

## **Report on the Joint World Bank – Ramsar Session on the Code of Conduct Arusha International Conference Centre Saturday 9 April 2005**

The session was opened and chaired by **Mr Anderson Koyo** who welcomed all participants and introduced the programme for the morning. Mangroves are particularly important in Africa from the perspective of biodiversity, fisheries and socioeconomic development. They serve as buffer zones in coastal areas. 53 participants from 32 African countries attended the session (Annex 1: List of Participants). In addition, representatives from the Ramsar Secretariat, WWF, Wetlands International and IUCN as well as NGOs were also present. **Dr Sarah Humphrey** of WWF International was volunteered as recorder.

### **The Tanzanian Experience in Mangrove Management**

**Mr Mbwambo** of the Tanzania Forestry and Beekeeping Division presented the Tanzanian experience in sustainable management of mangrove ecosystems on behalf of Mr Evarist Nashanda of the same Division. The full paper was distributed. (Annex 2)

Mr Mbwambo highlighted the history of legal protection of mangroves including designation of all mangroves as Forest Reserves in 1947, but noted that the government had not had the means to effectively manage these extensive and relatively inaccessible forests. In the light of growing pressures, the government decided to develop a comprehensive management plan building on a national inventory. Spatial zoning provides for four different categories of utilization including strict protection. The plan is implemented through a co-management system founded on a strong education and awareness programme. Other strategies include development of income generating activities, mangrove rehabilitation involving communities and children and improved interagency coordination.

Participants from Nigeria, the Ramsar secretariat, Ghana, and Guinea raised questions relating to conversion of mangroves systems to alternative uses such as agriculture, the use of satellite and aerial photography, technical aspects of the rehabilitation process and its transferability, and on how to achieve a balance between protection and maintaining community livelihoods that depend on extractive uses or mangrove conversion.

Professor Gordon noted that the need to balance protection and utilization is at the heart of the wise use concept of the Convention on Wetlands. There is no one model that can be applied to all countries as factors such as culture, society and land ownership vary between countries. He suggested that we could learn from examples and from the underlying principles in the Code that can be adapted to the local context.

**Professor Chris Gordon** of the Centre for African Wetlands thanked the participants for their participation, especially at end of a long week of meetings. Professor Gordon welcomed the participation of inland countries in the audience, noting the impact that upstream activities can have on coastal mangroves systems.

Professor Gordon introduced the Principles for a Code of Conduct for the Sustainable Use of Mangrove Ecosystems, which he was presenting on behalf of the World Bank (Annex 3.: Power Point Presentation without pictures). Copies of the Code had been distributed in English and French at the start of the Pre-COP meeting. The Code is a *work in progress* and the main aim of this session is to see how the document could be improved drawing on the experience of the participants. The Code was originally to be an internal document to guide development of World Bank projects, but the potential for wider use and application was soon realised. This could be achieved through Ramsar, whose endorsement is sought.

The significance to the Ramsar Convention is evident in Resolution VII.21 on intertidal wetlands, including mangroves (ref Box 11a in the Code of Conduct).

The Code represents a framework for sustainable management of mangroves that can be *adapted* to local circumstances. There is no recipe or prescription for success, but there are some common principles that can be modified to local conditions. The initiative has explored co-management approaches involving local communities as resource custodians as illustrated by the Tanzania experience.

The Code was developed through an initial literature Review, compilation of case studies from around the world (including Benin, Ghana, Mozambique, Senegal and Kenya), and a through three regional consultative meetings. The draft code of conduct then went to a peer review workshop in Washington.

There are 15 principles in the Code of Conduct. All documents can be consulted on line at

**[http://www.biology.au.dk/cenTER/MCB\\_2003.htm](http://www.biology.au.dk/cenTER/MCB_2003.htm)**

The aim of the session was:

1. To seek inputs on the Code and in particular on the 15 Principles;
2. To explore how best to widen participation in the consultation process;
3. To discuss endorsement of the Code through the Convention on Wetlands.

#### ***Comments on the Code***

Participants from Ghana, Tanzania, Sudan, the Ramsar Secretariat, Cote d'Ivoire, and Benin, and raised a number of questions and issues which were discussed. These included:

- The need to adapt to different contexts not only between but also within countries;
- The considerable amount of time required in establishing mangrove management, in order to build awareness, develop understanding, and ultimately change behaviour;
- Issues of overgrazing and of mangrove clearance for livestock in some countries;
- Land ownership by communities or governments;
- Management for single products or multiple products and services;
- Participation and co-management;
- Restoration and regeneration;
- Pollution derived from local and upstream sources and strategies to control this;
- Properties of different mangrove species, and cultural preferences for different types of fuel wood;
- The need to share lessons and information effectively between different management initiative and programmes in order to avoid duplication of efforts or loss of continuity.

#### ***Some specific issues were raised that need to be elaborated or corrected in the text:***

1. There should be a clearer and more comprehensive definition of participation in the Code. At present many references are vague and it is not clear that participation goes beyond consultation or involvement. The Tanzania example is a good illustration of community ownership and of a well developed co-management scheme. This and other case studies could be used in the document.
2. The need to expand the section relating to land use.
3. It was noted that the French translation of some technical terms is weak.

Since many participants had not yet read the document, Professor Gordon referred to the one page summary of the 15 principles in Annex 3 of the Draft Code. He requested feedback in particular on any fundamental disagreement or concerns with the 15 Principles. The following points were raised:

- Principle 2 could evoke the need for EIA prior to any developments in mangrove areas.
- Principle 7 should specifically refer to the need to conserve cultural values.

