

Project Proposals on Pollution

MUNICIPAL SOLID WASTE MANAGEMENT AND ENHANCEMENT OF ENVIRONMENTAL QUALITY IN SUB-SAHARAN AFRICA

1. IDENTIFIERS

Project Number:	POL – 1
Project Title:	Solid Waste Management and Pollution control
Requesting Countries:	Cote d'Ivoire, Gambia, Ghana, Kenya, Mozambique, Nigeria, Senegal, South Africa, Tanzania
Requesting Regional or National Organization:	<i>Cote d'Ivoire</i> – Ministry of Higher Education and Scientific Research <i>The Gambia</i> – National Environmental Agency <i>Ghana</i> - Ministry of Works and Housing Ministry of Environment and Science <i>Kenya</i> - Ministry of Environment and Natural Resources <i>Mozambique</i> – Ministry for the Coordination of Environmental Affairs <i>Nigeria</i> – Federal Ministry of Environment <i>Senegal</i> - Office of Environment and Classified Establishment <i>South Africa</i> – Department of Environmental Affairs and Tourism <i>Tanzania</i> – Presidents Office Regional Government and Local Government - Ministry of lands and Settlements - Ministry of Natural resources, Tourism and Environment
Executing Agencies:	<i>Cote d'Ivoire</i> – Centre for Oceanographic Research <i>The Gambia</i> – The Municipalities of KMC, BCC and Brikama Area Council <i>Ghana</i> - Densu Basin Management Board Accra Metropolitan Authority <i>Kenya</i> - Mombasa City Council <i>Mozambique</i> – National Directorate of Environment 1.1.1.1 Management <i>Nigeria</i> – Federal Ministry of Environment Centre for Environmental Protection and Natural Resources <i>Senegal</i> - Office of Environment and Classified Establishment <i>1.2 South Africa</i> – University of Cape Town <i>Tanzania</i> - Municipal Authorities of Dar es Salaam, Zanzibar, and Tanga
National Partners	<i>Cote d'Ivoire</i> – University of Cocody (UFR of earth Sciences and Natural Resources, Abidjan Centre for Pollution Control (CIAPOL), Service de Installations Classes <i>The Gambia</i> – BAMWORKS, UNDP-Gambia, DFID-Gambia, IDA, Department of Health Services <i>Ghana</i> - Water Resources Commission, Council for Scientific and Industrial Research, District Assemblies, Environment Protection Agency <i>Kenya</i> - Ministry of Local Government, Ministry of Health, National Environment Management Authority, , Kenya Marine and Fisheries

Research Institute, Coast Development Authority, Mombasa Chamber of Commerce, and Industry and NGOs
Mozambique – Local (Municipal Authorities), Private sector and NGOs
Nigeria – Federal Ministry of Health, University of Ibadan, Financial Institutions
Senegal – *Industry Patronate (SPIDS, SNES, CNP, CRODT, UCAD, ONG, ONAD and the Residents Association.*
South Africa – Civil Society Organisations
Tanzania – President’s Office Regional Administration and Local Government, Municipal/ Local Authorities, National Environment Management Council

Priority Issue Addressed: Solid Waste Pollution

Regional Scope: Other member countries of the Abidjan and Nairobi Conventions

Project Locations:

- Cote d’Ivoire:** City of Abidjan
- Gambia:** KMC, BCC and Brikama Area Council
- Ghana:** City of Accra
- Kenya:** Mombasa City
- Mozambique:** Maputo, Beira and Nocolé
- Nigeria:** Big cities of Nigeria: Lagos, Port Hartcourt, Worrie and Calabar
- Senegal:** Bay of Hann
- South Africa:** Selected hot spots and sensitive areas in coastal cities
- Tanzania:** Dar es Salaam City and Towns of Tanga, Zanzibar

Project Duration: Four years

Working Group: Pollution

2. SUMMARY

The population explosion in the coastal zones of Sub-Saharan African has not been accompanied by the requisite expansion in basic facilities and services such as those for water and sanitation. Coastal zone planning has been inadequate or absent in most coastal areas. Consequently, many coastal urban areas lack adequate waste collection, treatment and disposal facilities. Most wastes are therefore discharged into water bodies or onto beaches and river banks.

Degradable organic solids and plastics constitute the major components while steel and aluminium cans are also common in urban areas. Solid wastes cause mortality to marine organisms, notably sea turtles, marine mammals and sea birds. They also have negative aesthetic impacts, thereby affecting recreation and tourism and also constitute a hazard for navigation. In addition decay of organic solids invariably leads to eutrophication and attendant hypoxia and anoxia.

The threat of solid waste to the integrity of the marine and coastal environment has been recognised by countries of both Abidjan and Nairobi Conventions whose reviews of land-based activities have indicated that dumping of solid domestic waste leads to the degradation of coastal habitats. Amongst strategies and measures proposed by the two Conventions are ensuring that solid domestic and industrial wastes are not dumped on or around sensitive coastal habitats such as mangroves, installing adequate solid waste disposal facilities and possible recycling.

Although several initiatives have been taken by governments of the various countries to control the problem of solid waste pollution, the problem remains a big threat to the coastal population, marine and coastal environment. Both financial and technical assistance are required for provision of appropriate technologies, institutional capacity building and strengthening and human resources development. The goal of this project

is to improve domestic solid waste management and reduce pollution in order to protect human health as well as to enhance the quality of the coastal and marine environment in Sub-Saharan Africa. It focuses on urban domestic sources because they are the largest contributors to solid waste pollution especially from domestic sources.

Apart from national development objectives, several other project objectives will be enhanced. These include the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, Industrial Water Pollution Control in the Gulf of Guinea Large Marine Ecosystem, Integrated Management of the Bengula Current Large Marine Ecosystem and Sustainable Waste Management for African Countries.

