



MANGROVE INITIATIVE IN WEST AFRICA



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LIST OF ACRONYMS AND ABBREVIATIONS

ADAM	Association pour le Développement Agricole en Mangrove
BANP	Banc d’Arguin National Park
CDM	Clean Development Mechanism
CSRP	Commission Sous Régionale des Pêches (Sub Regional Fisheries Commission)
DNP	Diawling National Park
DSEP	Diagnostic Suivi Evaluation Participatif
GEF	Global Environmental Fund

IDRC	International Development Research Centre
IGA	Income Generating Activity
JICA	Japan International Cooperation Agency
MPA	Marine Protected Area
ODIL	Organisation pour le Développement Intégré du Littoral (Integrated Coastal Development Organisation)
PRCM	Programme Régional de Conservation de la zone Marine et Côtière (Regional Marine and Coastal Conservation Programme)
IUCN	World Conservation Union
VDC	Village Development Committee
WAAME	West African Association for Marine Environment
WAMI	West Africa Mangrove Initiative
WIA	Wetlands International Afrique

EXECUTIVE SUMMARY

The main activities planned in 2008 were the identification and initiation of rehabilitation actions in degraded mangrove areas, the development of pilot projects, the strengthening of national mangrove conservation policies, the development of the regional Charter and Action Plan and the initiation of fundraising for the latter. In addition, the synthesis of reports in Ecology/climatology and Socio-economy were to be finalised.

The identification of rehabilitation projects and micro-development projects to support villagers' economics activities has occurred in six countries, following community consultation. Thus reforestation, the building of improved ovens, the use of improved bee-hives, the production of salt, the training of mangrove surveillance brigades have started in the Gambia, Guinea Bissau, Guinea, and Sierra Leone based on local community priorities. Mauritania and Senegal are currently in the starting phases.

Studies on mangrove management policies have been carried out in Mauritania, Guinea and Sierra Leone. Furthermore consultation workshops with various actors which have ensured the consolidation and completion of work started by the World Conservation Union (IUCN) in Senegal, the Gambia, and Guinea Bissau. The main axes identified for inter-state collaboration are enhancement of the legal and institutional frameworks, wise use of resources, establishment of sustainable funding mechanisms, improvement of information availability and communication, enhanced community engagement, the restoration of the environment, a better organization of the by-products markets and the mitigation of the negative impacts of pollution. These axes have served as bases for the drafting of the Regional Charter and Action Plan of which a draft version is currently being finalized.

There have been two initiatives geared towards raising funds. The first is a research partnership with the University of Dakar on carbon sequestration. The preliminary results have shown that *Rhizophora* reforestation in the Saloum, Senegal have high potential as good carbon stores.

In addition, there is a funding opportunity from the International Development Research Centre (IDRC) for a project to establish a regional mangrove observatory. A concept paper is being developed.



The finalization of regional syntheses in Ecology/Climatology and Socio-economy is still underway and should be completed by December. Consultants were identified at the beginning of the project to deliver a regional synthesis at the project launch workshop. Preliminary results were delivered at the workshop but after further evaluation of the draft reports, the project coordination team found the Ecology/Climatology and Socio-economic reports unacceptable and sought out negotiations with the consultants to improve the reports. Finally, we have concluded that the consultants chosen were not up to our expected standards. Thus the synthesis was entrusted to two teams, one of Ecological/Climatological consultants, and the other Socio-economic. The reports will therefore be finalised during 2009.

0. INTRODUCTION

In March 2007, Wetlands International Africa Office and the World Conservation Union IUCN (West Africa Office – WARO) signed a memorandum of understanding for the implementation of the project entitled Initiative Mangrove en Afrique de l’Ouest¹ – IMAO. The memorandum was the result of the agreement of the MAVA Foundation to finance the said project for a term of three years starting from 2007.

The project seeks to improve the livelihood and security conditions of mangrove dependent communities from Mauritania to Sierra Leone by:

- Raising awareness of the status and value of mangroves;
- Piloting efforts aimed at restoring mangroves and demonstrating more sustainable approaches to mangrove use by local communities
- Improving and harmonizing mangrove management policies through a negotiated process.

In 2007 a regional workshop held under this project provided the opportunity for wide consultation with the different actors involved in ecosystem management and the project had first draft baseline study reports on ecology/climatology, socio-economics and mangrove mapping in West Africa. The results of this workshop have underpinned the main directions and emphasis of the work planned and under implementation by the project, particularly in the community based approaches.

In 2008, the rehabilitation of degraded mangrove areas, the development of pilot community projects, and the strengthening of national mangrove conservation policies were the primary activities planned.

This annual report, covering project implementation during 2008 is divided into 6 parts:

Summary of the demonstration field activities implemented in the project countries. These are varied and diverse with respect to the responses that we have tried to provide in order to reconcile conservation and development issues that are found in the various West African countries. These

¹ West African Mangrove Initiative



pilot projects were developed in response to national level consultation and will be presented as promotional models in the regional mangrove charter.

Summary of progress of the development of the regional mangrove charter in the PRCM zone.

IUCN has already conducted policy studies in Senegal, Gambia and Guinea Bissau. The project has integrated the results and completed the work in Sierra Leone, Guinea and Mauritania.

Building a partnership with scientific research organisations. A summary of knowledge development initiatives undertaken with research organisations during this project to help build the knowledgebase on western African mangroves.

Summary of project implementation, constraints and proposed solutions. An analysis of the main challenges that the project's implementation has been confronted with and solutions.

The financial report for 2008. A summary of expenditure, proposed budget amendments and a projected cash-flow to the end of the project is provided. A request for a budget neutral extension to the end of the project is made.

Priorities for implementation in 2009 and the activity plan. In this section, a 2009 activity chronogram is also presented. This puts a particular accent on monitoring of field activities implemented in 2008, the creation of a strong link between these activities and the mangrove charter to ensure its adoption by the PRCM, CRSP and ECOWAS. The development of funding sources to ensure that the charter is implemented will be a central activity in 2009.

1. DEMONSTRATION FIELD ACTIVITIES IMPLEMENTED WITH COMMUNITIES

The objective of the WAMI project is the restoration and conservation of mangrove ecosystems in the PRCM region while working to improve the well-being and security of mangrove dependent communities by raising their awareness, facilitating their interventions on the ground, and improving and harmonizing mangrove management policies through a negotiated process.

The project's strategy centres around the creation of a knowledge base, the transfer of community knowledge and practices from local to a regional scale, the establishment of conditions conducive to sound mangrove management and the strengthening of national and regional policies as well as action plans. In 2008 the basis for demonstration projects in each country was established and activities on the ground got underway. The following sections summarise this process and the results of project implementation to date.

1.1 Methodology

In each target country the main issues driving mangrove loss and degradation have been identified. This work had already been conducted in 2007 through consultation with national focal points and the results of the regional workshop. In 2008 suitable local scale interventions were designed to show how some of the typical issues confronted in West African Mangroves can be tackled through local scale initiatives implemented in partnership with communities.

For each country it was important to use a rigorous approach to engaging the respective local communities in the development and planning of on the ground activities for the demonstration projects. A community participation methodology was used to achieve this as this ensures that communities jointly own the aims and activities and therefore secure the best chance of their successful implementation. Community participation is the determining factor for the success of the project. It is for this reason that the team chose the Participatory Monitoring and Evaluation Diagnosis (PMED) approach. Its purpose is to encourage, support and build the existing capacities in

communities, identify their own needs, determine their own objectives, and monitor and evaluate the activities undertaken. This has helped us answer the following questions:

1. What are the required activities and which may be supported under the WAMI project?
2. Have communities identified other relevant and achievable activities in 2008?

The answers to these two questions require the usage of several participatory tools and techniques used during diagnoses. Among them are: Direct observation, Semi structured interviews, focus groups, triangulation.

1.2. Activities implemented per country

The aims of the local projects that were identified are varied and can be categorised as:

- Response to local community over-use / unsustainable use of mangrove resources: Capacity building to improve communities' ability to undertake sustainable income generating activities such as apiculture, salt production, and improved stove building which reduce the pressure on mangrove resources.
- Response to degradation / loss of mangrove ecosystems: Restoration and conservation of the mangroves through replanting
- Response to animal degradation of mangroves: Physical protection of mangroves from animals

Which activities have been chosen depends on the nature and acuteness of degradation issues and the abuse of mangrove resources by local communities the target countries. Actions have been identified and agreed upon using the methodology outlined above (see table below).

