

REPUBLIC OF THE GAMBIA
Department of Parks and Wildlife Management

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ACRONYMS

GEF	Global Environment Facility
GOTG	Government Of The Gambia
HQ	Head Quarters
ICAM	Integrated Coastal and Marine Biodiversity Management
L&S	Lands and Survey
MOU	Memorandum of Understanding
NBSAP	National Biodiversity Strategy and Action Plan
NEA	National Environmental Agency
NGO	Non Governmental organization
PC	Project Coordinator
PMU	Project Management Unit
PRA	Participatory Rural appraisal
PRCM	Programme Regional de Conservation Cotiere et Marine
PSC	Project Steering Committee
SMC	Site Management Committee
TA	Technical Assistant
TOR	Terms of Reference
TWC	Tanbi Wetland Complex
TNP	Tanbi National Park
WB	World Bank
WWF	World Wide Fund for Nature
WWF/WAMER	World Wide Fund for Nature/Western African Marine Eco region

I. BACKGROUND AND JUSTIFICATION

1.1. Context: National Policy, international conventions

The Banjul Declaration and the Wildlife Conservation Act of 1977 are origin for The Gambia commitment to the protection and the management of the country's natural environment. During 1990's Government of The Gambia took many actions towards better management of the environment, in particular many protected areas were created and environment and biodiversity strategies action plans adopted. The Gambia Environmental Action Plan (GEAP, 1992) and the National Biodiversity Strategy and Action Plan (NPSAP, 1999), both emphasize biodiversity conservation as a critical element of achieving this goal.

NBSAP's identified priorities for biodiversity conservation include, inter alia:

- increasing national capacity to support biodiversity conservation and sustainable use efforts (scientific and technical);
- increasing the representatively of protected area coverage, specifically coastal and marine habitats; and
- promoting a multi-sectoral integrated approach, which emphasizes the involvement of local communities in protection and management activities.

These priorities were taken into consideration during the preparation of the revised national biodiversity/wildlife policy objectives (as well as DPWM's strategic plan for 2000-2005). In this strategic plan, The Gambia aims to:

- increase the total protected land area from 3.7% to 5%, including samples of all major habitats represented in the country, and
- actively involve communities in the management of wildlife and biodiversity and to promote sustainable use of their associated habitats and ecosystems (both within and outside protected areas).

To meet this aim seven (7) national parks have been created: Niimi National Park, Bao Bolong Wetland Reserve, Kiang West National Park, River Gambia National Park, Tanbi National Park, Tanji and Bijilo Island Reserve and Abuko Nature Reserve, representative set of terrestrial, riverine, coastal and marine habitats. The protected areas cover 45,772ha which represents 4.1% of the territory. Most of the areas are recognized as Site of Regional and International Importance.

In this regard, Bao Bolong Wetland Reserve and Tanbi National Park have been designated as Wetlands of International Importance or Ramsar site.

A site protection is not only geographically indicating the boundary but also defining management tools. The Gambia Wildlife act as well as international conventions on biodiversity such as Ramsar Convention, Convention on biological diversity and World Commission on Protected Areas (WCPA) commission strongly recommends developing and implementing management plan and rules for each protected area.

In 1997, the Department of Parks and Wildlife Management of The Gambia carried-out ecological survey in most of the protected areas. From these studies results, management plans have been developed for Niimi National Park, Bao Bolong Wetland Reserve and Tanbi National Park, in 1999.

A management plan is dynamic and needs to be regularly updated. The convention on wetlands of international importance and WCPA recommends to update at least every five years

1.2. Justification

The Gambia's coast is an area that is under increasing human pressure. It hosts approximately 40% of the population in 17.4% of the country's area, a figure that is rising as a result of both population growth and in-migration. Tanbi National Park, a wetland of International Importance is located in Greater Banjul between Banjul Island and Kanifing City; the most densely populated area in the Gambia. The site is under intense human pressure such as land reclamation, mangrove cutting, fishing etc

Though, Tanbi is recognized as a site of regional and international importance by Western African Eco region's Conservation plan. Indeed, the site harbors globally significant species including more than 100 species of birds, manatees, Nile and dwarf crocodiles and is a pathway for dolphins. Its mangrove ecosystem dwells at least two important coastal and marine food chains and is a nursery of more than 70 species of fish. It plans major hydrological function for Gambian Coast.

The richness of the site and human pressure if not well managed could lead to conflicts. A management plan intends to avoid conflicts by zoning and assigning functions and uses from sound information on the site in consultation with stakeholders. A management plan based on 1997 wetlands studies of the Department of Parks and Wildlife Management survey was adopted in 1999.

After more than five years, it needs to be updated. The DPWM through the GEF/WB and WWF funded project: Integrated Coastal and Marine Biodiversity Management project (ICAM) has carried out public consultations in July 2006 and February 2007 that assessed the site status. A significant amount of information on hotspots, species, threats and ecological trends have been collected during the consultations.

The change of status for Tanbi, newly designated Ramsar Site and is being filed as national park, the duration of the last management plan (since 1999) and the new information gathered during public consultations justify to carry out new management plan for the site. In this regards, the current management plan of TWC aims to update the existing plan.

The updated management plan intends to:

1. Secure legal protected status for key critical, unique and vulnerable habitats by assigning clear functions to each zone and role to each stakeholder.
2. Develop community-based integrated management system models, including creating/reinforcing local participatory structures; establishing procedures for the effective participation of local community members in the conservation and sustainable use of coastal, marine and wetland resources; and identifying mechanisms for community benefit sharing.
3. Identify and facilitate conservation-friendly income generating activities
4. Increase capacity of both government and communities to manage their coastal, marine and wetland resources, with emphasis on protection of critical nursery, breeding, feeding, and refuge habitats for endangered and threatened species, both through provision of infrastructure and equipment as well as through skill building and awareness raising.

II. DESCRIPTION OF THE SITES

2.1. Geographic situation

Tanbi National Park (TWC) has an area of 6,304 hectares. TWC is a mangrove swamps that fronts the ocean to the north and the Gambia River to the east. It is located at the mouth of the River Gambia, occupying the southern portion of its estuary. It has developed through the combination of deposition of fluvial and marine sediments. It is an Estuarine and Intertidal forested wetland primarily of low mangrove forest, with a complex of vegetation types on its northern boundary and along the mangrove fringing the main land. The TWC functions include coastal stabilization, fish breeding and recreation.

The area is bordered by twelve villages. The greater Banjul human settlement surrounds TWC to the south and east. Madinari, Lamin and Abuko towns are bordering TWC to the south, to the west Fagikunda, Taliding, Ebo town and Jeshewan towns limit TWC, Banjul is at Northeastern border while Bakau Town is at North-West of TWC The area includes some part of the Banjul City area, some part of the Kanifing Municipality and some areas of the Brikama area council

The Central coordinates of the protected area is: 13° 26´ North and 16° 38` West. It is a low land with a mean altitude of 1m and a maximum of around 16m.

Complexe des zones humides de Tanbi

2.2. Physical features

2.2.1. Climate

The Gambia is in the inter-tropical and its climate is generally described as Sudano-Sahalian. Rainfall concentrates between the months of June to October, the average rainfall at Banjul from 1987 to 2006 is 840mm per annum. Annual rainfall from 1987 to 2006 is show in figure 1 which indicates high annual variability. There has been a 25-30% decrease in annual average rainfall over the period 1950 to 1990s.

GRAPH ANNUAL RAINFALL

Tanbi is in inter-tropical area, temperatures are high all year long, a maxima more than 32 degrees and minima always higher than 18 degrees. October and November are the hottest month of the year but the gap between minima and maxima is greater during the first quarter of the year (Jan-March); the temperature nearly double at this period of the year. In fact difference is high all the time (higher than 10 degrees).

The high temperature along with wind speed between 1.1 and 2.0 mean high evapo-transpiration; March and May have the highest evapo-transpiration level whilst the lowest occur in August and September

INSERT GRAPH

Conclusion

In general, according to weather conditions the period from March to June is critical for the management of water. The high temperatures and evapo-transpiration just after the rainy season make even harder to manage open water bodies around Tanbi. For the management purpose, one would favour water infiltration. A higher water table will interact with the swamp and feed the mangrove in fresh water

2.2.2. Geology

The Tanbi National Park is situated on the Holocene fluvial sequence that has arisen from a combination of marine and fluvial currents that produce a characteristic sediment type (Russel and Whyte, 1988). The sediments are generally fine textured sand, silts and clay and may include peat deposits (found at Lamin). This sequence overlies Pleistocene alluvium that consists of unconsolidated sediment (Ibid). Towards the north, the Banjul spit is considered to be a post-Nouakchottian feature, with the upper 4m predominately made up of sand with isolated bands of clay. At 4m depth, a compact fine sand occurs which is underlain by clay below 7 to 8m (Ramsar Wetland Study The Gambia 1997).

2.2.3. Soils

The soils found in the Tanbi National Park range from pure sand on the northern spit to hydromorphic clays on the mainland fringes of the wetland. Backing the sand spit and lagoons of the seaward shore the soil are fine textured clays and silts. Towards the fringes of the mangrove existing and potential acid-sulphate soils occur, which are unsuitable for agriculture. These acid-sulphate soils are often devoid of vegetation and are referred to as bare tannes. Where the acidity is moderate, halophytic vegetation occurs.

On the seasonally flooded periphery of the wetland, hydromorphic clays and silts occur, which often have a sandy substratum 10-30cm below the surface (FAO 1993). During the rainy season these soils are untilled for rice cultivation while during the dry season certain areas as at Bakau are intensively cultivated for horticultural production using hand irrigation from shallow hand-dug wells (Ramsar Wetland Study, the Gambia, 1997).