- On Principle 14, green labelling may represent an obstacle to African countries given the demands of such certification and that maybe there should be an allowance made for the situation of African countries. On the other hand, there is good potential to label non-timber forest products such as honey as coming from sustainably managed forests and such labelling can give products a competitive edge amongst informed consumers. It was suggested that the word “should” be changed in the summary.
- The reference under Principle 13 to education belongs better with Principle 8 on capacity and awareness.
- On Principle 13, it should be clear that regular tourism and ecotourism are very different and this distinction should be explicit. The term ecotourism is often used too loosely without proper consideration of issues such as direct benefits for local communities.

#### ***Adoption of the Code by the Convention on Wetlands***

The Chairman noted that Ramsar’s strength lies not in reports, but in the sharing of technology, skills and knowledge. In response to a question from Tanzania, the Secretary General, Dr Peter Bridgewater noted that the Code is being discussed at Preparatory Meetings for the COP9 in three of the Convention’s regions, namely the Americas, Asia (forthcoming), and Africa. If the contracting parties so desire, the Secretariat can explore formal adoption of the Code through the Steering Committee.

An abbreviated text prepared by the Secretariat, and containing the Principles, could form part of the advice and guidance notes of the Convention and would be reviewed by the STRP. He further noted that a Resolution on mangroves was adopted at COP8 in Valencia, so a further resolution referring directly to the Code should not be necessary. The Secretariat could also explore a more formal relationship with the World Bank to monitor application of the Code, perhaps involving FAO with which there is an ongoing discussion on mangroves.

#### ***Further Consultations***

Professor Gordon noted that this meeting is enlarging the debate and that he will provide feedback to the World Bank on the advice provide by participants. However, many key African stakeholders have not yet been involved in the process.

Professor Gordon presented a brief concept for a follow up project to expand the discussion on the Code, raise awareness on mangroves and on mangrove management amongst key agencies and decision makers, and expand access to available knowledge in five sub-regions of Africa by 2006. A discussion on the project by participants resulted in up scaling from Africa to a global project. (Annex 4 Project Proposal)

The Secretary General welcomed the proposal and suggested that it may be expanded to other Regions including those being consulted in the lead up to the COP and the Oceania Region where there are a growing number of contraction parties with particular interest in coastal wetlands. He offered the support of the Secretariat to further develop the proposal and present this to the World Bank for its support.

The Chair welcomed the initiative and thanked the Secretariat for its support and the promise to follow up.

#### **Other Issues**

Professor Gordon informed participants about the development of an updated edition of the World Atlas on Mangroves which has proved to be an important awareness-raising tool. He requested participants to actively assist in its preparation.

The participants thanked the Chair and the session was closed at midday.

ANNEX 1: List of Participants

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## **Annex 2 SUSTAINABLE MANAGEMENT OF MANGROVE ECOSYSTEM TANZANIA EXPERIENCE**

**UNITED REPUBLIC OF TANZANIA  
Ministry of Natural Resources and Tourism  
Forestry and Beekeeping Division**

**Sustainable Management of Mangrove Ecosystem  
Tanzania Experience**

**Paper presented at:  
AFRICAN REGIONAL PREPARATORY MEETING FOR COP9  
ARUSHA TANZANIA  
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**Prepared by Evarist Nashanda**

## **SUSTAINABLE MANAGEMENT OF MANGROVE ECOSYSTEM TANZANIA EXPERIENCE**

### **1. INTRODUCTION**

Mangroves are salt-tolerant forests or swamp ecosystems that occur along tropical and sub-tropical coastlines, usually shelter bays, and around river mouths. The Tanzania coastline extends over 800km from the border with Kenya in the north to Mozambique in the south. Mangroves along Tanzania coastline occur on gently sloping shores, and around river estuaries, creeks, and bays.

Tree biodiversity in mangrove sites is low because few trees can withstand high salinity, anaerobic sediments, acidic soils, and unstable substrate. Nine mangrove species are found in Tanzania. Mangrove forests are important economic and ecological resource in Tanzania. They are principal providers of tangible and non-tangible products and services. TCMP 2001 estimated that over 150,000 people make their living directly from mangrove resources in Tanzania. The Rufiji Delta, with extensive and deltaic mangrove (55,000ha) is the largest single mangrove forest in eastern Africa, extends into a shallow channel support shrimp and fish breeding grounds, small dugong population and crocodiles. A count in the Delta in 2001 recorded 40,160 water birds of 62 species. A high coral diversity (>45 genera) is found among the mosaic of reefs in the area, that also contribute to the varied demersal fish community (> 350 species). The delta artisanal fishery of about 7,000 fishermen produces about 4,500 tones of finfish per annum.

The importance of mangroves can not be overemphasized; the impact of Tsunami of 26 December 2004 following the severe earthquake of the coast of Sumatra was regulated by mangrove wetland. Out of 17 hamlets in Pichavaran area, 6 were protected by dense mangrove forests and suffered no damage at all, whereas 5 hamlets located near the open beach were totally destroyed. The remaining hamlets were further away from the coast and mangroves (IUFRO, 2005). According to report by Mafia Island Marine Park Warden and Zonal Mangrove Manager in Kibiti showed that, the effect of Tsunami was also felt in Tanzania coast especially Mafia Island and Rufiji delta respectively. Although 2 people died in the Rufiji delta, its impact to human life was regulated by mangroves. Rufiji delta together with Mafia Island and Kilwa district form a complex marine eco-region. The site is biologically rich and was in October 2004 nominated Rufiji-Mafia-Kilwa Marine Ramsar Site.