Table 1: synopsis of identified constraints / actions agreed upon during participatory diagnoses in each target country

Country	Chosen local communities	Constraints	Identified actions	Implementing bodies	WAMI support
SENEGAL	Gagué Chérif Dasselamé Sérer	Clandestine mangrove cutting Salinity Silting-up of shores	Establishment of village surveillance committees	Village development committees Focal Point	Financial and technical support
GAMBIA	Bali Mandinko	Salinity of channels	Capacity-	Village development	Technical and financial

	Jasobo Buram	with a local flow regime Die back	building Reforestation and bee farming	committees Focal Point NBAG	support
GUINEA BISSAU	Cacine Conamine Contaia Cadico	Abusive cutting for fish smoking / exportation and rice farming	Building of kilns with improved efficiency for fish smoking	Local communities Focal Point, Local NGO QUITAPESCA	Technical and financial support
GUINEA CONAKRY	Kindiadi- Baléssouri Sangaréyah Wonkifong bay	Cutting for trading, smoking and salt processing	Capacity- building Mangrove reforestation Saliculture	Focal Point Communities and local NGO ADAM, ODIL	Technical and financial support
SIERRA LEONE	Fogbo Tombo Matainkay	Abusive cutting to meet energy needs (brickmaking, cooking and fish smoking)	Capacity- building Mangrove Reforestation Building improved kilns	Local communities Focal Point	Technical and financial support
MAURITANIA	PNBA DNP	Salinity Grazing by camels and	Building of a protection fence against	Division of Diawling National Park	Financial support

		pollutions	camels	Focal Point	
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The identification process and community buy-in of the activities is based on the participative approach and is illustrated by the Pictures (1-4) below. Under the supervision of the IMAO project coordination team, all the reforestation activities and mangrove protection are led by government technical services and by the communities themselves. To ensure sustainability of the activities and knowledge transfer, it is necessary to technically prepare the communities to take over. On the ground, this partnership translates into the participation of the IMAO coordination team (see Pictures 1, and 3). This is followed by field visits to consolidate the national reports and statistics and to prepare the communities for field activities such as reforestation (Picture 2), and by proposing reforested species adapted to the site realities (Picture 4). The following sections give an impression of the process in each target country. The status of mangroves and the responses that the project has stimulated are described.

Pictures of participatory diagnoses



Picture 1 : Meeting with the village of Dasselamé Sérér (Senegal)



Picture 2 : Core drilling at Dasselamé Sérér (Senegal)



Picture 3 : Meeting with the representative of Dubréka (Guinée)



Picture 4 : Natural regeneration area in Jasobo (Gambia)

Overall, the field activities were planned in a participatory manner, as was the implementation with the benefiting communities. The implementation was preceded by the organization of a management committee which piloted all the activities under the supervision of the national project focal points. This approach guarantees the continuity of the project activities if funding is ensured.

Thus the capacity building with respect to the *Rhizophora* reforestation in Gambia was led in collaboration with the women of the Saloum and established experts. The negotiations for the improved stoves in Guinea Bissau were led in the presence of migrant fishermen from Senegal and Guinea. During these same negotiations, the illegal traffic of timber between Cacine, Guinea Bissau and Katcheck, Guinea was addressed in order to find a solution. Salt drying, which should begin soon



in Gambia and Sierra Leone, will employ the expertise from Guinea where this technique has been well mastered.

This type of approach favours exchanges between actors in different countries and allows the issues of mangrove conservation to be addressed on a regional level, which is the objective of the charter and the action plan to be proposed. 2009 will provide consolidation of small field projects in order to present them as models for the operationalisation of the charter and research funds.

1.2.1. The Gambia

1.2.1.1. Status of mangroves

The Gambian mangrove ecosystem is characterized by a striking contrast between the mangroves of the central estuary benefiting from a significant influx of fresh water from Fouta Djallon (average annual rainfalls over 3m) and those of the marine estuary of which salinity rate is similar to that of the Saloum in Senegal. The Rhizophora of the central estuary have a natural productivity two times as significant as that of the mangroves of the marine estuary downstream. This was observed in the area of the Farafenni ferry in Jasobo. But then, in the villages of Bali Mandinka and Buram more upstream, the effect of salinity is more acute, leading to the presence of *tannes* and small sized Rhizophora. However, it was noticed that the development of mangroves around the city of Banjul (Oyster creek between Benton Bridge and Lamin village) is strongly influenced by the local topography of mudflats: Rhizophora of high mudflats are moderately developed compared to low mudflats as there is less tidal submersion in high mudflats. In the central estuary, there is significant natural regeneration. We are noticing different stages of Rhizophora, the oldest ones (20-40 m of average height) often limiting the growth of seedlings.

One of the key challenges to mangrove conservation in Gambia is unregulated timber cutting such as in Farafenni. Like in Senegal, raised awareness of forest management is essential. It is clear that cutting downstream should be prohibited, and that reforestation efforts are essential. It is also possible to consider authorizing selective cutting of old trees to avoid allowing them to rot; this would provide firewood and timber while promoting the growth of young trees where natural regeneration is active. This approach clearly requires significant technical and logistical capacity building for the Water and Forestry services. Furthermore local communities need to develop alternative approaches to livelihood support which promote sustainable use of forest resources and are less reliant on exploitation of mangrove wood.

1.2.1.2. Activities implemented

Upon proposal of the Gambian Focal Point who follows the capacity mobilization and project implementation of the Gambian Forestry Division, the villages of Bali Mandinka, Jasobo and Buram have been selected as pilot sites. In each village participatory diagnoses have been carried out. This

has allowed, in mutual agreement with local communities, the identification and implementation of several actions.

1.2.1.1.1 Capacity building.

During the week of 21-27 July 2008, twenty village chiefs were trained on three modules requested by local communities during participatory diagnoses:

Organizational development. During the diagnosis we realized that the communities needed to better structure their association in order to successfully implement the development activities which would be entrusted to them later on. The training stressed the development of the internal capacity of local organizations to manage the implementation and monitoring of activities;

Beekeeping techniques as income generating activities which also support forest development. A summary of the session is shown below. The Project Community Liaison Officer visited the Wetlands International GreenCoast project (a post-tsunami project seeking to restore mangrove ecosystems and related livelihoods) in Banda Aceh in Indonesia. Here an innovative approach to micro-financing has been piloted called Bio-Rights (see Box Text 1). The concept of Bio-Rights has also been adapted and piloted in the Gambia. With very few financial means, IMAO adapted the concept with the final goal being the creation of village banks.

BoxText 1: Bio-rights – Linking Nature Conservation and Poverty Reduction

Poverty and environmental degradation are strongly linked to each other. Poverty often leads to unsustainable use of natural resources, whereas environmental degradation causes significant loss of nature's life supporting services. This negatives spiral needs to be stopped through an integrated approach of poverty and environment issues. As an innovative finance mechanism, Bio-rights is such an approach. Through micro-credits it provides local communities options for economic development. Instead of fulfilling their debts and paying interest, participants are required to actively involve in nature conservation activities, such as reforestation, decreased hunting and fishing or protection of existing habitat. Based on the success of these measures they will be granted their loan. As such this 'business-deal' accomplishes both economic development, nature conservation and long-term awareness on sustainable land use. Pilot projects in Mali and areas hit by the tsunami in Indonesia have proven very successful. Current initiatives aim to further develop the concept and to share lessons learnt with governments and both the public, private and financial sector.

Mangrove reforestation. We have noted, in the village of Bali Mandinka, that reforestation has failed due to a lack of supervision notably for the selection of sites, the selection of seedlings and the planting period. All these factors are well controlled in the villages of Saloum, and an expert of the

Saloum Delta National Park has managed to conduct a reforest session and lead the group on a field visit. More details are given below.

1.2.1.2.2. Mangrove reforestation

This activity has been implemented in the villages off Buram and Bali Mandinka with full village participation. It is integrated in the cultural calendar and the populations accept donating their time to participate in the reforestation. Under the supervision of the focal point, a mangrove management committee was put in place in each village which participated in the reforestation training session, and called the rest of the village for reforestation days. This same committee is responsible for the monitoring of the seedlings and gives regular updates to the village development committee and the IMAO focal point. Thus, for Buram, 7,800 seedlings have been planted on approximately 1.5 hectares. In Bali Mandinka, 2000 seedlings have been planted on half a hectare. There is a regeneration rate higher than 80%, which the communities monitor regularly.

1.2.1.2.3. Beekeeping

The bee-keepers in the villages have benefited from financial support amounting to €1.024 for the purchase of beehives and accessories. Prior to this activity a specialized local NGO, **National Beekeepers Associations of the Gambia** (NBAG), supported capacity building. For a week beehives and accessories were installed in pilot villages. According to the estimates of NBAG, the harvest will be done on a quarterly basis during the dry season and according to the capacity of flower trees, the harvest may reach 12 litres per hive. In the rainy season (between July and September) harvests are poor reaching 6 litres on average since a lot of trees are not flowering. With 4 harvests for 10 beehives, a village could harvest around 8 and 9 litres per hive (after processing). The annual production will be between 320 and 360 litres of honey meaning a market value of between 576 000 CFA francs or 878 € and 648 000 CFA francs meaning 988 €. The first harvests are expected for the month of January 2009.

The revenues drawn from this first year of harvest will be reinvested in order to increase the number of beehives and the production material. In the long-term (approximately 3 production seasons), the funds will be transformed into a village bank where each member of the community will have the opportunity to take out a loan at an interest rate that will be studied. A portion of the revenues will

be used for mangrove reforestation activities and for the community, which will bring about the best results benefiting from the supplementary funds.