2.2.4. HYDROLOGY

The Gambia coast is subject to a prevailing NW swell that induces a major southward sediment drift. The east-west orientation of the coast between Cape Point Banjul however, receives an eastward littoral drift (ICAM, 1996). The estuary acts as a sink since it is essentially a real (drowned river valley). Still in the process of being filled in (Ibid). Sediment deposition in the mouth of the river Gambia is thus centered on the south bank due to a combination of currents and the Coriolis effect. Resultantly the waters to the east of the wetland are shallow and extensive intertidal mudflats occur, most notably along Maidenhair Flats and in the area to south of the Bund Road. These flats are utilized by water birds for feeding and in addition, these associated vegetation though the slow advancement of mangrove vegetation is an ongoing process.

The tidal range at Banjul is 1.6m during spring tides and 0.7m at neap tides (Ramsar Wetland Study The Gambia 1997).

The area is characterized by a network of channels that dissect the mangrove forest and the coastal strip on the northern fringe. The entire complex is essentially estuarine in nature, though it is subjected to full salinities on the northern fringe during floor tides, and there are numerous freshwater flushes around the periphery during the rainy season. Hyper saline conditions can develop in some of the coastal lagoons and in the upper reaches of the bolons. The fringe of the wetland is seasonally flooded through rainfall and runoff which affects the

salinity regime within the mangrove and lagoon complex. Freshwater is found at approximately 2m depth in this fringe and during the dry season.

A chain of lagoon runs between Cape Creek and Oyster Creek bridge and a single lagoon occurs on the east of Toll point lagoons, which are subject to limited tidal inundation through narrow channels. This is a dynamic and ever changing stretch of coast-line with extensive erosion and deposition occurring. This being so, there is a risk that the lagoons may be breached in several new places in the near future

2.3. Ecological Features

2.3.1. The Swamp

Mangrove forest dominates the Tanbi Wetland south of the Banjul High way and covers approximately 4,800ha. The typical halophytic herbs growing on the inland edges of the forest include beach Morning-glory, Philoxerus

Vermicularis Ipomea pes caprae, sesuvium portulacastrum, vernonia chlorati and Blumea aurita are shrubs also found growing in this location

Insert Picture

The numerous bolons, which dissect the mangrove, form a mosaic of islands up to 800 hectares in size. Mangrove community along the channels reflects slight variation in soil levels, with sections of fringe forest interspersed with over wash forest. The extent to which these communities extend from the bolons is variable and often difficult to determine due to the thicket of branches and prop roots of these low forest. The mean height of the *Rhizophora* spp. Forest from soil level is 6-7m. At the head of many bolons however, individual trees of up to 10m occur, which may be a result of localized freshwater flushes reducing the osmotic pressure of particular trees.

In the slightly elevated interiors of the island and on the mainland fringe, scrub forest occurs in either pure stands of *Avicennia Africana* up to 1.5m in height, or in association with *rhizophora* spp. And *Laguncularia racemosa*. These areas are generally interspersed with salt marsh and bare tannes.

There are extensive areas of tannes (seasonal saline flats) on the periphery of the Tanbi Wetlands that are subjected to seasonal flooding and subsequent drying following the rains. The associated vegetation varies with the degree of salinity. It ranges from bare tannes to halophytic dominated vegetation including Seasonal Purslane, Beach Morning-glory and *Philoxerus vermicularis*, merging into grassland dominated by *Sporobolus spicatus*, *Phragmites australis* and *Paspalum vaginatum*. As the dry season progresses the vegetation of the seasonal saline flats dies back.

The seaward side of the lagoons has a sandy substrate with West Indian Alder and occasional *Avicennia Africana* occurring on the beach or sand dune, along with typical zerophytic-halophytic herbs such as Seaside purslane and Beach morning –glory. On the landward side of the lagoons the substrate is of finer silts and clays with a shrub mangrove community dominated by *A. Africana* with varying amounts of *Rhizophora* spp. And *Laguncularia racemosa*. Towards Oyster Creek and backing the lagoon at Toll point the vegetation occurs, characterized by Baobab *Adansonia digitata*, Swamp Date Palm *Phoenix reclinata*, African Nettle tree *Celtis integrifolia*, *Crateva religiosa*, *Strophantus sarmentosus* and *Hibiscus tiliaceus*. The introduced neem *Azadirachta indica* has colonized extensively in this belt to the East of Toll Point and poses a threat to the natural vegetation as it is fast growing and very drought tolerant.

2.3.2. Flora

The mangrove swamps that consolidate the wetland are considered as noteworthy. The main species are *Rhizophora mangle*, *R. harrisoni*, *R. racemosa*, *Avicennia Africana*, *Laguncularia*

racemosa, *Annona glabra* and West Indian Alder *Conocarpus erectus*. Their conservation is fundamental for the conservation of TWC.

Intertidal salt marshes with a typical halophytic assemblage of species are common in the fringe of the mangrove complex and in the upper reaches of some of the bolons including Cape Creek. These areas may be flooded only in the spring tides but nonetheless contain the typical halophytic assemblage of species associated with both permanent and seasonal salt marsh in The Gambia. Seaside Purslane *Sesuvium portulacastrum*, Beach morning-glory *Ipomoea pes-caprae*, and *Philoxerus vermicularis* typically dominate along with the grasses *Paspalum* sp, *Leptochloa* and *Sporobolus spicatus*.

The dune front fringing the sea forms a pioneer zone with a zerophytic-halophytic community binding the sand against wave and wind action. The outer fringe tends to be dominated by a sparse covering of Seaside purslane which merges with Beach Morning-glory further back. The community diversifies in the fringe dune to include *Ipomoea stolonifera*, *Philoxerus vermicularis*, Seaside Sword Bean *Carnivalia rosea*, *Leptadenia hastata*, *Alternanthera aritima*, *Pergularia daemis*, *Merremia tridentata* and the monocots *Cenchrus biflorus*, *Sporobolus spicatus* and *Cyperus maritimus*. The dune belt in places extends inland for up to 400m and behind the shelter of the fringe *Dodonaea viscosa*, *Maytenus senegalensis*, *Scaevola plumeri*, Tamarisk *Tamarix senegalensis* and *Thespesia populnea* form a shrubby mosaic with accessional small trees of *Calotropis procera*, Thirsty Thorn *Acacia seyal* and Winter Thorn *A. albida*. The herb-layer consists mainly of species such as River Bean *Sesbania bispinosa*, *Ipomoea heterotricha*, *Ruspolia hypocrateriformis*, *Amorphophallus aphyllus*.

In the dune backs on to a lagoon West Indian Alder dominates the vegetation with occasional *Avicennia Africana* on the lagoon margin

2.3.2. Aquatic invertebrates

The aquatic invertebrate fauna is composed predominantly of crustaceans and mollusks. Very abundant species include shrimps (*Panaeus notialis*), crabs and mangrove oysters *Crassostrea tulipa* (Ramsar Wetland study, the Gambia, 1997)

2.3.3. Fish

Fishes belonging to at least 5 families have been recorded in the Tanbi National Park. The most abundant of these species are *Tilapia* spp. Followed closely by Mulletts *Mugil* spp,. Although Atlantic Mudskippers *Periophthalmus papilio*, are also present in large numbers and are very

widespread. The fish fauna is comprised mainly of pelagic or demersal species in the fry, juvenile or sub-adult stages (Ramsar wetland study, the Gambia, 1997).

Communities' view on fish richness in Tanbi

Community cited more than thirty species present in Tanbi; only one species of Shark is noticed as disappeared: tiger fish (poisson-scue). Two species of crocodiles and two species of fresh water turtle are still sighted in and around Tanbi, but th population is considerably decreasing. The same trend is observed for manatees and dolphins. Tanbi wetland is not only harboring diverse fish species but also is a breeding and nursery ground for most of the species. Fishes lay eggs from May to October during the raining season than the dry season. Shrimbs species (*Paneus notialis*) have most of his crucial stage (eggs, larvae, and recruitment, juvenile to mature) in deltaic ecosystem from river Senegal to Guinea Bissau. Tanbi ecosystem as well as mangrove of the Gambia River is considered as the most important for this function in the sub-region.

TABLE 1: ASSESSMENT OF FISH DIVERSITY BY TANBI COMMUNITIES

Village	Fish			Other water species		
	Species	Trend	Observation	Species	Trend	observation
Mandinaring	33	The population is reduced to half		Manatee Turtle Dolphins Nile and dwarf Crocodiles Otters	All are present but in reduced number	Decrease of standing crops
Lamin	20	No changes of fish population noticed		Manatee Turtle Dolphins Nile and dwarf Crocodiles	All are present but in reduced number	
Taliding	35	Abundance and in good size before independence Population still considered normal	Reduced standing crops	Manatee Turtle Dolphins Nile and dwarf Crocodiles Otters	Threatened population	
Old Joshwang			Only one species of shark (poisons-scie) disappear			

Source PRA draft report 2006

2.3.4. Reptiles

Nile crocodiles *Crocodylus niloticus*, appear to inhabit the Tanbi National Park in low numbers (Ramsar wetland study, the Gambia, 1997, as there are two sites on the wetland fringe, Katchikally sacred pool, in Bakau, and Abuko Nature Reserve, that certainly contain crocodiles and which probably allow some movement of animals into the wetland. Communities indicate the presence of dwarf crocodiles in Tanbi belongs.

Green Turtles *Chelonia mydas* are likely to occur on the coastline of Tanbi, where they probably feed on the offshore seagrass beds. It is possible that they use the beaches between Cape Point and Banjul as breeding sites. The leatherback Turtle *Dermochelys coriacea* may also be found offshore. Bell's hinged Tortoise *Kinixys belliana* has been recorded from the coastal strip (Ramsar wetland study, the Gambia, 1997). Marsh Terrapin *Pelomedusa subrufa*, and Pan Hinged Terrapin *Pelusios subniger*, are likely to occur in the freshwater fringes of Tanbi as both have been recorded close to the edges of the wetland complex.

Lizards known to occur in the Tanbi National Park, include the Agama *Agama agama*, Brook's house Gecko *Hemidactylus brooki angulatus*, Fig-tree Gecko *Tarentola ephippiata*, Orange-sided Skink *Mabuya perrotetil*, Orange-throated

Skink *M. affinis* and the Nile Monitor *Varanus niloticus*. All of these species are relatively common, especially the smaller species. The Nile Monitor is still found in good numbers and large specimens are regularly encountered.

