters of BWR are very important as a nursery area.

Regarding the oysters it is only in Salikene where heaps of old oyster shells were observed at the fish landing site during this study. The African clawless otter occurs within the bolongs, while other mammals such as hippopotamus, West African manatee, sitatunga antelope, and animals such as warthogs, hyena and jackals are common in the upstream areas.

There are three community types of mangroves within the Reserve, namely fringe forest, riverine forest, basin forest and scrub or dwarf forest. The riverine mangrove forest is found along the River Gambia and lining the numerous bolongs which feed into it, and is dominated by the red mangrove, *Rhizophora racemosa* up to 25m in height. Throughout the inland water bodies, isolated small trees and thickets of the white mangrove, *Avicennia africana* and *Laguncularia racemosa* occur along the edges often in association with salt tolerant species such as the bitter leaf *Vernonia colorata*.

### ii) Socio-economic

Fishing activities within the Reserve are primarily conducted at the subsistence level. Table 1 compares the total population of the peripheral communities and the fishermen population, and it indicates that less than 2 percent are engaged in fishing. However, fishing is an important activity in Salikene and Katchang. In Salikene most fishing is conducted in the Mori bolong, and sometimes on the River Gambia and the larger bolongs using set gill nets. Some line fishing is also conducted in the bolongs; traps are used particularly at the end of the rainy season; flooded areas have a sluice of stakes set at the outlet, which traps the larger fish as the waters recede. There is considerable dependence on BWR for rice cultivation amongst the peripheral communities. The main rice growing areas are located on the floodplain southwest of Illiassa and in the area west of Duntumalang. Smaller scale cultivation occurs at various locations throughout the Reserve and appears to be dependent on the extent of rains in a particular year.

**Table 1: Population Distribution around Bao bolong and active Fishing Groups**

Community	Population	% Population	No. of Fishermen	% of Population Engaged in Fishing
JammehKunda	240	2.08	9	0.077
Salikenni	3151	27.25	28	0.242
Mandori	723	6.25	8	0.069
KekutaKunda	345	2.98	1	0.008
Burang-Ya	240	2.08	1	0.008
No-Kunda	2135	18.46	27	0.233
Dai Mandinka	174	1.50	24	0.207
KontehKundaNiji	590	5.10	12	0.103
India	522	4.51	3	0.025
Illiassa	950	8.21	2	0.017
Alkali Kunda	782	6.76	5	0.043
Katchang	1713	14.81	18	0.155
<b>TOTAL</b>	<b>11565</b>	<b>100</b>	<b>138</b>	<b>1.725</b>

*Cham et al, 2014*

Many of the peripheral communities are at least dependent on the BWR for the provision of firewood. The high prevalence of dry season fires in the woodland areas of the Reserve results in the death of many trees, which maintains a supply of dead timber. The communities also collect medicinal plants, herbs and the bark of trees, wild fruits and honey. Mangrove poles are also harvested for construction purposes, an activity which could have severe effects on the extent of the mangrove habitat.

Thatch grass is harvested for roofing quite intensively. The grass *Andropogon gayanus* is used in many areas as thatch for houses in the surrounding communities, most of this activity taking place in the period November to December when the grass is completely dry but not yet lodged, though cutting continues later in the moister areas.

## ii) Key Fish Species and Distribution

Due to the limited time available during the study at field level a detail review was not possible. However from samples viewed, and information from fishermen, some of the species found are indicated in Table 2.



**Table 2: Fish Families and Species of Commercial Importance Occurring in BWR**

Family	Scientific Name	English Name	Local Names	
			Mandinka	Wollof
Clupeidae	<i>E. fimbriata</i>	Bonga	Chalo	Kobo
Mugilidae	<i>Mugil cephalus</i>	Mullet	Tambajango	Tambajang
Polynemidae	<i>P. quadrifilis</i>	Threadfins	Kujalo	Kujali
Pomadasydae	<i>P. jubiline</i>	Sompat	Sompato	Sompat
Penaeidae	<i>P. notialis</i>	Shrimp	Sipa	Sipa sipa

The fisheries of the Bao bolong tributary as observed near Illiasa village is dominated by species of shad (bonga), tilapia, and mullets. The same species were observed at the Salikeni fish landing site where it was also reported that other species commonly caught in the saline waters include the “kujali”, some specimens of which could weigh as much as forty kilos.

### 2.1.2 Current Fishing Activities

Most of the fishermen operating in the BWR usually fish within the tributaries that are closer to their communities for the main reason that they cannot venture far because they do not have the required crafts and equipment.

Table 3 indicates the distribution of fishermen in the BWR. With a total of 148 fishermen recorded more than half are either assistant fishermen or part timers with Conteh Kunda, Salikenni, and Kachang having the highest numbers of head fishermen. Many of the fishermen in Salikenni and Kachang operate in the main river because of their relative proximity to the river; catch many types of high value fish species commonly found in the marine environment.

**Table 3: Distribution of Fishermen and Assistant Fishermen in BWR**

Community	Head Fisherman	Assistant Fishermen	Total Fishermen
Noo kunda	9	18	27
Conteh Kunda	10	2	12
Dai Mandinka	8	16	24
Mandory	5	3	8
Jammeh Kunda	3	6	9
Salikenni	11	17	28
Illiasa	2	0	2
India	1	2	3
Kachang	10	8	18
Jumansarr Koto	5	1	6
Alkali kunda	5	0	5
Kekuta Kunda	1	0	1
Buranya	1	0	1
Jirong	1	3	4
<b>Total</b>	<b>72</b>	<b>76</b>	<b>148</b>

### **Creation of Fishermen's Associations**

The involvement of the traditional leadership in natural resources management is quite evident within the BWR. The Chief of Upper Badibbu (Seyfo Ebrima Jammeh) has attempted to form a Fishermen's Association representing all fishermen, from Jammeh Kunda in Central Badibu to Balengho in Upper Bidibu, and has in fact encouraged the registration of the Association. It will be further noted that this Association includes member communities that are both within and outside the BWR. This report will however cover only the BWR (which is the scope of this study) which begins from Jammeh Kunda in Central Badibu, and ends at Jirong in Upper Badibu).

Incidentally the peripheral communities to the BWR have also formed smaller Fishermen's Associations based on their proximity to the respective tributary(ies) within which they operate. For example the villages of Noo Kunda, Dai, Kekuta Kunda and Buranya operate within the Kuyerr bolong (a tributary of the Manioka bolong) and have their landing base at Kuyerr tenda.

The communities of Conteh Kunda, Illiasa and India operate within the Bao bolong tributary, with their landing base at Bao bolong, whilst the community of Kachang uses the Basun bolong mainly, and lands at Kachang. The communities of Alkali Kunda, Yalal, Jirong, and Jumansar Koto fish within the Jirong bolong and one could land at Jirong tenda.

Salikenni, Jammeh Kunda and Mandori do not have as close an affinity to each other in terms of fishing areas as the others, although they each have their landing sites close to their communities (Salikenni uses the Mori bolong whilst Jammeh Kunda and Mandori use the Sanjong bolong, a tributary of the Mori bolong).

Consequently there are essentially 5 de facto fish landing sites based on this way of operation, and have formed themselves into 5 fishermen's associations, some of them duly registered. Actually the FGDs were conducted through these institutions which for the most part established the fact that their needs are basically similar within the respective landing sites. With appropriate equipment (crafts and the required types of nets, etc.) they claim that their economic circumstances could be transformed for the better. This is therefore the basis for the requested intervention as indicated in Annex 1A (1A -1E).

Regarding other aspects of fishing in the BWR, Table 4 indicates the types of fishing gears, and by extension the various forms of fishing in the wetland. These include the use of the cast nets, set gill nets and the seine net. Gill nets form the largest number of nets used. They are mainly used for high value species, as well as for the bonga with Kachang and Salikenni recording large numbers. Cast nets are also important, employed by many subsistence operators.

Whilst cast net fishermen generally target relatively low value fish species (tilapia, "tambajang", etc.) the gill net fishermen target the higher value species such as the "kujalo", and similar marine species.

**Table 4: Number of Fishing Gears by Type and by Community in BWR**

Community	GILL NET						HOOKLINES			Cast Net	Other
	Encircling Gill Net	Set/ Bottom Gill Net	Drift Gill Net	Stow Net	Other Gill Net	TOTAL GILL NET	Long line	Hook and line	TOTAL HOOK LINES		
Noo kunda	0	1	5	0	0	6	0	1	1	6	2
Conteh Kunda	0	4	5	0	0	9	0	0	0	6	0
Dai Mandinka	0	6	7	0	0	13	2	0	2	3	0
Mandory	0	0	1	0	0	1	0	0	0	5	0
Jammeh Kunda	0	3	1	0	0	4	1	0	1	2	0
Salikenni	0	10	9	0	0	19	0	2	2	2	0
Illiasa	0	2	2	0	0	4	0	0	0	0	0
India	0	0	0	0	0	0	0	0	0	0	1
Kachang	0	9	9	0	0	18	1	0	1	5	0
Jumansarr Koto	0	4	4	0	0	8	0	0	0	1	0
Alkali kunda	0	3	4	0	0	7	0	0	0	1	0
Kekuta Kunda	0	1	0	0	0	1	0	0	0	1	0
Buranya	0	1	1	0	0	2	0	0	0	1	0
Jirong	0	1	1	0	0	2	0	0	0	0	0
<b>Total</b>	<b>0</b>	<b>45</b>	<b>49</b>	<b>0</b>	<b>0</b>	<b>94</b>	<b>4</b>	<b>3</b>	<b>7</b>	<b>33</b>	<b>3</b>

*Cham et al, 2014*

### Use of Cast Net

This is the type of fishing most employed in the BWR, mainly used by fishermen who do not have canoes, and cannot venture too far out in the bolongs. Indeed many of the cast net fishermen who operate in the BWR do not use canoes (they claim that they cannot afford them). They wade into waist-deep waters to fish, emptying the catch into a plastic pan tied to their waist which they pull along as they wade through the water. The target species are the tilapia, “tambajang” and any other type that happens to be within range of the net. These fishermen are usually part timers, but some of them who are more industrious go to fish for more than half the month. They could fish for more days if they have access to more equipment, they claimed.

Cast net is also employed by other fishermen who use canoes, but unlike their counterparts without canoes, these move out farther away from their bases, and spend longer time than those who wade in waist-deep waters. Usually they catch more than those who wade in the water.

### The Bao bolong “Furo” Fishery

Along the main highway, at the Bao bolong tributary, there is a thriving fishery based on the small sized tilapia (called Bao bolong furo or “Kemedeto”). Essentially, this fishery is based on the use of the cast net, employed for the most part by fishermen from Illiasa, India and Conteh Kunda. The fishermen operate from the roadside, standing above the culverts to catch the small sized tilapia that attempt to swim through to the other side of the road.

The “Bao bolong furo” is much loved by the local communities; the catch is sold by the tin-cup (about a kilo) for D5 for small sizes, and D10 for larger individuals. Usually the entire catch of the cast net operators is sold out by the roadside, otherwise the fisherman peddles the catch on bicycle in the villages. Sometimes, female “banabanas” from Farafenni would buy the catch to sell at the Farafenni market at D15 per kilo.

### **The “kuruntu jalo”**

There are however, certain fishermen who use the seine or drag net (locally called “kuruntu jalo”) in the channel and deep parts of the tributary. As the name suggests the net is operated by 4-6 people holding the two ends and dragging the net over the bottom of the channel or swamp to catch any fish within its path. To further concentrate the fish towards the opening of the net, other members of the fishing crew would wade into the water between the openings of the net from the opposite direction, making as much noise as possible to scare the fish into the path of the approaching net. This net has very small meshes and would catch even fish fry and juveniles, and has the potential to disturb and destroy fish nests and eggs.

The most important fisherman in this fishery is from the village of India who operates the net with the help of his family members. The use of this type of net is the subject of animated discussions and complaints regarding its detrimental effects on the environment as well as the fishes it catches. On the day the site was visited, the operator was found using this net (with mesh sizes less than 13mm) by the roadside.

There are claims that this fisherman and his family could catch at least as much as 5 large plastic pans (approx. 150 kg) on a fishing trip. According to the “kuruntu jalo” fisherman, he makes at least D700- D1000 on each day he goes fishing, and he fishes (twice a day for almost every day of the week). He transports the catch in his pick-up truck, and some claim that often he markets the fish in the nearby Senegalese villages of Samba kutaya and Tamba kunda.

### **Set Gillnet Fishing**

The set gill net that is commonly used is the nylon monofilament, mainly used for catching white fish (kujali) and the bonga. This type of fishing is used in more open waters where there is space large enough to accommodate the length of the net (at least 100 metres). Where there is no space however some fishermen do set the net across the tributary diagonally, and thus disrupt traffic especially where they leave the net in place till the following day. Often however, the fisherman would sit by the set net, to wait for the tide to pick out the fish caught from the net. In this way he would allow traffic to go by because he would lower his net further into the water to allow others to move to their respective destinations.

### **Use of Ice**

The use of ice for cooling fish is not common among cast net fishermen because all the catch is sold out as soon as it is landed. For this reason, there is hardly any fish smoking or drying that is carried out within the BWR. However some more industrious “Banabanas” do travel relatively far to certain landing sites (such as Salikenni) to buy fish. These travel on bicycles, or a few of them use motorcycles. They target those fishermen whose catches include the “kujalo” and similar high value fish species that they would take to provincial markets such as Farafenni. This category of “banabanas” does need old freezers in which to keep their fish at the market using locally produced ice blocks sold at the household level.

### **Potential for Introduction of Fish Ranching at Bereto/Baransanto in Salikenni**

In Salikenni there is a floodplain or rice field called Bereto/Baransanto where, as in many parts of the BWR the area appears to be a nursery or sanctuary for many types of fish species including marine fishes such as the “kujalo”, “sompato”, etc. It is also populated by many species of the tilapia, “tambajango”, etc.

To protect the rice fields from salt water, an embankment has been constructed between the river and the rice fields extending almost the entire length of the rice fields. A sluice gate is constructed at one end to control the water when the tide comes in especially during the dry season when the salinity is high, and to let the water out from the rice fields when the rice is ripe for harvesting.

In the rains when the river overflows the banks and the water inundates the flood plain, much of the water is taken into a channel that extends for about 1.5 km. Fishes move out into the swamps to reproduce, and grow before they migrate back to the river by the time the water recedes. Figure 5 shows part of the flood plain that gets flooded at high tide. The channel is narrow at certain points (about 2 metres across) and widens up to about 10 metres at other points with the depth varying from about 1 to 2 metres at certain points.

Currently fishing within this water body is not regulated; villagers in need of fish will set their nets in the channel and the fish caught is usually for family use, and any excess would be sold to neighbours within the village. There is no control over the fishing periods, the mesh sizes, and fishing methods. The stream therefore lends itself to overfishing and potential destruction of fish habitats.

During the FGDS some community members expressed the need to manage this flood plain so that the fishes could be protected to enable them complete their necessary biological functions within the swamps; the young ones and juveniles will be protected and allowed to migrate back to the river when the sluice gates are opened. In addition those individuals that remain in the stream could be allowed to grow bigger.

Given the above, this study is recommending the introduction of some form of fish ranching in this water body, after an in depth study of the fish populations and dynamics of the area. In practice, the village community will agree to ban or restrict all fishing activities within the plains using any of their traditional management measures as appropriate. Annex 1B gives some more detail.

### **2.1.4 Major Environmental and Social Issues of Current Fishing Activities**

#### **i) Environmental Issues**

##### **The use of the “kuruntu jalo”**

This is a very poor fishing method; dragging the net along the bottom is destructive, and in addition the mesh size is too small to use in sensitive areas such as the tributaries where juveniles of important commercial fish species (besides the “furo”) occur. Even the “kuruntu jalo” fisherman conceded that his mesh size is too small.

It would seem there is no attempt to control how he and others like him operate within this fragile ecosystem. Although there is the presence of the DPWM in the BWR, the DOF does not have a personnel posted within the Reserve to enforce the existing laws and regulations. The DOF and the district and local authorities should consult and enforce the existing regulations.

Reports during the FGDs indicate that, in Jumansari-baa and other villages where fishing is not so much an important activity, weirs are constructed using nets or tree branches across the bolong to catch spawning fish as the dry season progresses. The impact of fishing methods (notably drag nets) and other illegal activities need to be considered in the light of the value of the area as a fish spawning ground.

### **The Elevated Culverts**

Another important environmental issue concerns the culverts on the sides of the main road within the BWR.

Some of the culverts have been constructed higher during the recent works on the main road, and this impedes the flow of water. With the relocation and increase in height of some of the culverts, when the water reaches a certain level in the bolong its flow is restricted because of the height of the culvert.

Thus one part of the bolong is drying up for lack of a good flow of water whilst the other part is useless for crops, especially in view of the current phenomenon of reduced rainfall due to climate change. It has now led to the situation where the rice fields adjacent to the road (which were used for rice cultivation during the rains) have now become hyper saline rendering them useless for any agricultural purposes. Furthermore because fish movement is restricted, catches have decreased. With this the environmental and socio-economic impact is imminent on the local communities.

### **ii) Socioeconomic Issues**

The use of the “kuruntu jalo” has further socio-economic ramifications. Some cast net fishermen in the “kemedeto” fishery who operate within the Bao bolong claim that whilst the “kuruntu jalo” is being operated, especially whilst they are also fishing, the former raises so much debris and mud that the water becomes too turbid to the point where they cannot see their target fishes swim past them. This results in low catches for them, they claim. Some even claim that as a consequence they have now moved to Tunku bolong (about 10 km from Conteh Kunda).

The socio-economic impact of the use of the cast net is apparent in that the catches are generally low in spite of the fact that the method of fishing is time consuming and tedious. The fisherman’s movement is restricted whilst fishing, and very soon he gets tired wading through the water. In addition he cannot go far out for fear of drowning. Consequently the catch is usually small and his eventual income equally relatively low.

### **2.1.5 Improving Current Fishing Conditions for Socioeconomic and Environmental Gains**

To improve the fishing conditions of the operators within the BWR, the following are recommended:

1. Provide support to the following Fishermen’s Associations. The support will involve the supply of fishing materials and equipment as detailed in Annex 1 (1AA – 1EE).
  - i. Dai/Duntumalang/Kekuta Kunda/Buranya/Noo Kunda Fishermen Association
  - ii. Bao Bolong/Conteh Kunda Niggi/ Illiassa/India Fishermen Association
  - iii. Kachang Fishermen Association
  - iv. Alkali Kunda/Yalal/Jumansar Koto Fishing Kafoo
  - v. Salikenni and Jammeh Kunda Landing Sites

2. Investigate in more detail for possible support for the development of Fish Ranching at Salikene (see Annex 1B). For more details see Part 3.

### 2.1.6 Major Issues Affecting the Exploitation of the Full Potential of BWR

Some major issues that affect the exploitation of the potential of BWR are indicated in Table 5 below.

**Table 5: Major Issues Affecting Exploitation of BWR Resources**

Activity	Issues/Constraints	Proposed Mitigation
Monitoring and enforcement of laws	Weak institutional capacity of DPWM and DOF	Build capacity of DPWM and DOF
	Weak information and knowledge base of local authorities and other stakeholders	Consultations and sensitization campaigns
Fishing	Use of drag nets/seine net in fragile and ecologically sensitive areas	Increase monitoring and surveillance of Park
		Enforce existing laws
	Illegal fishing by Senegalese fishermen based along the Atlantic coast.	Increase monitoring and surveillance
		Enforce existing laws
	Inappropriate mesh sizes in the “kuruntu jalo”	Increase monitoring and surveillance
		Enforce existing laws

As mentioned earlier the above constraints need to be addressed to effectively manage the fisheries activities within the BWR. Whilst some of the constraints can only be addressed in the medium to long term, others such as deployment of personnel by DOF can be carried out relatively more quickly.

Specifically enforcing the fisheries regulations in the BWR is practically non-existent; there is no personnel deployed from the DOF, and any form of natural resources monitoring is carried out by the staff of DPWM on the ground. Even the DPWM is weak in terms of staff numbers and equipment to use in monitoring. It is therefore no wonder that the use of illegal fishing methods is not uncommon.

It will be an added advantage for sustainable utilization and management should the local authorities be involved. The effort by the Chief of Central Badibu (supporting the fishermen to form an Association) is a laudable initiative because it could be a basis for the sustainable management of the wetland system in the Badibbus. With the involvement of the local authorities in the use of the fish resources there is a good chance that any management measure proposed and adopted will have the support of the local institutions. With their collaboration the government institutions responsible for the implementation of the national laws and regulations will be further strengthened

DOF needs to deploy fisheries personnel to the BWR to engage the local communities to build their knowledge and understanding of issues of sustainable resource use. It is strongly urged to extend its collaboration with the DPWM (within the context of their MOU) to support the implementation of this support planned to be extended to the BWR fishermen.

It is in this regard that capacity of the two institutions need to be strengthened. It is therefore recommended that the newly built headquarters of the DPWM at Noo Kunda be supported in the form of furniture and office equipment (desk top computer, printer, book shelf, etc.) In addition the Warden needs to be supported by way of mobility especially where he would be required under this planned support to monitor the operations of the supported fishermen through the Village Banking approach.

Similarly the DOF personnel to deploy at BWR needs to be supported by way of mobility to join his counterpart to monitor and enforce the regulations. It will in fact be responsibility as a trained fisheries personnel to support the fishermen. The DOF can share the DPWM office, and share the equipment in the process of carrying out his duties in the BWR.

Regarding the fishing community it is clear that the fishermen need a lot of support. In fact in as much as they are quite ambitious, most of them are not well equipped to raise their earnings sufficiently to be able to procure new materials and equipment. To a large extent this is the reason why some of the fishing operations are rudimentary and basic. Whilst some would wish (and are capable) to venture out into the main river to fish for high value fish, their current crafts and equipment cannot withstand the rigours out in the open river.

Their capacity therefore needs to be enhanced. They need to be supported in the form of fishing materials and equipment (including canoes and out board engines as indicated in the summary table below. The details of the support for the BWR fishermen and the relevant institutions is attached in Annex 1.