1.2.2. Guinea Conakry

1.2.2.1 Mangrove Status

The Guinean coast, 300 kilometres long is composed of a network of estuaries, populated by mangroves. There are freshwater marshland forests which stand behind this wall of mangroves. Floodable valleys, fed by heavy seasonal rains stretch from the running waters. Mangroves, amphibious forests which link the sea to land are typical of the Lower Guinean landscape. Periodically flooded by the tides, the mangroves extend a few hundred kilometres in the rivers, where the influence of the sea can still be felt. Here there is mainly *Rhizophora mangle*, and *Avicennia nitida*. Mangrove forests are fragile areas coveted by over two million Guineans. Fishermen, farmers and foresters all live off of the mangroves.

Five years ago, the coast was completely covered by mangroves, with the exception of Cap Verga and the areas surrounding Conakry. Agricultural clearing and the commercial logging has contributed to the destruction of a major part of the forest cover. In 1956 the mangrove covered 350,000 hectares, of which there is only 250,000 hectares left today. The annual loss has been 4.2% of the surface area. In Guinea, deforestation remains a constant issue (Yansané A. 1998).

The mangrove is vital habitat for many species of flora and fauna. The natural fertility and productivity in these zones is quite high. The coastal communities in this area are composed primarily of Baga, Soussou and Landouma ethnic group, as well as Peul and Malinke immigrants. This fragile zone supports several economic activities such as fishing, agriculture, salt production, timber exploitation, maritime transportation, and commerce.

In addition to the human pressure, climate change is an increasingly important factor in mangrove degradation. Rainfall has been declining since the 1980s along with the generally observed decline across West Africa. This has had a strong impact in the north of the Guinean coast due to the North-South rainfall gradient (Bazzo et al. 1988). This translates into irregular tides along the coast due to changes in freshwater flows and increasing risk of saline intrusion. This declining climatic situation

has also contributed to less unreliable rice cultivation which in turn has forced the rural population to substitute their incomes with increase exploitation of other resources.

1.2.2.2 Activities

IMAO, in association with the National Water and Forestry Division and some local NGOs, have targeted mangrove areas of three localities: Kindiadi Baléssouri, Sangaréyah Bay and Wonkifong.

1.2.2.2.1 Kindiadi Baléssouri

This site belongs to the Rural Development Community of Koba located approximately 100 km in the north-west of Conakry and falls under the jurisdiction of the prefecture of Boffa. The site for reforestation is a fishermen village, located in front of the sea. Apart from fishing and fish smoking, rice farming, and salt extraction activities are also being developed. Fish smoking is a devastating activity to the mangroves in this zone. The ovens follow the dyke which separates the village from the sea. At the suggestion of the focal point, and given the negative impact of mangrove wood cutting, widely noted in the Guinean national socio-economic report, this site was chosen. During the participatory diagnosis, the village association were reinvigorated and their actions were reoriented towards mangrove conservation. Having considered the need to restore the mangrove ecosystems, the populations decided to reforest in order to protect their village and stabilize the protective dyke. Thus 2.45 ha of *Rhizophora* have been planted by local populations (associations) with the support of the Water and Forestry division and the local NGO ADAM. With 1m spacing between rows and plants, 2.475 seedlings have been planted. A summary is provide in Table 2 below.

In the same site, 15 families coming from salt producers' associations will be trained and accompanied in solar salt production; this will be during the dry season between January and March.

Table 2: Mangrove planting areas in Kidia Balessouri

Sites	Dates of seedling harvest & reforestation	Species	Technique	Number of plants	Surface area (ha)	Number of members
Kindiadi Baléssory	26,30 September and 10,18 October 2008	Rhizophora	Ordinary	2475	2,45	35

With the support of the Guinean departments of water and forestry and the local NGO ADAM, the associations of fishermen, women who smoke fish, and rice farmers put in place bi-monthly monitoring.

1.2.2.2 Sangaréyah Bay:

The Sangareyah Bay is located at 50 kms north of Conakry. It is part of the Prefecture of Dubreka and to the special zone of Conakry. The main economic activities of this zone are:

- Agriculture: 60% of the population engages in extensive rice farming making up a yield of 2.5 T/ha on average for a total surface area of 319 ha.
- Fishing: 30% of the populations engage in fishing between the dry season and the beginning of the rainy season. The most fished species are bonga, konkoué, baracuda, sole, mullet. The average yield for fish is 57 kg per day.
- Family Farming: 25% of the population engages in family farming for a total surface area of 16ha.
- Forestry: 5% of the population for a surface area of 5.598 ha. The yield is 15 cubic metres every 15 days.
- Fish smoking: 1.5% of the population engages in fish smoking. They buy the fish fresh with 300,000 GNF per day and sell for approximately 330,000 GNF. They buy 5000 GNF of mangrove wood for the oven. It takes between one to two days to smoke with the oven.
- Salt production: 2 % of the population. The techniques used are sun-drying and cooking. The yields are: by sun, 20 kg/day; cooking given 48-50 kg/day. The season lasts for 4 months. During the campaign, an estimated 10,000 kg of wood will be necessary for heating.

Many of these activities have very negative impacts on mangrove extent. As a result it was decided to focus on forest restoration in this village. 3.11ha of avicennia have been reforested, notably the reforestation of Rhizophora. Overall, 124.880 seedlings of Rhizophora have been planted. This work has been done by local communities, notably the Associations of *Mounafanyi* Lumberjacks with the

support of the local NGO named ODIL (Organisation pour le Développement Intégré du Littoral). A summary of the replanting is provided in Table 3

Table 3: Mangrove planting areas in Sangareya bay

Sites	Period of harvest of plantlets & Reforestation	Species	Technique	Row spacing	Number of plants	Surface area(ha)
Unit 1	24- and 30 September 2008	Avicennia	Anderson's method	2m x 2	52 560	1,31
Unit 2	21- 24 et 28 October 2008	Avicennia	Anderson's method	2m x 2	72320	1,80
TOTAL					124 880	3,11

1.2.2.2.3 Wonkifong:

Wonkifong is the 3rd site visited, located approximately 75 km to the south-east of Conakry. It is a Rural Development Community belonging to the Prefecture of Coyah. Agriculture and salt farming are the main activities. Salt production employs 50% of the population. The yield is 5 tons per year; and uses 64 cubic metres of mangrove wood. Added to this is extensive rice production which yields on average 2t/ha for a total surface area of 664 ha. These activities are highly consumptive of mangrove forest; with the support of the department of water and forestry, reforestation was chosen as the key activity in order to protect the rice fields and the salt production perimeters.

The areas to be reforested are notably located in Folon and Yelia. In those three sites, 3 ha have been restored with *Rhizophora* and *Avicennia*, by the NGO/ADAM and local populations (associations). Overall, 25.905 seedlings of *Rhizophora* and 10.016 plants of *Avicennia* have been planted. See Table 4 below for a summary

Table 4 : Mangrove planting areas in Kidia Balessouri

Sites	Dates of harvest of seedlings plantlets & Reforestation	Species	Number of plants	Surface area (ha)	Number of members
Folon Wonwongbé	12 October 2008	Rhizophora	8 505	0,85	45
Yélia Tolinyiré	14,18 28 October 2008	Avicennia	10 016	1,00	58
		Rhizophora	17400	1,74	

1.2.3. Sierra Leone

1.2.3.1 The Status of mangroves of Sierra Leone

The coastline of Sierra Leone is traversed by nine major rivers and several smaller ones and many creeks. Mangrove swamps colonize several of these especially in the four main estuaries, viz. the Scarcies in northwest Sierra Leone; Rokel, north of Freetown in the Western Area; Yawri just south of the Western Area peninsula and Sherbro in the southwest of the country. No major effects on river flow have been reported in recent times, other than the normal seasonal reduction in volume of fresh water in these rivers in the dry seasons, which varies in intensity from year to year. The country as a whole experiences heavy monsoon rains in the wet season, which reverses the dry season effect of high acidity and salinity.

The mangrove is subject to a strong anthropic pressure, principally:

- Rice is the staple food of the majority of the people of Sierra Leone. The high population pressure in many coastal areas has led to agricultural-conversion of mangrove swamps more especially in the Scarcies areas of Kambia and Port Loko Districts where rice is cultivated.
- Salt production is commonly practiced in the mangroves in Sierra Leone, particularly in the north and Yawri Bay. Salt is required in the human diet and also used to preserve food (notably fish and meat) and in the maintenance of stock animals. Mangroves, as the most common littoral ecosystem are often destroyed due to solar salt operations. The specific conditions associated with the salt extraction process adversely affect the environment i.e. in most cases salt production is associated with the conversion of mangrove forests in a way that is often irreversible.
- Mangrove as firewood are used extensively in virtually all coastal villages for domestic use, but principally for smoking fish and in making salt. The coastal fishery industry is highly dependent on mangroves and adjacent woodlands for fuel wood because there are no other economic alternatives.