Snakes that have been recorded in Tanbi include African Rock Python *Python sebae*, Royal Python *P. regius*, Beauty Snake *Psammophis elegans*, Striped Beauty Snake *P. sibilans*, Olive Sand Snake *P. Phillipsi*, Bush Snake *Philothamnus irregularis*, Black-Necked Spitting Cobra *Naja nigricollis*, Forest Cobra, *N. Melanoleuca* and Puff Adder *Bitis ariens*. Snakes are generally killed on sight by Gambians, so very large specimens, especially of the Pythons and Cobras, are rarely seen. The Royal Python record comes from a single sighting near Old Jeshwang, but recently specimens have been found at Abuko Nature Reserve, so this species may be more common than was previously thought.

2.3.5. Birds

The avifauna is composed of both resident and inter-African and Palearctic migratory species. The 1997 study records 362 bird species from 66 families for the Tanbi National Park (Ramsar wetland study, the Gambia, 1997). The perimeter survey carried out in December 2005 lists 7859 individual and 122 species, the list is attached to the document.

Community identified Tanbi National Park as a hotspot for bird. Water birds are feeding in the low tidal mud and bolongs, resting in marshy parts of the islands, roosting in the mangrove and breeding in the small islands. Communities, during PRA and consultations, identified bird hotspots sites in Tanbi as shown in map 2. The following sites are considered as hotspots for birds:

- Island in Talindingo Bolong is a roosting site for birds
- Birds Island in Mandinary area is a breeding site; the breeding period in this island is from November to January
- Kusami bolong is a breeding place for birds like heron, pelican, Cray egret, black, white egret king fisher 8 different types. The breeding period is estimated by Tallinding community between August and December
- Devil Island different birds, no person used to go there, is a breeding place for birds and some animals
- Pelican Island: feeding ground for birds, resting sites you find monkey otter mole lizard

2.3.6. Mammals

The mammalian fauna of the Tanbi National Park is inevitably restricted due to the proximity of the large urban areas around the periphery of the complex. Large mammals are unlikely to occur regularly except in the complex south of Talinding which may still harbor animals such as Bushbuck *Tragelaphus s.scriptus*, as this area is less disturbed. The mangrove area along the coast and around Mandinari flats and Mandinari Point provides a possible corridor for the movement of such animals from the Tanbi Wetland to the Mandina wetlands to the south. Primates are still fairly well established in the Tanbi Wetlands, especially adjacent to Abuko Nature Reserve where large numbers of both Callithrix Monkeys *Cercopithecus sabaues*, and Western Red Colobus *Piliocolobus badius temminckii*, are protected, and venture out into the wider countryside from the secure base.

Aquatic mammals probably fare much better than those tied to the land. As Tanbi National Park consists in the main of aquatic habitats and human disturbance is much less in these areas. Both West African Manatee *Trichechus senegalensis*, and African clawless Otter *Aonyx capensis*, are known to occur in the bolons, though probably in low numbers. Both of these mammals may also use the River Gambia or the banks to travel between the Tanbi Wetlands and Mandina Complex to the south, Atlantic Hump-backed Dolphins *Sousa teuszii*, and Bottle-nosed Dolphins *Tursiops truncatus*, are sighted frequently in the River Gambia to the east of Tanbi. Though they have not been recorded in the wetland Complex itself, it is possible that they do occasionally venture into the area along the largest bolons, and are certainly reliant at some level upon the fish that have their nurseries amongst the mangroves of Tanbi.

2.4.Socio-economic context: demography, activities, current land use/tenure

2.4.1. Human settlement

Table 2: Human settlement around Tanbi

Village	Date of creation	Pop at independence	Population now	Major events
Mandinarang	1506	1,000	4,725	- WWII - Famine during 1960
Kerewan	1910	100	2,262	-
Daranka	1600	150	1,054	
Lamin	1600	600	17,033	- 1959 flood
Abuko	1600	100	8,958	
Fajikunda	1600	500	23,989	- 1980's drought
Taliding	1600	300	34,206	Drought during 1960-80's
Wusulun kunda	1500	800	13,319	1950's and 2003 flood
Old Joshwang	1700			

Source: PRA draft report 2006

Human settle around this area for five centuries. The population has skyrocketed since the independence 50 times more. High growth rate (4.2%) and migration from upland and neighbouring countries are the major reasons of this high increment of the population

Not all the population is directly using the wetland but activities such as Rhone palm's uses, fishing and mangrove cutting have increased along with the human settlement rise. Indirectly, the settlement is claiming land within the hydrological basin; waterways are blocked-up, increased sedimentation of the mangrove ecosystem,

At the independence, the mangrove stands was very good and very important population of Rhun palms (*Borassus aethiopium*) at the independence time. Rain water drainage to the wetlands were important but wetland users, oyster collectors in particular, are noticing a significant decrease of input of fresh water. The phenomenon affects the wetland productivity with lower mangrove and less oysters, shells and fish.

Climatic events such as 1962 and 1980's droughts and 1950's floods are the major natural events that put stress on the Tanbi around Tanbi National Park's ecosystem. The high growth of the population changed the landscape pattern. The low land ecosystem of Borassus aethiopicum and natural waterways are the most impacted landscape features by the large settlement around TWC after the independence.

2.4.2. Demography

The total population of the twelve villages and/or cities surrounding Tanbi is 177,285 (2003 census). In 1993, the total population of the twelve settlements were 128,994. That is an annual growth rate of 2.7%. The trends are not the same all area; indeed, while the population of Banjul and new Jeshwang is decreasing, it doubles everywhere else in 10 years period (figure 4). The same histograms show the repartition of the population around Tanbi; the fringe from Jeshwang to Fajikunda is the most populated area.

2.4.3. Economic activities

The communities living around Tanbi Wetland is diverse; one could notice two type of population: one not dependant on Tanbi resources and the other one directly or indirectly relying on the wetland resources. For the latter rice cultivation, vegetable growing, oyster collections for women, shrimp fishing and mangrove cutting for men are the main activities in the buffer zone and within the wetland. Tourism is developed around Lamin and Denton Bridge, surrounding communities are employed by they are having few benefits from it. The harvesting activities are dominant as shown in the following table 3.

Table 3: Economic activities within Tanbi

Activities	Constraints
1. OYESTER COLLECTION	Inappropriate working gears (gloves, shocks and shoes) No enough oyster in the bolong lack of own out boat (canoe). During the raining season when oyster collection is suspended, no other income generation activity
2. RICE CULTIVATION	Salt instruction in the rice fields lack of early maturing rice varieties
3. VEGETABLE GARDENNG	Inadequate water supply for watering , lack of input (fertilizer, pesticide and seats) pest and diseases cattle and wildlife
4. PETTY TRADING	Unreachable transport facilities to market outlets Lost of perishable commodities (tomatoes)
5. WINE PROCESSING (CASHEW)	The process is labor intensive
6. FIREWOOD COLLECTION	The fire wood collection area are far away from their oyster collection point

Source PRA draft report 2006

2.4.4. Major socio-economic constraints

Communities are getting many benefits from and near Tanbi National Park including oyster collection, fishing, fire wood and poles collection, palm wine tapping, vegetable gardening and rice cultivation. Many of them make their living from these activities. Unfortunately, a decreasing yield trend is noticed in each and every activity.

The non tidal zone before the settlement area is exploited by women for rice cultivation and vegetable gardening. The sites are encountering many problems, including sedimentation, pest invasion, salinisation, acidification and lack of water for cultivation. Oysters and fish stands are steadily diminishing; the price increase cannot cover the loss of weight. The erosion in upland because of building in waterways brings a significant amount of sand in the rice field reducing though the water retention with high impact of the production.

Human pressure leads to intensive cropping of the available land; same species are cropped over years in the same surface. This practice carries on pest and contributes to significant decrease of vegetable yields around Tanbi.

The vegetable gardens and rice fields are at the edge of tidal zone which is sensitive to the exchange of fresh and salt water. The human settlement and the decreasing trend of rain reduced the fresh water flow in the basin, then lowered down the water table and favoured salt water intrusion. In consequence, the agricultural farms are intruded by salt and ferric and/or alumina acid.

In general agricultural practices (low yield varieties, no or not enough fertilizers and high labour for watering) are not suitable for high level of production.

Table 4: Economic activities constraints

Vegetable Gardening	No Fencing, stealing, Access to water, Pest invasion, sale intrusion, high cost of gardening materials
Oyster collection	Decrease oyster population, lack of canoes, Poor collection method
Mangroves and fuel wood collection	Decrease mangrove stands and increase commercialization
Fishing	Inappropriate fishing gears and over fishing

Source: Public consultation validation report 2007

III. STATUS AND ASSESSMENT

This section ascertains the ecological value the site in a local, national and international context, identifying and appraising the relationships between biotic and abiotic factors, not only of plants, animals and habitats within the site, but also those in the surrounding areas that may control or have influence on the sit itself.

3.1 Biological diversity

A significant component of the nation’s wetland avifauna resides within the Tanbi National Park. The Tanbi National Park consists of a diverse number of habitat types raging from coastal lagoons and scrub through seasonal creeks to intertidal and gallery forests.

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 biodiversity is adversely affected. Approved proposals should seek to include mitigation measures that retain and improve on the biodiversity of the area.

3.1.1. Hotspots and Naturalness

Table below summarized hotspots in Tanbi: Communities have identified 8 manatee's hot spots, 10 crocodiles' hotspots and three turtle ones as shown in table 5.

Table 5: Hotspots of nationally and internationally important Species in Tanbi National Park

Spp. Name	Distribution Areas				
Manatee	Kubuneh bolong	Talinding	Lamin creek	Sibiji bolong	Wasulung confluence
Turtles	Kunku	Jerreh	Sabijii	Sinana	Wasulung
Crocodiles	Lasso warf	Kunkujang creek	Kerewan creek	Wayeto bolong	Talinding
Water birds	Lasso wharf	Kubuneh bolong	Kunkujnag creek	Daranka ricefields	Kunu joyeh

Source: Public consultations' validation workshop

A large proportion of the Tanbi wetland is natural. This includes the large area of mangrove, rivers, creeks and streams. It acts as an important nursery ground for many species of fish. Towards the peripheries of the area, human activities such as deforestation, rice growing, market gardening and development are degrading the naturalness of the area.

