Project Proposals on Management of Key Habitats

DEVELOPMENT OF SOUND LAND-USE PRACTICES AND REDUCTION OF SUSPENDED SOLIDS IN ESTUARIES AND LAGOONS IN SUB-SAHARAN AFRICA

1. IDENTIFIERS

Project Number: HAB5

Project Title: Development of sound land-use practices and Reduction of suspended solids in estuaries and lagoons in Sub-Saharan Africa

Requesting Country (ies): The Gambia, Ghana, Mozambique, Nigeria, Senegal, South Africa, Tanzania.

Requesting National Organization: Ministry of Coordination of Environmental Affairs (Mozambique)
Ministry of Environment and Sciences and Ministry of Waters and Housing (Ghana)
Federal Ministry of Environment, Abuja (Nigeria)
Ministry of Environment (Senegal)
Ministry of Natural Resources and Tourism (Tanzania)
Department of Environmental Affairs & Tourism, University of Cape Town, CSIR (South Africa)

Executing Agencies: Department of Parks and wildlife Management (Gambia)
Office of the National Parks of Senegal (Senegal)
Water Resources Commission, Volta River Authority (Ghana)
UEM (Eduardo Mondlane University – UNESCO Chair of Marine Sciences and Oceanography) (Mozambique)
Nigerian Institute for Oceanography and Marine Research (NIOMR),
Nigerian Conservation Fund (Nigeria)
Department of Environmental Affairs & Tourism, University of Cape Town, CSIR (South Africa)
Department of Forestry and Beekeeping (Tanzania)

Required National Partners: Gambia: National Environment Agency (NEA), Local Community members Department of Community Development (DCD), Action Aid The Gambia, Department of Forestry, Department of Fisheries

Ghana: Water Resources Commission, Department of Wildlife, Volta River Authority, Densu Basin Management Board and Ministry of Tourism

Nigeria: Niger/Benue River Basin Authority, Niger Delta Developing Authority, National Conservation Fust, Nigerian Institute for Oceanography and Marine Research (NIOMR), Federal Ministry of Agriculture, Federal Ministry of Water resources, State Ministry of Environment.

Mozambique: DNA (National Directorate of Water), GPZ (Zambezi valley development authority), UEM (Eduardo Mondlane University) (Mozambique);

Tanzania: Ministry of Water and Livestock, Rufiji Basin Development Authority (RUBADA)

South Africa: Academic and Research Institutions

Priority Issue Addressed:	Modification of Habitats and Ecotones, Modification of Stream Flow (Freshwater shortage and excess water), sustainable exploitation of estuarine and coastal resources, erosion and salt intrusion in the estuaries; protection of breeding and spawning grounds, maintenance of biological diversity.
Regional Scope:	Southern Africa, East Africa, West Africa
Project Location:	Rufiji River Basin (Tanzania); Incomati, Zambezi River/delta (Mozambique); Krynsa Estuary (South Africa); Western Gambia (Baobolong Wetland Reserve) Delta du Saloum in Senegal (Gambia); Niger Delta, Lagos, Elcet, Niger/Benue Catchment (Nigeria); Korle Lagoon (Ghana); Delta of the Senegal River (Senegal).
Project Duration:	5 years
Working Group of the African Process	Management of key habitats.

2. SUMMARY:

According to GPA (1995) natural sedimentation and siltation are important in the development and maintenance of numerous coastal habitats. Habitats requiring sediment input include coastal wetlands, lagoons, estuaries and mangroves. Reduction in natural rates of sedimentation can compromise the integrity of these habitats, as can excessive sediment loads, which may bury benthic communities and threaten sensitive habitats such as coral reefs, mangroves, seagrass beds, and rocky substrates.

Contaminated sediments, whether they are fresh inputs or dredged, may also lead to pollution, the latter through resuspension or improper disposal.

Anthropogenic modifications to sediment mobilization and sedimentation are made by, inter alia, construction activities, forestry operations, agricultural practices, mining practices, hydrological modifications, dredging activities, and coastal erosion. Effects are generally local in nature, but transboundary implications may occur in some areas where major river systems form a common border and where littoral currents carry inputs across international boundaries.