- Fish smoking is the main activity of Tombo, one of the major fishing ports of the western area of Sierra Leone; firing of bricks and other pottery crafts are the main activities in the village of Matainkay and salt processing in the village of Fogbo. Videos have been made and are available in the project's video archive.

1.2.3.2 Activities

During a visit in Sierra Leone in August, 2008 the IMAO team identified Matainkay as a suitable project site for the mangrove rehabilitation. Matainkay itself is an isolated fishing community (see Table 5 for summary data). The inhabitants depend on activities which impact negatively on the mangrove resources near the Rokel River for their livelihoods, including fish-smoking, salt-processing and ceramic works using mangroves as fuel wood to bake clay made into working stoves, pots, plates, candle stands etc. Sand mining is also done on commercial basis to provide sand for building construction in Waterloo and East Freetown. Large tracts of degraded mangroves and mudflats have resulted from the pressure on the mangroves for firewood to support these commercial activities.

Table 5 : Social analysis on Matainkay village

Village	Admin. data	Population	Ethnic group	Place of origin	Traditional activities
MATAINKAY	Western region	500 inhabitants	Temné	Indigenous	Fishermen / Potters
	Western rural district	2007 Census M : 40%	Limba	North	Farmers /palm wine collectors
	Headman : Hassan B. CONTEH (+ 232 76 42 91 38)	F : 60%	Loko	North	Farmers / Traders
			Mende	South East	Fishermen / Traders
			Sherbro	South	Fishermen / Farmers

By mutual agreement with these communities, the IMAO project is to provide technical and financial support to facilitate the implementation of reforestation activities. In this respect, two preparatory meeting have been held; following these meetings people were mobilized and the community joined experts for a field visit and selection of sites to be reforested.

During the diagnosis, we realized that the communities needed to better structure their association to successfully implement development activities which would eventually be entrusted to them. The

village never had a similar project or NGO or government support. Thus in accordance with the findings of the participatory diagnosis, WAMI has provided Matainkay with:

- 2 consultants who trained 20 participants over 2 days in mangrove collection, conservation and reforestation techniques;
- Logistics required for the reforestation including boots, machetes, baskets to store the seedlings and ropes;
- First Aid for Workers.
- The populations of Matainkay have, in three days, planted approximately 2.000 seedlings over a surface area of 6 ha.
- With the support of the Sierra Leone department of water and forestry, the village of Matainkay put in place bi-monthly monitoring.

1.2.4. Guinea Bissau

1.2.4.1 The Status of Mangroves in Guinea Bissau

According to one report (Silva, 1995), the mangrove forests of Guinea Bissau covered 7% of the nation's surface area in 1993, covering a long network of coast in the North, South and among the Bijagos islands. At the same time, it is precisely among the banks of the Cacheu River in the region of Tombali, along the banks of the Mansoa River in the Oio region, and on the banks of Orango island in the Bijagos archipelago that the greatest concentrations of the country's mangrove forests are found (Carty *et al.*, 1993) which, given their reach and preservation, seem to be the most vast in Africa (Carty *et al.*, 1999). The rare coastal zones where the absence of mangroves stands out are: a) Cabo Roxo, to the north of the mouth of the Cacheu River ; b) Punta Cabaiera, to the south, with a 3km radius; c) Verla, to the north, with a 15 km² radius from the beach ; d) Buba, to the south on the banks of the Rio Grande de Buba. Overall, the group of coastal islands of Guinea-Bissau are partially bordered by mangrove forests. Initially covered by 4760 km² of mangroves up until 1990, today it is noted that Guinea Bissau has lost a vast portion of this coverage (Edwin, 1987, in WCMC, 1991).

Key threats to mangrove areas include the harvest of wood for fish smoking, including its clandestine harvest for smuggling across the border to Guinea Conakry. Furthermore conversion of mangrove

forests is taking place for the creation of rice fields. This activity is not particularly sustainable. In addition to the loss of mangrove resources, salinity and acidity cause barren soil to develop after a few years of production, which compels peasants to clear other *Avicennia* mangrove forests, thus bringing about a farming nomadism and large areas of degraded mangrove which without protection that take many years to recover.

Table 6 – Surface area of mangrove forests and their regression

Zone	Coverage (Km ²)	Regression (entre 1956 et 1998)
Cacheu River	908	26,4
Tombali	608	-
Mansoa River (and the islands of Jeta and Pecixe)	505	-
Orango Island	174	19,8

Sources: WCMC data, 1991; FAO, 1997 and BIAI, 1998.

1.2.4.2 Activities

The pilot site of the WAMI project is located in Cacine, near the border with Guinea Conakry. The mangroves of Rio Cacine are used intensively both for rice farming and fish smoking not to mention the clandestine export of timber to neighbouring Guinea Conakry. The Biodiversity and Protected Areas Institute (IBAP) of Guinea Bissau sought IMAO's intervention in the area of fish processing with improved ovens, given the excessive consumption of mangrove wood in fishing ports. The project's targets have been local communities living along the harbours of Cacine, Canamine, Contaia and Kadico, with the support of the local NGO QUITAPESCA.

Participatory diagnoses have been carried out revealing that only the use of improved kilns consuming continental wood may reduce the negative impacts of the intensive wood cutting for smoking purposes. In the ports most of the fishermen are migrants and their smoking ovens are rudimentary, using huge quantities of mangrove wood, particularly *Rhizophora*. The project's interventions consist agreeing to support the establishment of improved ovens (to be fuelled by dead wood) provided that the fishermen participate in protecting the mangrove forests. QUITAPESCA which is very active in the region, together with communities of fishermen is working for the reduction or even eradication of the cutting of mangrove wood for fish smoking purposes.



Although detailed plans and estimates are available the rainy season and the following election campaign have delayed the work. Beginning in January 2009, the contractor will begin construction.

Rice farming is also a key issue in the area of these villages. In most of the perimeters visited in the villages of Cacafal and Camisoron, at least half of the closed fields are abandoned and often only a thin string of mangroves remains along the estuary. This situation requires measures allowing farmers to re-use rice fields avoiding abandonment, so as to promote the regeneration of *Avicennia* which is very active and deserves to be supported by a protective fencing to avoid the destruction of new plants.

The third destabilizing factor of the mangrove of Cacine is quite practical and is part of an exchange of goods and services between border villages of the two countries. During informal discussions with inhabitants of Cacafal and Camisoron, it was mentioned that wood is exported in Catchek in return for manufactured products and access to cheaper health care on the other side of the border. In addition, clandestine cutting was practiced by Guineans from Conakry, probably with local accomplices. This situation is known, but the Water and Forestry service seems powerless because of a lack of staff and resources to ensure an efficient surveillance. The IMAO team has asked the Focal Point to carry out a participatory diagnosis in Cacafal so as to better understand the socioeconomic problems, especially with the perspective of the regional charter.

1.2.5. Senegal

1.2.5.1. Status of the Mangroves of the Saloum

The Saloum is a vast alluvial plain, to the extreme south of the “Petite Cote”, fairly open to the ocean. The Delta is comprised of alluvial deposits, temporary deposits, temporary lakes and deltaic levees and deposits (cf. SDSU-RS-86-01, 1983; Marius C., 1979; EPEEC, 1982; 1983). Characterised by its geomorphology, the estuary zone of the Saloum is an eco-geographical zone. The Saloum, and its main tributary the Sine, are slow currents which feed a large submerged mud holes which influence the tides where thick mangrove formations have developed, scattered with spots which are truly saline grounds (P. Pélissier, 1966).

The daily tidal influence extends as far as Birkilane at about 130 km from the mouth and there is limited fresh water flow to meet the salt water (Marius, 1979). It is open to the ocean by three large rivers:

Up until 1987 the mouth of the Saloum was marked by a narrow peninsula, 18 km long: Songomar Point. This was cut in 1987 by the combined effect of the coastal drift and the retreat of the coastline up to the Djiffere camp site; which now provides a second opening to the Saloum of approximately 4 km.

The stream coming from the ocean penetrates the tail of the Diomboss and Bandiala Rivers, which are wide but short.

The right banks of the Saloum are covered by a web of channels that are not extremely dense or stable. The central and southern zones are covered with a very dense network forming a truly insulated area of which there are quiet frequent changes to the channels. The morphology of the Saloum is characterised by alluvial deposits, terraces, as well as levees and deltaic deposits. The most complete network of mangroves is found here, namely:

- *Rhizophora racemosa* ; *Rhizophora harrisonii* ; *Rhizophora mangle* (Rhizophoracées)
- *Avicennia africana* (Verbenacées)
- *Laguncularia racemosa* ; *Conocarpus erectus* (Combrétacées)

Key drivers of mangrove degradation in the Saloum are cutting for construction and for illegal timber trade. Other uses of mangrove wood tend to be more sustainable with old, dead-wood being taken as opposed to living green wood.

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1.2.5.2. Activities

From 09-15 March 2008 the project coordination team undertook a field visit in the Saloum Delta². The team was reinforced on the ground by: Dame KANE: the Water and Forestry Departmental Service Head at Foundiougne, Ibrahima LY: Water and Forest sector head at Djilor and Oumar SONKO : Water and Forest Brigade at Sokone.