**Table 6: Budget Summary Table for Support in Bao bolong Wetland Reserve**

Item/Activity	Estimated Total	Remarks
Fishing materials and equipment	3,254,500	Sect. 11 of Annex 1
Training and capacity building in Village Banking	96,750	Sect. 12
Management and operations of the Village Banks	12,250	Sect. 13
Institutional capacity building of DPWM NOO Kunda Office	197,500	Sect. 13
<b>Total support required for Bao bolong</b>	<b>3,561,000</b>	

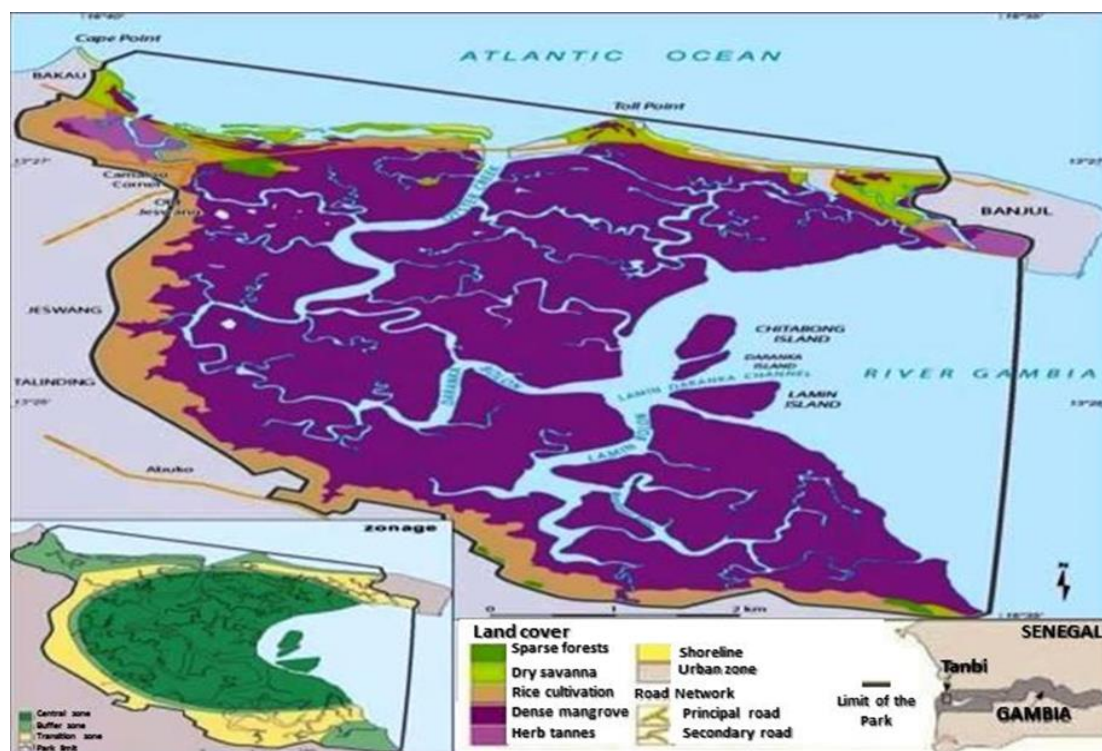
## 2.2 Tanbi Wetland National Park

### 2.2.1 Description and Location

Figure 2 is the map of the TWNP located at the mouth of the River Gambia, and occupying an area of approximately 6,000ha (of which mangroves make up 4,800 hectares). Banjul is at the northeastern border, and the Park skirts the Bund Road, while Bakau is at the north-west. It also includes Cape Creek, encompassing the fringes of the island of St. Mary at its Atlantic Ocean side.

The Park is bordered by fifteen communities; the greater Banjul human settlement surrounds it to the south and east. Madinari, Lamin and Abuko communities border the Park to the south and to the west; Faji Kunda, Talinding, Ebo town and Jeshwang limit the TWNP. It therefore spans part of the Banjul City area, some part of the Kanifing Municipality and some area of the Brikama Area Council. Table 6 indicates some the communities visited.

**Figure 2: Map of the Tanbi Wetland National Park**



*Land use map of TWNP (Adapted from: RAMSAR, 2007)*

Declared a Ramsar site in February 2007 and in 2008 a National Park, TWNP is characterized by a network of channels that dissect the mangrove forest and the coastal strip on the northern fringe. It is essentially estuarine in nature, though it is subjected to full salinities on the northern fringe during flood tides, and there are numerous freshwater flushes around the periphery during the rainy season.

### **2.2.2 Current Situational Analysis**

#### **i) Environmental**

##### **The Swamp**

Eighty per cent of TWNP is composed of forest wilderness made up of several species of mangroves including the *Avicennia africana*, *Laguncularia racemosa*, and the *Rhizophora spp.* with the occasional Baobab (*Adansonia digitata*) or the rhun palm (*Borassus aethiopum*) standing on more solid earth. The mangrove forest constitutes a delicate and biologically diverse ecosystem that plays a central role in transferring organic matter and energy from terrestrial to the marine areas. The Park is laced in a patchwork of tidal creeks (bolongs), lagoons and estuarial saline mudflats which play a key role in water retention. It also acts like a giant natural sponge for rainwater and tidal river flows, and also as a sewage sink for the fringing urban areas, fish breeding and nursery grounds.

##### **Threats**

The TWNP suffers from diverse threats to its ecological integrity and functioning. The major threats are on its northern and eastern peripheries where urban encroachment, industrial development and increasing agricultural activities are occurring. With industrial development the incidence of pollution has increased and the cumulative impact may result in the loss of fish through contamination. This phenomenon may be further exacerbated by the increasing agricultural development and the associated use of herbicides and pesticides, which could impact on the various types of fisheries.

The mangrove ecosystem where the oysters grow is under persistent threat of overexploitation due to deforestation, population growth, pollution, waste dumping, and unsustainable extraction of resources. Oyster harvesters who lack knowledge of sustainable collection methods tend to harvest too frequently, allowing too little time for regeneration. In addition, many harvesters and other residents peripheral to the Park contribute to deforestation by cutting mangrove trees for fuel wood and for construction.

##### **Elevated Culverts at Lamin Bridge**

The Lamin Bridge adjacent to the Abuko Nature Reserve along the main Brikama high way, allows flow of storm water from the village of Lamin through the Nature Reserve into the swamps. This process has however been disrupted after the rehabilitation of the Lamin Bridge in the early 2000s. The culverts that allowed the free flow of storm water under the bridge were elevated beyond the normal water level, and this has disrupted the flushing of the nearby swamps with fresh water during the rainy season. As a consequence, this has resulted in reduction of mixing of saline and fresh water for the optimal functioning of the adjacent mangrove vegetation.

In addition the space between the Reserve's fence and the bridge is continuously flooded during the rainy season (and is water logged for almost three months after the rains) because the water cannot flow through to the swamps. This has killed all the trees between the fence and the bridge.

##### **Fragile**

A large portion of the Park, including the large area of mangroves, rivers, creeks and streams is natural and is an important nursery ground for many species of fish. For this reason, the area can be regarded as fragile, mainly due to the close proximity of urban areas, and its associated uses and possible exposure to discharge and pollutants.

The wetland's proximity to the urban area and its bisection by the Banjul-Serrekunda highway combine to give the land a high value for development. Consequently, despite the fact that all proposed developments within the Park should be subject to a full environmental impact assessment, unlicensed tourist developments continue to be located on sensitive spots. Effluent discharges from these and other industries may not be in compliance with the and the Discharge and Permitting Regulations and thereby constitute a threat to water quality and the associated flora and fauna.

In view of the foregoing, it is recommended that the biodiversity of the area should be maintained and improved with an emphasis on reducing further encroachment into the area by farming and urbanization. Any proposed developments should not proceed if the biodiversity is adversely affected. Approved projects should include mitigation measures that retain and improve on the biodiversity of the area.

## ii) **Economic Activities in the TWNP**

The peripheral communities to the TWNP essentially comprise two types of populations: one not dependent on Tanbi resources and the other one directly or indirectly relying on the wetland resources. For the latter rice cultivation, vegetable growing, and oyster collection, etc. are mainly undertaken by women, whilst the men are engaged in fishing, and mangrove wood collection. It will be noted that oyster harvesting, fishing and mangrove cutting have increased with the increase in human population; this has indirectly claimed land within the hydrological basin in the Park; waterways are blocked-up increasing sedimentation of the mangrove ecosystem.

Overall, the fishing community makes up only a small part of the population of the TWNP (less than 1 percent of the communities visited). See Table 7.

**Table 7: Population Distribution around TWNP and Active Fishing Groups**

Community	Population	% Population	No. of Fishermen	% of Population Engaged in Fishing
Old Jeshwang	13,319	14.28	32	0.034
Tallinding	34,206	36.68	4	0.004
Faji-Kunda	23,969	25.70	12	0.012
Lamin	17,033	18.27	3	0.003
Mandinary	4,725	5.06	39	0.041
<b>TOTAL</b>	<b>93,252</b>	<b>99.99</b>	<b>90</b>	<b>.094</b>

*Cham et al, 2014*

## **Rice Farming and Vegetable Gardening**

Rice farming is taking place in several communities, but particularly at Old Jeshwang mainly carried out by Jola women. In certain areas, such as in Bakau vegetable gardening is also practiced intensively, the plots irrigated with water from shallow wells. Generally the residents have linked the increased agricultural practices in some parts of the TWNP, to land scarcity, increased family sizes, etc.

These fields are at the edge of the tidal zone which is sensitive to the exchange of fresh and salt water. Human settlements erosion in upland areas caused by developments and buildings in waterways brings a significant amount of sand into the rice fields resulting in sedimentation, reducing the water retention capacity with high impact on the production.

## **Oyster Harvesting**

This is another important economic activity within the TWNP. The industry provides employment and income, food and revenue to the harvesters. Historically, the oyster fishery in Gambia is dominated by the poorest members of the most economically marginalized communities; dominated by women aged between 25 and 45, who are often the sole income providers for

their households. They have worked as shellfish harvesters their entire lives, learning the profession from mothers and grandmothers. These women are mostly of the Jola tribe, while many are migrants from Guinea-Bissau and the Casamance region of Senegal.

The women carry out all the different operations (harvesting, processing and marketing). Occasionally men assist in the harvest in partnership with closely related women (usually their spouses and relatives), but processing and sales is entirely carried out by women.

Oyster harvesting is seasonal (March-June), leaving women with no alternative sources of income, financially insecure, and often facing debt in the off-season between July and February. Many of the interviewees indicate that there has been a general decrease in fish and oyster production over the years, and this has led to many of the residents engaging in alternative sources of income such as agriculture.

### **Mangrove Wood Collection**

In addition to the above, uses of mangroves within the TWNP are noticeably high for construction and fuel wood. The mangrove fuel wood is important and often linked to fishing and oyster collection activities, whereby smoking and steaming oysters is carried out simultaneously. The local communities use the wood for fences and for house constructions.

### **Tourism**

This activity is developed around Lamin and Denton Bridge, where the surrounding communities are employed. Tourist fishing boats offer trips along the Oyster Creek from Denton Bridge, down south to the Daranka Bolong, and out towards the estuary and Lamin Lodge.

### **iii) Key Fish Species and Distribution**

Table 8 presents the key fish species within the TWNP, most of the species occurring both in the lagoons and mangrove swamps. Tilapia and mullet species were reported to be abundant. At Madinaring and Lamin the fishermen revealed that relatively small individuals belonging to the families of the Lutjanidae, (Yakh) Ploynemidae, (Kujali) Pomadasysidae, (Sompat) and Sciaenidae (Tonone) are also present in their catches.

A major fishery within the TWNP is the shrimp Fishery. The pink shrimp (*P. notialis*) which is found in both the maritime and brackish riverine waters, is the principal commercial fishery in the TWNP. Catches are mainly destined for the fish factories which process for the export market in Europe and America (Box1).

**Table 8: Fish Families and Species of Commercial Importance Occurring on TWNP**

Family	Scientific Name	English Name	Local Names	
			Mandinka	Wollof
Cichlidae	<i>Sarotherodon melanotheron</i>	Black-chinned tilapia	Furo	Waas
Clupeidae	<i>E. fimbriata</i>	Shad/bonga	Chalo	Kobo
Mugilidae	<i>Mugil cephalus</i>	Mullet	Tambajango	Tambajang
Penaeidae	<i>P. notialis</i>	Pink shrimp	Sipa sipa	Sipakh
Polynemidae	<i>P. quadrifilis</i>	Threadfins	Kujalo	Kujali
Sciaenidae	<i>P. senegalensis</i>	Croaker	Tununo	Tonone
	<i>P. brachygnathus</i>	Law croaker	Tabase	Nguka
Lutjanidae	<i>Lutjanus lutjanus</i>	Snapper		Yakh
Pomadasysidae	<i>Pomadasys jubelini</i>	Grunts	Sompato	Sompat
Crassostrea	<i>C. gasar</i>	Mangrove oyster	Nganya	Yokhos

The occurrence of bivalve molluscs are evident in the TWNP, and they include the West African Mangrove oyster *Crassostrea gasar* and the cockle (*Anadara senelis*).

### 2.2.3 Current Fishing Activities in the TWNP

The main fishing communities in the TWNP are Old Jeshwang which is involved mainly in the bonga fishery and Madinaring, involved mainly in the shrimp fishery (Box 1). Table 9 indicates the distribution of fishermen in the TWNP. The fishing activities consist of the following detailed below

**Table 9: Distribution of Fishermen and Assistant Fishermen in TWNP**

Community	Head Fishermen	Assistant Fishermen	Total Fishermen
Tallinding	2	2	4
FajiKunda	9	3	12
Old Jeshwang	6	26	32
Lamin	3	0	3
Mandinary	35	4	39
<b>Total</b>	<b>55</b>	<b>35</b>	<b>90</b>

*Cham et al, 2014*

#### 1. Fin Fish Fishing

**Bottom Set Gill Net:** This essentially is a piece of netting held to the bottom of the estuary by an anchor or heavy stone, and weighed down by pieces of lead, and a series of floats and buoys to keep the netting stretched upright resembling a wall of netting. When the fish attempts to swim through the open mesh (only the head can get through the mesh) and realizes it cannot get through, it attempts to withdraw but would have its gills caught in the mesh, (hence the name gill net). The net could be as long as the fisherman can afford, and thus could be stretched for long distances, and left overnight; fish caught during this period will be collected the following morning. The fisherman would repeat the process, to return the following morning.

This fishing method is selective (it would catch only those individuals large enough to be stopped by the net), smaller specimens would swim through and thus escape. The mesh sizes observed in the TWNP are generally appropriate. The use of gill nets (set and drift gillnets) is more prevalent in Madinaring where it is used in conjunction with the shrimp net (stow net), especially when the tide is not ideal for shrimping (Table 10).

**Table 10: Number of Fishing Gears by Type and by Community in TWNP**

Community	Gill Net						Hook and Line			Cast Net	Other
	Encircling Gill Net	Set/ Bottom Gill Net	Drift Gill Net	Stow Net	Other Gill Net	TOTAL GILL NET	Long line	Hook and line	Total Hook/ Line		
Tallinding	0	2	2	0	0	4	0	0	0	0	1
Faji Kunda	0	9	5	0	0	14	0	0	0	1	1
Old Jeshwang	5	3	3	0	0	11	0	0	0	0	0
Lamin	2	1	2	1	0	6	0	0	0	0	0
Mandinary	0	25	18	24	0	67	2	3	5	0	0
<b>Total</b>	<b>7</b>	<b>40</b>	<b>30</b>	<b>25</b>	<b>0</b>	<b>102</b>	<b>2</b>	<b>3</b>	<b>5</b>	<b>1</b>	<b>2</b>

*Cham et al, 2014*

The main problem that is reported is that some fishermen would set their nets across the tributary or water way, and so discourage any movement by other traversing fishermen. Often this form of fishing obstructs another type of gill net fishing (drift gill net). Stow nets are another



important fishing method in the shrimp fishery. Its use is more prevalent in Mandinaring, and its catch is mainly for the export market.

**Seine Net:** Seine fishing is a method of fishing that employs a seine or drag net similar to the type used in BWR. A typical seine (Figure 10) has weights attached to the lead line at the bottom of the net and buoys or floats attached to the float line at the top of the net. The downward force of the weights counteracted by the buoyancy of the floats keeps the net open vertically when it is pulled through the water to entrap fish.

This form of fishing was reported in Mandinaring employed mainly by illegal fishermen from Senegal who enter the Park at night to operate the net. They would leave before dawn. Often verbal confrontations ensue with local fishermen when they encounter them within the Park. The matter has been reported to DOF, they claimed. Clearly, the issue needs to be addressed.

**Encircling Gill Net:** Within the TWNP this type of fishing is employed only at Old Jeshwang, and it targets mainly the bonga, which makes up more than 80 per cent of the fish landings at the site. Actually, the fishermen fish outside the TWNP, and only land at Old Jeshwang. On a typical day the catch is evacuated from the boats and spread out on raised platforms made from mangrove poles.

The top of the racks is covered with nylon fish netting and its main function is to drain the water, as well as to encourage air exchange to keep the fish cool before it is finally evacuated to market by the “Banabana”; there is no ice or refrigeration. Over time, the netting has gotten dirty, accumulating grit and dirt making the racks look unhygienic.

**Bonga Smoking at Old Jeshwang:** For smoking the fish is laid out on metal grills over earthen ovens that are located haphazardly on the fringes of the mangroves just by the water’s edge. The product is “cold smoked”, i.e. it as good as a fresh product, and thus requires cooling or refrigeration. Without ice or refrigeration, it therefore needs to be consumed within a short period.

The smoking process is tedious and hazardous to the women’s health they bend over the oven continually, the smoke getting into their eyes, and at the same time inhaling the smoke. They do not seem to encounter any marketing problems since practically all the fish can be sold on the same day. Serrekunda market is the principal market although some are sold in the village of Old Jeshwang to consumers.

However, a major problem encountered by the women is from the marauding pigs from within the Jeshwang area. If unguarded by the women, the pigs would devour all the fish (whether already smoked or not) on the grills; where they cannot eat up all the fish, the entire content of the grill will be overturned, spilling the fish unto the ground rendering it inedible and unmarketable. To prevent this the women are compelled to continuously watch over the ovens until all the fish is smoked and cooled before transferring it to the store. They requested for assistance in this regard.

It is being recommended that a security fence be erected between the water’s edge and the ovens to keep the pigs away. Annex 2C provides the details of the assistance to address the problem.

## **2. The Shell Fish Fishery**

The shell fish industry in the TWNP comprises the oyster and shrimp fisheries, the former involving mainly women, whilst the latter comprises men. It will be noted that for this report on the TWNP, the oyster fishery is the main focus for support. The shrimp and fin fish fisheries may be considered in subsequent assistance program. The shrimp fishery is however described briefly in Box 1.

## The Oyster Fishery

### BOX 1: The Artisanal Shrimp Fishery in the TWNP

An important industry, the shrimp fishery in Gambia is based on the shrimp found in both maritime and brackish riverine waters, but the artisanal shrimp fishermen mainly operate in the estuary and tributaries within the brackish water regime.

The pink shrimp (*Penaeus notialis*), known locally as Sipa Sipa) is the main target species of the artisanal fishermen operating in TWNP. It is most abundant during the rainy season between July to September in the coast and estuary of The Gambia. Another species of shrimp (*Parapenaeus longirostris*) is found in the deeper waters (100 to 400 m) and is targeted by large shrimp fishing vessels (more than 250 gross tons).

The shrimp stock found in the Gambia has its spawning grounds in the estuary/river including the TWNP. After hatching and metamorphosis to various larval stages in the river, juvenile shrimp migrate upstream in shallow areas of the River Gambia for feeding and growth in the nutrient-rich mangrove areas. After three months, the adult shrimp migrates to sea and back for spawning in the central and deepest part of the estuary.

While the fishery takes place year round, the peak fishing season is between June to September (during the rainy season). In the past, it was known that shrimp spawned when salinity in the river was high. This occurred during dry season when salinity levels due to evaporation and lack of rain were high. This pattern has changed over time as rainfall patterns have changed since the 1960s. Now it seems that shrimp manage two spawning cycles: one before the salinity increases too much and a second, smaller, peak in the fishery in February-March.

#### Capture Methods

Artisanal shrimp fishing is typically done with stow nets and shrimp drift gill nets. Stow nets locally known as “Mujas” are the main fishing gears employed in the estuary for shrimp fishing. A diverse assemblage of juvenile fish and small crustaceans are also captured as by-catch.

Specifications of the stow net are as follows:

- 25 mm minimum mesh size (Fisheries Regulations 1995)
- Total length between 10 and 14 m
- Netting material: Raschell (most common) and nylon knotted multifilament (210/12 for the belly and 210/18 for cod-ends)
- Colors: Blue, green (most common) and brown on the bellies and black on the cod-ends (fishermen preference)
- Net constructed as two seams

Shrimp drift netting (fele-feleh) is a foreign fishing method from Mali and Senegal. The drift nets are attached to medium-sized boats which are allowed by fishermen to drift in the waters between the deeper channel and the more shallow parts of the river. The length ranges from 100-200 m long and 1-1.5 m wide. Drift nets are usually handled by three fishermen.

#### Social Profile

The shrimpers in the TWNP are predominantly Senegalese, with Gambians coming in next, the remainder from countries such as Mali and Guinea Bissau. Similarly, the nationality of the crews is predominantly Senegalese, Gambian and other nationals.

The oyster fishery is an important source of livelihood for many people resident in these areas. The development of the fishery became a stated priority for Government since the 1980's, but little has been done to manage the fishery, or to provide technical support to develop it until recently. Information on the fishery is limited, and the total number of people involved in the oyster fishery countrywide is not known.