Estuaries and lagoons, fed by rivers, are often prone to siltation due to inflow of suspended sediments. Suspended solids are often considered pollution because cause deterioration of water quality. In addition, cause in-filling up of the channels, siltation of the seagrasses and of the corals. These, in turn, have considerable ecological, social and economic implications. Excessive sediment inflow down the rivers are a result of accelerated erosion in the river valley due to inadequate land use practices that include bad agriculture practices and deforestation.

Estuaries and lagoons have considerable ecological, social and economic value, for they are associated with nursery, breeding and spawning grounds of some key marine and terrestrial species; are sites where harbours are built, and sites of attraction of tourism development. Hence, these habitats need to be protected.

The present project proposal aims at promoting good land use practices that would reduce erosion along the river valley, and hence, reduce suspended solids in the estuaries. This would in turn result in prevention of degradation of coastal and marine environment due to changes in coastal erosion and silation caused by human activities.

The project will be implemented in specific river valleys (preferably the shared river basins) in sub-Saharan Africa, and would consist basically in sharing experiences and lessons learned between project implementation sites.

It is expected that the present proposal would result in an improvement of water quality in the estuaries, lagoons and bays, in reduction of cost of dredging activities. These would result in the increase in the availability of resources, in the maintenance of biodiversity and in the efficiency of navigation and harbour services. The increase in the availability of resources would contribute to the well being of the local communities and the development of the coastal countries. Thus, this project contributes to the poverty alleviation and to the promotion of sustainable development - the ultimate goal of the African Process and of NEPAD.

3. COSTS AND FINANCING (MILLION US $)[1]

International & bilateral sources:		
	Required financing by potential source	**:**
	Subtotal international financing	**:USD 2.100**
Co-financing:	**Governments in cash & kind**	**:**
	Subtotal Co-financing	**:USD 0.900**
Total Project Cost:		**:USD 3.000**

4. GOVERNMENT ENDORSEMENT(S)

Hon. John Kachamila, Minister of Environment of Mozambique
Ministry of Environment and Sciences and Ministry of Waters and Housing (Ghana);
Mrs Fatimata DIA TOURE, Director of the Environment and Classified Establishments (Senegal)
Federal Ministry of Environment (Nigeria)
Minister for Natural Resources and Tourism (Tanzania)
Minister Valli Moosa, Department of Environmental Affairs& Tourism, South Africa

5. GOVERNMENT FOCAL POINT(S)

Mr. Evaristo Baquete, Ministry of Environment of Mozambique
Water Resources Commission and Department of Wildlife (Ghana)
National Environment Agency (NEA), Department of Parks and Wildlife Management (DPWM (The Gambia)
Mrs Fatimata Dia Toure, Director of the Environment and Classified Establishments (Senegal)
Dr. Larry Awasoka, Director, Nigerian Institute for Oceanography and Marine Research (Nigeria)
Department of Botany and Institute of Marine Sciences (UDSM) (Tanzania)
Department of Environmental Affairs & Tourism, South Africa

6. AFRICAN PROCESS WORKING GROUP FOCAL POINT(S)

Dr. Antonio Mubango Hoguane (Moz)
Mrs Helena Motta (Moz)
Mr A.K. Armah (Ghana)

[1] This budget is preliminary and has not undergone a full consultation process with the respective countries. Therefore, it does not indicate the actual financial commitment that would be provided by participating countries once the project proposal and its components are finalised.

1.1.1.1 PROJECT DESCRIPTION

1. Background & Justification

The estuaries and lagoons are habitats that serve as nursery grounds of many fish and crustacean species of high commercial and social value. Further, they are sites associated with other sectors of development such as harbours, tourism and fisheries. Despite their ecological, social and economic value they are threatened by siltation.