The primary objective of this activity which is in line with the achievement of Result 4³, is to check the feasibility of reforestation actions proposed by the focal point upon request of local communities, including taking account of the recommendations of the PAGEMAS project And the multiple other organisations operating in the area of Saloum that are for the most part concerning themselves with reforestation.

During our diagnosis, the following lessons have been identified:

Firewood: *ethmalose* fishing is very developed in Saloum and is the object of smoking and sun drying (locally known as *Ketchak*) for the national and sub-regional market (Guinea, Mali, Burkina...). The fish is smoked with dead wood from land forest species (*dimb*), or coming from the mangroves. In the smoking centres visited in Missirah, Diogane Bassoul, Tialane, Bassar, Baro, Dionewar, Djirda, Fambine, Diamnadio, Maya, Baout, Wéligara, Rofaaguè and Félix, Senegalese and foreigners from the sub-region (Guineans...) use dry wood sold by women from neighbouring villages. This is a good practice likely to be disseminated in areas where green wood is commonly used.

In addition, the production of lime through the calcination of shells is an equally common activity in rural areas which fortunately uses dead wood as source of energy, thus without any major impact on the mangrove balance.

² Specifically the visit centred on the region of Fatick, department of Foundiougne, Rural Communities of Djilor and Toubacouta, the Villages of Gagué Chérif, Dassalamé Sérér, Missirah, Toubacouta and Sipo.

³ Actions for mangrove ecosystem restoration supported and linked with livelihood improvements at key sites in each target country.



Timber: in rural areas, rhizophora timber is sometimes used for the construction of huts. However, the impact on the ecosystem is not significant compared to the timber trade which employs illegal cutting, particularly in Niodior and Dionewar, and certainly elsewhere in isolated sectors out of the purview of forestry agents. A significant portion of the timber is available and sold in the Guedj market at. There may also be other points of sale. This chain is the subject of a detailed study upon which IMAO will support the search for solutions, notably the establishment of a negotiated system of management between conservation bodies (Water and Forestry Office, National Parks...) and the participants in the chain (woodcutters, mangrove wood traders...).

Mangrove regenerates at a significant rate: along the bolongs we have visited, the regeneration of the mangroves is unquestionable (picture below). We are noticing an adequate regeneration of Rhizophora in many mangrove areas alongside the Bandiala and its tributaries downstream of Foundiougne and alongside the Diomboss and its tributaries from Bolonas. This phenomenon is apparently linked to the level of substrate submersion: low lands receiving large volumes of water during high tides are more favourable to the regeneration than relatively emerged upper lands. As for the Avicennia, its regeneration is less significant in less submerged areas and close to sand bars (case of the village of Sipo)

After eight years of reforestation (1998 to 2006), the results are very limited: a quick assessment of reforestation tests carried out in Gagué Cherif and Dassalame Serer shows that the high salinity of the substrate is the major limiting growth of the two mangrove species, even if in some areas the compactness of the soil increases the risk of mortality among plantlets. This high salinity is explained by: there is a short winter period, a constant drop in the rainfall and the high temperatures all year-round, heavy intrusion of sea water, a retreat of the tidal limits and saline fronts. In comparing the plants from one to five years, we have noticed that the growth rate is very low due to the deficit in fresh water.

In Gague Cherif, reforestation actions were initiated by the NGO WAME, the University Cheikh Anta Diop, PAMEGAS and GEF/UNDP projects along the bolong Djaalo, while in Dassalame Serer, they were initiated by JICA (PAGEMAS) and GEF/UNDP along a tributary of the Bandiala, next to the village. The best growth rate observed for Avicennia was a relatively slow rate of regeneration of about 30cm/year in the area reforested by JICA. In addition, there is a very high mortality rate (over

85%). Finally, in the village of Soukouta, all the *Avicennia* plantlets planted behind a clump of *Rhizophora* had died, probably because of the combined effect of hypersalinity and the high compaction of the substrate.

Against this background of high restoration activity and relatively low success we have decided to rethink the planned strategy of restoration through reforestation especially given the mangrove regeneration capacity in some areas. The new orientation of IMAO is to develop, in consultation with local communities and Water and Forestry Services, Community Reserves in mangrove areas. In fact, in the islands at the outskirts of classified areas (RBDS and PMA of Bamboung), mangroves logs are sold at the entry to Kaolack. In order to combine conservation and development, it would be important to organize that chain; to promote income generating activities (IGA) in order to encourage and maintain the dynamics of natural regeneration. For that purpose, the Bio Right concept could be experimented in this area. One niche to be promoted is local micro-credit. Further planning is underway and activities will be implemented in 2009.

1.2.6. Mauritania

1.2.6.1 The Status of Mangroves in Mauritania

The situation regarding Mauritanian mangroves is quite specific: they are all located in protected areas which represent the northern limit of their geographic distribution and due to the extreme temperature variations which is at the limit of the tolerance of mangroves, Mauritanian mangroves are subject to an ecologic stress increased by the aridity in that region. Mangroves in two protected areas are considered below.

1.2.6.1.1 Banc d'Arguin National Park (BANP)

Cape Timeris, site of El Aine, Ezaine in the north of the Cape, Zemare and Khaja. The presence of one single species was observed: *Avicennia germinans*. This is a stunted and scattered species. Besides drought which is the main limiting factor, this species suffers from the effects of sand silting and

pollution due to waste disposal at sea (ropes, abandoned fishing nets and plastics) causing piling up of rubbish before trees.

In the area of **Cape Timeris** we have noticed natural regeneration at different stages of growth which include new seedlings on the watersides. The vegetation is associated with other species such as: *Zygodhullums*, *Salicornias*, *Salsola baryosma* and *Sesuvium partulacastrum*, violinist crabs, *Uca tangeri*, which live in colonies.

1.2.6.1.2 Diawling National Park (DNP)

Most of the mangroves are in the periphery of the park, in particular in the M'Boyé islands and in the basin of N'thiallah. The coordination team visited the Birette pond which has recently seen significant regeneration of *Avicenia germinans*, one of the two species (*Avicenia germinans* and *Rhizophora racemosa*) found here as well as the confluent of Bell/Khroumbam which has a high concentration of the species which is threatened by grazing and even uprooting by camels in some periods of the year.

1.2.6.2 Activities

At the end of the Mauritania planning workshop for field activities of 2008, the following actions were proposed:

- Capacity building followed by reforestation of 3ha of mangrove.
- Protection of mangrove natural regeneration areas (2ha)
- Development of income generating activities particularly in the fishing sector (improvement of fish drying and conservation techniques)

The participatory diagnosis carried out from 08-12 September 2008 in the National Park of the Banc d'Arguin (PNBA) and the National Park of Diawling (NPD) and was intended to verify the feasibility of reforestation actions proposed by the focal point. During that mission a new direction emerged from the diagnosis; to focus efforts on the area of the DNP where mangroves are much more present but subject to human / animal stress. The following new recommendations have been made by riparian communities and DNP technicians:

- Set up protective fences around areas fostering important regeneration and exposed to animals;



- Carry out awareness campaigns on the importance of the conservation of the mangrove ecosystem;
- Establish supervisors to watch over the protection of mangrove in collaboration with population;
- Set up management committees in rural areas.

The area to be protected has been demarcated and will be protected with a wall crowned with barbed wire, an enterprise has been contacted, and the work will begin in March during the period when the water level is low.

2. STUDIES RELATING TO MANGROVE POLICIES AND CHARTERS

3.1. Strengthening of national policies

The implementation of this activity, as defined in item 6 of the project document (*National policy is strengthened to provide support for community actions*), was started in 2006 by IUCN in Senegal, Gambia and Guinea Bissau, and has supported the production of a draft charter and action plan for the three countries on the basis of preliminary studies carried out by national consultants. The same approach has been used during this reporting period in Mauritania, Guinea and Sierra Leone to complete the information already collected to enable a synthesis that covers all six countries. On the basis of national reports, one-day technical workshops were held in each country and these have enabled wide consultation between the various actors involved in mangrove management. This approach allowed these actors to arrive at a general consensus around the current issues related to mangrove ecosystem management and the relevant elements of a strategy that would allow for the implementation of coordinated inter-state actions to improve mangrove resource management.

Two consultants specialized in socio economics and environmental law who previously supported the same process for IUCN, have been commissioned to facilitate workshops and complete the synthesis necessary to harmonize outcomes.

The following sections summarise the main findings from the national studies, the main results from the national consultations and the progress towards the development for the regional charter which is intended to arise from this process.

2.1.1 Studies on national policies

The study's terms of reference are to:

- Analyze the institutional and regulatory framework of ecosystem management in mangrove areas;
- Analyze the biophysical framework of mangrove forests;
- Analyze the socio-economic framework of mangroves areas;

Below the proposals and strategic recommendations of the various stakeholders whose conclusions are as follows.