### **2. HISTORY, LEGAL, LOCATION AND TENURIAL STATUS OF TANZANIA'S MANGROVES**

Records indicate that along with slaves and ivory, mangrove poles made up a major regional trade by the 9th Century. The treeless towns of southeastern Arabia and the Persian Gulf, especially Oman,

Siraf and Basra, all needed mangroves poles for construction. About 70- 80 dhows from various ports called in to load mangroves

from the Rufiji delta in the Northeast monsoons of late 1890's and early 1980's.

The economic importance of Tanzania's mangrove was recognized at the early stage in the country's colonization. In 1898, the Germans administration established an ordinance dealing with mangroves, especially those of Rufiji delta, and hence started the first Forest Office in the delta. The Tanganyika Forestry

Laws and Rules Handbook, 1947, describe mangrove reserves covering an approximate area of 80,000 ha in nine coastal districts. Under this legislation, building poles were sold by forest administration to the merchants who transported them to treeless areas of Arabia and the Persian Gulf. The British subsequently expanded the mangrove reserves. Some were gazetted as far back as the 1920s.

After independence, the Tanzania Government maintained their protective status as territorial forest reserves but failed to manage them as they did with the forests reserves on dry land. The Forest Ordinance of 1957, published in 1958, that governed the administration of territorial forest reserves was replaced by Forest Act No.14 of 2002, which came into force on 1st July 2004. Today Tanzania National Forest Policy and the Forest Act recognize participation of local villagers in the management of the resource as well as rights to use mangroves in a sustainable manner.

The Tanzania Mangrove Management Programme defines the boundary of gazetted mangrove forest Reserves as the area between low and high tide mark. Several reports and studies regarding mangrove of Tanzania have been completed. The most comprehensive and extensive base line information on distribution, coverage, uses, and status was created by Mangrove Management Project (Semesi 1991). This study delineates mangrove location in Tanzania and covers ten coastal districts. The programme divided these districts into three zones, North (Tanga, Muheza an Pangani), Central (Bagamoyo, Dar-Es-Salaam, Mafia and Rufiji), and South (Kilwa, Lindi and Mtwara) and subsequently quantified area, stand density, and height of each stand. The study also delineated salt pans, water channels, clear felled, and bare saline areas. The total estimated mangrove area according to this study, is 111,994 hectares along the mainland Tanzania and 172, 889 hectares if water in creeks, clear-cut areas, and salt pans are included (Semesi, 1991).

### **3. THREATS TO TANZANIA'S MANGROVES**

#### **3.1 Natural Threats**

Though the main threat to mangroves comes from human activities, there are also natural factors which can affect this dynamic and constantly changing ecosystem. These include:

**River floods** which cause considerable areas of mangroves to die as a result of alteration of water level, bank erosion and diversion of water courses. Mangroves cannot tolerate prolonged inundation by fresh or salt water and will die. Such flooding occurs regularly in some parts of the Rufiji delta.

**Sand deposition** from sea and land which can cut off portion of mangroves from salt water causing them to die. This problem is pronounced in most parts of Bagamoyo District.

**Rise in sea level** due to global warming may flood present mangrove areas. They would, however, be expected to colonize new land, the extent of which would depend on local topography.

#### **3.2. Anthropogenic Factors**

##### **Up-Stream Activities**

**Alluvial gold mining** There is close linkage between mangroves and upland watersheds through river systems. This means that activities even 100 km upstream can affect the mangrove ecosystem. Uncontrolled illegal artisan mining in water sources, water courses and river basins result into soil being eroded, transported down stream and finally deposited into Mangroves which may cut out a portion, resulting into dried mangrove vegetation.

**Up-land poor farming practices** Poor farming practices upland result into erosion. Washed away soils are transported and deposited into corals. Damaged and filled up corals are unable to reduce and check the sea water currents and therefore cause shore erosion.

**Over-allocations, Illegal abstraction, and diversion of fresh water** Mangrove ecosystems depend very much in fresh water, especially those in river mouths. However, water has now become scarce commodity in all river basins which discharges its water to the Indian Ocean. Increased water demands for economic activities such irrigation during dry seasons, brick making, industries, hydro-power generation and water for livestock have led to illegal water abstraction, over-allocation and diversion for different uses thus forgetting water for environment down stream

### **Unregulated Utilization**

**Unauthorized harvesting** Most coastal village communities use mangroves in a sustainable manner for local needs and it is mainly commercial activities which over-exploit the mangrove resource. The destruction of large areas of mangrove forests is caused by businessmen and women who usually come from inland. They pay local people to cut mangroves to be used as fuel for boiling brine to produce salt (Tanga), to produce lime (Bagamoyo, Lindi, Mtwara) and for the drying of fish (Pangani). They exploit the resource without regard for its survival or reproduction and communities most affected are not remunerated for loss of their resources. Almost none of the profit gained from these business enterprises remains in the villages. The demand for domestic fuel wood endangers mangroves in areas near large villages and towns. If the inland fuel wood source, often coastal forest, is already exhausted, people turn to mangroves as a second choice. What was originally a small scale domestic use at a village level grows with increasing village size and proximity to towns, into a commercial or semi-commercial.