**Oyster Harvesting:** Oyster harvesting is carried out in fifteen communities in the TWNP; all these communities are members of the TRY Oyster Women Association whose membership current stands at a little more than 300 from an initial figure of 500 women. (Box 2). This group of women is intended to be a major beneficiary of the outcome of this study; the support will be aimed at increasing their productivity, and at the same time ensure a sustainable utilization of the oyster resources they depend upon for their livelihood. At the time of the study the harvesting season had closed and most of the women had left the oyster bases for other engagements, and consequently some of the sites could not be visited.

Oysters are traditionally collected from the roots of mangroves, using rudimentary tools such as machetes and small axes. During high tide the oysters are submerged and therefore cannot be harvested. Most of the women harvesters do not own their own canoes, hence canoes are shared among community members. Usually the canoes are able to fit only one or two people, the day's food and water, with buckets and tools for harvesting.

The canoes are unmotorized, small, and locally-crafted. Many women who do not have access to canoes will simply walk out into the mangroves, leaving the landing site when the tide is low, harvest, and walk out before high tide sets in, carrying their loads of oysters on their heads.

The work is physically demanding and exposes the harvesters to a high degree of risk. Many of them cannot swim, making collection activities in small canoes (without lifejackets) a life-threatening proposition. The majority of harvesters also lack appropriate gloves and footwear; the sharp oyster beds pose a serious risk of injury.

**Oyster Processing:** The same women who harvest the oysters from the mangroves do the processing on shore either by steaming or by smoking. They steam or grill the freshly harvested oysters over open fires, shuck the meat, and sell by the roadside, or at village or urban markets such as Serrekunda and Banjul.

**Steaming:** The fresh oysters are steamed alive for approximately thirty minutes to one hour in half drums sitting on three stones, and during steaming the muscles ease allowing for easy opening. Mangrove wood is used in this process.

Usually the space below the drum is too large, and so there is the tendency to use a lot of fuel wood the cumulative effect of which has environmental implications. When the oysters gape, and for the woman to collect the steamed oysters from the half drum, she would push the drum over the side with the help of a stick unto a sack where the oysters are collected, whilst the hot boiling water spills away. The oysters are then collected in baskets, or carried on the sacks to the shucking area where the woman and her helper(s), (should there be any), would begin shucking with knives.

After shucking and in preparation for the market, the woman would wash the meat in sea water and leave it in a basket to drain before going to market. If however, the meat will not be sold on the same day after shucking, the woman would boil the meat on reaching home in fresh water (with salt added as a means of preservation as she has no cooling facility at home).

This process has some added advantages in that the meat is toughened, and with the added salt the shelf life is extended beyond a day. In addition any broken shell or grit is removed, and the meat is spread out on a clean cloth and allowed to drain in time for market the following day. Figure 15 shows a typical shucking shed at Lamin, provided by the UNDP the TRY Oyster communities.

There is an improved method of steaming oysters employed at the Senegalese village of Sukuta. It is the so called "Sinkiri kuto". Compared to the traditional Gambian system, the "sinkiri kuto" is more fuel efficient as most of the heat is directed under a much smaller container which reduces the steaming time, with much reduced smoke, and under a more hygienic and less hazardous environment.



The oysters are put in old onion bags which would be immersed in the pot; this allows for easy removal when the oysters gape by simply lifting the sack out (unlike the practice where the half drum is pushed over its side to collect the steamed oysters). Similar versions of this cooking stove are common in Gambian homes, used to prepare the family's daily meals, and like the "Oyster sinkiri kuto" they are equally fuel efficient and less hazardous to use. They are constructed from similar materials as the Senegalese "sinkiri kuto", from cement blocks, and burn bricks, and finished neatly with glaze tiles to make cleaning and maintenance easy.

It is recommended that the concept be introduced in the Gambian oyster industry to ease the drudgery involved in the use of the traditional system of steaming oysters. It will also be positive towards the environment as it requires less fuel wood. Trials should be set in a few selected sites. See Annex 2B for details.

**Smoking:** The oysters are roasted on metal grills over an open fire, the grills sitting on three stones and the space thus created acts as the stoke to put in the firewood. The disadvantages of this type of smoking are it consumes too much wood, it is time consuming, smoky, and hazardous.

With support from UNDP, improved smoke ovens were constructed at all the oyster landing sites to ease the drudgery involved in the traditional system. This oven is closed, requiring less fuel wood (labor and environmental benefits), producing less smoke to be inhaled, and reduces the danger from oyster shell fragments exploding in the fire (health and safety benefits).

However because they were constructed towards the end of the harvesting season, most of them have not been tested yet. Reports from some of the women who tested some of them (Ebo town and Lamin) indicate that the stoke (space between the oven's floor and the metal grill where the wood is fed) is too high, and that it would require a lot of wood to produce the heat sufficient enough to open up the oyster shell.

#### **BOX 2: Try Oyster Women's Association**

TRY Oyster Women's Association is a community-based organization of over 500 women oyster and cockle harvesters operating in the Tanbi Wetland National Park (TWNP) formed in 2007 to tackle the connected challenges of unemployment and coastal degradation, and also to tackle the challenges facing women oyster harvesters, such as rapidly declining mangrove forest and coastal health, and the task of educating the local population about the relationship between environmental degradation and deepening poverty.

##### **Governance structure**

The Association has experienced meteoric growth in its membership, beginning as a series of small gatherings of oyster harvesters in one community and expanding into a dynamic, connected network with organized leadership and members in 15 different communities. *It is* formally registered and legally recognized as a community-based organization with a Board of Directors, an Advisory Council, a Local Governing Board and an Executive Director.

The Governing Board is made up of representatives from the Association's 15 member communities. Officers of this body (including the President, Vice President, Secretary, Vice Secretary, Treasurer, Vice Treasurer, and community representatives) oversee the entire network of harvesters. Elections for these positions are held every two years.

##### **Creating equitable oyster supply-chains**

A primary activity of the association has been working with its growing membership of oyster and cockle harvesters to improve the quality of collected products, harvesting methods, processing and storage, and market supply-chains in order to diversify the market for locally harvested oyster and cockle products to ensure consistent demand and a higher premium for the women. One challenge previously facing women harvesters was the short shelf life of their products and the effect the prospect of unsold, spoiled oysters and cockles had on their bargaining power and asking prices. To address this issue, the Association is working with harvesters on value-added secondary processing techniques that will improve the shelf life of their products, including storing oysters and cockles in oil, freezing them, and smoking them.

All of these techniques allow the women to sell their products for a higher premium, and, in some cases, up to three months after the end of the oyster season. With continued income from oysters throughout much of the year, women harvesters are less likely to break the no-take rules that are part of the eight-month off-season or seasonal closures, as established in the Association's co-management plan.

##### **Co-Management of Tanbi Wetlands National Park**

One of TRY Association's biggest accomplishments to date has been its leadership in the development and implementation of the Oyster and Cockle Co-Management Plan for the TWNP, designated a "Special Management Area". The Association worked with partners in the Government of Gambia – including the Ministry of Fisheries – to draft a comprehensive natural resources management plan inclusive of TRY members and their work. The co-management plan, approved and launched on January 17, 2012, gives TRY Association exclusive use rights to the cockle and oyster fishery in the TWNP and delegates to the Association the authority and responsibility of sustainable management and conservation of the oyster and cockle resources in TWNP. A key output of this plan has been the designation of open and closed harvesting periods, formally establishing the length of the off-season for TRY Association members.

### **3. Trials in Oyster Culture**

The USAID-funded Gambia-Senegal Sustainable Fisheries Project (Ba Nafaa) supported trials in the culture of oysters in the TWNP. It set up experimental oyster racks in all the fifteen oyster

harvesting communities in 2010. Staff from DOF, DPWM, and TRY Oyster Association were involved in all the stages for technology diffusion.

In addition, an EU-funded coastal management project implemented by NEA conducted trials in rack culture in 2011 at the Lamin oyster harvesting site for the TRY members. The racks were made out of bamboo poles with old oyster shells used as cultches (the substrate on which the young oyster (spat) would set).

The old shells were strung up onto nylon strings and hung over the horizontal bars of the racks to allow the oysters to grow (submerged at high tide and exposed at low tide, in just the same way as in nature on the mangrove roots). The participating women used their local knowledge to identify suitable sites to construct the racks; they also participated in the collection of old oyster shells to make the cultches, punching, stringing, and hanging of the spat collectors on the racks.

Where possible, the women used their canoes to transport culture materials such as bamboo poles, oyster strings, ropes, and machetes. Alternatively motorized canoes were hired to transport materials to the culture sites especially in Lamin, Kubuneh and Denton Bridge.

The floating raft culture technique was supported by the Taiwanese Mission; this has not been fully implemented due to the break in diplomatic relations between Banjul and Taipei. The trial was supposed to have been conducted at Old Jeshwang, Lamin and Kubune. (See Annex 2A for details).

The floating rafts are ideal for spat collection, but can be equally efficient for grow out too, because unlike the rack (where the oyster is exposed every six hours and thus lose feeding time) the floating raft affords 24-hour feeding time since the oysters are continuously submerged even at low tide.

It will be noted that the rack culture trials that were carried out need to be repeated because the outcome of the trials have not been conclusive; much information was not collected on the growth rates, and production potential. Raft culture trials were not even implemented as they were prematurely aborted.

It is therefore recommended that support be provided to TRY and the DOF to continue with the trials for another year employing both the raft and rack systems of culture in selected landing sites.

## **2.2.4 Major Problems Identified in the Fin and Shell Fish Fisheries**

The major problems identified in the fishing activities in TWNP include the following:

### **In the Fin Fish Fishery**

#### **i) Apparent Overfishing**

Based on the perception of informants, the overall fish catch per person in the TWNP has decreased in recent years due to increased population size of the fishing community as well as diminishing fish stocks. This phenomenon applies to both subsistence fishing as well as the catches of the artisanal fishermen.

#### **ii) Inappropriate Fishing Methods**

Seine (drag net) fishing is one method of fishing that is causing major problems, both in terms of environmental as well civil and social, encouraging conflicts between the various operators. In addition to the seine operators from Senegal at night, some large pirogues with high engine horse powers that traditionally are ocean-going crafts and based along the Gambian Atlantic coast, have been observed in both BWR and the TWNP at night. They would set their nets across the channels, and because the nets are so long, they would occupy almost the entire length of a tributary preventing easy passage by other users. This often leads to verbal exchanges between the opposing sides; there is the possible danger of physical violence especially as the crews of the bigger pirogues are larger than the small operators from the TWNP and BWR who operate mainly as one or two- man crew.

#### **iii) Inappropriate Handling and Marketing Methods**

There is hardly any ice to cool the fish out at sea on board the boat in all the sites visited. This is because the catch is usually too small to warrant spending extra money to procure ice, and besides the fish would be sold out on reaching the shore anyway. Any additional expenses would not be worthwhile.

In this regard the fish is marketed without ice, and since there is hardly any “banabana” to service the landing sites, or buy the fish from the fishermen, the fisherman himself or his wife would sell the fish directly to the consumers at home.

However, the shrimp fishermen in Lamin and Mandinaring do use ice on landing especially if the catch is destined for the fish factories where they are processed for export to Europe. In these two communities where there is a large number of stow nets (for shrimps), the fishermen do engage in fin fish fishing when the tide is not appropriate for shrimping, and when they catch large quantities of fish they use ice blocks produced at the village of Mandinaring at the household level, or procure it from Lamin.

#### **iv) Women Fish Smokers and Marauding Pigs**

During the fish smoking process a major constraint encountered by the women is from the stray pigs from within the Old Jeshwang area that eat their fish right from the fire if the ovens are not guarded. A large number of the pigs can be seen within 2-5 metres from the ovens waiting for the chance when the women would lose concentration, and they would pounce on the ovens, and pull down the grill with the fish.

Complaints have been continually made for the animals to be retrained to no avail. They therefore are requesting support to provide a security fencing between the water's edge and the ovens to keep the pigs out. See Annex 2C for details.

## **In the Shell Fish Fishery**

### **i) Overfishing**

Similarly, as in the fin fish fishery there are too many oyster harvesters for the available resources (leading to migration by some) as is evident when harvesting season begins. Even though the harvest season is expected to last 4 months in the year, but by the end of the first month of the harvest season the resources are already depleted because of the sheer number of operators.

Some operators employ the services of extra family members (including their daughters) to enable them harvest as much as they can, and this scramble eventually leads to the resources' depletion soon after the season is open.

### **ii) Resource Use Conflicts**

A major problem is reported regarding certain communities that are not within the TWNP but are located within the same wetland ecosystem, but do not observe the 8- month "closed season" period in force as per the Oyster and Cackle Co- Management Plan agreed between TRY and the Government.

These are the communities of Kuloro and Mandinaba which harvest oysters located near Kubune. Whilst the members of TRY are observing the 8-month long "closed season" harvesters from these communities continue to harvest the same grounds that the TRY members are protecting by closing the harvest season, creating an unfair competition.

Technically Kuloro and Mandinaba are not members of TRY and so are not obliged to observe the Management Plan; they operate outside the TRY jurisdiction because the Co – Management Plan is confined to the limits of the TWNP which has defined boundaries as enacted in the law that designated the site as a National Park. Consequently, these communities are outside the TWNP and outside the jurisdiction of TRY; they are equally outside the jurisdiction of the DPWM as the government entity in charge of the TWNP. Under these circumstances only DOF, as the oversight government institution for the management of fish and fisheries resources nationally, can control and enforce the "closed season" management measure as prescribed in the co-management plan for the oyster fishery in the TWNP.

Given the above the only recourse that is available in the long term is to extend the boundaries of the TWNP to include the communities of Kuloro and Mandinaba and thereby bring them under the jurisdiction of TWNP and by extension under TRY. This will entail amendment of the existing law which delineates the TWNP, a process that will clearly take time. The snag here is that other communities outside an extended TWNP boundary may behave just like Mandinaba and Kuloro, and this would mean another amendment of the Act, and this could be repeated over and over, which will be cumbersome.

Another long term solution is that the DOF, in collaboration with DPWM and TRY must undertake extensive consultations and sensitization campaigns to encourage these communities (and indeed any other with potential to do the same) to observe appropriate management measures that would ensure the sustainability of all the natural resources within the Gambia's wetland areas, including the oyster resources in demarcated national parks and reserves.

### **iii) Lack of Credit Facilities**

During the "closed season" some oyster harvesters are out of work, and do find it difficult to take care of their families. Whilst some engage in other economic activities such as petty trading (buying and selling), others engage in fishing for crabs, "jalanding la" (a form of rudimentary fishing) to catch small sized tilapia and "tambajang" at low tide, picking periwinkles, harvesting cockles, etc. However, due to their low level of investment they can hardly make much by way of profit.

Some women have therefore requested for support in the form of a credit facility to help them boost their earnings during the closed season. Indeed they could even save towards investing in their harvesting operations especially where they are able to make some relatively healthy profit. In this regard, it will be recommended that a revolving loan scheme with a seed capital of D50,000 be lodged at the Social Development Fund (SDF) for possible onward lending to potential applicants from TRY.

## **2.2.5 Major Environmental and Social Issues of Current Fishing Activities**

### **Environmental Issues**

#### **The Fin Fish Fishery**

A major environmental issue that needs to be highlighted is the catching of juveniles. As indicated earlier another key species that is landed in the TWNP is the pink shrimp, which migrates into the wetlands; the shrimp stock found in the Gambia has its spawning grounds in the estuary/river including the Tanbi Wetland. Thus, a major environmental issue is the presence of juveniles and sub-adults in stow nets of 14mm at the cod end.

Another problem reported is the use of the beach seine ("mbali Laaw" or drag net) within the tributaries. This is particularly practiced by Senegalese fishermen who arrive at night and would fish till dawn, when they leave for Senegal. This is a bad fishing method because of its negative environmental impacts and negative impacts on fish stocks through the catching of juveniles. The fishermen highlighted high shares of juveniles in the catches, which contribute to overfishing because of small mesh sizes, and large portions of by-catch that are discarded.

Some fishermen would set their nets across the tributary or water way, and so discourage any movement or traffic by other traversing fishermen. Often this form of fishing obstructs another type of gill net fishing (drift gill net), or other fishermen who attempt to go to other fishing areas.

#### **In the Oyster Industry:**

The use of coarse harvesting tools (such as machetes) also often leads to the damaging of mangrove roots. In addition, many harvesters contribute to deforestation by cutting mangrove trees for fuel wood.

Currently oyster harvesting is only for 4 months in the year, (possible from March to June) though to harvest throughout this entire period would be unsustainable. However, harvesters who lack knowledge of sustainable collection methods tend to harvest too frequently, allowing too little time for regeneration. Too often people are driven by overwhelming need for any amount of income, and will harvest too early and too often. This not only means smaller oysters, but it also means destruction of the environment which breeds them. Thus the need for a closed season as advocated in the current management plan.

Some alternative livelihood possibilities need to be created for the women to reduce the fishing pressure on the oyster stocks. They could be trained in various arts and crafts designed to earn them some income to keep them away from fishing. Capacity of the harvesters and their helpers (including their daughters) should be built in such crafts as tie and dye, soap making, etc. The TRY Association should seek support from NEA, or any other possible to conduct this training.

During steaming and smoking oysters, too much wood is used; the traditional open tripod is not fuel efficient, (most of the heat is lost) and the oyster cannot cook or roast quickly enough. The cumulative effect on the mangroves has implications for the sustainability of the very fishery on which the woman depends for her livelihood. Mangrove deforestation could lead to reduction in the available space for oysters to set and grow.

## **Social Issues**

### **Fin Fish Fishery**

From the socio-economic view point, it is clear that the peripheral communities derive many benefits from the TWNP. Unfortunately, numerous constraints encountered have resulted in a decreasing yield trend in many of the economic activities, including in the oyster and fin fish fisheries.

At Old Jeshwang pigs from the area pose a serious threat to the livelihood of the women fish smokers. If unguarded the pigs would eat the fish smoking on the grills. This has financial implications for the women.

In the Oyster industry, the harvesters at Lamin indicate that for lack of water and sanitation facilities at their landing sites (Lamin Lodge and Siaka Tenda) they usually defecate in the stream or water's edge creating potential environmental problems. This could potentially jeopardize their oyster's quality particularly if the up-market segment is to be targeted with certain products such as the fresh half-shell trade.

Clearly the above have environmental and socio-economic consequences the impact of which could be reflected within the various fisheries as the overall livelihood of the operators could be impacted. This could result in diminished fish catches and oyster production and, consequently lower financial income.

### **2.2.6 Improving Current Fishing Conditions for Socio-economic and Environmental Gains**

Given the current conditions of the various operators in the TWNP it is clear that both the fin fish and shell fish operators need support. However, it will be recommended that the oyster industry be supported for now, whilst the need of the fin fish and shrimp fishermen could be considered in subsequent cycles. In addition the women fish smokers need to be supported as well.

The following are therefore being recommended in order to improve the socio-economic conditions of the oyster harvesting communities, and the women fish smokers at Old Jeshwang:

1. Pilot the raft and rack culture techniques (the former advocated by the Taiwanese Mission) given the fact that sufficient expertise is now available locally to carry on with the trials. However, it will be recommended that only a few selected sites be opened up rather than all the oyster bases.

This is an opportunity for TRY Oyster Association, DPWM, DOF and NEA to collaborate in this and similar activities. (See Annex 2A for details, including cost estimates). A set of Memorandum of Understanding (MOUs) are therefore necessary to consolidate this cooperation. Draft MOUs are also attached in this same Annex.

2. Provide prototypes of the so called "sinkiri kuto" oven that is being advocated by TRY Women Oyster Association, and pilot its use at Lamin, Kubune, and Old Jeshwang. If found suitable and acceptable the technology could be replicated at the other oyster sites. (See Annex 2B for details, including cost estimates). An MOU is necessary here as well (see Annex 2BB for a draft MOU).
3. Provide a fence around the smoke ovens for the women fish smokers at Old Jeshwang to keep out the pigs.
4. Many of the women harvesters engage in lime production by burning the oyster shells as an income generating activity, especially during the closed season. The current technology appears to require too much wood to accomplish the process, and this is not sustainable.

There is therefore need to investigate alternative ways of burning the shells with less wood than is currently used. In this regard, NEA and its collaborating partners are being urged to investigate alternative lime producing methods to be used by the women.

5. The harvesters at Lamin indicate that for lack of water and sanitation facilities at their landing sites (Lamin Lodge and Siaka Tenda) they usually defecate in the stream or water's edge.

It will be important if this constraint is addressed, especially in the next cycle of resource allocation by NEA. TRY Oyster Association should work with the DOF to seek support for the construction of this important facility.

6. Build a shucking shed for Old Jeshwang as there is none whilst all the other sites have shucking sheds.

In addition it is necessary to provide support to fence off the area being used by the oyster harvesters (which includes the smoke oven, the toilet and sanitation facilities and the proposed shucking shed).

It is however being recommended that a more detail assessment for these two interventions be carried out in time for the next cycle of support from NEA.

## 2.2.7 Major issues affecting the Exploitation of the Full Potential of Tanbi Wetland National Park

The major issues that can improve the performance of the operators (both fin fishermen and oyster harvesters) in the TWNP are indicated in Table 11 as raised during the consultations.