2.1.1.1 Mauritania

Mangroves are found in the lower delta of the Senegal River and in the Banc d'Arguin. The first are subject to constraints related to the drought and also to the impact of the Diama Dam which has changed the regime of freshwater flow and the embankment of the right side of the river.

The institutional framework established for the management and protection of the environment in Mauritania is characterized by a multiplicity of environmental institutions and actors. Yet, mangroves do not benefit from a particular institution and are ruled by general regulatory provisions governing the exploitation of forests, wildlife and wetlands.

To cope with the various environmental issues, the Mauritanian State began to review legislative and regulatory issues. Taking into account the serious climatic context marked by drought and desertification, the Mauritanian government has adopted several Acts and regulations. Among them are:

- The Act 2000-24 relating to the creation the Banc d'Arguin National Park in 1976;
- The Act 91-005 of January 14th 1991 creating the Diawling National Park ;
- The Act 97.007 of January 20th 1997 relating to the forestry code;
- The Act 97.006 of January 20th relating to the code on hunting and nature protection;
- The Act 2000.045 of July 26th, 2000, relating to the environmental code ;
- The Act n° 2005-030 of February 02, 2005, relating to the water code;
- The Littoral Act n° 2007-037 of April 17th, 2007.

The existence of customary laws and rules dedicated primarily to settling conflicts must also be considered. In the lower delta the most significant conflicts are related to access to land and resources in the mangroves areas . The implementation of these laws and rules is ensured by the Environment State Secretary, who is responsible for:

- the elaboration of the environmental policy, strategies and plans,
- the enforcement of the regulation related to environment,
- the establishment of environmental funding mechanisms
- the environmental monitoring and police, and
- the coordination of environmental activities.

Overall, the mangroves of Mauritania are supported by a political and legal environment that is quite favourable for their conservation, desertification being the main factor towards their degradation. It is still recommended to ease the impact of the landscaping of the Diwaling. The regional charter can effectively contribute to this effort through the action plan which takes this aspect into consideration.

2.1.1.2 Guinea Conakry

The high level of rainfall characterizing the Guinean coast favours significant mangrove development. The impact of drought is low compared to Sahel area and there are high rates of primary productivity and natural regeneration. The deterioration of the ecosystem is essentially the consequence of economic activities, particularly agriculture, and firewood and timber cutting.

The management of mangrove ecosystems is in the hands of a number of technical services of the administration operating within the limits of their competence and of local communities and NGOs operating in this area. The most implicated technical services are in:

- The Ministry of Agriculture, Cattle Breeding, Environment, Waters and Forests: National Waters and Forestry Divisions, Rural Engineering, Environment, and also the Guinean Office of Wood and the Institute of Agronomic Research of Guinea.
- The Ministry of Fishing: The national department of artisanal Fishing and the National Centre of Halieutic Sciences of Boussoura.
- The Ministry of Higher education: the Oceanographic Research Centre of Rogbane and the Research Centre in Environment

- The Ministry of Energy and Hydraulics: the Department of Traditional Energies Sector.

The implementation of various legal texts defining natural resource management is implemented in mangrove areas. However they are not explicitly described in this way. These include the forest code, the environmental code, the water code, the land and real estate code, the mining code, the pastoral code and the fishing code which all pay a particular attention to coastal ecosystems, of which mangroves are a significant part. All these codes are the object of various laws, as well as their decrees:

- The Act L/99/038/AN adopting and promulgating the forestry and wildlife protection code and hunting regulation;
- The Orders N° 045/PRG/87 and N° 022/PRG/89 relative to the code of environmental protection and promotion
- The Act L/95/51/CTRN of August 29th, 1995 relative to the pastoral code;
- The Decree D/94/180 of December 7th, 1994 relative to the land code;
- The Act L/95/036/CTRN of June 30th, 1995 relative to the mining code;
- The Act L/94/005/CTRN relative to water;
- The Act L/95/13/CTRN relating to the code of sea fishing;
- The Act L/2006/AN adopting and promulgating the law relative to the Local Governments code in the Republic of Guinea.

These regulatory provisions are in some cases transformed into Master Plans, of which the most important ones for mangroves are the Mangrove Development Master Plan within the National Forestry Action Plan, the Shrimp Farming Master Plan in coastal zones and the Hydro-agricultural Development Master Plan which pays a particular attention to mangrove lands.

The Guinean mangrove conservation policy is fairly well developed in theory, but in practice on the ground it is quite modest. The first marine protected area including mangroves is in an advanced stage, but many identical sites also merit this classification given the high pressure on the ecosystem. The Action Plans related to the Regional Charter should take into account the need to ease this

pressure, particularly the documentation of best practices of hydro-agricultural landscaping and energy policies that could economise mangrove wood.

2.1.1.3 Sierra Leone

The mangroves of this country develop in the same conditions as those of the neighbouring Guinea Conakry and present the same biophysical characteristics. The moderate influence of drought and thus of hyper-salinity promotes high primary productivity and active natural regeneration. Like in Guinea, the deterioration of the ecosystem is primarily of human origin including mangrove rice farming, as well as firewood and timber cutting.

The various policies related to the coastal environment are either part of a broader legislative framework, or are incorporated into legislative mechanisms within various ministries. The most important are:

The 1988 Act on Forests, and the corresponding regulations of 1990 provides for the management and development of all forestry resources, including mangroves. The Act distinguishes three types of forest reserves, namely forests of national production for the production of forestry resources, national protective forests for soil, water, flora and fauna protection, and community forests for the provision of forestry products and/or the protection of forest ecosystems and resources at community level.

- The Wildlife Conservation Act of 1992 establishes a legal framework for wildlife protection and the creation of national protected areas. It defines the management objectives for natural reserves, national parks, game and sanctuary reserves, controlled and prohibited hunting areas, and forest reserves.
- The 1988 Act on the Fisheries Management provides the framework for the regulation of fishing activities. The 2000 Act on the Environmental Protection refers to coastal environments.
- The 1994 Act on Mining and Minerals presides over all mining activities, included in coastal areas.

- The Agriculture Order, Cap. 185 defines control of imported phytosanitary products (public notice n° 66 of 1974) and sets the control and preservation of agricultural products in Sierra Leone.

We must also mention the existence of a National Council for Environmental policies (NCEP) which was approved by the Cabinet in 1990 and presides over specific fields related to mangrove management particularly on issues of land and territory development, the conservation of soil as well as coastal and marine resources, and in the participation of the public, of institutions and the government.

- The following governmental institutions have primary responsibilities in mangrove management:
- The Ministry of Agriculture, Forests and Food Security, the Ministry of marine resources;
- The Ministry of Lands, planning and environment, the Ministry of Mineral Resources;
- The Ministry of Tourism and Cultural Affairs.

In addition, the Conservation Society of Sierra Leone, a local NGO, is deeply involved in the protection of mangroves areas with the forestry Department in the following ways:

- Public awareness and action on the deterioration of the environment in mangrove areas;
- Promotion of public interest for the conservation and protection of biodiversity in mangrove areas.

The Institute of Marine Biology and Oceanography (IMBO) is the institution recognized for coastal zone and marine research. It is in charge of the collection and analysis of data on coastal resources, the deterioration of environment, pollution, oceanographic parameters and the rise of sea level.

The department of geography and biological sciences, Fourah Bay College, the University of Sierra Leone and the University College of Njala are also involved in research activities on other coastal issues.

The situation in Sierra Leone is comparable to that in Guinea, with the distinction that the national policy is weaker, leaving considerable room for local initiatives characterised by the abuse of mangrove resources. The Regional Charter, through the Action Plan should help to ameliorate this situation, particularly with the promotion of protected mangrove areas and the documentation of favourable practices for ecosystem balance, such as the salt drying technique which is well diffused in Guinea Conakry.

2.1.1.4 Senegal, Guinea Bissau, Gambia

In the three countries which have already been the subject of IUCN diagnosis in 2006, the national mangrove management policies are taken into account in various legal texts regarding the environment. On the ground, the various initiatives seek to restore and protect the ecosystem.

In Senegal, a large part of the mangrove forests (approximately 42%) is classified as marine protected areas, particularly in the Saloum Delta with the protected area of Banboug managed by the coastal communities. Thus various reforestation initiatives have been started by the population of the Saloum and Casamance. In Gambia, the reforestation of *Rhizophora* by the community members is an activity which is taking off. In addition, the departments of water and forestry have successfully initiated the community forestry policy to cover the needs of the populations and alleviate the pressure on the neighbouring mangroves.

In Guinea Bissau, the Coastal Planning Office has implemented a large cartographic project on mangroves and more than 36% of this area is protected and managed by the Biodiversity Institute of Marine Protected Areas.

2.1.1.5 Summary

In comparing the findings of the studies, one notes that mangrove management policies in Mauritania, Guinea and Sierra Leone share the fact that the various existing regulatory provisions are not fundamentally specific to this ecosystem. Nonetheless, their enforcement can ensure a sustainable use, despite the serious impact of drought, particularly in Mauritania. Likewise, the impact of some provisions differs depending on the country. In particular, the decision of Mauritania to classify the areas covering the mangrove ecosystems of the banc d'Arguin and Diawling as National Parks is more favourable to conservation than the definition of master plans as in Guinea, or

the distinction between wood production forests, soil and water protection forests, and community forests.