3.1.2. Rarity, Fragility and Typicalness

Rarety

The area has a number of species that are rare and endangered. The waterways of Tanbi are home to the regions rare aquatic mammals, the West Africa Manatee and African Clawed Otter. The Atlantic Humpbacked Dolphin also possibly utilizes the waterways and coastal waters. The sand shore line between Banjul and Cape Point may be used by nesting Green Turtles, a species that has suffered alarming declines in the last few decades (Eckert et al, 1999).

Nile Crocodiles are found in the Tanbi Wetland. The consultation process revealed that Dwarf crocodiles still exist in the wetland. The African Rock python and Royal Python also occur within the area. All of these reptiles have been hunted extensively (mainly for their skins) in West Africa and have declined in number (Pauwels and Meirtre, 1996).

Fragility

A large proportion of the Tanbi wetland can be regarded as being fragile. This is mainly due to the close proximity of urban areas, and its associated uses and possible exposure to discharges and pollutants. In addition coastal erosion is rapidly altering the morphology of the coastal strip threatening both infrastructure and habitat. The multiple causative factors remain to be discovered. The wetland proximity to the urban area and its bisection by the Banjul Highway combine to give the land a high value for development. Despite the fact that all proposed developments within the wetland complex are subject to a full environmental impact assessment, unlicensed tourist developments continue to be located on sensitive dune vegetation. In addition current effluent discharges from industries may not be in compliance with the National Management act requirements and thereby constitute a threat to water quality and the associated flora and fauna. Dumping of domestic and industrial waste is becoming an increasing problem along fringe of the Tanbi Wetland. Along the bund road there is illegal dumping of building rubble and old vehicles and small scale dumping of refuse occurs at numerous other points fringing the urban areas to the west and north of the wetland.

An oil storage facility is built at the edge of the wetland in Mandinaring. It is a hazardous facility because of the risk related to the fire, to leakage of fuel to the mangrove, etc.

Within the mangrove complex an increase in the amount of fuel wood and building posts harvested is evident and it is essential to determine the sustainable utilization level of this resources.

In addition, the entire wetland fringe is subjected to increasing agricultural and horticultural expansion and intensification which is diminishing the diversity of habitat and associated fauna. The process is subtle, with reduced size, intactness and diversity. Such as process needs to be monitored and regulated.

Typicalness

The Tanbi National Park contains variety of wetland types that are typical of those occurring in The Gambia, yet unique because of the coastal location of the area. For this reason, Tanbi National Park is designated as wetland of international importance since 2006.

3.2. Tanbi a Wetland of International Importance

3.2.1 Tanbi classified as National Park

3.2.2. Tanbi: a Ramsar Site

Tanbi National Park is part of the Western Africa Marine ecoregion. TWC is at the mouth of the River Gambia delta. The Tanbi wetland Reserve meets many criteria of a Wetland of International Importance. In particular, it meets criteria 1,2,3,4 and 8

Criterion 1

The hydrological importance of TWC, in particular in the wake of the rising sea level and other effects of climate change meets criterion 1 to its designation as a Ramsar site.

More than 80% of the TWC is a mangrove swamp which is under daily tidal scheme. It has all the ecological characteristics of mangrove swamp:

- The mangrove mud, rich in organic matter, has the capacity to retain until 100 times its weight. TWC plays a key hydrological role in the greater Banjul area. The Island of Banjul is only one meter above sea level. The great Banjul area receives around 850mm of rain. Tanbi National Park catches most of the water coming from all Kombo higher land.
- The drainage water as well as tidal are stored and released steadily in the Tanbi swamp. TWC is a hydrological buffer zone, preventing Banjul area from floods. This hydrological importance is enhanced by the threat of climate change and rising sea level.
- TWC is at the mouth of the Gambia River which has its source 1200km upstream, an area with high rainfall pattern. The water coming from the delta deposits organic matter to the ocean, providing basic nutrients of the ecosystem food chain. TWC plays a role in receiving upland input and releasing it in a regular manner into the sea. Thus it is a source of nutrient and a cement to hold the consistency of the river mouth.

Criterion 2

The Tanbi National Park is harbouring vulnerable species such as African manatees (*Trichechus senegalensis*) and African Clawless otter (*Aonyx capensis*). The former is considered vulnerable by IUCN red list book and the second an endangered species by 2002 Gambia Wildlife Act and it is listed on CITES App.II. Bell's hinged Tortoise *Kinixys belliana* (CITES App.II) has been recorded on the coastal strip, as well as the Nile crocodile *Crocodylus niloticus* (CITES App. II), as well as

the Western Red Colobus *Piliocolobus badius temminckii* (EN according to IUCN Red list) occur at the site too.

Criterion 3

The 1997 ecological survey revealed 362 species from 66 families of birds. During the last December perimeter survey of Tanbi Wetland 85 species of birds and more than 7800 individuals birds were counted. The species list is at the annex. More birds are sighted inside the Wetlands but not counted yet.

The African Marsh Owl *Asio capensis* dwells in the TWC during wet-season, that is its only known habitats in the Gambia.

Criterion 4

The TWC is a pathway for fish, birds and dolphins species. Atlantic Hump-backed Dolphins *Sousa teuszii*, and Bottle-nosed Dolphins *Tursiops truncatus* are reliant at some level upon the fish that have their nurseries amongst the mangroves of Tanbi.

The site harbours a mixture of Ethiopian and Eurasian species. The latter winter in the area and the mudflat is crucial for their feeding before returning to reproduce. In the neighbouring site, The Saloum Delta biosphere reserve (Senegal) which is known as Ramsar site, bird species regularly found in TWC as well as in Saloum, are identified as migrating from 12 European countries.

During the onset of the rains a considerable movement of African species occurs with many species utilizing the wetland areas for breeding and feeding purposes. In the early autumn the Palearctic migration gets underway and a large diversity and abundance of species accumulate in the Tanbi wetlands. Many of these birds will stop off to build up fat reserves after their migration, before dispersing further into the continent. The Tanbi National Park thus act as one of the main staging posts on the Palearctic migration being located as corridor to the inland area of the continent as well as providing extensive wintering grounds for many species. By the time the spring migration north commences, much of the TWC have dried and its feeding value for waders and waterfowl is reduced. Nonetheless, it still holds valuable feeding and roosting conditions for gulls, terns and certain species.

Criterion 8

- The shadow of the mangrove trees is a resting ground for many marine and coastal species. Juvenile species nurse at the edge of mangrove shaded waters. In particular, critical stages of the shrimp species *panaeus notialis* development occur in the area (eggs coming with tidal waves from the ocean are kept in the mud to become larvae and stay in swamps all over the juvenile stage). The Gambia River delta is among key recruitment site of this shrimp species in the Western Africa Marine Ecoregion.
- One of the two important food chains in the eco-region starts with mangrove ecosystems. Mangrove leaves are cut by crabs and mixed with mud to produce rich organic matter, which is used then by herbivores such as Tilapia (*Tilapia spp.*) and mullet (*Mugil spp.*), shrimps and zooplanktons. Primary carnivores and up to the top of the food chain (ospreys, Fish Eagles, sharks, dolphins, etc.) rely heavily or partly on it.
- Researches in the neighbouring Saloum Delta site have proven that more than 80 marine and deltaic fish species spawn or nurse in the mangrove swamps. It is believed that TWC plays a similar role.

3.4. Historical evolution of the landscapes and major species

The fish, mammal and reptiles diversity still exists in Tanbi; though, the population is diminishing.

3.4.1/ Trend of the landscape for Tanbi and its surrounding environment.

Table 6 shows communities' view of the trend of the landscape. The vegetation was dense, dominated by *Borassus aethiopicum* and mangroves at independence, waterways and spring were numerous and pristine at the same time as well. Nowadays, all communities consider that the canopy cover has declined from 90% to less 10%, there are less springs and many signs of soil erosions.

Village	Landscape		Three Canopy		Waterways		Major Natural events
	Independence	Now	Independence	Now	Independence	Now	
Mandinarang Kerewan Daranka	Dense mangrove stands	Decline in mangrove, rhone palm and Andopogonae	Dense low land ecosystem dominated by Borassus aethiopium	Cutting of Rhone palm for settlement drives to total loss of the canopy cover	Natural flow of the river Gambia estuary basin almost pristine	All diverted and narrowed down with related soil erosion and creeks siltation	<ul style="list-style-type: none"> - WWII - Famine during 1960's
Lamin Abuko Fajikunda	Dense	Land reclaimed for settlement	Dense lowland canopy of Borassus aethiopium and mangrove	Only low mangrove is left	Very stable and secured	Spring water diminishing and siltation of creeks	<ul style="list-style-type: none"> - 1959 flood - 1980's drought
Talinding	Normal with no erosion signs and dense vegetation	Inhabited	90% cover of Borassus aethiopium at the creation, no major loss at the independence	0% of Borassus aethiopium and low mangrove		Reduced water ways Natural flow diverted	Drought during 1960-80's
Wasulun kunda Old Joshwang	Dense forest	Land reclaimed	Dense Borassus aethiopium	Reduced canopy cover to less than 10%	Existing shallow water bodies	Diminishing of water bodies more flood claim, erosion and siltation	1950's and 2003 flood

3.4.3. Grand Animals

The area was rich in biodiversity at the villages' creation, many grand animals such as elephants and lions disappeared before independence but the major loss is experienced after 1960s with the low of watering springs and the lack of mobility with human settlements. According to the survey, most of the terrestrial animals are no more present around TWC since later 1970s. duikers are the only species sighted along the pathways from Abuko to Pirang.