**Table 11: Major Issues Affecting Exploitation of TWNP Resources**

Activity/Issue	Constraints	Proposed mitigation
Monitoring and enforcement of laws	Weak institutional capacity of DPWM and DOF	Build capacity of DPWM, DOF and Gambia Navy
	Weak information and knowledge base of local authorities and other stakeholders	Consultations and sensitization campaigns
Fin Fish Fishing	Use of drag nets/seine net	Increase monitoring and surveillance of Park
	Illegal fishing (Senegalese boats)	Increase monitoring and surveillance
	Inappropriate mesh sizes	Increase monitoring and surveillance
Fish Smoking	Pigs eating fish when not guarded	Fence off smoking area at Old Jeshwang to stop pigs getting to the ovens
		Consult and sensitize pig owners on the impact of the pigs on the women smokers
Lime Production	Uses too much wood	Investigate alternative methods of lime production
Oyster Collection	Inappropriate working gears	Provide gloves, shocks & shoes, etc.)
	During the rains and closed season, no other income generation activity	Engage in petty trading
		Fish for crabs, cockles, fish



	Lack of credit facilities	Create Revolving loan scheme for operators
	No enough oysters in the bolongs	Practice sustainable harvesting methods (closed season)
		Sensitization and capacity building of oyster harvesters
		Practice oyster culture (Capacity building)
	Lack of own canoe	Provide canoes
Oyster Steaming	Tedious and hazardous	Provide “sinkiri kuto” (Capacity building)
	Uses too much wood	
Oyster Smoking	Tedious and hazardous	Provide improved smoke oven
	Uses too much wood	

Given the above Table, and on the observation of the study team there is a lot of weakness on the part of the DOF. There is no personnel on the ground. Certain complaints concerning illegal fishing operations (poaching at night by Senegalese fishermen) need to be addressed. The DOF therefore needs to be supported by deploying an officer, and providing mobility for the personnel to monitor the area. He would work with his counterpart (DPWM) who has offices at Old Jeshwang and Lamin to enforce the regulations.

One of these offices (preferably at Lamin) should be supported by the NEA to provide office equipment and furniture. See Annex 2 for details).

The Gambia Navy and local authorities should be alerted to assist to arrest illegal fishing operations.

Try Oyster women need to be supported with appropriate materials and apparel as detailed in Annex 2. They use sacks and cloths to cover their feet when going out to sea, which is risky. Appropriate clothing and materials can be provided for them for better protection.

In view of the apparent overfishing of the oysters when the season is open there is need for alternative sources of oysters apart from harvesting from the wild. Potential for Oyster culture should be investigated some more to see if it will solve the problem. In addition, harvesters should be sensitized regarding the problem and institute some internal rules and regulations to manage the resources. This could include fishing on alternate days rather than daily, etc.

Given the above it is recommended that support be provided to implement the proposed projects in the TWNP as summarized in Table 12 below. The details will be found in Annex 2 of this report. This support will go towards financing trials in oyster culture and provision of appropriate apparel for oyster harvesters, introduction of a new innovation in steaming of oysters, and assisting women smokers to keep stray pigs away from their smoke ovens.

**Table 12: Budget Summary for Implementation of Proposed Projects in TWNP**

Proposed Project/Activity	Estimated Cost	Remarks
Trials in Oyster Culture	876,650	Sect. I of Annex 2
Introduction of Sinkiri Kuto	279, 840	Sect. 12 of Annex 2
Provision of fencing for Women Smokers	84,350	Sect. 9 Annex 2
<b>Total support required for TWNP</b>	<b>1,240,840</b>	

### Part 3: CONCLUSIONS AND RECOMMENDATIONS

To enhance the current fishing conditions for the socio-economic improvement of the communities that utilize the resources, and the environmental sustainability of the wetland areas of BWR, and TWNP it is clear that these fishers need support. The value of the total requests from the two wetland areas equals D4, 801, 840.

In addition during the presentation of the main study findings of this study at NEA, the Project observed that a baseline study needs to be conducted as soon as possible to form the basis for the impact assessment of the project in the lives of the beneficiaries a few years after the support. This is a valid observation, and consequently the consultant concurs with the observation. It is therefore recommended that resources be provided for this study to begin as soon as possible.

In addition, should the available money be insufficient to procure all the requested items it is recommended that Project should procure all the materials and equipment requested by the operators from TWNP now, and only some materials for BWR. The rest of the materials for BWR can be provided in the next cycle of funding. Accordingly consider the following:

1. Procure all the materials and equipment for TWNP	D1,240,840
2. Conduct of Baseline Study	D400,000
3. Capacity building of DPWM Annex 1)	D197,500 (see Section 13 of
4. Procure fishing materials for BWR (nets, ropes, old freezers, bicycles, etc.) valued at Annex 1)	D264,500 (see section 11 of
5. Procure 5 of the requested 13 outboard motors valued at Annex 1)	D400,000 (see section 11 of
<b>Total value</b>	<b><u>2,502,840</u></b>

The following are additional recommendations:

#### FOR BAO BOLONG

##### Recommendation 1

The use of the drag or seine net results in the capture of substantial quantities of juvenile fish and other invertebrates, and is a threat to the maintenance of sustainable yields. Its use should be prohibited in accordance with the existing Fisheries regulations to protect ecologically sensitive areas, and spawning fish populations to enhance recruitment of stocks.

##### Recommendation 2

All future developments in the BWR should be adequately assessed at the proposal stage to ensure compliance with the existing environmental regulations and objectives of the Fisheries Department. In addition, the socioeconomic implications to the peripheral communities of proposed development projects should be included in the assessments.

### **Recommendation 3**

At Bereto/Baransanto plains in Salikene there is the potential for introducing Fish Ranching. As in most parts of the wetland the areas appears to be a nursery or sanctuary for many types of fish species including marine fishes such as the “Kujalo”, “sompato”, etc. It is also populated by many species of the tilapia, “tambajango”, etc.

However, it will be recommended that a more in-depth assessment of the possibility of introducing fish ranching be carried out as the time that the study team had at its disposal was too short to answer all the relevant questions. A study to determine the dynamics, species abundance and diversity need to be undertaken to enable reasonable predictions.

## **FOR TANBI WETLAND NATIONAL PARK**

### **Recommendation 1**

As in BWR, in the fin fish sector at TWNP a critical issue that requires urgent attention is the use of drag nets or “mbali laaw” which catches juvenile fish and shrimps within the Park.

It is therefore recommended that DOF in collaboration with DPWM, the Gambia Navy and local authorities take necessary actions to control illegal fishing by poachers from Senegal, and the use of inappropriate fishing methods in sensitive and fragile areas within the Park.

The existing national policies and regulations need to be enforced to control these activities, including imposition of seasonal restrictions on fishing or closed areas to protect nursery grounds.

### **Recommendation 2**

In the oyster industry the “closed season” management method for harvesting is clearly positive, in terms of bigger sized oysters fetching higher prices. However, the oyster populations decline rapidly soon after declaring the season open due to the high number of harvesters.

Therefore the harvesters need to be sensitized regarding sustainable management and harvesting (perhaps harvesters resorting to fishing on alternate days or “rest days”, rather than on each day) of oysters. Local authorities need to be involved in the consultations and sensitization campaigns to raise awareness of the harvesters.

### **Recommendation 3**

At Old Jeshwang, there is clearly need to build a shucking shed for the women as there is none whilst all the other sites have shucking sheds.

In addition support needs to be provided to TRY to fence off the area being used by the oyster harvesters (which includes the smoke oven, the toilet and sanitation facilities and the proposed shucking shed) to exclude intruders.

It is recommended that for the fencing of the facilities, a more comprehensive assessment of the works needs to be carried out given that part of the fence will run through some muddy and spongy ground. TRY Association should work with NEA and DOF to develop a proposal for future funding by NEA or any other potential funding source.

### **Recommendation 4**

The harvesters at Lamin need to be provided with sanitation facilities to forestall possible environmental and public health problems within the industry.

It will be important if this constraint is addressed. TRY Oyster Association should work with DOF to seek funding from NEA or any other possible source to address this need.

### **Recommendation 5**

Many of the women harvesters engage in lime production through burning the oyster shells as an income generating activity, especially during the closed season. The current technology appears to require too much wood to accomplish the process, and this is not sustainable.

There is therefore need to investigate alternative ways of burning the shells with less amount of wood than is currently used. In this regard, NEA and its collaborating partners are being urged to investigate alternative lime producing methods to be used by the women.

**Recommendation 6**

DOF must, as a matter of urgency, deploy staff to the two wetland sites to oversee implementation of the national fisheries policy, including enforcing the existing legislation in general, and specifically to support other stakeholders to implement the proposed projects and activities in the study Report.

There are offices built by DPWM at both TWNP and BWR that could be shared with DOF (based on the existing MOU between the two institutions).

**Annexes:**

- Annex 1: Proposed Support for the Fishermen's Associations in Bao bolong Wetland Reserve
- Annex 2: Proposed Projects for Implementation at Tanbi Wetland National Park
- Annex 3: One Year Implementation Program and Plan
- Annex 4: Long Term Self-financing Plan For the Trials Focused on the Fisher Folks in Bao bolong Wetland Reserve and Tanbi Wetland National Park
- Annex 5: Persons Met

## **ANNEX 1 - Proposed Support for the Fishermen's Associations in Bao bolong Wetland Reserve**

### **Introduction and Background**

This report describes the implementation of the support that is intended for the fishermen operating in the Bao bolong Wetland Reserve (BWR) following the study commissioned by the National Environment Agency (NEA). It is an Annex of the main report, and should therefore be read in conjunction with the report. Among other things, the study recommendations include provision of fishing equipment and materials to some of the fishermen and other operators such as "Banabanas" to enhance their performance.

### **1. The Fisheries Activities**

Most of the fishermen operating in the BWR usually fish within the tributaries that are closer to their communities for the main reason that they cannot venture far because they do not have the required crafts and equipment. Fishing in most of the fishing villages visited is insignificant operations primarily conducted at subsistence level. Fishing activities involve the use of cast nets, gill nets, and hook and line, and seine fishing, with a few fishermen owning canoes.

Others without canoes wade waist deep in the shallow areas of the bolongs with cast nets pulling along a plastic pan tied to their waist to empty the catch. Some gill netting is also carried out by a few fishermen in Salikenni, Katchang and Dai.

### **2. Creation of Associations**

The Chief of Upper Badibu (Seyfo Ebrima Jammeh) has attempted to form a Fishermen's Association which includes all fishermen, from Jammeh Kunda in Central Badibu to Balengho in Upper Bidibu, and has in fact encouraged the registration of the Association. This Association covers member communities that are both within and outside the BWR.

Incidentally the peripheral communities to the BWR have also formed smaller Fishermen's Associations based on their respective proximity to the tributary (ies) within which they operate. For example the villages of Dai, Noo Kunda, Kekuta Kunda and Buranya operate within the Kuyerr bolong (a tributary of the Manioka Bolong) and have their landing base at Kuyerr tenda.

The communities of Conteh Kunda, Illiasa and India operate within the Bao bolong tributary, with their landing base at Bao bolong, whilst the community of Kachang uses the Basun bolong mainly to land at Kachang. The communities of Alkali Kunda, Yalal, Gerong, and Jumansar Koto fish within the Gerong bolong and one could land at Gerong tenda.

Salikenni and Jammeh Kunda do not have as close an affinity to each other in terms of fishing areas as the others, although they each have their landing sites close to their communities (Salikenni uses the Mori bolong whilst Jammeh Kunda operate on the Sanjong bolong, a tributary of Mori bolong).

Consequently there are essentially 5 de facto fish landing sites based on this way of operation, and have formed themselves into 5 fishermen's associations, some of them duly registered.

Therefore the support is aimed at the following Associations:

- i) Dai/Duntumalang/Kekuta Kunda/Buranya/Noo Kunda Fishermen Association
- ii) Bao Bolong/Conteh Kunda Niggi/ Illiassa/India Fishermen Association
- iii) Kachang Fishermen Association
- iv) Alkali Kunda/Yalal/Jumansar Koto Fishing Kafoo
- v) Salikenni and Jammeh Kunda Landing Sites

### **3 Converting the Grant into a Fishermen's Revolving Loan Fund**

It is recommended that the grant of materials be made to the Associations, which will on lend them to the members, to be repaid over a period of time to be decided by themselves. The value of each beneficiary's material will be the loan to be repaid in equal monthly installments with a small interest charge (also to be paid monthly), and a compulsory saving (amount to be decided by the group).

### **4 Sustainability**

Sustainability of the scheme is premised on the fact that the money is paid back with interest, causing the fund to grow, and will form the Associations' financial base from which other members who have not benefited from the current support will be assisted under the same terms and conditions.

The regular monthly loan repayments and savings will be available for distribution to the individual members, on the basis of a formula that links payout to the amount saved. This lump sum distribution provides some amount of money that members can then use as they want, without restriction. The "compulsory savings" element will provide any future investments that the beneficiary wishes to undertake by using his own savings either as equity or as collateral.

### **5 Introducing the Village Banking Concept**

Revolving loans have been extended to Gambian fishermen over the years, and unfortunately most of the beneficiaries defaulted in their repayments due mainly to lack of monitoring and follow-ups by the donors. However, to make this Revolving Loan scheme work, the "Village Banking" concept will be introduced. The concept was first introduced in BWR by the ICAM II (Integrated Coastal Area Management) Project funded by GEF/World Bank, and implemented by DPWM. Village banking techniques enable poor people to compulsory save enough money to buy useful items for the household and make opportunistic business investments.

The main outcome of the scheme will be the sustainability of financing of fishing operations within the BWR. In this case this will be in the form of:

- i. Establishing an expanded system to provide fishing gear, outboard engines, spare parts, and cash sales facility
- ii. Improved income earning opportunities in the fishing communities
- iii. Improved knowledge and skills in Village Banking techniques
- iv. Improved market outlets for fresh fish through the encouragement of improved handling

At BWR village banking has developed the capacity of the women to manage a revolving loan scheme; it has been in operation for 3-4 years now during which time their money has grown 4 fold, and all the loans have been recovered.

## **6 Proposed Approach**

In this Project each of the recipient Associations will be regarded as a “Village Bank” and will open an account with the Trust Bank in Farafenni into which all loan repayments and savings are paid after each collection day. As mentioned earlier, the value of each beneficiary’s material will be regarded as the loan which will be repaid in equal monthly installments with a small interest charge. To guide the Associations, a comprehensive set of “House Rules” (See Annex 2) will be applied, adopted by the members; they will be sensitized, and their capacity built around the document.

To start off the process, the members of the participating Associations (whether supported by NEA or not) will enroll by making an initial contribution of D50 in the form of a Savings Pass Book (this amount could be reviewed by the members as necessary) before the materials are distributed. A three-day capacity building workshop will be conducted at the DPWM Offices at Noo Kunda to train the fishermen in the participating Associations on the implementation of the Village Banking scheme

Presided over by elected Executive Committees regular monthly meetings will be held by each Association (date and place will be agreed by the respective memberships) during which loan repayments and savings will be collected, and each individual’s monthly savings noted in the Savings Pass Books. In addition other issues relating to the Association will be discussed.

## **7 Coordination and Monitoring**

The current Warden of BWR will be the Coordinator of this scheme. Following the success of the ICAM II Project, and in view of his experience in coordinating the women’s Village Banking scheme in BWR. It is intended that he performs similar roles in the fishermen’s case.

He will visit all the landing sites at least once a fortnight week with a view to ensuring that the materials and equipment are being used appropriately and whether or not the fishermen are actually going to sea. This is a very important element in the monitoring and follow-up responsibilities of the Coordinator. Very often one of the reasons for fishermen to default on loan repayment is simply because they are not monitored.

In addition, he will coordinate and attend all monthly meetings of the Associations, helping out in the organization, record keeping, collection of all monies, and executing all banking transactions with support from the Associations’ Executive Committees. He will compile all periodic reports for submission the DPWM, NEA and DOF.

## **8 Capacity Building**

With his experience in the women’s Village Banking process, the BWR Warden will train and build the capacity of the members on the application of the concept of Village Banking. The training will promote and sensitize the fishermen on the ways to improve and strengthen rural microfinance management, and will enhance the fishermen members to form reliable and strong village banking systems as alternative ways of getting financial support.

Most importantly the fishermen will review and adopt the draft Loan Agreement and “House Rules” with the accompanying Forms (Annex 2) as the guiding principles of the Associations. During a three day session (before the materials and equipment are distributed to the beneficiaries) all the Associations’ members will assemble at the DPWM head office in Noo Kunda for the training. The training team will be led by the Warden of BWR and supported by two others from DPWM and DOF.

Annex 3 provides a draft MOU that will provide the formal basis for the participation and cooperation of the various stakeholders in this project as well as the Oyster project in the TWNP (NEA, DOF, and DPWM).



**9 Implementation Plan for the Distribution and Management of Materials and Equipment  
– Bao bolong Wetland Reserve Fishermen’s Associations**

No	Activity	Period	Particip ants	Institutional Responsibil ity	Implementatio n Responsibility	Output
1	Procurement of materials for (nets, ropes, engines, etc.)	Oct 2014	Fisherm en Reps. DPWM, NEA	NEA	NEA/NPC	Netting materials available
2	Consultative meetings with the respective Associations regarding logistics and planning towards the training sessions	Jan 2015	Fisherm en, DPWM, DOF	DPWM	BWR Warden	Logistics and training modules discussed
3	Training in Village Banking	Jan 2015	All Fisherm en Associati ons, DPWM, DOF	DPWM	BWR Warden	Fishermen trained in village banking
4	Distribution of fishing materials to the Associations	Jan 2015	All Fisherm en Associati ons, DPWM, DOF	DPWM	BWR Warden	Materials distributed to Associatio ns
5	Preparation and mounting of nets by beneficiaries	Feb 2015	Fisherm en	DPWM	BWR Warden	All nets mounted and ready to use
<b>START OF FISHING OPERATIONS AND MARKETING</b>						
6	Monthly monitoring visits to landing sites and Associations to check on activities	Feb. 2015- 2016	BWR Warden, Fisherm en, SIMI	DPWM	BWR Warden	Loans repaid, savings made, Reports

## 10 Project Monitoring and Evaluation Plan- Indicators and Responsibilities

No	Activity	Monitoring indicators	Means of Verification	Project Stage	Responsibility
1	Procurement of materials (nets, ropes, engines, etc.)	No. and types of nets, ropes, reports	Self-checks by Fishermen reps. DPWM, DOF and NEA officials	Preparatory	BWR Warden, NEA, Fishermen reps.
2	Consultative meetings with respective Associations regarding logistics and planning towards the training sessions	No. of meetings and consultations held	Available reports; self-checks	Project Preparatory	BWR Warden
3	Training in Village Banking	No. of fishermen associations and beneficiaries trained	Workshop reports; independent checks by NEA, DOF, and DPWM officials	Project preparatory	BWR Warden, DOF
4	Distribution of fishing materials to the Associations	No. of materials distributed	Available reports; self-checks	Preparatory	BWR Warden, NEA, DOF
5	Preparation and mounting of nets by beneficiaries	No. of nets mounted	Available reports; Self-checks	Project implementation	BWR Warden, Fishermen
<b>START OF FISHING OPERATIONS AND MARKETING</b>					
6	Monthly monitoring visits to landing sites and Associations to check on activities	No. of visits; Monitoring reports	Self-checks; monthly checks by DPWM, SIMI	Fishing/marketing period	BWR Warden

9. Budget Summary for Fishing Items Requested															
Association	Items requested														Value
	Tam. Jalo	Engine	Canoe	Chaso	Boroba	Twine	Cast net	Bicycle	Freezer	Rope 1	Rope 2	Hook	Line	Tray	
Dai/Noo Kunda	11	1	4	11	9	0	0	7	3	26	0	0	0	2	
Value	17,600	400,000	750,000	20,900	40,500	0	0	24,500	7,500	10,400	0	0	0	1,000	1,272,400
Bao bolong	5	1	1	2	2	2	0	5	6	2	9	3	0	0	
Value	8,000	80,000	150,000	3,800	9,000	0	5,000	21,000	5,000	3,600	600	0	0	0	286,000
Katchang	3	3	3	3	0	5	4	0	0	6	3	0	0	0	
Value	4,800	240,000	450,000	5,700	0	500	4,000	0	0	2,400	600	0	0	0	708,000
Alkali Kunda	0	3	3	6	6	0	0	0	0	12	0	2	2	0	
Value	0	240,000	450,000	11,400	27,000	0	0	0	0	4,800	0	600	800	0	734,600
Salikenni	6	1	1	5	0	0	0	0	0	11	0	0	0	0	
Value	9,600	80,000	150,000	9,500	0	0	0	0	0	4,400	0	0	0	0	253,500
Total Items	25	13	13	27	17	5	9	13	5	64	6	2	2	2	
Value	40,000	1,040,000	1,950,000	51,300	76,500	500	9,000	45,500	12,500	25,600	1,200	600	800	1,000	3,254,500

The details of the requests can be found in Annexes 1AA-1EE.