Channels in estuaries and lagoons are being filled up by sediments, causing considerable damages to the habitats and ecosystems in the adjoining seas. Some of the impacts of excessive sediment loads include siltation in the seagrass beds and in corals, both habitats sustain important fisheries resources and endangered marine species such as Dugongs and marine turtles. In addition, the filling up channels have impacts in the economy of the countries since the navigation channels that guarantee the access to the harbours have to be dragged regularly. Further, suspended sediments hamper the penetration of light in the subsurface layers, and consequently reduction in the primary production.

One of the main causes of excessive sediment loads in estuaries and lagoons is high erosion rate along the river valley due mainly to artificial excessive flow regime and to deforestation of the river valley. The deforestation of river valley, in turn, is accelerated by inadequate land use practices (e.g. agriculture practices, burning forests) and due to deforestation caused by firewood and charcoal demands.

Inappropriate agricultural and forestry land use practices have been identified as a major cause of increased suspended solid loads to rivers, estuaries and lagoons, but also result in a habitat alteration and distruction, reduced fisheries, pollution (eutrophication), and modified streamflow.

The Gambia National Report, for instance, identified the Loss of Ecosystems and Ecotones as one of the major environmental issues in the coastal zone, namely mangroves. At Bintang Bolong "the high load of sediment and suspended solids transparency of the water has been seriously hampered, and it is expected that in turn the rate of photosynthesis, and consequently, primary productivity. The shrimp ingests this rotten and dark suspended debris and organic matter, and this tends to turn its characteristic pink colour to the colour of the dark surrounding water. The colour thus appears different from the usual pink colour of the Paeneus notialis. Some reports mistakenly even suggest that shrimps from Bintang Bolong are a different species." One of the primary causes of the increased suspended solids are "upstream agricultural activities such as especially rice cultivation and horticultural production takes place within the immediate 300m zone from the high water mark. Due to population pressure and consequently land scarcity, the tendency for overusing the available land is becoming increasingly common resulting in many farmers undertaking inappropriate farming practices. The clearing of vegetation and continuous cultivation (ploughing) of the soil leaves it exposed to erosion."

The Ghana report has also identified siltation as a major problem in Korle Lagoon, where suspended particulate matter (SPM), also known as suspended solids, is an indirect measure of siltation. The system showed a gradient from high levels at the upper reaches to low levels at the outfall near the sea. Values measured were generally higher during the low tides than at high tides. This indicates clear inflow of particulate matter from the built up area into the lagoon. SPMs also enter the system from the sea.

The lagoon empties into the sea near Korle Gonno through a rubble–mound outfall of width 22 m. This southern-most section is tidal. Siltation has been a problem and is to a large extent caused by floodwaters, which erode unpaved areas in the catchment and transport the silt into the lagoon. The lagoon was dredged between 1961 and 1963. Again in 1976, inadequate attempts were made to deepen the tidal sections. But since then, its capacity has been seriously reduced by siltation and also by the proliferation of mangrove plants.

Currently, the Korle Lagoon Ecological Restoration Project (KLERP) is underway. The project consists of dredging of the lagoon, sanitation control and flood control measures, and upgrading of the lagoon surroundings. The project is intended to dredge the lagoon to a depth of 4 m with the removal of between

1.25 to 1.5 million m^3 of dredged. The sanitation control measures involve construction of interception drains to collect dry-weather wastewater followed by primary treatment before discharging into the sea. The flood control component of the project involves widening the lower reaches of the Odaw channel joining the lagoon and deepening the lagoon to increase the water storage capacity of the lagoon. The upgrading of the lagoon surroundings by landscaping is intended to encourage human contact with the lagoon as well as discourage direct pollution through indiscriminate littering.

In **Mozambique**, expansion of agricultural land and shifting cultivation practices may have contributed to deforestation, particularly in Incomati and Zambezi rivers. Apart from this, indiscriminate cuts for wood fuel and building material as well as uncontrolled forest fires contribute to the loss of vegetation cover. Saket (1994) estimated a rate of 4.27 % over a period between 1972-1990, which means an annual average rate of 0.23 %. Particularly along river basins, deforestation can be a serious problem due to its effects on erosion and siltation of river channels, lakes and dams.