Table 7: history of grand Predator in Tanbi and its surroundings

Village	Grand predators			Ungulate		
	Species	Trend	Last seen	Species	Trend	Last seen
Mandinaring	Leopard	Very abundant at I, decline of spring water	Leopard 35 Hyena: 26	Antelope eland derby sitatunga, giraffe, duiker	Abundant before Ind. All gone except duiker in very limited population	2005
Lamin					Small pop	
Taliding	Leopard, hyena, lion	Exist at the creation of the village Lack of spring No more grand predators		Derby, water bucks, duiker	Existed with minimal disturbances No more found	Water buck last seen 25 years ago
Old Joshwang	Elephants Dragon Leopard Grass cutter	Existed at the village creation All disappeared now	All last seen before independence	Duiker Antelopes	Disappear	

Source: PRA draft report 2006

3.4.4 Status of Key Resources within Tanbi

The status of key resources exploited by communities in the wetland: fish, oysters, mangrove, shrimp and clams is assessed in Table. Communities estimates that clams and shrimps population are unchanged but for other resources, they are diminishing. Kunkujang and Jatakunda communities assessed the contrary; for them mangrove and fish are increasing. These communities live eastward of the side and high mangrove remains in this area. In general the decreasing trend is noticed.

3.5. Major factors affecting of the current status of site

The major threats for the wetland are:

- Decreasing trend of rainfall
- Land claim
- Sedimentation of bolongs
- Waste dumping and littering
- Inappropriate oyster collection
- Destructive fishing methods
- Speed boats

3.5.1. Decreasing trend of rainfall

The graph below the decreasing trends of rainfall during the 20th century around Tanbi catchment area. Before 1960s, the main rainfall was around 1100mm. This event did occur since 1961; the average rainfall since independence dropped to 800mm, more than 20% decrease. The third and fourth curves show the downward moving trend of rainfall; since 1970's Banjul is receiving less than 20% of the average rainfall.

These curves confirmed PRA results that assessed that the declining trend is noticed since independence.

3.5.2. Land claim

The unprecedented increase of the human population reclaimed the major party of the palm tree and lowland ecosystem. The Rhone and palm trees are reduced: 42% of the communities consider that there are few stand remaining. The area between Fagi kunda and old Joshwang seems the most affected. Land reclamation is affecting the mangrove ecosystem as well. Around Talinding and Eboutown, communities are clearing mangrove to dwell in the wetland. Private companies such as oil fuel tanks in Mandinaring, are eprivate offices at Joshwang, vegetable gardening and rice field in Bakau area are occupying the tidal area

3.5.3. Sedimentation of the bolongs

The human settlement on natural waterways and groundwater recharges zones contributed to develop gullies and soil erosion. 78% of the communities consider that the water bodies are affected by sedimentation. At Old Joshwang, it is considered as one of the major threat of Tanbi creeks; Kubaneh creek is significantly affected by siltation.

INSERT PICTURE

3.5.4. Waste dumping and littering

Soild waste and industrial waste are considered as major problem for the wetlands by more than 52% of the communities. The greater Banjul area domestic waste is mainly dumped at the shore of the wetland. There is no disposal to process it properly. Subsequently it has direct effect on human health; pollutes the ground and surface water. It impacts the wetland food chain

3.5.5. Mangrove cutting

Mangrove is the most important resource of TWC; the park is a mixture of mangrove and creeks and salt marsh. The biological diversity of the site and the hydrological function rely on the mangrove stands. The communities are using the resource for their livelihood that includes fuel wood and house roofing. The existence of large cities around TWC favours the

commercials use of the mangrove. The mangrove situation is differently assessed by local communities.

3.5.6. Intensive Oyster collection

Twelve out of fourteen communities consider that the oyster population is decreasing. The drought and the obstacle of fresh water run off from upstream to the wetland is one of the causes. The inappropriate oyster collection is another cause. The demand for oyster is increasing in relation with the population increase; subsequently, the collection is more intensive. Though collectors are no more cutting roots, the intensity of the harvest is increasing, oysters are becoming smaller and women going further in the wetland. However, the lack of boat limits women to go far inside the wetland and the rainy season biological rest is still applied.

3.5.7. Destructive fishing methods

Tanbi is one of the most important fishing ground in Greater Banjul area; at night hundred of boats enter the bolongs. But it is considered that the fish stand is decreasing in number and size because of destructive fishing methods such as: high number of fishing boats, no use of resting period and site, fishing in spawning areas, use of drag nets, use of small size mesh nets and use of surrounding nets to catch shrimps,

3.5.8. Speed Boat

Tourism facilities are well developed and tourist are using water bodies without strict rules. It has advantages by enhancing economic value of the site but drawbacks as well. At Denton bridge, boats are parked every where jamming waterways and causing night accidents. Speed boats re increasingly entering in the wetland around Kubaneh and Joshwang; in particular. It is happening around the main confluence between Banjul and Lamin creek adjacent to Wharf Njago which is a manatee resting site at high tides and where many fish enter inside bolongs species such as manatees are perturbed by noise thus speed boat once lead to the displacement of such species in the tanbi if not controlled

3.6. Potential for improvement and/or restoration

The wetland has real direct value for the communities living around. But the full benefit is far from reached; (i) the level of production is very low and communities are not getting optimum return value, (ii) tourism and other non consuming activities are lacking. Improving people's livelihood and conserving activities are lacking. Improving people's livelihood and conserving major ecological functions of Tanbi are the most important challenges for the wetland. There are three types of measures in this regard.

Improving production condition, preventing pollution and site degradation and protecting hotspots

The following table list solutions proposed by communities during public consultations in February 2007 to improve working conditions

Table 10: Proposed Solution for Improving Livelihood Activities and Community Management Measures

Resource user groups	Proposed solutions	Proposed management measures
Vegetable growers	-improve fencing, well, dyke/dams, storage facility - Bio pesticide	Crop rotation and use of manure
Oyster collector	- Harmonize Harvesting periods - Training of collectors - Develop oyster culture	Community Bi-laws on harvesting Period (Dec-April)
Mangroves collectors	Planting early maturing trees for fuel and roofing materials	Introduce fines and intense patrol
Fishermen	Reduce influx of fishermen in Tanbi	Confiscation of improper fishing gears
Small women business	Introduce small grants and credit union	

Source: Public Consultations' validation workshop

Together with Kanifing municipality, organize and manage sustainably domestic waste to prevent its intrusion in the wetland, put in place erosion control system, improve water flow to the wetlands are the second series of measures to be taken.

Control access to the wetland by putting in place pillars at the agreed demarcation, zoning and protecting hotspots, regulating fishing gears, controlling mangrove cuttings are the third set of measures to conserve Tanbi. Patrolling, surveillance and law enforcement shall be intensified to implement later measures.

The department of Parks and Wildlife Management as well as surrounding communities will take major role to achieve these objectives by negotiating with stakeholders on management

practices, collecting resources to implement the planned activities and enforcing the law protecting the area.

The Department of Parks and Wildlife Management has recruited 14 staff to contribute to the wetland surveillance. Communities are inequally involved in policing and resources protection from low 5% (Banjul and Daranka) to full participation in Kunkujang Jallaya

INSERT GRAPH

IV. MANAGEMENT PLAN OBJECTIVES

The management plan defines the protected area rules of management and investment to be made to protect the site. The management includes:

- Zoning
- Objective 1: Maintain Ecological processes of Tanbi Wetland
- Objective 2: Enhance human benefits

4.1.Overview

Tanbi National Park is composed of 5 zones

- Core zone (Zone A)
- Controlled Zone, Part 1 (Zone B)
- Controlled Zone, Part 2 (Zone C)
- Land Management Zone (Zone D)
- Settlements

Objective 1. Maintain Ecological processes of Tanbi Wetland

Specific objective 1.1: Enhance Tanbi conservation status

Outputs

- Tanbi wetland Designated as National Park
- Clear demarcation and signage put in place
- Rules and regulations adopted and enforced
- Surveillance facilities (infrastructures, logistics and required personnel) put in place
- TWC Staff capacity enhanced
- Revenue collection and sustainable financing in place

Specific objective 1.2 Develop conservative actions

Outputs

- Tanbi watershed restored/protected
- Sustainable use of fisheries developed and implemented
- Monitoring system of species and research program put in place
- Regular reporting and publishing

Objective 1.3: Develop a co-management strategy

Outputs

- Overseeing bodies (SMC, CMWG, etc.) strengthened
- By-rules set and implemented by communities
- Fishing effort regulated and controlled (shifting fishing systems, biological rests, ban of bad fishing nets, etc.)
- Communication strategy (environment awareness programs) implemented

Objective 2: Enhance human benefits

Specific objective 2.1: Develop communities' development activities

- Communities services facilitated
- Adult literacy program in place
- TWC Volunteers organized and capacity enhanced
- Solid waste management system in place
- Long term policies to implement MDG in place around Tanbi

Specific Objective 2.2: Develop Income generating activities

- Modern beekeeping system in place and community well trained to manage it
- 1000ha of organic and high yield gardening in place
- High value and sustainable oyster production in place
- Community ecotourism put in place
- A credit Union for women is in place
- Other alternative livelihood activities

4.2. Zoning

For effective management of the site, and also to ensure that both wildlife and local people's needs are catered for, a zoning scheme is advocated. Five main zones are envisaged.

(i) Core zone (Zone A)

The core zone is a mangrove swamp with many creeks; communities identified three major creeks and near 20 small bolongs in the wetland. The hotspots indicated in map 3 confirm the importance of the area for marine and estuarine species conservation. The swamp is a nursery as well as spawning ground for fish; the dead end bolongs in particular. The mudflats are feeding areas for birds, recruiting zones for crustacean such as shrimps and clams. All features in the core zone (water body for fish, manatees, mollusks, mangrove forest covering overall functioning of the system) play important role in western Africa marine eco-region. Tanbi is considered as a site of regional importance by PRCM panel of experts as shown in map 4.