#### 10. Estimated Budget for Training and Capacity Building in Village Banking

Item	Description	Quantity	Unit Price (D)	Total Price (D)
Flip chart paper	Writing material	2	250	500
Marker	Used for writing	1 packet	250	250
Food/ water	Breakfast and lunch	5 communities	D200 x 60 x 3 days	36,000
Allowance	Night/Transport refund for Fishermen and Banabanas	80 Fishermen and Banabanas	60 x D200 x 3 days	36,000
Resource persons	Lectures on Parks and Fish. management	3 Persons	3 x 1000 x 3 days	9,000
Trainer	To train in Village Banking, savings, loan repayment, etc.	1	1 x 5,000 x 3 days	15,000
<b>Total</b>				<b>96,750</b>

### 11. Estimated Budget for Operation of the Village Banks

Item	Quantity	Unit Cost (D)	Total Cost (D)
Individual Saving Pass books	100	300	3,000
Association Membership Savings Registers	5	200	1,000
<b>Sub Total</b>			<b>4,000</b>
<b>Management and Administration of Village Banks</b>			
Stationery (A4 Paper)	20 boxes	150	3,000
Associations Stamps	5	500	2,500
Stamp Pads	5	100	500
Calculators	5	400	2,000
Stapling machines	5	50	250
<b>Sub Total</b>			<b>8,250</b>
<b>Capacity Building of DPWM NOO Kunda Office</b>			
Junior Executive Desk	2	12,000	24,000
Junior Executive Chair	2	8,500	17,000
Filing Cabinet	1	7,500	7,500
Visitors Chairs	2	4,000	8,000
Book Shelf	1	10,000	10,000
Desk top Computer	1	35,000	35,000
HP Laser Jet Printer (P1006)	1	6,000	6,000
Motor Cycle (for Warden and DOF personnel)	2	45,000	90,000
<b>Sub total</b>			<b>197,500</b>

### 12. Budget Summary Table for Support in Bao bolong Wetland Reserve

Item/Activity	Estimated Total	Remarks
Fishing materials and equipment	3,254,500	Section 11 and Annexes 1AA-1EE
Training and capacity building in Village Banking	96,750	Section 12
Management and operations of the Village Banks	12,250	Section 13
Institutional capacity building of DPWM NOO Kunda Office	197,500	Section 13
<b>Total Support Required for Bao bolong</b>	<b>3,561,000</b>	

**ANNEX 1AA: DAI/DUNTUMALANG/KEKUTA KUNDA/BURANYA/NOO KUNDA FISHERMEN ASSOCIATION**

<b>Name</b>	<b>Item</b>	<b>Quantity</b>	<b>Unit</b>	<b>Total</b>
Siaka Bass	Canoe	1	150,000	150,000
	Chaso	3 bundles	1, 800	5,400
	Engine	1	80,000	80,000
	Rope	3 bundles	400	1,200
	Boroba	3 bundles	4,500	13,500
	Rope	3 bundles	400	1,200
<b>Sub total</b>				<b>251,300</b>
Lang Jammeh	Canoe	1	150,000	150,000
	Chaso	2 bundles	1,900	3,800
	Engine	1	80,000	80,000
	Rope	2 bundles	400	800
	Tam. Jalo	1 bundle	1,600	1,600
	Rope	2 bundles	400	800
	Boraba	2 bundles	4,500	9,000
	Rope	2 bundles	400	800
<b>Sub total</b>				<b>246,800</b>
Kalilu Cessay	Canoe	1	150,000	150,000
	Engine	1	80,000	80,000
	Chaso	2 bundles	1,900	3,800
	Rope	2 bundles	400	800
	Tam. Jalo	2 bundles	1,600	3,200
	Rope	2 bundles	400	800
	Boroba	2 bundles	4,500	9,000
	Rope	2 bundles	400	800
<b>Sub total</b>				<b>248,400</b>
Foday Jadama	Tam. jalo	2 bundles	1,600	3,200
	bicycle	1	3,500	3,500
<b>Sub total</b>				<b>6,700</b>
Lang Fofana	Tam. jalo	2 bundles	1,600	3,200
	bicycle	1	3,500	3,500
<b>Sub total</b>				<b>6,700</b>
Buramanding Dampha	Tam. jalo	2 bundles	1,600	3,200
	Bicycle	1	3,500	3,500
<b>Sub total</b>				<b>6,700</b>
Suntu Camara	Canoe	1	150,000	150,000
	Engine	1	80,000	80,000
	Boroba	2 bundles	4,500	9,000
	Rope	2 bundles	400	800
	Chaso	2 bundles	1,900	3,800
	Rope	2 bundles	400	800

<b>Sub total</b>				<b>244,200</b>
Sainy Dampha	Canoe	1	150,000	150,000
	Engine	1	80,000	80,000
	Chaso	2 bundles	1,900	3,800
	Rope	2 bundles	400	800
	Tam. jalo	2 bundles	1,600	3200
	Rope	2 bundles	400	800
<b>Sub total</b>				<b>238,600</b>
<b>Grand Total</b>				
<b>BANABANAS</b>				
Ba Saiku Dampha	Bicycle	1	3,500	3,500
	Trays	2 trays	500	1,000
<b>Sub Total</b>				<b>4,500</b>
Kebba Fanding Jadama	Bicycle	1	3,500	3,500
	Old freezer	1	2,500	2,500
<b>Sub total</b>				<b>6,000</b>
Bakary Jammeh	Bicycle	1	3,500	3,500
	Old freezer	1	2,500	2,500
<b>Sub total</b>				<b>6,000</b>
Kebba Yankuba Bass	Bicycle	1	3,500	3,500
	Old freezer	1	2,500	2,500
<b>Sub total</b>				<b>6,000</b>
<b>Total</b>				<b>22,500</b>
<b>Grand Total</b>				<b>1,251,800</b>

**ANNEX 1BB: BAO BOLONG/CONTEH KUNDA NIGGI/ ILLIASSA/INDIA FISHERMEN ASSOCIATION**

NAME	ITEMS	QUANTITY	UNIT PRICE	TOTAL
Kebba Madi Jadama	Fai jalo/Cast net	2 bundles	1,000	2,000
	Bicycle	1	3,500	3,500
<b>Sub total</b>				<b>5,500</b>
Karamba Konteh	Bicycle	1	3,500	3,500
	Fourou jalo/cast net	1 bundle	1,000	1,000
	Rope	1 bundle	200	200
	Tambajang jalo	1 bundle	1,600	1,600
	Rope	1 bundle	400	400
<b>Sub total</b>				<b>6,700</b>
Kebba Yerro Konteh	Canoe	1	150,000	150,000
	Engine	1	80,000	80,000
	Freezer	1	2,500	2,500
	Boraba	2 bundles	4,500	9,000
	Rope	2 bundles	400	800
	Chaso	2 bundles	1,900	3,800
	Rope	2 bundles	400	800
<b>Sub total</b>				<b>246,900</b>
Lamin Touray	Tam. Jalo	1 bundle	1,600	1,600
	Rope	1 bundle	400	400
	Fourou jalo/castnet	1 bundle	1,000	1,000
	Rope	1 bundle	200	200
	Bicycle	1 bundle	3,500	3,500
		1	3,500	3,500
<b>Sub total</b>				<b>6,700</b>
Kebba Suso	Tamabanja net	1 bundle	1,600	1,600
	Rope	1 bundle	400	400
	Rope	1 bundle	200	200
	Fouru jalo/cast net	1 bundle	1,000	1,000
<b>Sub total</b>				<b>3,200</b>
Ousman Touray	Bicycle	1	3,500	3,500
	Tam. Jalo	1 bundle	1,600	1,600
	Rope	1	400	400
<b>Sub total</b>				<b>5,500</b>
Kalilu Darboe	Bicycle	1	3,500	3,500
	Tam. jalo	1 bundle	1,600	1,600
	Rope	1 bundle	400	400
<b>Sub total</b>				<b>5,500</b>
<b>BANABANA</b>				
Sarjo Minteh	Bicycle	1	3,500	3,500
	Old freezer	1	2,500	4,500
<b>Sub total</b>				<b>8,000</b>
<b>GRAND TOTAL</b>				<b>288,000</b>

# ANNEX 1CC: KACHANG FISHERMEN'S ASSOCIATION

NAME	ITEM	QUANTITY	UNIT PRICE	TOTAL
Lamin Secka	Tam. jalo"	1 bundle	1,600	1,600
	Rope	1 bundle	400	400
	Fai Jalo/Cast net	2 bundles	1,000	2,000
	Rope	1 bundle	200	200
<b>Sub total</b>				<b>4,200</b>
Kausu Janneh	Canoe	1	150,000	150,000
	Engine	1	80,000	80,000
	Chali Jalo/chaso	1 bundle	1,900	1,900
	Rope	1 bundle	400	400
<b>Sub total</b>				<b>232,300</b>
Musa Barrow	Canoe	1	150,000	150,000
	Engine	1	80,000	80,000
	Tambajang Jalo	2 bundles	1600	3,200
	Chali	2 bundles	1900	3,800
	Jalo/chaso	5 rolls	100	500
	Pelato/Twine	4 Bundles	400	1,600
	Rope			
<b>Sub Total</b>				<b>239,100</b>
Alieu Ceesay	Canoe	1	150,000	150,000
	Engine	1	80,000	80,000
<b>Sub total</b>				<b>230,000</b>
Salimena Ceesay	Fai jalo/cast net	1 bundle	1000	1, 000
	Rope	1 bundle	200	200
<b>Sub Total</b>				<b>1,200</b>
Lang Tunkara	Fai jalo/cast	1 bundle	1000	1000
	Rope	1 bundle	200	200
<b>Sub total</b>				<b>1,200</b>
<b>Grand total</b>				<b>707,100</b>



**Annex 1DD: ALKALI KUNDA/YALAL/JUMANSAR KOTO FISHING KAFOO**

Name	Materials/ Items	Quantity	Unit Price	Total
Musa Manneh	Canoe	1	150,000	150,000
	Borabaa	2 bundles	4,500	9,000
	Rope	2 bundles	400	800
	Chasso	2 bundles	1,900	3,800
	Rope	2 bundles	400	800
	Engine (8HP)	1	80,000	80,000
<b>Sub Total</b>				<b>244, 400</b>
Burama Jammeh	Canoe	1	150,000	150,000
	Boraba	2 bundles	4,500	9,000
	Engine	1	80,000	80,000
	Rope	2 bundles	400	800
	Chaso	2 bundles	1,900	3,800
	Rope	2 bundles	400	800
	Hook	2 boxes	300	600
	Line	2 bundles	400	800
<b>Sub Total</b>				<b>245,800</b>
Birom Bah	Canoe	1	150,000	150,000
	Engine	1	80,000	80,000
	Boraba	2 bundles	4,500	9,000
	Rope	2 bundles	400	800
	Chaso	2 bundles	1,900	3,800
	Rope	2 bundles	400	800
<b>Sub Total</b>				<b>244,400</b>
<b>Grand Total</b>				<b>734,600</b>

**ANNEX 1 EE: SALIKENI AND JAMMEH LANDING SITES**

Name	Item	Quantity	Unit (D)	Total (D)
<b>Kemo Kassama (Jubeh)</b>	Canoe	1	150,000	150,000
	Engine	1	80,000	80,000
	Chaso	3 bundles	1,900	5,700
	Rope	3 bundles	400	1,200
	Tam. Jalo	4 bundles	1,600	6,400
	Rope	4 bundles	400	1,600
<b>Sub total</b>				<b>244,900</b>
<b>Lang Jadama</b>	Chaso	2 bundles	1,900	3,800
	Rope	2 bundles	400	800
	Tam. Jalo	2 bundles	1,600	3,200
	Rope	2 bundles	400	800
<b>Sub total</b>				<b>8,600</b>
<b>Grand Total</b>				<b>253,500</b>

## DRAFT LOAN AGREEMENT

### LOAN AGREEMENT BETWEEN DAI/DUNTUMALANG,....., FISHERMEN'S ASSOCIATION AND

**Siaka Bass of ..... Village**

Today, the ...11<sup>th</sup> day of September, 2014..... Siaka Bass ..... has concluded a loan agreement with the Dai/Duntumalang ..... Fishermen's Association.

The loan of materials and equipment valued at GMD \_\_\_\_\_ is to be reimbursed in the DAI/DUNTUMALANG Account number \_\_\_\_\_ on the following conditions:

Length of Loan period -----

**Last day of Repayment:** \_\_\_\_\_

**Interest rate:** 10%

**Minimum saving required: 250/month**

No.	Name	ID	Loan amount	Initial Saving	Signature
1					
2					
3					

Total in words: \_\_\_\_\_

<b>For the Management Committee</b>
President: .....
Signature: .....
Treasurer: .....
Signature: .....
Secretary: .....
Signature: .....

## **DRAFT – HOUSE RULES**

### **HOUSE RULES OF THE BAO BOLONG FISHERMEN'S ASSOCIATION'S VILLAGE BANK**

#### **Article 1:**

The Village Bank of Dai/Duntumalang ....., Fishermen's Association is baptised.

## **MEMBERSHIP – RESIGNATION – EXPULSION**

#### **Article 2:**

Married and unmarried men from **18 to 60 years** can be members of the village bank.

#### **Article 3:**

Membership status is acquired by having an individual passbook of **GMD50**.

#### **Article 4:**

Membership status can be lost at any time by resignation, expulsion or on the decision of the members of the General Assembly or by failing to abide the internal bank regulation.

## **THE LOAN ACCOUNT**

#### **Article 5:**

The first loan account is set at the total value of the materials and equipment received.

#### **Article 6:**

There is a compulsory saving for all loan beneficiaries. The saving should be at least D250 per month.

#### **Article 7:**

The loan is divided into 24 equal monthly payments. Those payments are made during the monthly meetings of the Village Bank.

#### **Article 8:**

If the saving deposited in a month is more than the least, the surplus amount can be retrieved by the saver during the cycle (during the monthly meetings), or at the end of the cycle, (the day of recovering the loan). No retrieval of the surplus can be done if the cycle is already closed, before the opening of the subsequent cycle.

#### **Article 9:**

The closure of a cycle corresponds to the repayment of the loan expected by the end of the cycle.

#### **Article 10:**

The minimum saving set for each cycle can be retrieved only in case of resignation or expulsion of the member.

#### **Article 11:**

The interest rate per cycle is set at 10% maximum of the total amount received by each member of the Association. It shall all be paid into the Associations Account to support the structures of the Association divided as follows: 9%: support structure: 1%: to the Coordinator of the Dai/Duntumalang ...Fishermen's Association's Village Bank.

**Article 12:**

The loans and the interests on the loan account (as calculated per cycle) are compulsorily repaid at the end of the cycle.

**Article 13:**

Any loan of the bank can be given by procuration.

**INTERNAL ACCOUNT****Article 14:**

For reasons of solidarity internal beneficiaries account (savings of members and bank interest), are in priority order.

1. Fishermen within the Association but have not received this loan
2. Fishermen members of the Bank

**Article 15:**

Internal account loan are monthly and the first ones are fixed at **GMD1, 500** and levelled up at **GMD 3, 000** and **GMD 5,000**.

**Article 16:**

The interest rate on the account loans is fixed at 5% per month.

**Article 17:**

Loans and interests of internal accounts are compulsorily repaid at the end of the month during monthly meetings.

**Article 18:**

The Bank's Management Committee shall be composed of three members; (President, Secretary, and Treasurer) and elected for one year's mandate, renewable by the General Assembly which meets every month.

**Article 19:**

The qualities, roles and responsibilities of the Bank's Management Committee are:

- The President should be a well-educated person, honest, polite and dynamic and an active man. He is responsible for calling up meetings, to inform the members and the partners, and to chair the meetings. He also signs the loan agreements, bank accounts, and correspondences. He ensures the smooth running of all the Associations activities.
- The Treasurer should always be reachable, intelligent and honest. His income should not be weak.
- The secretary should always be an educated man. He should bring to light all documents: (register and individual booklets) and classify them. He should develop a financial report and present it during the monthly meetings.

**Article 20:**

Only the Management Committee is allowed to approve expenses and loan requests of the internal account. However, the General Assembly may oppose the decision of the Management Committee. The Managing Committee is obliged to respect, and to make people respect these internal rules.

## THE ACCOUNT OF RECYCLED SAVING

### Article 21:

The beneficiaries of the recycled savings account are exclusively those who are not members of the Dai/Duntumalang Fishermen's Associations.

### Article 22:

The loans of the saving recycled account are five months' duration. The first loan of each beneficiary is fixed to **GMD 1,500** and levelled up to **GMD3, 000**. Those loans are repaid at the fifth month of the cycle.

### Article 23:

The interest rate on the loans of recycled saving account is fixed to **7%** for the five months of the cycle. That rate cannot exceed **7%** for the five months.

## ORGANISATION AND MANAGEMENT

### Article 24:

During the first cycle of the loan, the General Assembly of members shall meet every month.

### Article 25:

Monthly savings meetings take place at 3pm. Any member who fails to come from 3:00pm – 3:15pm at the meeting is liable to a fine of **D5**. A member who comes at the meeting sixteen (16) minutes past 3:00pm to half past 4:00pm is liable to a fine of **D10**.

### Article 26:

A member who is missing without permission or without valid reasons (sickness, mourning, wedding, baptism or a long commercial trip) is liable to a **D25** fine.

Three times of lateness are considered as being absent. A member who leaves the meeting before the end is considered as absent.

### Article 27:

Any member involved in disturbance during a bank meeting (useless, discussions, murmurs, insolence, talking without being permitted, pacing up and down, greetings when the meeting has already started, sleeping) is liable to a **D5** fine.

A member who refuses to pay his fines, the Management Committee will take from his savings an amount equal to his unpaid fines during the next meeting.

### Article 28:

All members are obliged to participate to an ecosystem preservation program lead by DPWM and DOF.

### Article 29:

The following reasons lead to an expulsion of a member:

Unpaid loans, fights, three times of being absent in meetings in the same cycle without any valid reason, embezzlement, and insults.

### Article 30:

All fines levied during a meeting are paid in the next meeting at the latest, and they should be taken by the Treasurer.

### Article 31:

A part of the profit obtained by the Bank at the closure of a cycle can be given to the members as dividends, in proportion to their savings.

**Article 32:**

A member who resigns from the Bank, can after regularisation of his account (payment of loans and interests) take his whole savings and his dividends. In case of an expulsion or a voluntary resignation without reasons, the member is able to have his savings but he loses his dividends.

**Article 33:**

The members of the Bank should be enrolled in an Adult Literacy class is possible, so as to follow regularly the lessons.

**Article 34:**

The beneficiaries of an account in the Bank: (Materials loaned, internal and recycled account) are obliged to take part physically and verbally in the activities of reforestation and preserving ecosystems.

**Article 34:**

The beneficiaries of an account in the Bank are obliged to respect these internal rules. Only the General Assembly is able to modify these internal rules.

**Article 35:**

These internal rules have been adopted and approved by the General Assembly which meets at its meeting, this is day:

**Thursday 4 September 2014.**

**The General Assembly and by Delegation, the Managing Committee**

\_\_\_\_\_  
**The President**

\_\_\_\_\_  
**The Secretary**

\_\_\_\_\_  
**The Treasurer**

Village: Dai

**Management Committee**

Secretary:.....

Treasurer:.....

**List of Members of the Village Bank**

<b>Name</b>	<b>Village</b>	<b>National ID Card Number</b>	<b>Remarks</b>

### FISHERMEN'S SAVING FORM

Name of Village .....

Date.....

No.	Name	Savings	Stamp/Signature

### FISHERMEN'S LOAN AND INTEREST PAYMENT FORM

Name of Village .....

Date.....

No.	Name	Loan and Interest	Stamp/Signature

**DRAFT MOU BETWEEN NEA, DPWM AND DOF  
DRAFT MOU BETWEEN NEA, DOF, AND DPWM ON VILLAGE BANKING AND OYSTER  
TRIALS IN BWR AND TWNP**

**MEMORANDUM OF UNDERSTANDING**

**BETWEEN**

**THE NATIONAL ENVIRONMENT AGENCY, DEPARTMENT OF FISHERIES AND  
DEPARTMENT OF PARKS AND WILDLIFE MANAGEMENT**

**THIS MEMORANDUM OF UNDERSTANDING** made this \_\_\_\_\_ day of \_\_\_\_\_ 2014.

**BETWEEN**

**THE NATIONAL ENVIRONMENT AGENCY** represented by the Executive Director, on the one part

**AND**

**THE DEPARTMENT OF FISHERIES and the DEPARTMENT OF PARKS AND WILDLIFE MANAGEMENT** represented by their respective Directors on the other part.

The National Environment Agency shall be referred to as “NEA”

The Department of Fisheries and shall be referred to as “DOF”

The Department of Parks and Wildlife Management shall be referred to as “DPWM”

The NEA, DOF and DPWM shall be referred together as “The Parties”

**WHEREAS**

1. The Government of the Gambia needs to develop the capacity and skills of the fishermen operating in the Bao Bolong Wetland Reserve (BWR), and the women oyster harvesters operating in the Tanbi Wetland National Park (TWNP) in order to meet their full economic and nutritional requirements.
2. NEA has the resources and is willing to support the local fishermen of BWR and oyster women in TWNP in the achievement of their economic and nutritional goals and over all, the Government’s objectives.

**AND WHEREAS**

3. There is a general lack of skills in Village Banking in BWR area, and in the face of low level capacity in fishing in the BWR communities; need for assistance to the oyster women in the TWNP.

In recognition of the specialized skills in the area of Village Banking at the behest of DPWM at BWR, and specialized skills at the behest of DOF in oyster culture and oyster processing, to assist the NEA to coordinate and develop these various skills and expertise within the peripheral fishing communities of BWR and TWNP. This support is aimed at achieving the national goal of poverty reduction through the specific aims and objectives listed below.



## **Aims and Objectives**

- a. To promote and develop approaches that will enhance the sustainable harvesting of the fisheries resources of the BWR and TWNP, taking into consideration the local conditions.
- b. To encourage the participation of local communities in fishing ventures.
- c. To help increase the ability of these wetlands' peripheral communities to maximize the usefulness of unused land into Aquaculture operations and Fish Ranching.
- d. To support the national drive to create employment for the youth living in the rural communities.

## **AND**

**WHEREAS** achieving these aims and objectives requires, in part, from:

### **DPWM**

1. That the DPWM, dedicate a Focal Person full time to coordinate the process of Village Banking development, and monitoring of the equipment and materials to be supplied to the fishermen in BWR
2. The Focal Person becomes the counterpart to the DOF personnel to be deployed to the BWR and TWNP by DOF.
3. The Focal Person represents the DPWM in all the activities and assignments that these development processes demand.
4. The Focal Person is entirely on the payroll of the DPWM, including the payment of the necessary allowances as they may be due to him.
5. That the Focal Person will guide the Fisheries counterparts within the BWR and TWNP whilst in the process of transferring skills and knowledge.

### **DOF**

1. That the DOF dedicate a Focal Person full time to coordinate the Wetland Fisheries Policy implementation, and monitoring of fishing activities in the BWR and TWNP, and DOF to implement the proposals to alleviate the drudgery in the oyster fishery.
2. The Fisheries Focal Persons become the counterparts to the DPWM Personnel to be provided by DPWM at both BWR and TWNP.
3. The Focal Persons represent the DOF in all the activities and assignments that this wetland fishery development process demands.
4. The Focal Persons are entirely on the payroll of the DOF, including the payment of the necessary allowances as they may be due to him.
5. That the Focal Persons will work in close collaboration with the BWR Warden as counterpart within the BWR, and TWNP Warden.
6. That DPWM provides office space and other necessary facilities in BWR HQ at Noo Kunda village, and at the Old Jeswang Office in TWNP.

7. That the DOF Personnel, in collaboration with the BWR Personnel conduct monitoring patrols of illegal fishing methods and activities, to deter the use of wrong mesh sizes and gears by the community and others.
8. In addition DOF personnel to work with TRY Oyster Women to develop their skills in oyster culture.