**Salt making** This is similarly true for construction of salt pans for solar evaporation in Tanga, Bagamoyo and Mtwara Districts. Pans often constructed within mangrove areas involving the total clearing of the forest. But in many cases, it would be possible to construct them behind vegetated mangrove areas on bare saline patches. Cutting of poles, if done on a large scale and in an unplanned manner, can reduce the genetic pool by removing all trees with straight trunks, leaving behind only badly formed stems unsuitable for regeneration of mangroves harvestable as poles in the future.

**Agricultural activities** Agriculture activities within Mangrove Forest Reserve take place in the Rufiji Delta, where shifting cultivation for rice growing is a serious threat to the mangroves. Mangroves are also endangered by oil and industrial pollution, by excessive salination due to man's degradation of catchment areas, by herbicides and insecticides coming from inland via development. Such activities as petroleum prospecting, oil pollution from ships, the dumping of garbage and sewage and various types of industrial chemical pollution in the estuarine environment also they have direct negative effects on mangroves.

**Unsustainable Development** Today as result of globalization, infrastructure development, financial sector reforms and others reforms have attracted many investors to invest in Tanzania. Mangrove ecosystem is one of the potential areas for developmental projects. Rufiji delta for example with its fragility is one of the potential site for prawn farming, located about 150 km south of Dar-Es-Salaam, the delta is midway between Tanzania's Selous Game Reserve and the Mafia Island Marine Park, making it potential candidate for eco-tourism.

Large-scale prawn farming although promoted as a way to reduce stress on ocean fishery, in practice, has proven environmentally destructive in virtually every country which it has been tried (Stephen L. Kass and Jean M. McCarroll, 1998). Even where government regulation is theoretically in place, the pressure to produce prawns for export have lead to excessive feeding, widespread use of antibiotics, effluent contamination of coastal waterways, depletion of soils, destructive of tropical mangrove forests and excessive draw-down of groundwater supplies. Both Rio Declaration and Agenda 21 call all nations to carry out meaningful Environment Impact Assessment (EIA) for any developmental

project. Although Tanzania has implemented Rio declaration by put in place various legislations which addresses EIA as mandatory, however, due to remoteness location of potential sites for prawn farms and inadequate human resources, meaningful inspection and enforcement is likely to prove extremely difficult in practice, and the widespread opportunity for corruption will tend to erode even the best intention of regulatory authority.

**Problem related to institutional failure** Government institutions directly or indirectly involved in issues concerning mangroves are: Tanzania Investment Promotion Centre, Lands Division, Fisheries Division, Forest and Beekeeping Division(FBD), Wildlife Division, Ministry of Water and Livestock Development, Ministry of Energy and Minerals, Ministry of Regional Administration and Local Government, National Environmental Management Council, University of Dar Es Salaam, Sokoine University of Agriculture, Ministry of Agriculture and Food Security as well as various non-governmental organizations are not well coordinated and may issue unclear directives over mangrove land and issuing licenses and permits for salt making, construction of houses, cultivation, fish/shrimp farming etc, forgetting that, FBD is legally entitled to manage mangroves.

#### **4. MANAGEMENT PLAN**

For many years Mangroves in Tanzania received less attention from Forestry and Beekeeping Division, recognizing the values of mangrove and key threats, the Tanzania Government in 1988 initiated the Mangrove Management Programme with the support from Royal Kingdom of Norway through Norwegian International Development Agency (NORAD). The actual implementation started in 1994. The Programme emphasizes on mangrove conservation and utilization by involving local adjacent communities through Joint Forest Management approach (JFM).

##### **4.1 Long Term Objective**

The overall development goal is to enhance the contribution of mangrove ecosystems to the economy of the country by rational utilization of mangrove ecosystems on a sustainable basis and improve livelihood of coast communities.

##### **4.2 Short Term Objective**

These are defined as follows:

- (a) Conservation of mangrove for protective functions (windbreaks and shore erosion).
- (b) The optimization of livelihood and conservation.
- (c) Management of representative areas for biodiversity, tourism research and education.
- (d) Improve institutional capacities in managing mangroves.

##### **4.3 MANAGEMENT STRATEGIES**

The plan put forward suggestions on how to improve forest management at the same time increase benefit to the surrounding communities. The participation of the coastal villagers is of paramount importance for the success of the management of the mangrove resources. However, local communities need assurance that their participation will payback. Combinations of approaches have been used to encourage their participation. The plan also suggests increase of staff working in mangrove ecosystem; strengthen institutions and inter-sectoral collaboration and coordination on mangrove management and zoning of mangrove forest into;

**Zone I: Forests which receives total protection:** Mangrove that protect the coast from wind and erosion, maintain genetic resources and protect flora and fauna.

**Zone II: Forests which are under production.** These are ecologically stable areas with sufficient regeneration potential to permit controlled harvesting.

**Zone III: Degraded areas which requires rehabilitation** and closed from cutting for periods of varying lengths to allow recovery

**Zone IV: Areas set aside for development of different types.** Areas are regarded as suitable for certain defined, carefully-controlled development activities both at the commercial level and that of

the village. Example, tourism is at present almost non-existent in mangrove areas except in Tanga, but is of potentially great importance in the Rufiji Delta.