It is a key area of high biodiversity due to its size and intactness and due to the avifauna present. This area is suffering habitat degradation and restrictions on the use of the mangrove need to be implemented. In the short term fuel wood collection should be allowed to continue at a subsistence level. It is known that there is currently some commercialization of this resource. This practice should be actively discouraged, as should the taking of live mangrove for any activities.

Other activities such as fishing and oyster harvesting should also continue at a subsistence level. There should however be no harvesting of the roots of the mangroves. Sport fishing should be allowed to continue and all activities should be monitored.

There island exist within the core zone. Landing on the island should be discouraged and any development prohibited.

(ii) Controlled Zone, Part 1 (Zone B)

This area comprises of a buffer zone on the periphery of zone A. the width of the buffer zone will vary from 100 to 200m depending on its location and proximity to settlements. Current traditional use of the zone (e.g. subsistence farming) should be allowed to continue, but be monitored. Particular effects should be made to control bush fires and encourage tree planning of native species. The use of agro-chemical should be stopped in the long term being replaced by selective pesticides/herbicides. This use of fire in farming operations should also be stopped and composting actively encouraged.

(iii) Controlled Zone, Part 2 (Zone C)

This area includes the coastal land north of the Banjul highway and land around Mandinari Point. Current traditional use of the zone (e.g. subsistence farming) should be allowed to

continue, but be monitored. Any development proposal must be preceded by an environmental impact assessment, and if development is approved, mitigating measures must be put in place to ensure the biodiversity of the area is maintained

(iv) Land Management Zone (Zone D)

This area includes all other sections of the wetland complex and comprises mangrove, bush scrub land, forest and farmland. This portion of the reserve is considered sensitive in terms of likely effects of human activities (e.g. agricultural practices). Current traditional use of the zone (fishing and subsistence farming) should be allowed to continue, but be monitored. The land use patterns in this area have been mapped out, and the appropriate management measures and controls should be put in place to minimize any possible adverse effects (e.g. deforestation, soil erosion, agro-chemical run off) of land use practices in the wetland ecosystem. Particular efforts should be made to control bush fires and encourage tree planting of native species. The use of agro-chemicals should be stopped in the long term being replaced by selective pesticides/herbicides. This use of fire in farming operations should also be stopped and composting actively encouraged.

(iv) Settlements

This area comprises the villages within and on the close periphery of the area. Management efforts within these areas would be directed at rationalizing waste disposal to minimize pollution, protecting waterways and controlling soil erosion

4.3. Objective 1: Maintain Ecological processes of Tanbi Wetland

Specific objective 1.1: Enhance Tanbi Conservation status

Outputs

- Tanbi wetland Designated as National Park
- Clear demarcation and signage put in place
- Rules and regulations adopted and enforced
- Surveillance system (infrastructures, logistics and trained personnel) put in place

Specific objective 1.2 Develop conservative actions

Outputs

- Tanbi watershed restored/protected
- Sustainable use of fisheries developed and implemented
- Monitoring system of species and physical features implemented
- Regular reporting and publishing

Objective 1.3: Develop a co-management strategy

Outputs

- By-rules set and implemented by communities
- Fishing effort regulated and controlled
- Overseeing bodies in place
- Communication strategy implemented

4.3.1. Description of targeted feature

Tanbi is a wetland of International Importance but surrounded by densely populated settlements. The loss of biodiversity is noticed along with population increase; in fact, low lands of Tanbi wetland's catchments are entirely taken by buildings and farms. Nonetheless, Tanbi has high richness of biodiversity and is considered in 2005 by PRCM board of experts as a site of regional and international importance for coastal and marine species (habitat for key species such as manatees, dwarf and Nile crocodiles, humpback dolphins, nursery and spawning ground of fish and invertebrates aquatic species, etc.)

Hence, TWC is classified as wetland of International Importance since 2006. With the mangrove and mudflat ecosystem rich in organic matter, Tanbi contributes to regulate the hydrological system of the Gambia River embouchure thus Tanbi is protecting Banjul Island (one meter above sea level height) from flood and sea level rise

The coast line from central Senegal to Guinea is called the land of river which is a network of estuaries including Tanbi National Park where upland nutrients transit to the ocean to maintain marine food chains of Western Africa Marine Eco-region (WAMER). ALONG WITH THE Canary current up-welling system, the delta and estuaries make the WAMER one the richest marine eco-region of the globe.

The Tanbi 4800ha green mangrove swamp forest is one of the rare carbon sink of greater Banjul area that provides beautiful scenery making it a potential recreational site as well

The ecological services and functions listed above appeal to their continuation and to level off threats.

4.3.2. Factors (natural and human) influencing the features

The major threats to the wetland as stated in chapter 3.5 are anthropogenic:

- Land claim

- Sedimentation of bolongs
- Waste dumping and littering
- Mangrove cutting
- Inappropriate oyster collection
- Destructive fishing methods
- Less water flowing to the wetland

The countries sharing Gambia River basin through OMVG are planning to build a hydroelectric dam upstream in next few years, it could reduce the species move along the river and the disturbance of water supply could impact the ecological system processes downstream such as Tanbi estuary.

Rainfall decreasing trend noticed since late sixties is a natural and human factor affecting the wetland. 10 to 30% less rain impacts ecological processes in the estuary but non controlled human settlement reduces quality and quantity of water drained to the river and ocean.

The rainfall decreasing trend is somewhat linked to climate change; the temperature increment disturbs heat exchanges in the atmosphere and its related events such as rainfall. Sahel drought though natural might have been enhanced by global climate change that have local effect. Indeed, coastal wetlands such as Tanbi are one of the most sensitive features to the rising temperature of earth and rising sea level. Hence, climate change with its direct and induced effect could influence the trend of Tanbi National Park.

4.3.3 Solutions

Human factors influence the evolution of Tanbi National Park; thus rules and regulation are to be taken to control the negative effects. Six major groups of solutions will be taken to ensure the maintenance of the ecological function of Tanbi wetland.

4.3.3.1 Specific objective 1.1: Enhance Tanbi conservation status

1. The area needs to get strong protection such as classifying the site as a National Park and enforcing national and international laws and conventions pertaining to the status of the site Ramsar Convention, CBD and CCC.

Tanbi National Park has been designated as wetland of international importance since 2006; yet, because of the threats, it is planned to get a higher status for that is to classify as National Park for the whole area covered by tidal waters before 2009. With communities hotspots of

key species identified, dead-end bolongs are recognized as nursery and spawning sites for fish species, clear signage will be put in place to catalogue them as non take zones. Regular surveillance by DPWM staff in collaboration with communities will be enforced.

To stop human encroachment and solid waste dumping, a buffer zone between the park and the residential area allocated to organic vegetable gardening and wetland forestry will be delimited all around the wetland and protected.

To enforce the zoning and users rules, Tanbi Management team will put signage along the perimeter and clear delimitation of the protected area

2. The Tanbi Management team will be equipped to carryout regular surveillance actions to enforce the law

This set of solutions lead to specific objective 1.2.; Four output are expected to be achieved before 2009.

Specific objective 1.1: Enhance Tanbi conservation status

Outputs

- Tanbi wetland Designated as National Park
- Clear demarcation and signage put in place
- Rules and regulations adopted and enforced
- Surveillance system (infrastructures, logistics and trained personnel) put in place

4.3.3.2. Specific objective 1.2 Develop conservative action

3. Natural conditions of Tanbi Wetland functioning such as water flow, salt and acid intrusion, habitats for key life stages (fish spawning grounds, nurseries, bird feeding area, manatees and turtles sites) are disturbed by human settlement in and around, in this regard mitigation measures will be taken to restore and/or protect major ecosystem functions.
4. The biodiversity described in the above chapters and the sensitivity of the area required regular monitoring of the species and habitat of Tanbi Wetland. Hence a regular ecological monitoring and reporting of the conditions will be put in place.

The second set of objectives related to these two solutions aims to develop conservative actions.

Specific objective 1.2 Develop conservative actions

Outputs

- Tanbi watershed restored/protected
- Sustainable use of fisheries developed and implemented
- Monitoring system of species and physical features implemented
- Regular reporting and publishing

4.3.33. Objective 1.3: Develop a co-management strategy

To improve resource users' conditions within Tanbi, new sustainable techniques and activities will be put in place. They will get benefits while applying new restrictive management rules

A significant part of the communities living around Tanbi Wetland rely on the resources to make their living. They are collecting oysters and other crustaceans, harvesting mangrove, tapping palm trees, cultivating rice and vegetables, hunting threatened species, fishing in Tanbi wetland. Despite hard labour, the income gained from the resources is very low; indeed, these resources users are often among the poorest within the communities. The reasons of this condition are:

- Lack of set of rules for sustainable use of resources and poor knowledge of the threats linked to the current practices
- Use of techniques that add little value to products,
- Lack of resources (technical know-how and financial) to devote themselves to alternative sustainable activities

The conservation of Tanbi wetlands shall address the improvement of the livelihood resources' users. The communities' organizational capacity to police the wetland and resources uses will be strengthened through awareness and education program, trainings and equipment of stakeholders in co-management.

5. A regular awareness program targeting communities, resources users, decision makers, school children will be carried to ensure that stakeholders are aware Tanbi functions and contribute to the protection of this sensitive area.

Objective 1.3: Develop a co-management strategy

Outputs

- By rules set and implemented by communities
- Fishing effort regulated and controlled
- Overseeing bodies in place
- Communication strategy implemented

4.4 Objective 2: Enhance human benefits

Specific Objectives 2.1: Develop community development activities

- Communities services facilitated
- Adult literacy program in place
- TWC Volunteers organized and capacity enhanced
- Solid waste management system in place
- Long term policies to implement MDG in place around Tanbi

Objective 2.2 Implement an Income generating activities program

- Modern beekeeping system in place and community well trained to manage it
- 1000ha of organic and high yield gardening in place
- High value and sustainable oyster production in place
- Community ecotourism put in place
- A credit Union for women is in place

4.4.1. Description of targeted featured

Tanbi wetland encompasses two parts, the site under tidal water and the lowland cultivated by women. The tidal or core zone is a low mangrove swamp, a decreasing trend of resources such as oysters and fish is noticed; threatened species remain but in low numbers. Human activities are the major causes of this trend.