Apart from excessive suspended solid outflow from the river, the Mozambican report identified also the depletion of the vegetation cover over the coastal sand dunes as a major problem that stimulates coastal erosion that in turn contributed to the death of corals and seagrass by siltation.

In South Africa, Siltation has been increasing in certain areas in Knysna Lagoon not so much as a result of increased sediment input but more as a result of obstructions in the lagoon. As far back as 1952, Day et al. pointed out that siltation has been accelerated in the upper reaches of the estuary since the completion of the rail bridge. The Thesen's Island causeway has resulted in the Ashmead channel having been filled in completely in the vicinity of the causeway and to have become narrower and shallower along much of the reach north of the island. Similarly, the Leisure Island causeway has resulted in some accumulation of sediment in the original channel around the island."

In Tanzania Rufiji River Basin (Tanzania); in mangrove areas such as in Mafia Island, and some parts of Chwaka Bay and Kaole, sediments are sometimes washed away on the seaward side, for reasons not well understood, and mangroves are swept away by wave action (Semesi, 2001).

The present project proposal aims at reduction of the inflow of suspended solids into the estuaries and lagoons through promoting improved land use practices in the upper river valley. The issues of the modification of streamflow will be dealt with in other separate project, HAB2 "Promoting the establishment of RAMSAR sites and developing participatory and integrated approach for river basin management in Sub-Saharan Africa".

During the present project proposal research and studies should be conducted in the designated river basin, estuaries and lagoons for assessment of the current sediment loads, determination of the current land use practices, and for identification of the suitable land use practices that would result in reduction of sediment load in the estuaries and lagoons. Good land use practices should promoted among the communities.

At the end of the project, it is expected that:

- Bad land use practices are identified and people are fully aware about their implication in the ecosystems and in the coastal and marine natural resources
- Good land use practices are identified and people are implementing along the river basins.
- Sediment loads in the estuaries and lagoons should be reduced and hence, water quality in estuaries and lagoons should be improved.

2. Objective & Expected Results:

The overall objective of the project is to promote best land use practices in the river valley as to reduce erosion and suspended solids in the estuaries, lagoons and adjoining seas. The specific objectives are as follows:

The specific objectives of the project include:

- Evaluation of ecological and socio-economic impacts of suspended solids in estuaries and lagoons;
- Identification and promotion of good land use practices (agricultural and forestry) that reduces erosion in the river valley;
- Promotion of awareness and environmental education;

This project is to be implemented in pilot demonstration sites in selected river basins and/or lagoons. In the selection of the sites the following two main criteria will be considered, among others: (a) shared watercourse (e.g. The Gambia / Senegal initiative), (b) interaction between river system and coastal and marine ecosystem (e.g. Zambezi, Incomati) and (c) demonstration value.

The expected results are as follows:

(i) Information on bad and good land use practised along the river to increase or reduce erosion.
(ii) Evaluation of ecological and socio-economic impacts of suspended solids in estuaries and lagoons;
(iii) Awareness material/campaigns for designation for prevention of bad land use practices that accelerate erosion along the river valley.
(iv) Guidelines on good land use practices for reducing erosion in the river valley.
(v) Trained people from the communities on the good land use practices along the river valley.

3. Project Components/Activities:

The project will consists of basically two main components: (a) identification and raising awareness on the bad land use practices and (b) identification and promotion of good land use practices.

Component 1. Identification and raising awareness on the land use modalities currently practices in the river valley with serious problem of siltation

Activity 1.1. Identification and selection of the river basins and wetlands for the implementation of the project

Activity 1.2. Identification and analysis of the stakeholders to work with.

Activity 1.3. Assessment of the current sediment load in estuaries and lagoons

Activity 1.4. Identification of bad and good land use practices with respect to erosion

Component 2. Identification and promotion of good land use practices for reduction of erosion

Activity 2.1. Through a participatory process and with support from the local communities and stakeholders, conduct studies for identifying good land use practices for reduction of soil erosion in the river valley.