#### **4.4 MANAGEMENT INTERVENTIONS**

**Involvement of local communities in managing mangroves** Mangrove Management Programme works with the surrounding local communities in the protection and conservation of mangrove ecosystem through Joint Forest Management. Local communities participate in various activities such as rehabilitation of degraded mangroves area, protection and supervising exploitation of mangroves. This is achieved through awareness creation using various awareness creation techniques such as video show, seminars, meeting and environmental education in primary schools in the coast districts. For effective MMP provide working gears to village natural resources committees, these includes, providing dug out canoes, bicycles, fuel, plastics shoes, and stationary for report writing.

In the process of empowerment of the local people, the Programme is facilitating 100 villages along the coast to develop village based management plans, formulation and approval of village by-laws and preparation of management agreements. After lessons have been learnt way forward is to scale-up to cover all mangrove adjacent villages along the coast of Tanzania.

**Building Capacity at local level and Institutions** To improve management capacity, Local communities were trained on basic management skills, law enforcement, record keeping and entrepreneurship skills, beekeeping and fish farming. Programme staff was provided with short and long term training. In addition to trainings, various equipment and machines were procured in order to improve working environment for both. Mangrove Management Authorities have regularly hold meetings and seminars with the aim of strengthening co ordinations of all stakeholders, which resulted into signing of memoranda of understanding regarding management of mangroves in Tanzania.

**Promotion of income and employment generation activities** In collaboration with the communities, mangrove management programme support and promote alternative income generation activities. The identified activities aimed at addressing Millennium Development Goals on issue related to poverty reduction, food security and Energy crisis activates supported includes handcraft, beekeeping, sea weed farming, fish farming, improved energy saving stoves and ecotourism.

**Ecotourism** Agenda 21 adopted at Rio summit underline the possibilities of using the sustainable tourism as a tool to poverty reduction, through employment creation and sale of various products to tourists. The programme assists local community to promote sustainable tourism through support in developing camping sites and promotion of locally produced products.

**Promotion of Handcraft** Mangrove Project support production of various products from the locally available materials like coconut husk, this is done through supporting training and acquisition of materials and equipment. This support is aimed at reducing income poverty and local community's dependence on Natural resources hence reduced environmental degradation.

**Beekeeping development** Beekeeping has been identified as one of the major opportunity to boost the house hold income for peoples living adjacent to the mangrove ecosystem. Its potential feature is the presences of abundance bee colonies in the undisturbed mangrove. Produced honey is sold to generate income to the family and also to improve food security of the family.

**Fish Farming** Fish farming is another activity supported improve the livelihood of coastal communities and improve nutrition. Other Mariculture initiatives include also seaweed farming.

**Providing alternatives wood resources** The best known use of Mangrove is for the construction poles for traditional houses, the reason being the fact that Mangrove poles last for many years and are relatively resistant to termites as compared to non mangrove tree species. To reduce pressure on mangrove exploitation for house construction, the programme promotes planting of fast growing tree species such as teak, eucalyptus and casuarinas. To complement the efforts the programme has introduced technology on production of less cost bricks made out of lime and mud for construction purpose.

**Promotion of appropriate technology on wood fuel production and Use** Mangroves are used widely as wood resources of different purpose and under different circumstances. On local subsistence level, mangrove wood are the major fuel woods available for cooking. In places where salt is obtained by boiling brine, mangroves is a major source of fuel.

In order to reduce pressure on the Mangrove resources various efforts have been undertaken. This includes developing and promotion of improved energy serving stoves and promotion of establishment of village wood lot in the village close to mangrove forest.

Similarly, appropriate technology and training on construction of energy serving stove has been carried out.

## **5. THE IMPACT OF MANGROVE MANAGEMENT INTERVENTIONS**

### **5.1 Change of mangrove overtime**

The immediate impact of the project interventions is the restoration of mangrove forests in many areas, particularly in the Southern and Northern Zones. Semesi, (1991) estimated mangrove area to be 111,994 hectares along the Mainland Tanzania coast or 172,889 hectares if water in creeks, clear-cut areas, and salt pans are included. Comparison of data between 1990 and 2000, the two time periods shows that there has been no dramatic change in mangrove areas over the most recent 10 years. Mangrove areas declined in the district of Rufiji, Kisarawe, and Kilwa, and slightly increase in other districts (Wang et al 2002).

### **5.2 Established Village level Institutions for Mangrove Management**

Positive impacts that have been identified as a result of the programme initiative include mobilization of local community to participate in the forest conservation. This evident through existing and functioning village natural resources committees (VNRC), village based management plans, management agreements and village by-laws as means to ensure involvement of local community in the management of mangrove ecosystem. Involvement of local community in rehabilitation and protection of mangrove has resulted in decrease of incidences of illegal activities hence recovery of the formerly degraded areas.

### **5.2 Improved livelihood**

Mid Term Review (2004) of the Management of Natural Resources Programme has noted that as result of rehabilitation of degraded areas, villagers in Chongolieni village (Tanga district), where about 40% of the households are involved in fishing, the daily catch of fish has increased, resulting in lower prices in the local communities. Thus most households now have access to fish and consequently better nutrition. Despite the lower price, fishers have been to earn more income from the higher volume of fish caught, such that daily income had risen from TAS 2,000 before the programme to TAS 5,000 currently. Increased fish has also increased opportunities for women who are involved in selling fried fish.

Villagers were reported to be using the additional income from the fishing, plus the other income generating activities such as beekeeping, sea weed farming and fish farming to buy food, pay for school fees and provide for other school amenities for their children. The programme has also

contributed towards environmental education in schools through curriculum review, training material and contributing towards competition between schools.