## **NEA**

1. That NEA provides the financial resources to procure the equipment and materials to support the fishermen of BWR, and the Oyster women at TWNP.
2. That the planning, execution and review of all stages in the process of implementation of these activities be extended to the Focal Persons.
3. That the NEA where necessary to build the capacity of the Focal Persons and Institutions by providing mobility, office equipment and materials to support the Village Banking scheme within the BWR, and the implementation of the proposals for the development of the oyster industry at the TWNP
4. That NEA, where requested provides targeted assistance to these wetland fisheries management processes.

## **NOW THEREFORE**

The Parties hereto agree as follows:

### **Terms of Agreement**

1. This Memorandum shall be valid for a period of .... months, years with effect from the ....., day of ....., 2014 with options for renewal.
3. The Focal Persons shall provide quarterly reports to DOF, DPWM and copied to NEA.
4. Local communities should be assisted, where necessary their capacities and other skills developed.
5. All data collected separately by the DPWM and DOF will be provided to each other.
6. DPWM and DOF assure to the NEA, the access to all premises in BWR and TWNP necessary to implement the above activities in order to achieve the above objectives.
7. In the event of a breach or breaches of any of the above conditions the Parties undertake to serve notice in writing of such alleged breach requesting the relevant Parties to remedy the said breach within 28 days.
8. AMENDMENTS. This Memorandum may not be extended or amended in any respect except when agreed in writing by the Parties, upon the approval of the Executive Director of the National Environment Agency.

Signed by: .....  
EXECUTIVE DIRECTOR NEA

Signed by: .....  
DIRECTOR DOFISH

Signed by: .....  
DIRECTOR PARKS AND WILDLIFE MANAGEMENT

In the presence of: .....

## **ANNEX 1B - POTENTIAL FOR INTRODUCTION OF FISH RANCHING AT THE BERETO/BARANSANTO RICE FIELDS IN SALIKENE**

In Salikenni there is a plain or rice field called Bereto/Baransanto where, as in many parts of the BWR the area appears to be a nursery or sanctuary for many types of fish species including marine fishes such as the “kujalo”, “sompato”, etc. It is also populated by many species of the tilapia, “tambajango”, etc.

To protect the rice fields from salt water an embankment has been constructed between the river and the rice fields extending almost the entire length of the rice fields. A sluice gate is constructed at one end to control the water when the tide comes in especially during the dry season when the salinity is high, and to let the water out from the rice fields when the rice is ripe for harvesting.

In the rains when the river overflows the banks and the water inundates the flood plain, much of the water is taken into a channel that extends for about 1.5 km. Fishes move out into the swamps to reproduce, and grow before they migrate back to the river by the time the water recedes. The stream is narrow at certain points (about 2 metres across) and widens up to about 10 metres at other points with the depth varying from about a metre to 2 metres at certain points.

Currently fishing within this water body is not regulated; villagers in need of fish will set their nets in the stream and the fish caught is usually for family use, and any excess would be sold to neighbours within the village. There is no control over the fishing periods, the mesh sizes, and fishing methods. The stream therefore lends itself to overfishing and potential destruction of fish habitats.

During the FGDs some community members expressed the need to manage this stream so that the fishes could be protected to enable them complete their necessary biological functions within the swamps; the young ones and juveniles will be protected and allowed to migrate back to the river when the sluice gates are opened. In addition those individuals that remain in the stream could be allowed to grow bigger.

Given the above, this study is recommending the introduction of some form of fish ranching in this water body. In practice meanwhile, the village community will agree to ban or restrict all fishing activities within the plains using any of their traditional management measures as appropriate. Meanwhile the fishes will be allowed to feed, reproduce, and grow before they migrate back to the river by the time the water recedes.

A sluice gate constructed at the mouth of the stream will be opened (with netting of appropriate sized mesh laid to stop large individuals) to allow the water to flow back to the river, and in this way juvenile fish and small sized individuals, will escape to the river into the river. Individuals large enough to be stopped by the mesh will be prevented from going back, and thus could be caught when the ban is lifted by the village. Enforcement of the ban on fishing will be the responsibility of the community; it will control the period of fishing, types and sizes of fish to be caught, types and methods of fishing, etc.

It will be noted however that in this form of practice and management, there is usually a very high catch rate, because when fishing is declared open, practically all would want to take part (using any type of receptacle to catch fish). There is usually abundant fish, and the catch will rapidly go up and then suddenly slump, clearly overfishing setting in. To forestall this phenomenon certain measures would need to be applied, such as allowable catch (quotas, appropriate sizes, etc.). This will enable an extension of the fishing period.

In addition, it is probable that there will likely be abundant fish during this time, (almost all families will take part in catching fish), and many catching more than they would need. At this time it is anticipated that there will not be much demand, and therefore there will be need to preserve the surplus either by drying and or/salting since there is no ice or cooling facility in the

village. Capacity building in smoking/salting/drying will in this case be required which the DOF can provide should they come to that stage.

In the meantime however, it will be recommended that a more in-depth assessment of the possibility of introducing fish ranching be carried out as the time that the study team had at its disposal was too short to answer all the relevant questions. A study to determine the dynamics, species abundance and diversity need to be undertaken to enable reasonable predictions.

## **ANNEX 2: PROPOSED PROJECTS FOR IMPLEMENTATION AT TANBI WETLAND NATIONAL PARK**

### **ANNEX 2A: Trials in Oyster Culture in Tanbi Wetland National Park-Description and Approach**

#### **1. Background Information**

The development of oyster culture in The Gambia became a stated priority for Government from the 1980's because oyster culture is oyster resource management measure to curb over exploitation of wild oyster, preserve mangroves, reduce the time spent in harvesting and distance covered. Oyster culture can also increase income of the oyster women as well as increase oyster stocks resulting from spawning before harvest.

With these, among other reasons in mind, the Department of Fisheries conducted some studies on the culture of the West African mangrove (*Crassostrea tulipa*) with support from the Canadian International Development and Research Cooperation (IDRC). Results of the studies identified great commercial potentials, but the market was not adequately identified. The rack system of culture employed during the research indicated a more efficient method for the exploitation of oysters, and a more sustainable alternative to existing harvesting methods, which are destructive to the mangrove ecology.

In 2010 the USAID-funded Gambia-Senegal Sustainable Fisheries Project (Ba Nafaa) supported the rack culture system in all the fifteen oyster harvesting communities in the Tanbi Wetland National Park (TWNP) and some peripheral oyster harvesting communities. The objective of setting up experimental racks in each oyster harvesting community was to determine suitable sites for grow-out, and suitable sites for spat collection. The results showed that Kubuneh, Lamin and Abuko are suitable sites for grow-out, and Ebo Town, FajiKunda, Old Jeshwang and Kamalo are suitable areas for spat collection. In 2011, an EU-funded coastal management project tried the rack culture system at Lamin in collaboration with the TRY Oyster Women.

The raft culture technique was supported by the Taiwanese Mission; this has not been fully implemented due to the break in diplomatic relations between Banjul and Taipei. The trial was supposed to have been conducted at Old Jeshwang, Lamin and Kubune.

The floating rafts are ideal for spat collection, but can be equally efficient for grow out too, because unlike the rack (where the oyster is exposed every six hours and thus lose feeding time) the floating raft affords 24-hour feeding time since the oysters are continuously submerged even at low tide.

#### **2. The Proposal**

This proposal is intended to replicate these trials in a few communities based on the experience acquired. It is proposing to implement:

1. The rack culture system at Ebo Town, Abuko, and Kubune. At each of these sites it is proposed to build 50 racks made from bamboo poles.
2. The raft culture system at Old Jeshwang/Wencho cluster and Lamin where a total 10 rafts will be constructed

#### **3. The Process - Materials and Methods**

##### **The Rack System**

The rack culture system is usually carried out at inter tidal zones. This will allow the construction of the racks and to hang the cultches on the racks at low tide. The cultches are exposed at low tide and submerged at high water. The advantage of exposure of the rack at low tide is that fouling organisms such as ascidians and nematode parasites are killed, resulting to improved farm yields.

Locally available materials will be used to construct the racks; these include such as bamboo, eucalyptus or gmalina. Bamboo is preferable due to its durability as it can last for three years especially when treated with lime. Depending on the type of rack, the amount of bamboo poles used for construction varies.

For the tripod rack one needs nine bamboo poles, six poles of two and half meters long, and three poles of five meters. Two poles are driven vertically into the mud at a distance of one meter apart. The two top ends are pulled together and tied up. Two other poles are fixed the same way in a row at two meters apart, and a third, and so on. The cultches are hung over the horizontal bamboo poles, and up to 60 cultch strings could be hung on a horizontal pole.

### **The Raft System**

The proposed raft system is made out of bamboo poles with 20 liter oil drums used as floats attached on the sides for buoyancy. Figure 2 shows the raft designed by the Taiwanese Mission. The raft is constructed on land, and later installed at the site of culture site.

It is made up of four or five poles (4 or 5 meters long) placed vertically with a space of one meter apart. Six to seven bamboo poles of two to three meters long are placed horizontally the entire length of the vertically placed poles at a spacing of half meter. Each intersection of the vertical and horizontal bamboo is tied up with a nylon string. Twenty liter oil drums (floats) are attached to the rafts on all sides.

The raft is transported to the culture site by motorized boats and installed firmly with the aid of anchors. The cultch strings are hung on the raft both inside and outside.

### **4. Cultch Materials and Spat Collection**

Old oyster shells will be used as the cultch materials on which to grow the oysters. This is because spats prefer rough and hard surfaces, and carried along by the current, they hit these shells and set on them by producing a cement-like substance which glues them firmly on the shell, where they continue to grow.

To collect spats, (young oysters) the old shells are strung tightly together on nylon ropes of 2-3 meters (depending on the depth of water where the spats will be collected) and lowered into the water hanging from the rack or raft for the spats to set. After a week or two (when the cultch would have had numerous spats on the old shells) the strings would be pulled out. The shells will now be separated from each other by a knot, done on the rope. This space would allow the spats to grow out unhindered.

The floating rafts can be used for both spat collection and for grow-out. When rafts are used for spat collection, the juvenile oysters that set on the cultches are transferred on to racks for grow - out. On the other hand, when rafts are used for grow-out and the oysters' weight increases, additional floats are required to prevent the raft from sinking.

### **5. Monitoring and Management**

During the construction phase of the rafts and racks, TRY Oyster women from target communities will participate in all phases of the process, both for technology diffusion and to engender ownership. The routine monitoring and management of the rafts and racks will be the responsibility of the TRY Oyster women, (the eventual beneficiaries of the technology). They will be trained and supervised by DOF and the Fisheries Officer based at TRY.

A draft MOUs are attached to provide the formal basis for cooperation among the various stakeholders (i.e. NEA, DOF, DPWM), and between TRY and NEA to formalize the relationship.

The local knowledge of the women will be used to identify suitable sites for construction of racks; they will participate in the selection culture sites because they know best the types of bottom

substrate in each of the tributaries in TWNP. They will also participate in the collection of oyster shells for cultches, punching, stringing, and hanging of the spat collectors on the racks.

As much as possible the canoes of the women will be used to transport culture materials (bamboo, oyster strings, ropes, etc.) to the construction sites. Alternatively, motorized canoes will be hired especially to transport the rafts to the culture sites. The rafts cannot be transported by small boats, so motorized boats will be required for installation at culture sites. During the construction stage, some food will be provided for each of the communities on any field day (either in the morning or afternoon, depending on tide).

Racks will be constructed in the recipient communities (Abuko, Kubune and Ebo Town) over a period of three weeks, and the rafts will be constructed over a period of two weeks in Lamin and Wencho/Old Jeshwang cluster.

Monthly monitoring of the rafts and racks will be carried out by the Fisheries Officer at TRY, in association with the women harvesters. The visits will be aimed at monitoring growth of oysters, fouling organisms, and transferring skills and knowledge to harvesters regarding management of racks and rafts.

## **6. Proposed Sites for the Trials**

The selected sites for the trials will be as follows:

1. For Rafts – a total of 20 Rafts
  - a. Wencho/Old Jeswang Cluster 10 Rafts
  - b. Lamin 10 Rafts
2. For Racks - a total of 150 Racks
  - a. Kubune 50 racks
  - b. Ebo Town 50 racks
  - c. Abuko 50 racks

## **7. Capacity Building**

Five days' training will be conducted for the target communities in their communities. Two days training will be held for Wencho and Old Jeshwang community, and three days in Abuko, Kubune and Ebo Town communities.

The training will focus on: substrate selection for cultches; punching of oyster shells; tying of oyster string; hanging cultches; monitoring and maintenance of racks; fouling organisms; harvesting; processing and marketing of oysters.

It is anticipated that institutional capacity of DOF will be enhanced through the provision of office equipment as indicated in Section G. In addition appropriate apparel and equipment will be provided for the participating women in the communities (see Section H). The availability of these will enhance successful implementation of the project.



## 8. Implementation Plan For the Oyster Culture Trials

No	Activity	Period	Participants	Institutional Responsibility	Implementation Responsibility	Output
1	Procurement of materials for construction of racks and rafts	Oct. 2014	TRY, DOF, DPWM and NEA	TRY	Fisheries Officer at TRY and NEA	Materials for raft and racks construction available
2	Consultative meeting with TRY Oyster Women in the various communities regarding rack and raft construction and training	Jan 2015	TRY, DOF, DPWM and NEA	TRY	Fisheries Officer at TRY	Training modules and oyster rack culture technique discussed
3	Construction of oyster culture racks in and rafts for the various communities	Jan/ Feb 2015	TRY, DOF, DPWM	TRY	Fish. Officer at TRY	150 Racks and 20 rafts constructed
4	Conduct training workshop at the various communities	Jan/ Feb 2015	TRY, DOF, DPWM	TRY	Fisheries Officer at TRY	Capacity of oyster built
5	Hanging of cultches for grow out at the various communities	Feb/ Mar 2015	TRY, DOF, DPWM	TRY	Fish. Officer at TRY	Spats on cultches and oysters growing
6	Monthly monitoring and maintenance of rafts and racks in beneficiary communities	Mar 2015- Feb 2016	TRY, DOF	TRY	Fish. Officer at TRY	Rafts and racks in beneficiary communities maintained

## 9. Project Monitoring and Evaluation Plan- Indicators and Responsibilities

N o	Activity	Monitoring indicators	Means of Verification	Project Stage	Responsi bility
1	Procurement of materials for construction of racks and rafts	No. and types of materials; reports	Self-checks by TRY, DOF, DPWM and NEA officials	Preparatory	Fish. Officer at TRY and NEA
2	Consultations and meetings with beneficiary communities and other stakeholders	No. of meetings and consultations held	Available reports; self-checks	Project Preparatory	Fish. Officer at TRY
3	Rack and raft construction and preparation of cultches; spat collection	No. of racks constructed	Available reports; self-checks	Construction Spat collection	Fish. Officer at TRY
4	Conduct training workshops on practice of oyster culture	No. of communities and beneficiaries trained	Workshop reports; independent checks by NEA, DOF, TRY and DPWM officials	Project preparatory	Fish. Officer at TRY
5	Hanging of cultches for grow out	Number of cultch strings hung out on racks	Available reports; Self-checks	Grow-out period	Fish. Officer at TRY
6	Monitoring and maintenance of racks and rafts	Maintenance plan; Monitoring reports; Maintenance records verified by Fish. Officer at TRY;	Weekly checks by TRY; Monthly checks by TRY, DOF, SIMI	Grow-out period	Fish. Officer at TRY
7	Conduct validation and consensus meeting	No. of meetings held; No. of communities involved	Available reports	Grow-out period	Fish. Officer at TRY
8	Harvesting and processing of the cultured oysters	Total weight of oysters harvested (in shell) Weight of oyster meat	Available reports; Self-checks;	Harvesting period	Fish. Officer at TRY

## 10. Budget Estimates

### Rack Culture

#### A: Budget Estimate for Materials and Construction of Racks

Item	Description	Quantity	Unit Cost (D)	Total Price (D)
	Bamboo poles used for frame of the rack	3 Poles	100	300
Nylon mono	Cultch string to string up oyster shells after punching	1 roll	200	200
Rope	Used to tie up both ends of the rack to the horizontal bar	1 roll	100	100
<b>Sub total</b>	<b>Construct complete rack</b>	<b>1 rack</b>	<b>600</b>	<b>600</b>
<b>Estimates for 50 racks per site</b>				
Materials	Construct complete rack at Kubuneh	50 racks	600	30,000
Materials	Construct complete rack at Ebo Town	50 racks	600	30,000
Materials	Construct complete rack at Abuko	50 racks	600	30,000
<b>Grand total</b>				<b>90,000</b>

#### B: Budget Estimate for Labour and Hire of Boat to Transport Culture Materials

Item	Description	Duration	Unit Cost (D)	Total Price (D)
Hire of boat	Transportation of culture materials and people to culture site on each field day in Kubune	5 days	1500	7,500
Hire of boat	Transportation of culture materials and people to farm site on each field day in Abuko	5 days	1500	7,500
Hire of boat	Transportation of culture materials and people to culture site on each field day in Ebo town	5 days	1500	7,500
<b>Sub total</b>		<b>15 days</b>		<b>22, 500</b>
Labour	Sea allowance for technical staff from DPWM, DOF and TRY	4 Staff for 15 days	4 X 400 X 15	24,000
Food/water	Food is prepared for the participating community during rack construction* (see below)	15 days	1,300	19,500
<b>Sub total</b>				<b>43,500</b>
<b>Grand total</b>				<b>66,000</b>

## Raft Culture

### C: Budget Estimate for Materials and Construction of Oyster Rafts

Item	Description	Quantity	Unit Price (D)	Total Price (D)
Bamboo Pole	Used for frame of the raft	10 poles	100	1,000
Nylon mono	Used as cultch strings to string up oyster shells after punching	5 rolls	200	1,000
Rope	Used to tie up both ends of the raft to the horizontal bar	3 rolls	200	600
Empty 20-litre oil drum	Used as floatation	20	25	500
Anchor	For holding raft in situ	1	1,000	1,000
Anchor rope	To tie the raft to the anchor	1 length	400	400
<b>Sub total</b>	<b>Construct complete raft</b>	<b>1 raft</b>		<b>4,500</b>
	Construct complete raft for Wencho/Old Jeshwang cluster	10 rafts	2,600	45,000
	Construct complete raft at Lamin	10 rafts	2600	45,000
<b>Grand total</b>				<b>90,000</b>

### D: Budget Estimate for Labour and Hire of Boat to Transport Culture Materials

Item	Description	Duration	Unit Price (D)	Total Price (D)
Hire of boat	Transportation of culture materials and people to site on each field day in Wencho/Old Jeshwang cluster	5 days	2,000	10,000
Hire of boat	Transportation of culture materials and people to culture site on each field day in Lamin	5 days	2,000	10,000
<b>Sub total</b>				<b>20,000</b>
Labour	Sea allowance for technical staff from DPWM, DOF and TRY	10 days	4 X 400 X 10 days	16,000
Food/water	Food is prepared for the participating community during raft construction	10 days	1,300 per day	13,000
Driver	Per diem for driver	25 days	300	7,500
Fuel gas	Fuel for vehicle	25 days	500	12,500
<b>Grand total</b>				<b>69,000</b>

### E: Budget Estimate for Capacity Building and Training

Item	Description	Quantity	Unit Price (D)	Total Price (D)
Flip chart paper	Writing material	2	250	500
Marker	Used for writing	1 packet	250	250
Food/ water	Breakfast and lunch	5 communities	D4,00/day x 5 com.	20,000
Refreshment	Soft drinks	5 communities	D1,000/day x 5 days	5,000
Allowance	Transport refund for oyster women	200 Women participants	200 x D300	60,000
Res. person		2 Persons	2 x 1000 x 5 Days	10,000
Trainer		1	1 x 5,000 x 5 days	25,000
<b>Total</b>				<b>125,750</b>

### F: Budget Estimate for Monthly Monitoring of Rafts and Racks

Date	Description	Period/Month	Unit Cost	Total Cost
Feb. 2015- Feb. 2016	Sea allowance to rafts and racks	4	400	1,600 x 12 months
<b>Total</b>				<b>19,200</b>

### G. Institutional Capacity Building for Department of Fisheries

Item	Quantity	Unit Price (D)	Total Price (D)
Junior Executive Desk	1	12,000	12,000
Junior Executive Chair	1	8,500	8,500
Filing Cabinet	1	7,500	7,500
Visitors Chairs	2	4,000	8,000
Book Shelf	1	10,000	10,000
Desk top Computer	1	35,000	35,000
HP Laser Jet Printer (P1006)	1	6,000	6,000
Motor Cycle	1	45,000	45,000
<b>Total</b>			<b>132,000</b>

### H: Equipment and Material Supply to TRY Oyster Women Association

Item	Quantity	Unit Price (D)	Total Price (D)
Gloves	200 pairs	151	30,200
Boots/Shoes	200 pairs	604	120,800
Goggles	200	352	70,400
Life jackets	200	300	60,000
<b>Total</b>			<b>281,400</b>

# I: Budget Summary for the Oyster Culture Trials at Tanbi Wetland National Park

Item/Activity	Estimated Value	Remarks	
<b>Oyster Culture Trials</b>			<b>Section</b>
Materials and construction of racks	90,600	10 A	A
Labour and hire of boat to transport culture materials	66,000	10 B	B
Materials and construction of oyster rafts	94,500	10 C	C
Labour and hire of boat to transport culture materials	69,000	10 D	D
Capacity building and training (raft and rack construction, collection of shells, punching, hanging, monitoring)	120,750	10 E	E
Monthly Monitoring of rafts and racks	22,400	10 F	F
Institutional capacity building for Department of Fisheries	132,000	10 G	G
Provision of appropriate gears and clothing for TRY Oyster women	281,400	10 H	H
<b>Total</b>	<b>876,650</b>		

**DRAFT MOU BETWEEN NEA, DPWM AND DOF**

**DRAFT MOU BETWEEN NEA, DOF, AND DPWM ON VILLAGE BANKING AND OYSTER TRIALS IN BWR AND TWNP**

**MEMORANDUM OF UNDERSTANDING**

**BETWEEN**

**THE NATIONAL ENVIRONMENT AGENCY, DEPARTMENT OF FISHERIES AND  
DEPARTMENT OF PARKS AND WILDLIFE MANAGEMENT**

**THIS MEMORANDUM OF UNDERSTANDING** made this \_\_\_\_\_ day of \_\_\_\_\_ 2014.

**BETWEEN**

**THE NATIONAL ENVIRONMENT AGENCY** represented by the Executive Director, on the one part

**AND**

**THE DEPARTMENT OF FISHERIES and the DEPARTMENT OF PARKS AND WILDLIFE MANAGEMENT** represented by their respective Directors on the other part.