Activity 2.2. Dissemination of the information on the need to adopt good practices as to reduce sediment loads in estuaries. This will entail the development of awareness materials, elaboration of manuals and review documents based on experience carried out in the selected sites and providing guidance to governments and practitioners.

Activity 2.3. Conduct a series of regional workshops to further facilitate the sharing of information and experience amongst the stakeholders.

Activity 2.4. Appropriate training courses will be developed and run for enhancing the involvement of the local stakeholders in the process.

The main activities of this project are summarized in the table below. It calls for a five-year implementation period. The first year of the project will consist of establishing the facilities for the implementation of the project. This would include the setting of project co-ordination and implementation structures at local and regional level; logistic arrangements and selection of the pilot project sites, in consultation with local stakeholders. In the

second year, research and studies for helping to shape the future activities of the project will be conducted. In addition the participatory and consultative process will be engaged to develop a common strategy to address the issues of common concern (i.e. reduction of sediment load in estuaries and lagoons).

Main activities and time frame.

Activities	**2003**	**2004**	**2005**	**2006**	**2007**
Genetral					
Establishment of the project management structures					
Identification and raising awareness on the land use modalities currently practices in the river valley					
Selection of the implementation sites (river basin)					
Identification and analysis of the stakeholders					
Assessment of the current sediment load in estuaries and lagoons					
Identification of bad and good land use practices with respect to erosion					
Identification and promotion of good land use practices for reduction of erosion					
studies for identifying good land use practices for reduction of soil erosion in the river valley					
Dissemination of the information on the need adopt good practices as to reduce sediment loads in estuaries.					
development of material for raising awareness and training					
Conduct training, workshops and seminars					

4. Linkages to Other National or Regional Activities / Transboundary Aspects

The present proposal, because it is concerned with the conservation of estuaries and lagoons, and hence, of coastal habitats, can be considered as one of the ways for the implementation of the Nairobi and Abidjan Conventions. Further, it can be linked to the UN convention on biodiversity, the UN convention on Law of the Sea, Agenda 21 on sustainable development at the Rio Summit and the Oslo and Paris convention.

There are quite a number of initiatives that could be linked to or contribute to the success of the present project. Within the programme of intervention, the following are relevant to the present proposal, e.g. control of erosion and management of river basin and wetlands.

Initiatives outside the programme of intervention of the African process that are linked to the present project include:

- LOICZ initiative. This could contribute in understanding the interaction between river and coastal habitats.

- GIWA. this could help in the assessment of the impacts of the river and river management in the coastal ecosystems.

- GPA/LBA Integrated Coastal and River Basin management

- The Korle Lagoon Ecological Restoration Project in Ghana. The project consists of dredging of the lagoon, sanitation control and flood control measures, and upgrading of the lagoon surroundings

5. Demonstrative Value & Replicability*:*

The issues of river basin management are often common. In addition, most of the rivers are of transboundary nature. Hence, the projects of management of river basin are often replicable or transferable. However, the project may need to be adjusted for the specific conditions of the site for which is to be replicated. With regard to the wetlands, efforts are being made world-wide for their conservation. Gathering of experiences in different wetland systems is in course. Experiences form one system, if not literally transferable, could benefit the others.

6. Risks and Sustainability

The present proposal is designed on the basis of the availability of adequate finance and necessary logistics. In the absence of these, the implementation of the project might be difficult.

The present project proposal aims at identification and introduction of new land use practices in the communities. Often people are reluctant to change in their traditional habits and behaviour. So, major risks associated with the present project are the difficulty in identification of good practices that would be accepted by local communities. However, these risks can be mitigated by adequate education and awareness approaches.

Selection of the project sites can be another difficulty, since the areas are many and often large. To identify representative areas and communities is going to be difficult. National reports and inputs from country co-ordinators might be helpfully.

Resources for promoting new land use practices are required, as this would provide demonstration of the benefits of the practices (both environmental and to the wealth of the local community) and hence, stimulate the acceptance by the local community.