## **6. Lessons Learnt**

Developing effective community participation is a process. For local community to participate full in the conservation and protection of mangrove, cost benefit sharing mechanism need to be developed as a pre-requisite for active participation. There are many factor affecting involvement of local communities, the most important being lack of income therefore continued effort to promote income generating activities for local people is required.

### **6.1 Challenges**

Inadequate capacity (funds, staff, equipment) to effectively manage mangrove ecosystem, the management heavily depends on development partners. You need expensive boats, fuel and special trainings to curb illegal export of mangroves and other forest produce, supervision and monitoring of logging and developmental projects within mangrove ecosystem.

The Rufiji delta has the population of approximately 10,000 people; whom entirely depend on fishing and agriculture. They clear mangrove and plant rice, in a shifting manner. Mangrove ecosystem is fragile, fertile, and potential for developmental projects, the challenge is how to balance between livelihood of people, developmental projects and conservation of Rufiji delta ecosystem.

### **6.2 The way Forward**

Involvement of local communities in mangrove forest management has proved very successful however, for the meaningful participation of local people in mangrove management and improve livelihood of coastal communities, as well as rise royalty for the government, there is a need for participatory research on multiple land-use of mangrove ecosystems. The findings should strike a balance between, livelihood, conservation and income for the government and local communities.

**PRINCIPLES FOR A CODE OF CONDUCT FOR THE SUSTAINABLE MANAGEMENT OF MANGROVE ECOSYSTEMS**

A WORK IN PROGRESS

Presented for discussion on behalf of the World Bank by Prof. Chris Gordon Centre for African Wetlands University of Ghana Legon, Accra, Ghana

**Collaboration**

- The Center for Tropical Ecosystem Research, Aarhus University, Denmark
- Stirling University, Scotland
- International Society for Mangrove Ecosystems, Japan
- The Bank - Netherlands Partnership Program – Forest Biodiversity Window
- Plus about 50 NGOs, multilateral organizations, and institutes in Asia, Africa, Latin America, Europe, and North America

**Rationale**

- Mangroves serve important coastal functions:
  - ⦿ Protection against coastal storms;
  - ⦿ Critical habitats for coastal biodiversity;
  - ⦿ Spawning areas for coastal, marine, and inland aquatic and terrestrial species and birds;
  - ⦿ Waste treatment;
  - ⦿ Source of timber (construction material and fuel) and non-timber products (honey, brackish water organisms, etc.); and
  - ⦿ Recreation
- Poor communities in the vicinity of mangroves have traditionally depended upon them for income generation, often through sustainable management practices.

**The application of economic valuation to mangroves**

	On - site	Off site
Marketed	Usually included in economic analysis, e.g., poles, charcoal, woodchips, crabs	May be included in economic analysis, e.g., fish and shellfish caught in adjacent waters
Non marketed	Seldom included in economic analysis, e.g medicinal uses., fish nursery areas, wildlife sanctuaries, biodiversity attributes, educational recreational and research values.	Usually ignored e.g., nutrient flows to estuaries, buffer, against storm damage erosion control

## Medical Uses of Mangrove in W. Africa

- ***Rhizophora racemosa***

Roots used with palm oil as an ointment for boils.  
Bark extract used for fungal infections of the skin;  
treatment of diarrhoea and dysentery in children;  
leprosy; sore throat.

- ***Avicennia africana = germinans***

Leaves: ashes used as a salt substitute.  
Bark: powdered bark mixed with palm oil for treatment  
of lice, ringworm and mange;  
Seeds: germinating seeds used as a poison.

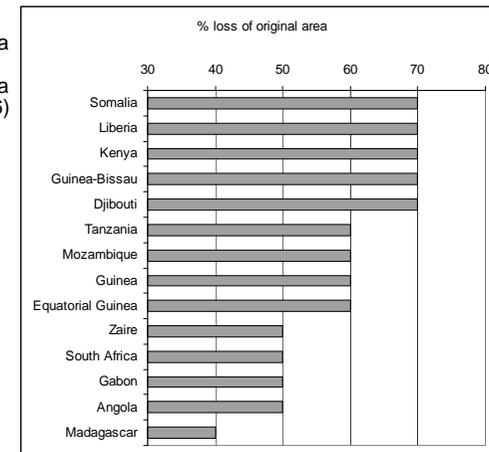
- ***Conocarpus erecta***

Leaves: decoction used as a febrifuge.  
Latex: applied to cuts to stop bleeding.  
Roots: ground and boiled as a cure for catarrh.  
Bark: used in the treatment of gonorrhoea.

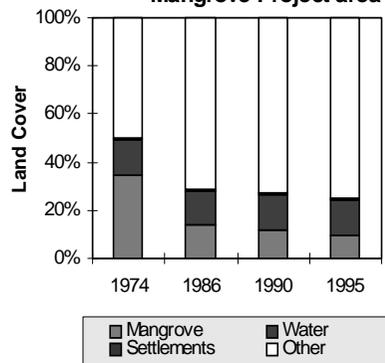


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Estimated loss of original mangrove area in different regions (based on country data available in WRI, 1996)



## Changes in mangrove cover in the Lower Volta Mangrove Project area



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## Project Concept

- Provide a guide for sustainable management of mangrove ecosystems that can be adapted local circumstances; and
- Develop co-management strategies among communities, NGOs, and related government agencies through a consultative process that can lead to a regulatory framework.