Vegetable gardening and rice cultivation dominate inside the lowland but yields and production are low and in constant decreasing trend. The last survey of the area shows that this cultivated area covers more than 1000ha and around 5000 women are working inside. The area is experiencing salt intrusion, acidification and siltation of sandy particles. Deforestation and human settlement contribute to worsen the situation.

The cultivation techniques are poor (hand tools, no fertilizers, local seeds and without facilities that retain water). Although greater Banjul area is relying on the importation of vegetable, the lowland perimeter around Tanbi has a potential to significantly contribute to Gambia's self-sufficiency in agricultural products.

The settlements area around Tanbi is one of the densest in the country; the lack of environmental plan to control solid waste, erosion, sanitation and many other impacts negatively the wetland by increasing pollution

4.4.2 Solutions

The solution in the swamp area is to introduce new sustainable uses such as beekeeping, oyster-culture, and ecotourism while applying by-rules to the users

Specific Objectives 2.1: development activities

The lack of solid waste management system is a major threat to the wetland. All communities as well as industries are dumping in the mangrove area of the wetland. Actions need to be taken to stop dumping.

- The first action to be taken is to clean all around the wetland. The management team, in partnership with Banjul and Kanifing Councils, and the communities will clean the solid waste existing within the wetland.
- The management plan will facilitate the implementation of dumping bin in the villages; a sensitization program will be carried-out to encourage community to dump at designated sites
- The nation and the mayoral offices are supposed to organize regular collect system.
- Tanbi staff will patrol to stop any illegal dumping (industrial or domestic within the wetland)

The high density of the population around the wetland implies the implementation of MDG goals in this site. In particular, Tanbi manager will work together with education department to raise literacy level. In partnership with community, and adult literacy program will be developed with all beneficiaries of income generation activities. The major objective of the management plan is to ensure the conservation for longer term benefit. In this regards, a capacity building and environmental protection awareness program will be implemented for DPWM staff as well as for volunteers in the communities.

The hydrological studies identified the widespread of erosion in the street system around Tanbi. The planning intends in five years period to reduce at 50% gullies in greater Banjul area road system. The planning intends to contribution to reduce women overload of household activities by the facilitation the building of drinking water facilities such pumps and/or wells. The co-management specific objective described above participates to community's development activities as well. The outputs of this specific objective are:

- Co-management strategy in place
- Adult literacy program in place
- Gullies and eroded street system reduced
- Solid waste management system in place
- Communities welfare and communication facilities put in place
- Long term policies to implement MDG in place around Tanbi

Objective 2.2 Implement an Income generating activities program

- Modern beekeeping system in place and community well trained to manage it
- 1000ha of organic and high yield gardening in place
- Community ecotourism put in place
- A credit Union for women is in place

1) Output 1: Modern beekeeping system in place and community well trained to manage it
A process leading to implement honey production facility will be put in place. It comprises:

- Training mangrove cutters and key communities living around the wetland in modern beekeeping methods,
- Facilitating a loan scheme to put a significant number of beehives in the near mangrove,
- Favouring the build of a professional organization
- Putting in service an extension team to monitor the launch of the production
- Running a small honey processing facility
- Promoting the commercialization of new products

2) Output 2: 1000 ha of organic and high yield gardening in place

The vegetable gardening in the buffer will be supported. In particular,

- Gardeners will be trained on the use of organic pesticide and fertilizers,
- A credit saving scheme will be put in place to widespread the use of good seeds and introduce tools that ease women's working conditions
- Facilities will be built to secure gardens, improve the soils conditions, ensure water supply
- Build commercial capacity of gardeners
- Ensure

3) Output 3: High value and sustainable oyster production in place

The management plan intends to improve oyster production around Tanbi

- Oyster collectors will be taught to make artisanal tools such as gloves, socks, etc. to improve their working condition
- A facility that put value on fresh oyster that enable producers to sell to hotels and restaurants will be implemented in a partnership that include fisheries, tourism industry and collectors
- Modern method of conservation of dry oyster opening to abroad market will be facilitated
- All the components comprise: training, organizational management capacity building, credit saving program,
- Oyster farming with new available techniques

4) Output 4: Community ecotourism put in place

Tanbi wetland is suitable place for ecotourism. Hotels are using the site in this regards; cruising, bird sighting and boat speeding are the main tourist activities within Tanbi. The site management team does not have benefit from the current activities because the actors are paying entrance fees. The hotels to stop unsustainable activities such a boat speeding and raises entrance fees

Communities know the place and can identify key species sites and timetable. During the PRA they clearly spot high biodiversity sites and even guided management team to find key species such as crocodiles and manatees in their habitats. Most of the knowledgeable people are hunter or fishermen that are will to share their capacity and to work closely with conservation community. The management intends to accompany the reconversion of these hunters and develop specific ecotourism programs.

The new community ecotourism actors will be trained in tourism guiding, a credit will support them to acquire small boats, and ecotourism routing will be mapped and published widely in relation with Gambia Tourism Authority. At least two routing (one for manatee sighting, another for bird watching and cruising) will be implemented. Hence, the new circuit will be exploited by the reconverted communities living around Tanbi.

5) Output 5: a credit Union for women is in place

Poverty is recognized as the driving factors for resources uses; the plan intends to contribute to alleviate it. The activities above are designed in that purpose but are only targeting direct users. A credit/saving program will be put in place for women's small businesses. The objectives of the credit/saving are (i) to develop non resources uses around Tanbi, (ii) enhance

good partnership between communities and the new park, (iii) create saving programs to promote autonomous and local financing programs.

5. Action Plan

Specific objectives	Outputs	Activities	Inputs/Tools	Total cost	Timeframe	Responsible
1.1 Enhance Tanbi conservation status	Tanbi wetland designated as Nation Park	Public Consultations	Resources for meetings	D30,000	May-July 2007	DPWM
		Legal procedure at administrative level	Publication materials	Undetermined	January-December 2007	SOS F&E and DPWM
	Clear demarcation and signage put in place	Mapping and surveying	GPS, Surveyour	D20,000	2006	DPWM, Lands and Surveys
		Putting in place Boundary Pillars	Building materials	D100,000	2006-2010	DPWM and Tanbi Staff
		Putting in place sign boards	10 Sign boards	D50,000	2008	DPWM Tanbi Staff
	Surveillance system (infrastructures, logistics and trained personnel) put in place	Building Towers and information center	Building materials and human resources	D2,000,000	2008-2009	DPWM
		Putting in place Logistics	Motorized Boat, boots, bicycles, binocular, Motorcar	D2,000,000	2008-2010	DPWM
		Firebelt clearance	Staff Volunteers Cutlass, axes, etc	D150,000	Annual	SMC,DPWM and Tanbi Warden
		Training Plan implemented	Consultants and training cost	D1,000,000	2008-2012	DPWM
		Training Tanbi personnel in surveillance and patrolling	Trainer one month training material	D100,000	2008-2009	DPWM
		Patrolling Plan Implemented	Staff and patrolling logistics	TBD	Ongoing	DPWM and Tanbi Staff, PMO
		Reporting	Stationeries	TBD	Quarterly and annually	Tanbi Warden

Specific Objectives	Outputs	Activities	Inputs/Tools	Total cost	Timeframe	Responsible
1.2 Develop conservative	Tanbi watershed restored/protected	Erosion control (10 by community)	Training communities on erosion control techniques Purchase and transport material Building gabions	D1,200,000	2008 and 2009	Communities' leaders Communities Tanbi Staff Officials DPWM NEA
		Annual Clearance of filled culverts	Staffing Small materials	D100,000	Yearly April-May	NEA Road authorities, city Council, DPWM, Communities' leaders
		Building new culverts (at least 3) allowing regular flow from upland to the wetland	Technician to Design Building procurement	TBD	2008-2012	Road authority (GRA), DPWM NEA
		Stop building in natural waterways and within the wetland	Sign boards Lobbying through decision makers Government staff to enforce law		2008-2009 Ongoing Ongoing	NEA, Tanbi staff, city council
		Removal of dumping in the wetland	Staffing Put in place garbage bins Lobby for Regular removal of household waste by city councils	TBD	2008 2008-2009 ongoing	NEA, Tanbi staff, city council,

Specific Objectives	Outputs	Activities	Inputs/Tools	Total cost	Timeframe	Responsible
	Sustainable use of fisheries developed and implemented	Ban unsustainable fishing practices	Law enforcement Staff (DPWM and Fisheries department)	Civil servants salaries D200,000 Already Budgeted	Ongoing 2008-2009	Fisheries departments Tanbi staff Communities' leaders and SMC
		Patrolling and surveillance	Nautical equipments			
		Sensitization of stakeholders	Awareness materials			
		Ban fishing in (i) dead-end bolongs, (ii) known threatened species habitats, and (iii) recognized nurseries	Law enforcement staff	Idem above	Idem above	Fisheries Department Tanbi staff Communities's leaders
			Nautical equipments			
			Sign boards			
Monitoring system of species and research program put in place	Five-year Ecological survey	2 experts, DPWM STAFF	D1,000,000	2009	DPWM	
		GPS, Binoculars				
		Aerial photos or satellite data				
		GIS facility				
	Logistic					
	Regular turtle survey	Beach survey	Turtle action plan budget	May-November each year	DPWM	
	Regular dolphin survey	Monthly river survey	Dolphin action plan budget	Ongoing	DPWM	
	Manatee radio tracking	Expert, Radio track, Logistics, Staff	Manatee action plan budget	3 years	DPWM	
	Database	DPWM Database	DPWM database	Ongoing	DPWM	