This project would provide more impact if it is carried out along side with the project of provision of alternative livelihood.

Establishing the reference base line (data) from where the impacts of the project should be measured from is almost impossible, because in some rivers there is no systematic record of data. Hence, measurement of the success of the project would be difficult.

Generally, the level of risk associated with the proposed project is acceptable in the context of the clear need to support this resource sector in the Sub-Saharan Africa and the stated commitment to this process.

Sustainability of the project will be assured by building local capacity as to continue using the recommended land use practices. The project puts emphasis on the capacity building both in the provision of basic infrastructures as well as the human development through desired training. These would no doubt assure sustainability.

The implementation of this project is based mostly in the local community, local expertise and local institutions. This should assure ownership and continuity. The development of the present project proposal, and of the overall project of intervention had involved wide consultation in the countries' institutions and experts. Local decision-makers, governments and local experts should be involved as much as possible. This assured ownership and is a step forward towards sustainability. The implementation of the project should be steered and carried by locals as much as possible.

7. Stakeholder Participation

This project links with all relevant stakeholders at the village, national and regional level, for it is concerned with common resources and/or transboundary resources. The main stakeholders include:

- Government, research and higher education institutions.
- NGO's, local communities.
- International organisations such as: LOICZ, IOC, GIWA, GWP, IUCN, WWF-ecoregion
- Government and public sectors such as government departments and river basin authorities
- Development sectors such as: tourism, agricultural and fisheries.
- Private sector

Sound and integrated management of these resources can not be achieved without the involvement of all the stakeholders. The present project proposals envisage the involvement of all the stakeholders. Appropriate approaches to involve and assure full participation and mutual benefit of all stakeholders should be adopted. These would include:

- Involvement of locals in the implementation of the project;
- The creation of consultative committees;
- Public meetings;
- Informal consultations with stakeholders;
- The publication of discussion papers; and
- The use of public media to inform and provide a forum for discussion and promotion of the active role of local NGOs.

8. Project Management & Implementation Arrangements

For the implementation of the present project an adequate project management/co-ordination structure should be established. The structure should have regional and national Coordination Units (CU). The regional coordination unit would be responsible of co-ordinating and ensuring harmonisation of the implementation of the project, by providing necessary logistics to the implementing institutions and should ensure linkages between the implementing institutions in different countries. The national CU (or leading national institution) would be responsible for national activities, identifying and ensuring the participation of relevant institutions and organisations in the implementation of the project at the national level, and ensuring linkages between the implementing institutions and the regional co-ordinating secretariat.

The project is not intended to duplicate the existing institution, but rather, to use much of the existing facilities. So, the secretariats may be hosted by existing regional and national institutions. Potential national

leading institutions are indicated in paragraph 1. “Executing Agencies”, above. Regional secretariat may be hosted by regional organisation such as UNESCO, UNEP, SADC…

The community must be involved since the planning stage of the activities and in the implementation of the project at the local level, particularly in the implementation of the management strategies at the local level. During the research and studies, the community might provide valuable information, particularly regarding the traditional knowledge, which could complement modern sciences. The involvement of local community is an assurance of the ownership and of the sustainability of the results of the project.

9. Project Financing & Duration

The project should last for five years and the total coast of the project should be about USD3,000,000.00 Local institutions are expected to contribute by about 30% and mostly in kind.

The major components of the implementation of the project are as follows:

Project management – this might take about 10% of the budget. It refers to the cost of the management of the project both at the regional and national levels. Includes salaries, overheads, rental of offices and all costs referring to the day-to-day of the management of the project.
Research and studies – estimated at about 25% of the total budget. Refers to surveys needed for identifying and assessing the impacts of the current land use practices, and both basic and applied studies required to developing procedures for good land use practices in the river valley.
Awareness material and campaigns – About 25% of the budget. Refers to the activities required to raise awareness among the stakeholders on the need to prevent land use practices that increases erosion and consequent siltation in estuaries, lagoons and adjoining seas.
Promotion of the good land use practices – about 40% of the budget. Refers to the activities required for conduct education campaigns on the land uses practices that reduces sediment loads in estuaries.