The National Environment Agency shall be referred to as “NEA”

The Department of Fisheries and shall be referred to as “DOF”

The Department of Parks and Wildlife Management shall be referred to as “DPWM”

The NEA, DOF and DPWM shall be referred together as “The Parties”

**WHEREAS**

2. The Government of the Gambia needs to develop the capacity and skills of the fishermen operating in the Bao Bolong Wetland Reserve (BWR), and the women oyster harvesters operating in the Tanbi Wetland National Park (TWNP) in order to meet their full economic and nutritional requirements.
2. NEA has the resources and is willing to support the local fishermen of BWR and oyster women in TWNP in the achievement of their economic and nutritional goals and over all, the Government’s objectives.

**AND WHEREAS**

4. There is a general lack of skills in Village Banking in BWR area, and in the face of low level capacity in fishing in the BWR communities; need for assistance to the oyster women in the TWNP.

In recognition of the specialized skills in the area of Village Banking at the behest of DPWM at BWR, and specialized skills at the behest of DOF in oyster culture and oyster processing, to assist the NEA to coordinate and develop these various skills and expertise within the peripheral fishing communities of BWR and TWNP. This support is

aimed at achieving the national goal of poverty reduction through the specific aims and objectives listed below.

### **Aims and Objectives**

- c. To promote and develop approaches that will enhance the sustainable harvesting of the fisheries resources of the BWR and TWNP, taking into consideration the local conditions.
- d. To encourage the participation of local communities in fishing ventures.
- c. To help increase the ability of these wetlands' peripheral communities to maximize the usefulness of unused land into Aquaculture operations and Fish Ranching.
- d. To support the national drive to create employment for the youth living in the rural communities.

### **AND**

**WHEREAS** achieving these aims and objectives requires, in part, from:

#### **DPWM**

- 6. That the DPWM, dedicate a Focal Person full time to coordinate the process of Village Banking development, and monitoring of the equipment and materials to be supplied to the fishermen in BWR
- 7. The Focal Person becomes the counterpart to the DOF personnel to be deployed to the BWR and TWNP by DOF.
- 8. The Focal Person represents the DPWM in all the activities and assignments that these development processes demand.
- 9. The Focal Person is entirely in the payroll of the DPWM, including the payment of the necessary allowances as they may be due to him.
- 10. That the Focal Person will guide the Fisheries counterparts within the BWR and TWNP whilst in the process of transferring skills and knowledge.

#### **DOF**

- 9. That the DOF dedicate a Focal Person full time to coordinate the Wetland Fisheries Policy implementation, and monitoring of fishing activities in the BWR and TWNP, and DOF to implement the proposals to alleviate the drudgery in the oyster fishery.
- 10. The Fisheries Focal Persons become the counterparts to the DPWM Personnel to be provided by DPWM at both BWR and TWNP.
- 11. The Focal Persons represent the DOF in all the activities and assignments that this wetland fishery development process demands.
- 12. The Focal Persons are entirely on the payroll of the DOF, including the payment of the necessary allowances as they may be due to him.
- 13. That the Focal Persons will work in close collaboration with the BWR Warden as counterpart within the BWR, and TWNP Warden.



14. That DPWM provides office space and other necessary facilities in BWR HQ at Noo Kunda village, and at the Old Jeswang Office in TWNP.
15. That the DOF Personnel, in collaboration with the BWR Personnel conduct monitoring patrols of illegal fishing methods and activities, to deter the use of wrong mesh sizes and gears by the community and others.
16. In addition DOF personnel to work with TRY Oyster Women to develop their skills in oyster culture.

#### **NEA**

2. That NEA provides the financial resources to procure the equipment and materials to support the fishermen of BWR, and the Oyster women at TWNP.
4. That the planning, execution and review of all stages in the process of implementation of these activities be extended to the Focal Persons.
5. That the NEA where necessary to build the capacity of the Focal Persons and Institutions by providing mobility, office equipment and materials to support the Village Banking scheme within the BWR, and the implementation of the proposals for the development of the oyster industry at the TWNP
4. That NEA, where requested provides targeted assistance to these wetland fisheries management processes.

#### **NOW THEREFORE**

The Parties hereto agree as follows:

#### **Terms of Agreement**

1. This Memorandum shall be valid for a period of .... months, years with effect from the ....., day of ....., 2014 with options for renewal.
3. The Focal Persons shall provide quarterly reports to DOF, DPWM and copied to NEA.
4. Local communities should be assisted, where necessary their capacities and other skills developed.
5. All data collected separately by the DPWM and DOF will be provided to each other.
6. DPWM and DOF assure to the NEA, the access to all premises in BWR and TWNP necessary to implement the above activities in order to achieve the above objectives.
7. In the event of a breach or breaches of any of the above conditions the Parties undertake to serve notice in writing of such alleged breach requesting the relevant Parties to remedy the said breach within 28 days.
8. AMENDMENTS. This Memorandum may not be extended or amended in any respect except when agreed in writing by the Parties, upon the approval of the Executive Director of the National Environment Agency.

Signed by: .....  
EXECUTIVE DIRECTOR NEA

Signed by: .....  
DIRECTOR DOFISH

Signed by: .....  
DIRECTOR PARKS AND WILDLIFE MANAGEMENT

In the presence of: .....

## **DRAFT MOU BETWEEN NEA AND TRY OYSTER WOMEN ASSOCIATION**

### **MEMORANDUM OF UNDERSTANDING BETWEEN THE NATIONAL ENVIRONMENT AGENCY AND TRY OYSTER WOMEN ASSOCIATION**

**THIS MEMORANDUM OF UNDERSTANDING** made this \_\_\_\_\_ day of \_\_\_\_\_ 2014.

#### **BETWEEN**

**THE NATIONAL ENVIRONMENT AGENCY** represented by the Executive Director, on the one part

#### **AND**

**THE TRY OYSTER WOMEN'S ASSOCIATION** represented by their Executive Director on the other part.

The National Environment Agency shall be referred to as "NEA"

The TRY Oyster Women's Association shall be referred to as "TRY"

The NEA AND TRY shall be referred together as "The Parties"

#### **WHEREAS**

1. The Government of the Gambia needs to develop the capacity and skills, introduce new technology, as well as equip and enhance the livelihood of the women oyster collectors operating in the Tanbi Wetland National Park (TWNP) in order to meet their full economic and nutritional requirements.
2. NEA has the resources and is willing to support the TRY Oyster Women's Association in the achievement of their economic and nutritional goals and over all, the Government's objectives.

#### **AND WHEREAS**

3. In recognition of the specialized skills in the area of oyster culture at the behest of DOF, to assist the NEA to coordinate and develop oyster culture techniques within the peripheral communities of TWNP.
4. There is a general lack of skills and knowledge of oyster culture at the TRY Oyster Women Association, and in the face of low level capacity in the management of the shell fish industry in the TWNP, this assistance is aimed at achieving the national goal of poverty reduction through the specific aims and objectives listed below.

#### **Aims and Objectives**

To promote and develop new technologies that will enhance the sustainable management of the oyster fishery in TWNP, taking into consideration the local conditions, including the women's tendency to overharvest the oysters in the wild due to the increasing number of harvesters.

- a. To encourage the participation of local communities in the oyster fisheries.

- b. To help increase the ability of the women of the peripheral communities to develop new oyster harvesting techniques.
- c. To support the national drive to create employment opportunities for the women and youth living in the urban communities of TWNP.
- d. To support successful implementation of government efforts to equip and enhance the ability of oyster women harvesters to generate more income through new oyster harvesting techniques.

**AND**

**WHEREAS** achieving these aims and objectives requires, in part, from:

#### **TRY OYSTER WOMEN ASSOCIATION**

1. That TRY, dedicate a Focal Person (in the form of the Fisheries Officer at TRY) full time to coordinate the process of the oyster culture within the TWNP.
2. The Focal Person at TRY to become the counterpart to the DOF Personnel.
3. The Focal Person represents TRY in all the activities and assignments that this support from NEA demands.
4. The Focal Person is entirely on the payroll of DOF including the payment of the necessary allowances as they may be due to him.
5. That the Focal Person will guide the Fisheries Counterpart within the TWNP whilst in the process of transferring skills and knowledge. That the oyster culture expert demonstrates at all times the skills and expertise in the presence of the women harvesters.

#### **NEA**

1. That NEA finances the capacity building, equipment and materials that are used to support the oyster women of TWNP.
2. That the planning, execution and review of all stages in the process of implementation be extended to the Focal Persons.
3. That the NEA where necessary to build the capacity of the Focal Persons and Institutions.
4. That NEA where requested, provides targeted assistance to the processes within the oyster industry.

#### **NOW THEREFORE**

The Parties hereto agree as follows:

#### **Terms of Agreement**

1. This Memorandum shall be valid for a period of .... months, years with effect from the ....., day of ....., 2014 with options for renewal.
3. The TRY and the Focal Persons shall provide quarterly reports to DOF, DPWM and copied to NEA.

4. Local communities should be assisted where necessary, their capacities and other skills developed.
5. All data collected separately by TRY will be provided to DOF, DPWM and NEA.
6. TRY assures NEA, access to all premises and oyster culture sites in the TWNP, during the implementation of the above activities.
7. In the event of a breach or breaches of any of the above conditions the Parties undertake to serve notice in writing of such alleged breach(s) requesting the relevant Parties to remedy the said breach(s) within 28 days.

AMENDMENTS. This Memorandum may not be extended or amended in any respect except when agreed in writing by the Parties, upon the approval of the Executive Director of the National Environment Agency.

Signed by: .....  
EXECUTIVE DIRECTOR NEA

Signed by: .....  
EXECUTIVE DIRECTOR TRY

In the presence of: .....

## **ANNEX 2B: INTRODUCING THE “SINKIRI KUTO” IN THE OYSTER FISHERY**

### **1. Introduction and Background**

This describes some of the details in the introduction of the “Sinkiri Kuto” oven as recommended in the main report. It includes the following:

- i. Implementation plan of the trials including the various stakeholders that will implement the plan
- ii. Monitoring and evaluation of the trials
- iii. Budget estimates for the conduct of the trials
- iv. Draft MOU to formalize the cooperation and relationships among the various stakeholders

The “Sikiri kutu” that is being proposed was first seen by representatives of the women harvesters during a study tour to the Senegalese villages of Sukuta and Touba kuta. On their return they hoped to secure funds to introduce the concept, but unfortunately their main partners, the Ba Nafaa Project, had come to an end. The advent of this project rekindled the interest once again, and hence this proposal.

### **2. Traditional Oyster Processing**

The same women who harvest the oysters from the mangroves do the processing on shore either by steaming or by smoking. They steam or grill the freshly harvested oysters over open fires, shuck the meat, and sell by the roadside, or at village or urban markets such as Serrekunda and Banjul.

Traditionally oyster processing is done by either boiling the oyster in seawater or roasting which is one of the steps in the chain of activity before consumption of the oyster. The fresh oysters are steamed alive for approximately thirty minutes to one hour in half drums (covered with a piece of cloth) sitting on three stones, and during steaming the muscles ease allowing for easy opening. Mangrove wood is used in this process.

When the oysters gape and for the woman to collect the steamed oysters from the half drum, she would push the drum over the side unto a sack where the oysters are collected, whilst the hot boiling water spills away. The oysters are then collected in baskets, or carried on the sacks to the shucking area where the woman and her helper(s), (should there be any), would begin shucking with knives.

### **3. The Constraints and Difficulties**

The traditional method of boiling oysters over open fires with tripod stones consumes huge amount of fuel wood as the wind blows over the fire without control, the cumulative effect of which has environmental implications.

To get at the steamed oysters the woman processor would stoop and stretch to use her hands or stick, to push the half drum of boiling oysters to the ground on a piece of cloth. This is tedious and hazardous; and the drum is not durable due to the corrosive action of salt water and heat.

### **4. The Improved Cooking Oven “Sinkiri Kuto”**

At the villages of Touba kuta and Sukuta, the women processors were introduced to a potentially more efficient method of steaming oysters (**Figure 2**) when compared to the traditional Gambian system. The “sinkiri kuto” is more fuel efficient because most of the heat is directed under a much smaller container which reduces the steaming time, with much reduced smoke, and under a more hygienic and less hazardous environment.

The oysters are put in old onion bags which would be immersed in the pot; this allows for easy removal when the oysters gape by simply lifting the sack out (unlike the practice where the half drum is pushed over its side to collect the steamed oysters).

The improved “Sinkiri kuto” could be designed in multiple ways depending on the material used for construction. Common ones are either made out of fire bricks with a chimney for domestic cooking, or metal ovens with frame or concrete oven. Regardless of the material and design, these ovens are fuel efficient and durable, and the materials used for construction are locally available.

## **5. Proposed Methodology**

The introduction will be in phases, a trial phase and a possible replication phase. For steaming of oysters, the trials can only last for 4 months (March-June) given that there is an 8-month closed season for harvesting of oyster from the wild. The results will be evaluated by end of June 2015 after the first cycle of 4 months, to determine its efficacy, among other attributes. During the 8-month “Closed Season” some of the women are engaged in cockle harvesting, which is steamed the same way as the oysters. The ovens will therefore continue to be evaluated for the rest of the 8-month period of the “Closed oyster season”.

Construction of the ovens will however begin any time before the harvesting season so that the women could be sensitized in good time for the actual use of the ovens when the season eventually opens. As per the implementation plan (Section 10), the activities will include consultative and sensitization meetings with potential beneficiaries in the proposed locations to solicit their views and inputs. Particularly it must be ensured that the women who visited the Senegalese villages are involved in the discussions and implementation of the works. For more details see Section 10.

## **6. Capacity Building**

It is not expected that there will be any extended form of training in the use of the ovens given that they are not necessarily new innovations. Similar types are not uncommon in the homes of many of the women, which they use in preparing food for their families. It will be important however, that some of the women who saw the ovens in operation in Senegal be involved during the construction and commissioning of the prototypes.

Their views, and perhaps recollection, could be of immense benefit to the contractor who will be hired to build the ovens. Equally important will be their potential contribution in operating them since they have seen them in action in Senegal. If there will be any form of training, indeed they should be at hand to demonstrate to their peers what they saw in Senegal; this will be only a matter of an hour.

## **7. Monitoring and Management**

Management and monitoring of the facilities will be the responsibility of TRY. A draft MOU is attached to formalize the cooperation between the NEA and TRY. Specifically the leadership of the various oyster bases will be responsible for the smooth operation and daily management of their respective ovens, ensuring that they are well looked after, and that all have access to them. They could design some form of “User Rooster” or any form of order that allows the members to have access to them, which should not be difficult to implement given their experience of working together over time.

Periodically, the sites will be visited to appraise the performance of the ovens, relying mainly on the perceptions and experience of the women, which will form the basis of any future replication of the technology at other oyster bases.

## 8. Sustainability

For the sustainability and long term use of the facilities, it is expected that a small fee will be paid each time that a woman uses the ovens. This amount will have to be decided by the members of the base. The actual sustainability measure (s) to adopt will have to be studied and discussed with the women in the course of the trial period. At such a time, the rules that would guide the use of the ovens, particularly to enhance sustainability will be drawn up.

## 9. Proposed sites for the Trials

The trials will be conducted at the following oyster landing sites: Kubune, Old Jeshwang, and Lamin. At each site one unit of two ovens as pictured above, will be constructed, the materials comprising burnt bricks, cement bricks, etc. Each site will also be supplied with two “Mbanda”/”Jindibali” in which to steam the oyster.

## 10. Implementation Plan for the Introduction of the Sinkiri Kuto

Activity	Period	Participants	Institutional Responsibility	Implementation Responsibility	Output
Procurement of materials for construction of the improved oven	Oct 2014	Contractor	TRY, NEA	Fish. Officer at TRY	Materials procured and available at all the sites
Consultative meeting with TRY Oyster Women in Old Jeshwang, Kubune and Lamin for introduction of the improved oven and training	Oct 2014	TRY, DOF, & NEA	TRY	Fish. Officer at TRY	Training modules of and modus operandi discussed
Selection of site for construction of the ovens in the selected communities	Dec 2014	TRY, DOF & NEA	TRY, Contractor, NEA, DOF	Fish. Officer at TRY, Try members	Sites identified for the construction of the improved ovens
Construction of the improved ovens at the respective bases	Dec. 2014	TRY, DOF, Contractor and NEA	TRY, Contractor NEA, DOF	Fish. Officer at TRY	Ovens constructed at all the sites
Monitoring and evaluation of the construction works	Dec. 2014	TRY, DOF, Contractor and NEA	TRY, NEA	Fish. Officer at TRY	Monitoring and evaluation done at all the sites
Inspection and handing over of the ovens to TRY Oyster Women Association	Feb. 2015	TRY, Contractor and NEA	Contractor NEA	Fish. Officer at TRY	Ovens handed over to the communities
Organize demonstration and training on Standard Operating Procedures of the oven	Feb. 2015	TRY, DOF and NEA	TRY	Fish. Officer at TRY	Beneficiaries trained on the use of the improved ovens
Use of ovens begin	Mar.2015	TRY	TRY	Fish. Officer at TRY	Shorter steaming time, less fuel used
Monitoring and evaluation visits to see performance of the ovens	Apr.-July 2015	TRY,NEA, SIMI, DOF	TRY	Fish. Officer at TRY	Information on performance
Evaluation and consultations on performance of ovens	July 2015	TRY,NEA, SIMI, DOF	TRY	Fish. Officer at TRY	Information on performance, and



					conclusions on way forward
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## 11. Project Monitoring and Evaluation Plan- Indicators and Responsibilities

No	Activity	Monitoring Indicators	Means of Verification	Project Stage	Responsibility
1	Procurement of materials for construction of the improved ovens	No. and types of materials; reports	Self-checks by TRY, DOF, NEA officials	Preparatory	Fish. Officer at TRY and NEA
2	Consultative meeting with TRY Oyster Women in Old Jeshwang, Kubune and Lamin for introduction of the improved oven and training	No. of meetings and consultations	Available reports; self-checks	Project Preparatory	Fish. Officer at TRY
3	Selection of site for construction of the ovens in the selected communities	No. of sites selected	Self-checks by TRY, DOF, NEA officials	Project Preparatory	Fish. Officer at TRY
4	Construction of the improved ovens at the respective bases	No. of ovens constructed	Available reports; self-checks	Project Preparatory	Fish. Officer at TRY
5	Monitoring and evaluation of construction works at the various sites	Monitoring reports and records	Weekly checks by TRY and DOF	Implementation	Fish. Officer at TRY
6	Inspection and handing over of the ovens to TRY Oyster Women Association	No. of ovens handed over	Available reports; self-checks	Implementation	Fish. Officer at TRY
7	Organize demonstration and training on Standard Operating Procedures of the ovens	No. of training and demonstrations held	Available reports; self-checks	Implementation	Fish. Officer at TRY
9	Use of Ovens begin	No. of ovens in use; No. of women using ovens	Available reports; self-checks	Implementation	Fish. Officer at TRY
10	Monitoring and evaluation visits to see performance of the ovens	Monitoring reports; Maintenance records	Weekly checks by TRY; Monthly checks by TRY, DOF, SIMI	Implementation Harvesting period	Fish. Officer at TRY
12	Propose long term self-financing mechanisms for the technology	No. of mechanisms proposed	Available reports	Implementation	Fish. Officer at TRY
14	Evaluation and consultations on performance of ovens	No. of meetings held; No. of communities involved	Available reports	Harvesting and processing stage	Fish. Officer at TRY

## 12. Budget Estimates for Building and Implementation of Sinkiri Kuto

Item/Material	Quantity	Unit Cost (D)	Total Cost (D)	
Sub-structure; trenching and concreting works	8.9m³	37,080	37,080	
Super structure – fire bricks,		47,000	47,000	
Tile works and decorative finish of surrounding		9,200	9,200	
Total Cost for one Unit of Oven			93,280	
Estimate for three units of oven				
Site	Item	Quantity	Unit Cost (D)	T0tal Cost (D)
Kubune	Oven	1	93,280	93,280
	Mbanda	2	3,000	6,000
Sub Total				99,280
Lamin	Oven	1	93,280	93,280
	Mbanda	2	3,000	6,000
Sub total				99,280
Old Jeshwang	Oven	1	93,280	93,280
	Mbanda	2	3,000	6,000
Sub Total				99,280
Grand Total				279,840

## **MEMORANDUM OF UNDERSTANDING**

### **BETWEEN**

**THE NATIONAL ENVIRONMENT AGENCY AND TRY OYSTER WOMEN'S ASSOCIATION**

**THIS MEMORANDUM OF UNDERSTANDING** made this \_\_\_\_\_ day of \_\_\_\_\_ 2014.

### **BETWEEN**

**THE NATIONAL ENVIRONMENT AGENCY** represented by the Executive Director, on the one part

### **AND**

**THE TRY OYSTER WOMEN'S ASSOCIATION** represented by their Executive Director on the other part.

The National Environment Agency shall be referred to as "NEA"

The TRY Oyster Women's Association shall be referred to as "TRY"

The NEA AND TRY shall be referred together as "The Parties"

### **WHEREAS**

3. The Government of the Gambia needs to develop the capacity and skills, introduce new technology, as well equip and enhance the livelihood of the women oyster collectors operating in the Tanbi Wetland National Park (TWNP) in order to meet their full economic and nutritional requirements.
4. NEA has the resources and is willing to support the TRY Oyster Women's Association in the achievement of their economic and nutritional goals and over all, the Government's objectives.