Specific Objectives	Outputs	Activities	Inputs/Tools	Total cost	Timeframe	Responsible
		Management		Budget		
	Regular reporting and publishing	Regular publication on the status of Tanbi Scientific publications	DPWM senior staff Experts and/or students	DPWM budget D500.000	Yearly starting 2009 At two articles	Tanbi Warden. DPWM Partners, DPWM
1.3: Develop a co-management strategy	By-laws set and implemented by communities	Negotiation meetings to set by laws with Resource users Validation meeting	50 meetings	D250,000	2008	Communities Leaders, DPWM, Fisheries Department
	Fishing effort regulated and controlled	Communities control and law enforcement		Non Costed	Ongoing	SMC
	Overseeing bodies (SMC, CMWG, etc) strengthened	Regular meetings Training in co-management Exchange visit and networking	Meeting resources Expert Logistics	D300,000	4 times a years	SMC DPWM Sub-regional Partners
	Communication strategy implemented	Design communication strategy and action plan School clubs activities	Meeting resources Audiovisual tools Stationary Education Visits Logistics Competition	D50,000 D300.000	2008 Three times a year	DPWM Tanbi staff Teachers and students

Specific Objectives	Outputs	Activities	Inputs/Tools	Total cost	Timeframe	Responsible
		Publish leaflets, posters and brochures	Designer Publishing materials	D70,000	2009	DPWM, TWC staff
2.1. Enhance human benefit by improving community development activities	Co-management strategy in place	See above specific objective				
	Communities services facilitated	Community development need assessment Implement identified needs on community services	Meeting resources Services inputs	D3,000,000	2008-2012	DPWM DCD Partners Local communities SMC
	Adult literacy in place	Training plan design Implementing training plan	Teachers Training resources		2008-2012	DPWM DCD ANFE
	TWC Volunteers organized and capacity enhanced	Incorporated in DPWM training plan			2008-2012	
	Gullies and eroded street system reduced	See specific objective 1.1 outcomes				
	Solid waste management system in place	Advocacy (NEA, Ministry)	Staff	TBD	2008-2009	DPWM, NEA
		Clean the current dumping	MOU with BCC and KMC Meeting communities	TBD	Early 2009 2008-2009	DPWM, CL, BCC, KMC

Specific Objectives	Outputs	Activities	Inputs/Tools	Total cost	Timeframe	Responsible
			Acquiring cleaning tools Cleaning cost		Early 2009 2009	
		Sensitizing	Regular meetings cost Signboards	Tanbi staff salaries See above	2008 onward	Tanbi staff
		Developing compost production	Training Transport organic waste Technical support	TBD	2009-onward	Vegetable growers, Tanbi staff
		Installing boxes	Boxes cost	TBD	2009	DPWM, CL, BCC, KMC, NEA
		Organising regular collect	Collect cost	TBD	2009, onward	DPWM, CL, BCC, KMC, NEA
		Regular evaluation and reporting	Technical and financial auditors Annual Evaluation meeting	D150,000	Annual	DPWM, CL, BCC, KMC, NEA
2.2 Implement and income generating activities program	Modern beekeeping system in place	Training	6 training sessions at the inception Annual training	D120,00	End 2008	Beekeeping association (BA), Tanbi staff, communities leaders (CL)
		Organizing beekeepers	Meetings Establishing by-laws	D30,000	Last quarter 2008 First quarter 2009 First quarter	BA, DPWM, Credit Union CL

Specific Objectives	Outputs	Activities	Inputs/Tools	Total cost	Timeframe	Responsible
			MOU with DPWM Beekeeping organization		2009	
		Set-up beekeeping appearances		D30,000	2009-2010	BA, Tanbi staff, producers
		Putting in place a credit Union to purchase Beekeeping equipment	Initial saving Initial loan/grants for beekeeping appearance Second loan Loan to set a factory	D500,000	Second quarter 2009 2 nd quarter 2009 2011 2010	BA, DPWM, Credit Union CL
		Extension program and monitoring the production	Staff time of extension workers, Bike and boat	D300,000 D100,000	Ongoing	BA, producers, Tanbi staff
		Acquiring Honey processing facility	Procurement	D350,000	2010, onward	BA, producers, Tanbi staff
		Honey production marketing	Transport Factory staff-time Promoting fees marketing produce Reimbursing loans and saving	Interiozed by producers D50,000	2010, onward	BA, producers and Tanbi staff

Specific Objectives	Outputs	Activities	Inputs/Tools	Total cost	Timeframe	Responsible
			Reinvesting			
		Beekeeping growers benefited an adult literacy program	Select participant Conduct level 1 AL Conduct level 2 AL Conduct level 3 AL	1 month consultant fee 4 months trainer staff times 3 4 months trainer staff time 3 Training tools	D5,000 D60,000 D60,000 D25,000	DPWM, BA, CL DPWM, BA, CL, Tanbi staff, Eudcation Department, Private AL Association
		Regular Evaluation and reporting	Technical and financial auditors Annual evaluation meeting	D150,000	Annual	BA, DPWM, Credit Unions CL
	1000 ha of organic and high yield gardening in place	Organizing producers and training on Agricultural resources Management MoU with DPWM	Three months Technician staff time	D21,000	2008	DPWM
		Putting in place credit Unions	Initial saving Initial loan to implement facilities	D500,000 D1,800,000	2008 2009	Producers and Tanbi staff

Specific objectives	Outputs	Activities	Inputs/Tools	Total cost	Timeframe	Responsible
			Initial loan to acquire horticultural inputs and tools	D100,000	2009	
		Building facilities	Fencing, equipped wells	See above D1,800,000	2009	Producers and Tanbi staff
		Training on modern organic horticulture	Technician staff time	D50,000	2009	DPWM and producers
		Production Extension services and monitoring program	Extension workers staff time	D500,000	Ongoing	DPWM and producers
		Vegetable growers benefited from an adult literacy program	Select participant Conduct level 1 AL Conduct level 2 AL Conduct level 3 AL	1 month consultant fee 4 months trainer staff times 3 4 months trainer staff times 3 Training tools	D5,000 D60,000 D60,000 D60,000 D25,000	DPWM, BA, CL DPWM, BA, CL, Tanbi staff, Education Department, Private AL Association
		Regular evaluation and reporting	Technical and financial meeting	D150,000	Annual	DPWM, Credit union CL
	High value and sustainable oyster	Training and oyster collectors	3 sessions for oyster collectors	D150,000	2009	DPWM, Fisheries department

Specific objectives	Outputs	Activities	Inputs/tools	Total cost	Timeframe	Responsible
	Production in place	Capacity building				Consultant, oyster producers
		Feasibility studies on the implementation of modern Oyster farming facility	2 month consultants time	D420,000	2009-2010	DPWM, Fisheries department, consultant, oyster producers
		Production, extension program and monitoring	Installing facilities	TBD	2010, onward	DPWM, Fisheries department, consultant, oyster producers
			Technicians staff time	D500,000		
			Production cost	TBD		
			Marketing cost	TBD		
Oyster collectors benefited from an Adult literacy program	Select participant	1 month consultant fee	D5,000	DPWM, BA, CL DPWM, BA, CL, Tanbi staff, education Department, private AL association		
	Conduct level 1 AL	4 months trainer staff times 3	D60,000			
	Conduct level 2 AL	4 months trainer staff times 3	D60,000			
	Conduct level 3 AL	4 months trainer staff times 3 4 months trainer staff times 3 Training tools	D60,000			
			D25,000			
Regular evaluation and reporting	Technical and financial auditors	D150,000	Annual	DPWM, Oyster collectors union, fisheries department		
		Annual evaluation				

Specific objectives	Outputs	Activities	Inputs/Tools	Total cost	Timeframe	Responsible
			Meeting			
	Community ecotourism put in place	Select and train young people from the community	Tanbi staff time	Salaries	Mid 2009	Tanbi staff
		Map ecotourism routes and activities	Surveying cost GIS processing cost	D400,000	2009	DPWM, GTA consultant
		Training in eco-guiding	Training staff and material	D200,000	2009	DPWM, GTA
		Acquiring ecotourism equipment	2 Equipped local Boats, 20 binoculars, 2 maps	D200,000	2009	DPWM, GTA
		Implementing the ecotourism program	Guiding and maintaining facilities	Internal cost	2009, onward	Communities, DPWM,GTA
		Regular evaluation and reporting	Technical and financial auditors Annual evaluation meeting	D150,000	Annual	Communities, DPWM, GTA
	Credit union for women is in place	Install progressively village 'banks' in the Tanbi surrounding communities	Training cost Feasibility study cost Loan for 12 banks	D75,000 D120,000	2009 Progressive starting 2009	DPWM and Catholic relief Service (CRS)

Specific objectives	Outputs	Activities	Inputs/Tools	Total cost	Timeframe	Responsible
		Monitoring village 'banks' activities	Technician staff time	D150,000	Starting 2009	DPWM, CRS
		Women benefited from an adult literacy program	Select participant	1 month consultant fee	D5,000	DPWM, BA, CL DPWM, BA, CL, Tanbi staff, education department, private AL Association
			Conduct level 1 AL	4 months trainer staff times 3	D60,000	
			Conduct level 2 AL	4 months trainer staff time 3	D60,000	
			Conduct level 3 AL	4 months trainer staff times 3 Training tools	D60,000	
	Regular evaluation and reporting	Technical and financial auditors Annual evaluation meeting	D150,000	Finance	DPWM, CRS and Finance	
	Converging all above sustainable activities in a single line credit and saving Union	TBD	TBD	TBD	DPWM	

CONCLUSION

Tanbi wetland is sensitive area, rich in biodiversity and plays an important role to control the hydrological system in greater Banjul area. Tanbi is designated as wetland of international importance and hotspot of regional importance for marine and coastal species. Many sensitive species such as manatees, crocodiles and clawless otters dwell in the Tanbi Wetland.

Communities living around are using biological resources of the area such as fish, oyster and clams, mangroves, etc., often in an unsustainable manner.

The threats for maintenance of the biological diversity are mainly anthropogenic.

This update management plan has an overall goal to conserve Tanbi National Park. Two main objectives which are: objective 1: Maintain Ecological zoning and ecological and social surveys are to be implemented. The achievement of the objectives in a five years time frame will accomplish 20 significant results that improve the functions and the conservation of Tanbi Wetland and communities livelihood.