Table 1. Component & Activity Financing

	External Source of Funds			National Government		Total USDx10^3
	Source 1	Source 2	Source 2	Cash	In-kind	
Project management	100,000				200,000	300
Component 1 Identification and raising awareness on the land use modalities currently practices in the river valley	700,000				300,000	1,000
Activity 1.1 identification and selection of the river basins and wetlands for the implementation of the project						
Activity 1.2 identification and analysis of the stakeholders to work with						
Activity 1.3 assessment of the current sediment load in estuaries and lagoons						
Activity 1.4 identification of bad and good land use practices with respect to erosion						
Component 2 Identification and promotion of good land use practices for reduction of erosion	1,300,000				400,000	1,700
Activity 2.1 studies for identifying good land use practices for reduction of soil erosion in the river valley						
Activity 2.2 Dissemination of the information on the need adopt good practices as to reduce sediment loads in estuaries.						
Activity 2.3 development of material for raising awareness and training						
Activity 2.4 Conduct training, workshops and seminars						
Total						3,000

Note: This budget is preliminary and has not undergone a full consultation process with the respective countries. Therefore, it does not indicate the actual financial commitment that would be provided by participating countries once the project proposal and its components are finalised.

10. Monitoring, Evaluation &Dissemination

Project steering committees will be established at the project implementation sites and at the regional level. The composition of the project steering committees should include representatives of government, target community, implementation and funding agencies. The steering committees should meet regularly (twice a year) to analyse progress in the implementation of the activities and plan the future activities with due adjustments.

Project monitoring and evaluation will be both participatory and continuous with quarterly progress reporting and reviews. A mid term project review will be conducted with a view to determining the validity of the initial assumptions, and where necessary re-orient the project as appropriate to reflect the prevailing situations on the ground.

There should be an internal and external evaluation. The internal evaluation should be conducted by a team set/approved by the steering committee. The external evaluation should be conducted by a team set/approved by the funding agencies. During the evaluation, both quantitative and qualitative indicators shall be used in the process of monitoring and evaluation and will include the following:

- Assessment reports on improvement of the water quality in the river (reduction of sediment loads)
- Number of pilot sites created to demonstrate new land use practices
- Written and oral evaluations of the project's contribution to introduction and assimilation of new land use practices and reports on the states of the suspended solids down stream the river
- Local Communities evaluations of the benefits derived from the implementation of the project

11. Work Plan and Timetable

Table 2 : Outline Work Plan and Timetable

Year[2]	**1**				**2**				**3**				**4**				**5**	
Quarter	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**	**3**	**4**	**1**	**2**
Establish project management structure																		
Component 1 Identification of problems and raising awareness																		
Activity 1.1																		
Activity 1.2																		
Activity 1.3																		
Activity 1.4																		
Component 2 Identification and promotion of good land use practices																		
Activity 2.1																		
Activity 2.2																		
Activity 2.3																		
Activity 2.4																		

ANNEX

Logframe Matrix

Summary	Objectively verifiable indicators	Means of Verification (Monitoring Focus)	Critical Assumptions and Risks
Overall goal of the intervention Reduction of siltation in the river valley, through promotion of good land use practices in Sub-Saharan Africa	Estimate of sediment loads in estuaries and lagoons Number of villages applying new land use practices	Reports and interviews	Willingness of all the stakeholders. Resources available
Objectives of the relevant National Programs and the country, regional strategy.			
1. Identification of land use practices (agricultural and forestry) that accelerates erosion in the river valley;	1. Studies and interviews to local communities	Reports, interviews	Availability of resources
2. Evaluation of ecological and socio-economic impacts of suspended solids in estuaries and lagoons;	2. Studies and interviews to local communities		Availability of resources
3. Identification of good land use practices (agricultural and forestry) that reduces erosion in the river valley;	3. Studies and interviews to local communities		Willingness of all the stakeholders and availability of resources
4. Promotion of awareness and environmental education;	4. Seminars, meetings and training courses conducted		Willingness of all the stakeholders and availability of resources
5. Promotion of good land use practices (agricultural and forestry).	5. Number of sites or villages involved and number of new practices introduced		Willingness of all the stakeholders and availability of resources
Outcomes that lead to the achievement of the outlined regional and national objectives. Changes due to intervention (project impact)			
1. Information on bad and good land use practised along the river to increase or reduce erosion.	1. Studies and interviews to local communities	Reports, interviews	Availability of resources
2. A list of the river valleys with notorious siltation problems produced for Sub-Saharan.	2. Studies and interviews to local communities		Availability of resources