## Project Design and Strategy

- Conduct a literature review of global experience on the management of mangrove ecosystems;
  - Prepare case studies from the Asia-Pacific, Africa and Latin American and Caribbean Regions;
  - Based on findings from the review and case studies, prepare an early draft of the Code of Conduct;
  - Conduct regional workshops to advance the formulation of the Code through consultation;
- 
- Conduct local workshops particularly with involved NGOs, other stakeholders and government agencies to adapt and field test the code as well as make further adjustments to its context; and
  - Collaborate with international NGOs, national, and multilateral organizations to gain endorsement or adoption of Code.

## COUNTRY CASE STUDIES

### South and Southeast Asia

- Bangladesh
- India
- Malaysia
- Philippines
- Thailand
- Vietnam

### Central and South America

- Brazil
- Colombia
- Ecuador
- Nicaragua

## COUNTRY CASE STUDIES

### Africa

- Benin
- Ghana
- Kenya
- Mozambique
- Senegal

## Three Regional Consultation Workshops

South and Southeast Asia

Central and South America

Africa



**Workshop and Peer Review at  
the World Bank in Washington, DC September 2003**



15 PRINCIPLES OF THE  
CODE OF CONDUCT

For all documents, go to:

[http://www.biology.au.dk/cenTER/MCB\\_2003.htm](http://www.biology.au.dk/cenTER/MCB_2003.htm)

**Principle 1. Objectives of Mangrove Ecosystem Management**

*The fundamental objective of mangrove ecosystem management is to promote conservation, and where necessary restoration or rehabilitation and sustainable use of mangrove ecosystems and their associated habitats to benefit local to global populations.*

**Principle 2. Precautionary Approach to Management**

*The overall approach to mangrove management should be a precautionary one, but a lack of scientific information should not be used as an argument for postponing, or failing to conserve mangroves or to manage them sustainably.*

**Principle 3. Policy and Legal Frameworks**

*National and international policy and legal frameworks are required to provide overall guidance for the conservation and sustainable use of mangrove resources and to ensure protection for mangrove-associated biodiversity.*



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**Principle 4. Implementation and Integration**

*There is a general weakness in the implementation of policy and legal frameworks for mangroves, lack of consultation between the management agencies and the various mangrove stakeholders, inadequate monitoring and evaluation of implementation performance and lack of integration of mangrove management with coastal and river basin area management.*

**Principle 5. Mangrove Assessment**

*Mangrove survey, mapping, inventory and monitoring data are required to support the sustainable management of mangrove ecosystems.*

**Principle 6. Socio-Economic Considerations**

*Mangroves provide important socio-economic benefits to indigenous peoples and local communities worldwide; it is essential therefore to manage mangrove ecosystems and their resources sustainably to maintain and improve their livelihoods.*



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**Principle 7. Cultural and Community Issues**

*Mangrove ecosystems are associated with unique human traditions and knowledge, but they are also under severe pressure from some forms of exploitation, both traditional and non-traditional.*

**Principle 8. Capacity Development**

*Capacity development for mangrove ecosystem management, and awareness raising about mangroves in general are needed at all levels from decision makers in government, to district and municipal officials, community leaders and educational institutions (teachers, students and school children).*

**Principle 9. Forest Management and Silviculture**

*Mangrove forestry/silviculture objectives may have an economic, environmental or aesthetic basis, or a combination of these. Wherever, possible, multiple use management should be the ultimate goal of mangrove forest management.*



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**Principle 10. Fisheries**

*Mangrove associated fisheries have worldwide importance in providing subsistence food and income, as well as commercial benefits, for a wide range of stakeholders, including indigenous peoples and local fisher communities. However, lack of enforcement of existing fishery regulations, including lack of protection of mangrove nursery sites and habitat degradation are among the major reasons for the widespread decline in mangrove fisheries.*

**Principle 11. Aquaculture**

*Mangrove associated aquaculture has worldwide importance in providing subsistence-level food and income, as well as commercial benefits, for a wide range of stakeholders. Unfortunately, some aquaculture development has also resulted in severe environmental degradation and socioeconomic problems, due in part, to poor management practices and/or lack of enforcement of environmental regulations.*

**Principle 12. Agriculture, Salt production and Mining**

*The conversion of mangroves to other forms of land use, including agriculture and salt pans has been a major cause of wetland habitat loss in many countries. Mining has also caused significant localized damage to mangrove ecosystems, especially in Africa*



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**Principle 13. Tourism, Recreation and Education**

*Tourism is one of the World's largest and fastest growing sector of the global economy. Mangrove ecosystems can provide ecotourists with unique habitats and biodiversity opportunities, with many potential activities, including recreational fishing, bird watching, viewing wildlife and scenic boat trips.*

**Principle 14. Mangrove Products and Responsible Trade**

*Sustainably produced mangrove products should be promoted by "green labeling" and they should be marketed following the principles of fair-trading and benefit sharing.*

**Principle 15. Mangrove Research and Information Dissemination**

*Inadequate understanding of the functions and values of mangrove ecosystems is one of the main constraints to conserving and managing mangrove resources sustainably. However, there are considerable skills, information and opportunities available worldwide to use research knowledge more effectively to improve mangrove management – e.g., [www.glomis.com](http://www.glomis.com)*



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**NEXT STEPS**

Conduct local workshops particularly with involved NGOs, other stakeholders and government agencies to adapt and field test the code as well as make further adjustments to its context; and

Collaborate with international NGOs, national, and multilateral organizations to gain endorsement or adoption of the Principles and formulation of local Codes.