2.2. National Policy Consultations

One-day technical workshops organized in each country have allowed for a wide consultation between the different actors involved in mangrove management. This approach allowed the various actors to achieve general consensus on the characteristic current issues around mangrove ecosystem management. The relevant elements of a strategy useful for the implementation of coordinated inter-state actions to improve mangrove resource management between actors has been identified. Finally the relevant strategy items allowing to implement a series of coordinated inter-state actions was discussed. The conclusion drawn from this analysis also taking into account the earlier results of consultations in Senegal, Gambia and Guinea Bissau was that there is poor management of mangrove ecosystems in the six countries. This adverse situation arises out of the combined effect of several negative factors such as:

- Inadequate and weak institutional frameworks
- Poor communication between all actors
- Insufficient involvement of local populations
- Abusive exploitation and use of resources by local populations as well as sometimes state and/or private initiatives
- Low regeneration of resources due to the (increasingly) adverse climatic conditions
- Irrelevant funding system for the mangrove management policy
- Weak regulation of market mangrove products

2.3. The Regional Charter

This activity is outlined in item 7 of the project document (Result 7.1 Produce draft and advocate for validation of the policy accord by government agencies through PRCM, in consultation with ECOWAS or CSRP).

2.3.1 Rationale and progress towards the Regional Charter

The idea of a regional charter for mangrove management has been welcomed everywhere. The rationale stems from the following observations:

- It is a shared resource from Mauritania to Sierra Leone with common benefits from and challenges to its maintenance across many of the West African coastal countries
- The mangrove is a rich ecosystem ensuring critical ecological and economic functions in the marine and coastal space;
- The mangrove zone is fragile, its degradation linked to climate change, and the abusive use of its resources has increased these last years;

It is important to note that the management of the various mangrove resources is nothing new in the six states: forestry and wildlife codes, fishing laws, land laws, texts on water flows all address elements of mangrove management. It is one of the particularities of mangroves that the legal framework is diversified and dispersed amongst the various laws and codes. However, the majority of West African countries have started to address this and have progressively initiated a labour intensive textual reform to better integrate the objectives of sustainable resource management, as well as traditional practices. Despite this the principle aspects of these diverse and dispersed mangroves codes are still quite diluted amongst the forestry, agricultural, land, water, and marine laws. Thus it is important to bear in mind that the legal corpus around resource management is still in preparation. Recognising the number of gaps in and violations of these laws and codes leads to the thought that it is essential to head more and more towards the solution of a regional charter with a cross-boundary approach. By achieving consensus at a regional level this can help to drive the filling of these gaps across the region based on a common understanding of the issues at hand. To this end drafting the structure and content of the Regional Charter has begun in 2008.

The Charter is subdivided into six Titles (I-VI) and 26 Articles (1-26) ; the Articles of Titles III and V are each put in Chapters. The Titles define the main cornerstones of the charter:

- Definitions;
- Purpose and scope;
- Principles and conditions of a sustainable management of the resources of the mangrove ecosystem;
- Protection and preservation of the environment ;
- Provisions related to the implementation of the charter;
- Final provisions.

The Articles clarify the content of the main axes identified by actors in the six countries so as to:

- Enhance legal and institutional frameworks;
- Ensure wise use of resources;
- Establish sustainable funding mechanisms;
- Improve the information and communication system;
- Ensure better community participation;
- Restore the environment;
- Improve organisation of the by-products market;
- Mitigate the negative impacts of pollutions.

As part of the implementation of the charter, a three-year (3) action plan has been proposed so as to test its efficiency, and if appropriate, its adaptation to field realities.



2.3.1 The Action Plan

The action plan, designed for a three year test phase is part of the implementation of the Charter. Its aim is to promote a common sustainable mangrove management, so as to contribute effectively to poverty reduction and thereby to improve the living conditions of populations directly involved in the exploitation of the shared resources of the mangrove ecosystem.

The key guidelines as well as areas of articulation of activities and the different measures proposed for their operationalisation derive essentially from the results of consultation workshops held in the six countries and included in the Charter. They are complimented by other information taken from study reports of national policies.

Additionally, small field projects will be presented as operational models for the charter and research funds. The action plan is synthesized to allow for global vision of all items and the links between them. It is envisaged that the Plan will follow the structure provided below:

Actions to be implemented	Timeline	Outputs/Interim outcomes	Responsible and/or relevant Bodies/institutions and/or services	Costs/Resources to use	Remarks

At this stage of the drafting, the actions, the timeline and the Outputs/Interim outcomes are indicated. The Responsible Bodies/Institutions and the Costs/implementation resources will be negotiated in each country together with the Charter in the coming period.

3 BUILDING A PARTNERSHIP WITH SCIENTIFIC RESEARCH ORGANIZATIONS

During the baseline assessments and development of local livelihood focused demonstrations a number of knowledge gaps have been elucidated. IMAO has been active in trying to frame these questions further and undertake some initial research to guide future directions.

3.1 Study on the contribution of mangrove reforestation to carbon sequestration

This study was carried out in Saloum in partnership with the Environmental Science Institute of the University of Dakar as part of a post graduate research. It was intended to help facilitate support to communities to access carbon credit, which will allow them to increase their revenues while contributing to restoration. The aim was to study the dynamics of mangrove reforestation and evaluate the quantity of carbon sequestered by forest biomass. The study targeted reforested plots of *Rhizophora* aged 8 to 9 years in the villages of Djirnda and Sangako.

The key conclusion is that the plantations have fully played their role as carbon stores by sequestering, despite their young age, more than 4 tonnes of carbon per hectare in Djirnda and more than 2 tonnes in Sangako per hectare. The development of above-ground biomass explains the difference in the rate between the two sites.

In addition, the village of Djirnda is better organized, especially thanks to the establishment of a women's association for mangrove reforestation and development efforts for ecotourism. Good social organisation is a decisive factor in respecting the management rules and for amplifying this initiative. This is a major strength for the eligibility to projects in the carbon market under the clean development mechanism (CDM).

3.2 Support to the Groupe de Recherches et de Réalisation pour le Développement Rural (GRDR) in Casamance

The purpose of the intervention of the project in Casamance was to conduct a land assessment in the rice zones developed with the support of GRDR based in Ziguinchor. This support has allowed us to compliment our knowledge of mangroves in Senegal while developing links with a major stakeholder



which has supported populations in the south of Senegal. This intervention was combined with an evaluation of the hydro-sedimentary conditions prevailing in the areas in question and which have a significant impact on the viability of the developed zones and the productivity of the rice paddies. The diagnosis has been carried out in eight zones developed in valleys associating mangrove and low lands. For soils the intervention focused on the constraints of salinity, acidity and the possibilities of water management per plot.

Training in the assessment of pH and conductivity using hand held meters was conducted and completed during a monitoring programme of these parameters during the rice growing season.

4. SUMMARY OF PROJECT IMPLEMENTATION, CONSTRAINTS AND PROPOSED SOLUTIONS

4.1 Summary

In general good progress is being made in the implementation of the project. Pilot field activities to develop alternative approaches to local community livelihood support, mangrove restoration and related capacity building have been well established and are beginning to show signs of strong results that are feeding into the development of the Charter and related action plan. Furthermore these show promise as actions that can be replicated and built upon in the future and will likely form the focus and basis of fund-raising during 2009. The process of development of the Charter is also progressing well with the consultations having been largely completed and the work of drafting the Charter and associated action plan to be undertaken in 2008.

4.2 Constraints

Despite good technical achievements, the project is running up against a time constraint. The current implementation period of the project is set as 2007-2009 inclusive. Given the slow start-up phase to the project in 2007 (as noted in last year's annual report the project only reached full implementation in mid-2007 when the Memorandum between IUCN and Wetlands International had been signed and both staff members recruited) implementation had to be achieved in 2.5 years rather than 3. Although every effort has been made to achieve this it seems likely that more time will be needed to bring the project to a successful conclusion.

In addition to this general time constraint there have been some other factors that have created some delays and prevented the Project being completed in the planned shorter timescale:

- Use of national focal points: The coordination of field activities for the rehabilitation of the mangrove and the design of micro projects has been undertaken through national government focal points. Despite their commitment, they are civil servants who are involved in other activities and who, consequently, are engaged part-time in the project. This has often caused delays in the planning and implementation of local projects. Future work would benefit from a coordinator in each country responsible for liaising with the different

government and non-government stakeholders whose is able to provide dedicated time to the project, although this would likely have more significant resource implications.