3. Evaluation of ecological and socio-economic impacts of suspended solids in estuaries and lagoons;	3. Studies and interviews to local communities		Willingness of all the stakeholders and availability of resources
4. Awareness material/campaigns for designation for prevention of bad land use parctices that accelerates erosion along the river valley.	4. Seminars, meetings and training courses conducted		Willingness of all the stakeholders and availability of resources
5. Guidelines on good land use practices for reducing erosion in the river valley.	5. Studies and interviews to local communities		Willingness of all the stakeholders and availability of resources
6. Trained people from the communities on the good land use practices along the river valley.	6. Number of training courses conducted and of people trained		Willingness of all the stakeholders and availability of resources
Results to be delivered by project which will enable necessary changes (project outputs)			
1. Survey on the land use modalities currently practices in the river valley with serious problem of siltation	1. Studies and interviews to local communities	Reports, interviews	Resources and funds available to carry research and studies
2. Education and awareness on the environmental implications of bad land use practices and	2. Seminars, meetings and training courses conducted	Reports, interviews	Willingness and co-operation of all the stakeholders needed. Further, resources and funds available.
3. Identification and promotion of good land use practices for reduction of erosion	3. Number of sites or villages involved and number of new practices introduced	Interviewing local community. Technical reports	Willingness and co-operation of all the stakeholders needed. Further, resources and funds available.
Components/Activities to be implemented in order to obtain planned results (Project components)			
1. Identification and selection of the river basins and wetlands for the implementation of the project	1. River basin for the implementation of the project selected.	Technical reports produced	Resources and funds available to carry research and studies
2. Identification and analysis of the stakeholders to work with.	2. Stakeholders in the designated river basins identified.	Reports	Willingness and co-operation of all the stakeholders needed.

3. Carrying studies and interview on the land use currently practised in the selected river valleys	3. Studies and interviews conducted		Willingness and co-operation of all the stakeholders needed. Further, resources and funds available.
4. Identification of the land use practices that accelerates erosion	4. Studies and interviews conducted		Resources and funds available.
5. dissemination of the information on the need to adopt good practices as to reduce sediment loads in estuaries.	5. Guidelines of the good land use practices produced	Reports	Willingness and co-operation of all the stakeholders needed. Further, resources and funds available.
6. Development of awareness materials/campaigns/training and workshop and seminars.	*6.* Awareness materials /campaigns/training courses to promote best practices produced.		Willingness and co-operation of all the stakeholders needed. Further, resources and funds available.
7. Identification of good land use practices for reduction of soil erosion in the river valley.	7. Good land use practices identifies (Guidelines for best land uses produced)		Willingness and co-operation of all the stakeholders needed. Further, resources and funds available.
8. Elaboration of manuals and review documents based on experience carried out in the selected sites and providing guidance to governments and practitioners.	8. Manuals and review documents providing guidance to governments and practitioners produced.		Resources and funds available.
9. Conduction of a series of regional workshops to further facilitate the sharing of information and experience amongst the stakeholders.	9. Number of workshops conducted		Willingness and co-operation of all the stakeholders needed. Further, resources and funds available.
10. Development of appropriate training courses for enhancing the involvement of the local stakeholders in the process.	10. Number of training courses conducted		Willingness and co-operation of all the stakeholders needed. Further, resources and funds available.