- **Project Title:** Raising of awareness of the Code of Conduct for the sustainable management of mangrove ecosystems as a means for the integrated management of key coastal wetlands
- **Duration of Project:** three years **Timetable:** 2006 - 2009
- **Zone of intervention:** Global, sub-region by sub-region, taking account distribution of mangroves
- **Linkages to existing regional and/or international frameworks:** NEPAD Capacity-Building and Environment Initiatives, CBD, Ramsar, UNEP, ITTO
- **Total Estimated Cost:** US\$ 1,250,000
- **Project Objective:** *To disseminate the Code of Conduct for the sustainable management of mangrove ecosystems at all levels of decision making and stakeholder groups.*



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## Annex 4 Project Concept

By Prof. Chris Gordon, Centre for African Wetlands, Legon Ghana

**Project Title: Raising of awareness of the Code of Conduct for the sustainable management of mangrove ecosystems as a means for the integrated management of key wetlands**

Duration of Project: Three years      Timetable (start-end of project): 2006-2009

Zone of intervention: Global, sub-region by sub-region, taking account distribution of mangroves

Lead Agency: Ramsar Secretariat

Linkages to existing regional and/or international frameworks: CBD, UNEP, UNDP, ITTO, NGOs (e.g., ISME) as well as Regional Capacity-Building Initiatives,

Total Estimated Cost: US\$ 1,250,000

Existing level of funding (if any): US\$ 150,000 (including in-kind contributions)

Additional funding required: US\$ 1,100,000

Problem background/rationale: It is universally recognised by states and stakeholders that the poor management of mangroves are a contributing cause of poverty and a primary cause of species loss, ecosystem decline and as such pose a threat to sustainable development in many coastal regions. The Code of Conduct for the sustainable management of mangrove ecosystems has been prepared by the World Bank as an instrument to guide policy direction for the sustainable management of mangrove ecosystems. It is appreciated that the mere creation of the Code of Conduct will not ensure its use and that currently it is only a small circle of mangrove ecologists and technical staff who are aware of the Code of Conduct. There is a need to evolve a strategy and public information plan to ensure that knowledge of the Code of Conduct goes to a wide audience and that the Code is understood in its entirety. It is proposed that the dissemination of the code should be done regionally through the creation and operation of sub-regional hubs so that States may learn from the lessons of other States. The full implementation of the code would help avoid the unnecessary wastage of scarce resources in project duplication, loss of experience and the poor deployment of staff.

**Project Objective: *To disseminate the Code of Conduct for the sustainable management of mangrove ecosystems at all levels of decision-making.***

### Project Components/Activities

- a. Establishment and enhancement of networks for mangrove management
- b. Sharing of mangrove management experience with the view of placing a regional perspective on the Mangrove Code of Conduct
- c. Establishment and enhancement of sub-regional information hubs for mangrove management
- d. Production of appropriate information materials from the Mangrove Code of Conduct for mangrove management at all levels
- e. Dissemination of appropriate information materials from the Mangrove Code of Conduct for mangrove management at all levels

Activities within each component:

Activity a1: Design a survey protocol for identifying existing networks for mangrove management

Activity a2: Conduct the survey and Compile a directory of mangrove networks

Activity a3: Sub-regional workshops to identify additional networks if needed

Activity a4: Creation of new networks to fill gaps in networks or extension of existing network coverage to fill gaps

Activity b1: Organise sub-regional workshops to learn and shared experiences on mangrove management in each region with the view to “regionalise” the Mangrove Code of Conduct.

Activity b2: Document experiences and lessons learned to strengthen the Mangrove Code of Conduct.

Activity c1: Identify existing institutions carrying out mangrove management using the mangrove Code of Conduct within the region

Activity c2: Establish mechanisms for information exchange and flow between the identified institutions

Activity c3: Select a sub-regional hub as an information clearing house

Activity c4: Support sub-regional hubs to function

Activity d1: Collate available/existing information on the operation of the Mangrove Code of Conduct

Activity d2: Catalogue the collected information

Activity d3: Review the information collected

Activity d4: Synthesise the information for applicability to each regional setting

Activity d4: Produce awareness and information materials for all levels

Activity e1: Identify relevant stakeholders and decision makers active in mangrove management

Activity e2: Develop strategies for promoting the awareness of the Code of Conduct

Activity e3: Implement strategies for promoting the awareness of Code of Conduct

Activity e4: Disseminate Code of Conduct information materials

Activity e5: Evaluate efficacy and impact of Code of Conduct information materials

## 12. Project Outputs/results

- a. At least ten coastal sub-regions with mangrove networks established or enhanced
- b. Fifteen sub-regional workshops
- c. Awareness created on the Mangrove Code of Conduct in all regions by 2009
- d. Information materials produced on the Mangrove Code of Conduct in all sub-regions
- e. Information materials disseminated on the Mangrove Code of Conduct in all sub-regions

Stakeholders involved: Policy-makers, managers and technical staff responsible for land, water, mangrove and natural resource management, training institutions, research institutions, etc.

Suggested or potential focal point/ contact institutions: Wetland International, ITTO, WWF, IUCN regional organisations (ECOWAS, SADC, IGAD, UMA, CEMAC, CILSS and COMESA) specialised organisations such as Centre for African Wetlands, NESDA, NIOMR, KMFRI, ISME