- Completion of baseline reports: All draft reports were received by the end of 2007 / early 2008. However, review of these reports showed that they did not all reach the standards expected. Specifically the socio-economy report and ecology and climate report were deficient in this respect. Despite every effort by the IUCN and WI project team it proved impossible to motivate the consultants to deliver appropriate reports. The exact reasons are unclear but it is thought that as both consultants had multiple roles in other work they did not have the time available to complete the task. As a result the contracts had to be terminated and new consultants engaged to complete the process. This has caused delays in the final delivery of these reports.
- The draft Charter is now being consolidated both by specialists at the PRCM partners and country level in order to validate it in October. The process of ratification by the states after the validation is however subject to some delays due to the generally slow administrative processes in the countries concerned and also to the political and institutional instability in some of them (Mauritania, Guinea, Guinea Bissau and Sierra Leone)
- Improved communication of project results and outputs in the form of reports, website and publications to improve visibility of IMAO and support the resource mobilisation efforts.

4.2 Proposals for improvement

Taking into account the issues outlined above Wetlands International and IUCN Senegal would like to request a budget neutral extension to help ensure complete and successful implementation of the project. The original planned duration of the project was for three years, closing at the end of 2009. We would request that we can have a budget neutral extension that sets the project end date as 30th June 2010. This would effectively reset the project's implementation period to 3 years taking into account the slow start-up in 2007. The planning for this period is illustrated in Section 5 (financial report and planning) and 6 (activity planning) below. Furthermore some amendments to the originally planned budget are necessary to help overcome some of the issues outlined above.



5. FINANCIAL REPORT

5.1 Financial Report

The financial report to the end of 2008 is provided below, including the previously submitted report for 2007. The rate of expenditure has remained within the anticipated budget, but this is largely due to the slow start-up in 2007 which meant that there was underspend in that year.

5.2 Cash flow analysis to project end

As can be seen from the finance report, there are differences between the originally planned expenditure and the actual expenditure to date at the end of 2008. A number of transfers of budget between budget line are proposed. These have been driven by:

- Changes in the implementation approach that have proved necessary since the original budget formulation in the proposal. These have been driven by:
 - The needs expressed by the stakeholder workshop held in late 2007 which lead to some changes in the project implementation approach
 - Need for enhanced communication of the IMAO results and outputs to raise greater awareness of the issues confronting West African mangrove areas and support resource mobilisation efforts.
 - Dealing with the practical challenges of implementing the project that had not been anticipated earlier. Particular examples of this include:
 - The need to provide some funding support for national level focal points was not originally envisaged but has proved essential to maintain motivation
 - The necessary advocacy work to promote the regional charter will be more intensive than expected

- The need to maintain engagement of the staff in the project for a longer period of time both as a result of the changed approach to implementation and to accommodate the proposed budget neutral extension. The key changes in this respect are:
 - The Community Liaison Officer position was originally planned as a two year appointment. However, it has been decided to extend the role in order to maintain the community focused activities to the end of the project and to maintain the link between the project's local scale activities and the policy work
 - The Coordinator position must be extended to the end of the project in mid 2010

It has been possible to address these needs because of some budget line underspend and economising in some other areas of the project. Some of most significant underspends have been:

- The stakeholder workshop in year 1 – the meeting costs were less than originally planned
- Coordinator and Community Liaison costs – rates of pay for these two positions were less than originally anticipated



Report on expenditure 2008 and cash flow prediction for 2009 / 10.

	Total Project Budget	Budget 2007	Expenditure 2007	Project balance 2007	Expenditure 2008	Balance 2008 (cumulative)	Proposed budget 2009	Proposed budget 2010
1. Workshops								
1.1 1st regional stocktaking workshop	55,000	55,000	37,406	17,594	11,806	5,788	0	0
1.2. Three national workshops to review outcomes of studies on economics and policy @ 5 000 per workshop*	15,000	0	0	15,000	13,371	1,629	0	0
1.3 National Action Plan implementation workshops for stakeholders in three countries @ 5000 per workshop (year 3)	15,000	0	0	15,000	0	15,000	15000	0
2. Studies & Surveys								
2.1 Mangrove Economy & Livelihoods	15,000	15,000	3,583	11,417	229	11,188	4188	0
2.2 Mangrove Ecology, Climate & Biodiversity	20,000	20,000	6,326	13,674	2,525	11,149	8149	0
2.3 Mangrove policy	15,000	15,000	9,147	5,853	6,098	-245	3016	0



3. Consultations & Negotiations

3.1 Negotiations, training in rehabilitation	20,000	0	0	20,000	7,444	12,556	19556	3000
3.2 Local stakeholder travel and subsistence	25,000	8,334	4,991	20,009	4,443	15,566	8333	3000

4. Coordination & Operation

4.1 Coordinator @ 3200 monthly	124,999	48,333	20,277	104,722	25,026	79,696	25026	15843
4.2 Community liaison officer	34,560	17,280	4,305	30,255	14,163	16,092	15717	4401
4.3 Staff time	18,400	6,133	5,661	12,739	6,593	6,146	6146	0
4.4 Vehicle hire + chauffeur costs	12,000	4,000	2,381	9,619	6,121	3,498	3497.677	1233
4.5 Payment for field services (guides, translators, films and mentoring agreements)	24,000	8,000	380	23,620	11,455	12,165	9187	3134
4.6 Communication and awareness	15,000	5,000	2,575	12,425	1,967	10,458	10458	9183
4.7 Air travel and per diems coordination and advocacy	15,000	5,000	4,516	10,484	18,991	-8,507	18377.771	7500
4.8 Office equipment & software	5,000	2,500	2,720	2,280	887	1,393	1126	0



5. Monitoring, communication & evaluation.

5.1 Monitoring & evaluation of activities

(year 2 / year 3)	10,000	0	0	10,000	534	9,466	9466	0
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5.2 Production of reports, translation, multiplication

Bank charge	8,000	2,666	429	7,571	550	7,021	5521	0
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Totals (1) €	446,959	212,246	104,697	342,262	132,203	210,059	162764.45	47294
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Overheads WI Africa and IUCN (5%)

	22,348	10,571	4,518	17,830	8,169	9,661	6846.1112	2815.35
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Totals (2) €	469,307	222,817	109,215	360,092	140,372	219,720	169610.56	50109.35
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Overheads WI HQ (2.5%)

	11,174	5,306	2,617	8,557	3,305	5,251	4069.1112	1182.35
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Total (3) €	480,481	228,123	111,833	368,648	143,677	224,971	173680	51292
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6. PRIORITIES FOR IMPLEMENTATION IN 2009 AND THE ACTIVITY PLAN

6.1 Overview of activity planning for 2009 / 10

The table below lays out the timing and planning of the remaining project activities to be implemented by the project. As noted above we are requesting a budget neutral extension to mid 2010 to ensure complete and successful implementation of the project.

Result area as per the proposal to MAVA Foundation	Activities	Schedule (per quarter)			
		2007	2008	2009	2010
4. Actions for mangrove ecosystem restoration supported and linked with livelihood improvements at key sites in each target country	<p>Engage negotiations and demonstrative rehabilitation training with key mangrove communities</p> <p>In 2008, various activities have been started in different countries, including the reforestation in the Gambia, Guinea and Sierra Leone, the construction of improved stoves in Guinea Bissau, community awareness on the protection of Saloum sites for natural regeneration of mangroves, in Mauritania fence of natural regeneration sites. These activities will continue during 2009.</p>				



	<p>Develop and support small scale projects with mangrove communities demonstrating practical Action Plan implementation</p> <p>The dissemination of solar salt in the Gambia, the promotion of improved beekeeping in the Gambia is started in 2008. In 2009, these activities will continue.</p>																		
	<p>Develop fundraising for implementation of the mangrove Action Plan</p> <p>Preliminary scoping of donors began towards the end of 2008 with visits to various Embassies (Japan, Switzerland) in Dakar by the Wetlands International Africa Office. Furthermore consultation with other actors working in the Wets African Mangrove zone began to help scope the niche for follow-up activity began. This will be continued in 2009.</p>																		
<p>5. Key mangrove stake-holders have engaged in formulation of a regional Action Plan for strengthening and extending community actions</p>	<p>Co-opt key stakeholders representatives in drafting process for Strategy and Action Plan</p> <p>Three national meeting are organize : Mauritania, Guinea Conakry and Sierra Leone</p>																		



	<p>Mangrove community representatives pursue consultations with concerned government agencies to establish consensus in each country on the stakeholder proposals for a Strategy and Action Plan</p> <p>The draft action plan proposed by the consultant is submitted to the national focal review, amendment and additional information, including the elements of the plan of action (appointment of officials or concerned with the implementation of actions planned, the timing of their execution, the necessary means to achieve them so.)</p>																				
	<p>Strategy and Action Plan is published for use regionally and in each country by PRCM</p> <p>Six national meetings are planned in countries. This, to make sure that widest technicians of all specialties involved in the planning of activities in mangrove have been consulted</p>																				



	<p>Identify potential incentive mechanisms to stimulate community mangrove management identified e.g. grants programme, bio rights approach etc</p> <p>Bio rights approach is started in Gambia with apiculture program and salt production program and improving stoves for fish smoking in Guinea Bissau</p>																						
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