### **AND WHEREAS**

3. In recognition of the specialized skills in the area of oyster processing at the behest of the TRY Coordinator and her support team at TWNP, to assist the NEA and DOF to coordinate and develop new oyster steaming techniques within the peripheral community of TWNP.
4. There is a general lack of efficient oyster steaming technologies in the TWNP, and in the face of low level capacity in the management of the shell fish industry in the TWNP, this assistance is aimed at achieving the national goal of poverty reduction through the specific aims and objectives listed below.

## **Aims and Objectives**

- e. To promote and develop new technologies that will enhance the sustainable management of the oyster fishery in TWNP, taking into consideration the local conditions, including the women's safety during oyster processing.
- f. To encourage the participation of local communities in the oyster fisheries.
- g. To help increase the ability of the women of the peripheral communities to develop new oyster processing techniques.
- h. To support the national drive to create employment opportunities for the women and youth living in the urban communities of TWNP.
- i. To support successful implementation of government efforts to equip and enhance the safety of oyster women harvesters to generate more income through efficient processing techniques.

## **AND**

**WHEREAS** achieving these aims and objectives requires, in part, from:

### **TRY OYSTER WOMEN ASSOCIATION**

- 6. That TRY, dedicate a Focal Person (in the form of the Fisheries Officer at TRY) full time to coordinate the process of the oyster culture trials and development as well as the introduction of the new concept of "sinkiri kuto" in steaming oysters within the TWNP.
- 7. The Focal Person at TRY to become the counterpart to the DOF Personnel.
- 8. The Focal Person represents TRY in all the activities and assignments that this support from NEA demands.
- 9. The Focal Person is entirely on the payroll of DOF including the payment of the necessary allowances as they may be due to him.
- 10. That the Focal Person will guide the Fisheries Counterpart within the TWNP whilst in the process of transferring skills and knowledge.

### **NEA**

- 5. That NEA finances the capacity building, equipment and materials that are used to support the oyster women of TWNP.
- 6. That the planning, execution and review of all stages in the process of implementation be extended to the Focal Persons.
- 7. That the NEA where necessary, to build the capacity of the Focal Persons and Institutions.
- 8. That NEA where requested, provides targeted assistance to the processes within the oyster industry.

## **NOW THEREFORE**

The Parties hereto agree as follows:

### **Terms of Agreement**

1. This Memorandum shall be valid for a period of .... months, years with effect from the ....., day of ....., 2014 with options for renewal.
3. The TRY and the Focal Persons shall provide quarterly reports to DOF, DPWM and copied to NEA.
4. Local communities should be assisted where necessary, their capacities and other skills developed.
5. All data collected separately by TRY will be provided to DOF, DPWM and NEA.
6. TRY assures NEA, access to all premises and oyster steaming sites in the TWNP, during the implementation of the above activities.
7. In the event of a breach or breaches of any of the above conditions the Parties undertake to serve notice in writing of such alleged breach(s) requesting the relevant Parties to remedy the said breach(s) within 28 days.
8. AMENDMENTS. This Memorandum may not be extended or amended in any respect except when agreed in writing by the Parties, upon the approval of the Executive Director of the National Environment Agency.

Signed by: .....  
EXECUTIVE DIRECTOR NEA

Signed by: .....  
EXECUTIVE DIRECTOR TRY

In the presence of: .....

## **ANNEX 2C: Keeping the Pigs away from the Smoke Ovens at Old Jeshwang**

### **1. Introduction and Background**

At the Old Jeshwang landing site the bonga is the main species that is landed, from where the fish is transported to the Serrekunda market where it is sold fresh, usually without ice. Some of the fish however is retained at the landing site, procured by small scale women operators who purchase the fish from the fishermen, to essentially add value to the fish.

### **2. Reasons for Smoking the Bonga**

Smoke-drying of fish is essentially a process to preserve the product in the absence of refrigeration. In general there are two main different smoking techniques: cold smoking involves smoking the fish for a limited period, say 2 to 3 hours. The water content of the final product may be as high as 60 per cent or more and the product must be consumed within a couple of days. This product therefore, essentially has a local market.

Unlike the “cold smoked” product “hot-smoked” products have a longer shelf life as most of the water has been removed after 2-5 days of smoking. Hot smoked products have a much longer shelf life (sometimes up to six months). In the Gambia the first is considered of superior quality than the second and has a better market acceptance.

Another reason why the women smoke the bonga is to satisfy their customers, who insist that they prefer the smoked product to the fresh bonga.

### **3. Processing Method**

At Old Jeshwang the fish is laid out on metal grills over earthen ovens located haphazardly on the fringes of the mangroves, just by the water's edge. A fire is lit on the floor of the oven which gradually drains water from the fish. Jute bags and cardboards are used to cover the fish to retain the heat.

However, availability of wood for smoking is a severe constraint, so the women use different materials such as old and sometimes discarded cardboards, coconut husks, etc. The final taste and colour of the smoked product is influenced by the kind of wood or material used. Some processors have their own ways of ensuring the ‘right’ colours to the final product, in accordance with consumer preferences. However, given the scarcity of wood for smoking, there is not much the women can do than to resort to the use of the materials named above.

After 2-3 hours of smoking the covering is removed and the product is allowed to cool before it is collected in baskets and taken home, to market, or kept in a smoke house converted to a store by the women at the landing site.

The smoking process is tedious and hazardous to their health because the women bend over the ovens continually, the smoke getting into their eyes, and at the same time inhaling the smoke. They do not seem to encounter any marketing problems since practically all the fish can be sold on the same day.

### **4. Marauding Pigs**

A major problem encountered by the women is from pigs that come from within the Old Jeshwang area. They would be lurking within the nearby mangroves, and would pounce on the ovens if unguarded by the women; the pigs would devour all the fish (whether already smoked or not) on the grills. Where they cannot eat up all the fish, the entire content of the grill will be overturned, spilling all the fish unto the ground rendering it inedible and unmarketable.

To prevent this the women are compelled to continuously watch over the ovens until all the fish is smoked and, cooled before transferring it to the store. They requested for assistance to provide a security fencing to be located between the water's edge and the ovens to keep the pigs away from the ovens.

## 5. Materials and Equipment Required

There are two smoking areas that need to be fenced off from the water's edge, where the pigs get access to the ovens. One is about 70 metres long, along the water's edge x 15 metres wide; the other is 115 metres along the water's edge x 20 metres x 20 meters. See Section 9 for details.

## 6. Implementation and Coordination

It is recommended that works begin as soon as possible. Implementation of the works at the site will be led by the President of the Old Jeshwang landing site, Mr. Alhaji Saine. He will mobilize the community and lead all discussions and consultations with the stakeholders and project implementers.

Representatives of DOF and DPWM will be onsite to collaborate and supervise the works after NEA has made the materials available. They will work closely with Mr. Saine who will be responsible for community mobilization and sensitization. Annex 1 provides an MOU to be signed to this effect.

## 7. Implementation Plan for the Fencing of the Smoking Areas at the Old Jeshwang Landing Site

No	Activity	Period	Participants	Institutional Responsibility	Implementation Responsibility	Output
1	Procurement of materials (Chain link fence, angle iron, galvanized wire, etc.)	Oct. 2014	Fishermen Reps. DOF, DPWM, NEA	NEA	NEA	Materials available
2	Consultative meetings with the community, and the women smokers in particular, regarding logistics and planning towards the works	Oct 2014	Fishermen, DPWM, DOF	DOF	DOF	Logistics discussed
3	Start of works	Nov 2014	The Fishermen group	DOF	DOF	Fences built

## 8. Project Monitoring and Evaluation Plan- Indicators and Responsibilities

N o	Activity	Monitoring indicators	Means of Verification	Project Stage	Responsibi lity
1	Procurement of materials	No. and types of materials, reports	Self-checks by DOF, DPWM and NEA officials, fishermen reps. Smokers	Preparator y	NEA
2	Consultative meetings with the community, and the women smokers in particular, regarding logistics and planning towards the works	No. of meetings and/consultatio ns held	Available reports; self- checks	Project Preparator y	DOF
3	Start of works	Reports	Independent checks by NEA, DOF, and DPWM officials	Project execution	DOF

## 9. Budget for Fencing Protecting the Smoke Ovens from the Pigs

Item/Material	Quantity	Unit Cost (D)	Total Cost (D)
Chain link fence	11 bundles	2,400	26,400
Galvanized wire	6 bundles	2,400	14,400
Angle iron	38 lengths	450	17,100
Binding wire	5 bundles	350	1,750
Cement	10 bags	270	2700
Sand	1 trip	6,000	6,000
Gravel	1 trip	6,000	6,000
Labour		10,000	10,000
<b>Total</b>			<b>84,350</b>



## **MEMORANDUM OF UNDERSTANDING**

### **BETWEEN**

**THE NATIONAL ENVIRONMENT AGENCY AND NDAM LORR (JAPOR) FISHERMEN'S ASSOCIATION OF OLD JESHWANG**

**THIS MEMORANDUM OF UNDERSTANDING** made this \_\_\_\_\_ day of \_\_\_\_\_ 2014.

### **BETWEEN**

**THE NATIONAL ENVIRONMENT AGENCY** represented by the Executive Director, on the one part

### **AND**

**THE NDAM LORR (JAPOR) FISHERMEN'S ASSOCIATION OF OLD JESHWANG** represented by their President on the other part.

The National Environment Agency shall be referred to as "NEA"

The **NDAM LORR (JAPOR) FISHERMEN'S ASSOCIATION OF OLD JESHWANG** shall be referred to as NDAM LORR

The NEA AND NDAM LORR (JAPOR) shall be referred together as "The Parties"

### **WHEREAS**

5. The Government of the Gambia needs to equip and enhance the livelihood of the women fish smokers operating at the Old Jeshwang fish landing sites in order to meet their full economic and nutritional requirements.
6. NEA has the resources and is willing to support the fish smokers of NDAM LORR (JAPOR) in the achievement of their economic and nutritional goals and over all, the Government's objectives.

### **AND WHEREAS**

5. In recognition of the need to keep the pigs that are roaming within the Old Jeshwang community out of the fish smoking areas of the women, and the need to assist the NEA, DOF, and DPWM to coordinate and erect the fences to stop the pigs.
6. There is a general lack of financial resources at the Old Jeswang landing site, and in the face of the inability of the community to provide fences, this assistance is aimed at achieving the national goal of poverty reduction through the specific aims and objectives listed below.

### **Aims and Objectives**

- j. To promote and develop technologies that will enhance the sustainable management of the fisheries in TWNP, taking into consideration the local conditions, including safe guarding and protecting the women smokers' livelihood.

- k. To support the national drive to create employment opportunities for the women and youth living in the urban communities of TWNP.
- l. To encourage the participation of local communities in the fishing industry.
- m. To support successful implementation of government efforts to equip and enhance the women fish smokers to generate more income.

**AND**

**WHEREAS** achieving these aims and objectives requires, in part, from:

**NDAM LORR**

- 11. That NDAM LORR, dedicate a Focal Person (in the form of the President of the Association) full time to coordinate the process of constructing the fences at the Old Jeshwang landing site
- 12. The Focal Person at NDAM LORR to report to the DOF Personnel at TWNP on the progress of work.
- 13. The Focal Person represents NDAM LORR in all the activities and assignments that this support from NEA demands.
- 14. The Focal Person is entirely on the payroll of NDAM LORR including the payment of the necessary allowances as they may be due to him.
- 15. That the Focal Person will guide the Fisheries Counterpart at the Old Jeshwang landing site whilst the process of building the fences is ongoing.

**NEA**

- 9. That NEA finances the fencing of the smoking areas of the women at the Old Jeshwang landing site.
- 10. That the planning, execution and review of all stages in the process of implementation be extended to the Focal Person.
- 11. That NEA where requested, and where possible, provides targeted assistance to the process within.

**NOW THEREFORE**

The Parties hereto agree as follows:

**Terms of Agreement**

- 1. This Memorandum shall be valid for a period of .... months, years with effect from the ....., day of ....., 2014 with options for renewal.
- 3. The NDAM LORR and the DOF personnel shall present a completion report to DOF, DPWM and copied to NEA.
- 6. NDAM LORR assures NEA, access to all premises and fish smoking sites in the Old Jeshwang fish landing site, during the implementation of the above activities.

7. In the event of a breach or breaches of any of the above conditions the Parties undertake to serve notice in writing of such alleged breach(s) requesting the relevant Parties to remedy the said breach(s) within 28 days.

#### 8. AMENDMENTS

This Memorandum may not be extended or amended in any respect except when agreed in writing by the Parties, upon the approval of the Executive Director of the National Environment Agency.

Signed by: .....  
EXECUTIVE DIRECTOR NEA

Signed by: .....  
PRESIDENT – NDAM LORR

In the presence of: .....

## **Annex 4: Long Term Self-Financing Plan for The Trials Focused on the Fisher Folks in Bao Bolong Wetland Reserve and Tanbi Wetland National Park**

### **1. Converting the Grant into a Fishermen's Revolving Loan Fund**

With the grant of materials made to the Associations, which will on lend them to the members, to be repaid over a period of time to be decided by themselves is a good way of sustaining the activities of the fishermen. The value of each beneficiary's material will be the loan to be repaid in equal monthly installments with a small interest charge (also to be paid monthly), and a compulsory saving (amount to be decided by the group). This will make the fund to grow, and will form the Associations' financial base from which other members who have not benefited from the current support will be assisted under the same terms and conditions.

The regular monthly loan repayments and savings will be available for distribution to the individual members, on the basis of a formula that links payout to the amount saved. This lump sum distribution provides some amount of money that members can then use as they want, without restriction. The "compulsory savings" element will provide any future investments that the beneficiary wishes to undertake by using his own savings either as equity or as collateral.

### **2. Introducing the Village Banking Concept**

Revolving loans have been extended to Gambian fishermen over the years, and unfortunately most of the beneficiaries defaulted in their repayments due mainly to lack of monitoring and follow-ups by the donors. However, to make this Revolving Loan scheme work, the "Village Banking" concept will be introduced.

The concept was first introduced in BWR by the ICAM II (Integrated Coastal Area Management) Project funded by GEF/World Bank, and implemented by DPWM. The techniques enable poor people to compulsory save enough money to buy useful items for the household and make opportunistic business investments.

The main outcome of the scheme will be the sustainability of financing of fishing operations within the BWR. In this case this will be in the form of:

- i) Establishing an expanded system to provide fishing gear, outboard engines, spare parts, and cash sales facility
- ii) Improved income earning opportunities in the fishing communities
- iii) Improved knowledge and skills in Village Banking techniques
- iv) Improved market outlets for fresh fish through the encouragement of improved handling

At BWR village banking has developed the capacity of the women to manage a revolving loan scheme; it has been in operation for 3-4 years now during which time their money has grown 4 fold, and all the loans have been recovered.

### **3. Proposed Approach**

In this Project each of the recipient Associations will be regarded as a “Village Bank” and will open an account with the Trust Bank in Farafenni into which all loan repayments and savings are paid after each collection day. To guide the Associations, a comprehensive set of “House Rules” (See Annex 1) will be applied, adopted by the members; they will be sensitized, and their capacity built around the document.

To start off the process, the members of the participating Associations (whether supported by NEA or not) will enroll by making an initial contribution of D50 in the form of a Savings Pass Book (this amount could be reviewed by the members as necessary) before the materials are distributed. A three-day capacity building workshop will be conducted at the DPWM Offices at Noo Kunda to train the fishermen in the participating Associations on the implementation of the Village Banking scheme

Presided over by elected Executive Committees regular monthly meetings will be held by each Association (date and place will be agreed by the respective memberships) during which loan repayments and savings will be collected, and each individual's monthly savings noted in the Savings Pass Books. In addition other issues relating to the Association will be discussed.

### **4. Coordination and Monitoring**

The current Warden of BWR will be the Coordinator of this scheme. Following the success of the ICAM II Project, and in view of his experience in coordinating the women's Village Banking scheme in BWR. It is intended that he performs similar roles in the fishermen's case.

He will visit all the landing sites at least once a fortnight with a view to ensuring that the materials and equipment are being used appropriately, and whether or not the fishermen are actually going to sea. This is a very important element in the monitoring and follow-up responsibilities of the Coordinator. Very often one of the reasons for fishermen to default on loan repayment is simply because they are not monitored.

In addition, he will coordinate and attend all monthly meetings of the Associations, helping out in the organization, record keeping, collection of all monies, and executing all banking transactions with support from the Associations' Executive Committees. He will compile periodic reports for submission the DPWM, NEA and DOF.

### **5. Capacity Building**

With his experience in the women's Village Banking process, the BWR Warden will train and build the capacity of the members on the application of the concept of Village Banking. The training will promote and sensitize the fishermen on the ways to improve and strengthen rural microfinance management, and will enhance the fishermen members to form reliable and strong village banking systems as alternative ways of getting financial support. Most importantly the fishermen will review and adopt the draft “Loan Agreement” and “House Rules” with the accompanying Forms (Annex 1) as the guiding principles of the Associations.

During a three day session (before the materials and equipment are distributed to the beneficiaries) all the Associations' members will assemble at the DPWM head office in Noo

Kunda for the training. The training team will be led by the Warden of BWR and supported by two others from DPWM and DOF.

For the long term sustainability of the activities within the TWNP, consultations will be conducted in the course of project implementation way forward. In the meantime however, attempts will be made to encourage contributions for the use of the “sinkiri kuto” towards the upkeep of the ovens.

Regarding the sustainability of the oyster culture trials, a similar approach will be used in that the outcome of the trials will decide the type and approach to employ.

## ANNEX 5: Persons Met

NAME	DESIGNATION	ADDRESS
Ousainou Touray	Assistant Director	DPWM, ABUKO NATURE RESERVE
Nuha Jammeh	TANBI WARDEN	Tanbi Wetland National Park
Famara Darboe	DIRECTOR	Department of Fisheries
Dr. Bamba Banja	Permanent Secretary	Ministry of Fisheries
Momodou Saidy Leigh	Fisheries Officer	DOFISH. BANJUL
Alagie Manjang	CO-ORDINATOR	WWF-WAMER,KAIRABA AVENUE
Zainab Diab	ADMIN. SECRETARY	WWF-WAMER OFFICE
Alhaji Dodou Saine	Head of FISHERMEN	Old Jeswang Fish Landing Site
Momodou Jeng	fisherman	✓
Momodou Joof	✓	✓
Ebrima Charreh	✓	✓
Ablie Charreh	✓	✓
Sainey Senghore	✓	✓
Dodou Saine	✓	✓
Bakary Charreh	✓	✓
Momodou Barrow	✓	✓
Alkali Senghore	✓	✓
Dodou Jeng	✓	✓
Momodou Charreh	✓	✓
Lamin Jeng	✓	✓
Fatou Janha	Executive Director	TRY WOMEN ASSOCIATION CENTRE
Mariama Ashcroft	Volunteer	✓
Babanding Kanyi	Fisheries officer	✓
Aret Jatta	Oyster collector	Ebo Town
Nene Manga	✓	✓
Aret Jatta Jeshwang	✓	✓
Sainabou Jatta	✓	✓
Kelemansa Jammeh	✓	✓
Haddy Jatta	Lady President	✓
Haddy Demba	TRY WO A. PRESIDENT	Lamin Village
Kumba Jassey	Oyster collector	✓
Siaka Senghore	Head fisherman	✓
Lamin Senghore	fisherman	✓
Abdou Senghore	fisherman	✓
Sunkaru Jarju	✓	✓
Masamba joof	✓	✓
Lewoo Jatta	✓	✓
Alhaji Fansu Sarr	✓	Mandinary Village
Abdou Jassey	✓	✓
Ensa Keita	✓	✓
Sheriffo Touray	✓	✓
Momodou Lamin Jallow	✓	✓
Lamarana Jallow	✓	✓
Ousman Sonko	✓	✓

Amara Conteh	✓	✓
Kang Saikou Drammeh	✓	✓
<b>NAME</b>	<b>DESIGNATION</b>	<b>ADDRESS</b>
Musa Jallow	✓	✓
Abdoulie Joof	✓	✓
Sainey Manneh	✓	✓
Masamba Joof	✓	✓
Samba Jawo	Ranger TWNP	✓
Alimatou Jatta	Oyster collector	Kubuneh Village
Amie Sambou	✓	✓
Marie Sambou	✓	✓
Baafica Sanyang	✓	✓
Jarra kujabi	✓	✓
Mam Manga	✓	✓
Jariatou Gibba	✓	✓
Dagana Jammeh	✓	✓
Ebou I.S.Tamba	ALKALOO	✓
Ebrima Jallow	Park Warden	Bao Bolong Wetland Reserve
SHEIKH YADA	FISHERMAN	Baddibou Jammeh Kunda
Subung Sanyang	✓	✓
Sitokoto Kassama	✓	✓
Sherrifo Ceesay	✓	✓
Bakary Daffeh	✓	✓
Bakary Cham	✓	✓
Lamin Jadama	✓	✓
Sherrifo Kassama	✓	✓
Boto Kassama	✓	✓
Omar keyabo	✓	✓
Lamin Cham	✓	✓
Momodou Bintou DIBBA	✓	Salikenni village
Sulayman Njie	✓	✓
Baba Fofana	✓	✓
Kemo Kassama	✓	✓
Baba Trawally	✓	✓
Junkung Dibba	✓	✓
Saidou Danso	✓	✓
Ansumana Dibba	✓	✓
Omar Touray	✓	✓
Lamin Fadera	✓	✓
Siaka Baas	✓	NOO-KUNDA VILLAGE
Lamin Njie	RANGER	✓ BWR
Jalibakary Saine	✓	✓ BWR
Kawsu Janneh	FISHERMAN	KATCHANG VILLAGE
Suntu Camara	✓	KEKUTA KUNDA VILLAGE



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