3. COSTS AND FINANCING (MILLIONS US \$)¹

The total cost per project area is estimated at US\$1,415,000. For a maximum of 16 hotspot or sensitive areas in 8 participating countries, the grand total will be US\$ 22,640,000. This amount is however subject to confirmation of interest in the project by the 8 countries by way of Government endorsement which involves commitment of financial and human resources.

It is envisaged that the national governments should be able to contribute 10% of the total cost of each project in kind, that is, US\$ 141,500 for each project area.

Total Project Cost: US\$ 22.640.000 (US\$1.415.000 x 16 project areas)
National Contributions: US\$ 2.264.000 (US\$141.500 x 16 project areas)
External Contributions: US\$ 20.363.000

4. GOVERNMENT ENDORSEMENTS

Cote d'Ivoire –	Ministry of Higher Education and Scientific Research
The Gambia –	Ministry for Environmental Affairs, the Director for National Environment to follow up
Ghana -	Ministry of Environment and Science
Kenya -	Ministry of Environment and Natural Resources
Mozambique-	Ministry for Coordination of Environmental Affairs
Nigeria –	Federal Ministry of Environment
Senegal-	Ministry for Environmental Affairs
South Africa –	Ministry of Environmental Affairs and Tourism
Tanzania -	Ministry, Ministry of Natural Resources and Environment

5. GOVERNMENT FOCAL POINTS

Cote d'Ivoire –	Centre de Recherches Oceanologiques Abidjan
The Gambia –	Momodou Cham, National Environmental Agency
Ghana -	Julius, Wellens-Mensah, Hydrological Services Department
Kenya -	Ali Mohammed, Ministry of Environment and Natural Resources
Mozambique-	Evaristo, Bapueye, Eduardo Mondlane University
Nigeria –	Larry, Awosika, Nigerian Institute for Oceanography and Marine Research
South Africa –	Director-General, Department of Environmental Affairs and Tourism (DEAT)
Tanzania-	Jeremiah, Daffa, Tanzania Coastal management Partnership

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.

6. AFRICAN PROCESS WORKING GROUP FOCAL POINTS

Working Group : Pollution

Regional Coordinator:

Aka, Marcel Koussa, Centre de Recherches
Oceanologiques, Cote d'Ivoire

Natural Science Expert:

Emmanuel, O. Oyewo, Nigerian Institute for Oceanography
and Marine Research Nigeria

Socio-Economic Expert:

Sylvia, S. Temu, University of Dar es Salaam,
Tanzania

PROJECT DESCRIPTION

1. Background and Justification

In many countries of Sub-Saharan Africa, the coastal zone is the most developed and urbanized, where capital cities and most industries are located. To cite a few examples, the coastal zone of Nigeria, which stretches for about 853 km, harbours 25% of the national population of 120 million. Lagos, the economic nerve centre of the country, has about 60% of all industrial establishments in Nigeria. In Tanzania, 25% of the national population live in the five coastal regions which cover about 15% of the country's total land area. In the region of Dar es Salaam, the population density has been estimated as 17,450 persons/km² compared to the national average of 36 persons/km². The economic capital of Cote d'Ivoire where 60% of all industries are located, Abidjan, has a population of 3 million which represents 21% of the total national population and 51% of the total urban population. Also, coastal populations in these countries are still increasing at rates higher than the national averages, for example the coastal population growth of the Gambia stands at about 8% double the national growth rate.

The population explosion in the coastal zones of Sub-Saharan African countries has however not been accompanied by the requisite expansion in basic facilities and services such as those for water and sanitation. The rapid and chaotic growth of urban populations in coastal areas has far exceeded the capacity of municipal authorities to cope with the situation. Coastal zone planning has been inadequate or absent in most coastal areas of Africa. Consequently, many coastal urban areas in Sub-Saharan Africa generally lack adequate waste collection, treatment and disposal facilities. Most wastes are therefore discharged into water bodies or onto beaches and river banks. Worsening the pollution situation is also the lack of or ineffective national policies, laws and regulations governing pollution control particular coastal waters. In addition the pollution control is being made worse due to lack of coastal planning and management as well the absence of compliance with regional obligations under various international legal agreements or lack of enforcement measures at national level.

Solid waste or litter is any persistent manufactured or processed solid material which is discarded, disposed of, or abandoned in the environment, sometimes also called marine debris, if dumped or generated in the marine environment. Solid waste entering the marine and coastal environment has multiple sources which include poorly managed or illegal waste dumps adjacent to rivers and coastal areas, windblown litter from coastal communities, and waste that is channelled to the marine and coastal environment through municipal storm water systems and rivers (UNEP, 1995). A large proportion of solid waste thus originates from land-based activities coupled with improper waste disposal and management (World Bank, 1995). Mangroves and wetlands are often used as garbage dumps, contaminating surrounding waters through the introduction of toxic substances and pathogens which cause physical and hydrological damage to the ecosystem. Marine-based sources of pollution are also important and originate from dumping of garbage into the marine environment by recreational and commercial vessels as well as by municipal authorities.

The environmental impact associated with solid waste pollution on marine living resources include loss of biodiversity through entanglement, suffocation and ingestion and degradation of the visual amenities of marine and coastal areas with negative effects on tourism and general aesthetics (UNEP, 1995). Litter in the marine environment can also destroy coastal habitats and in some situations interfere with biological production in coastal areas. Uncontrolled burning of litter containing plastics may generate significant quantities of POPs, metals and hydrocarbons which can reach the marine and coastal environment. Floatable litter is known to travel considerable distances with sometimes transboundary implications.

There are many adverse socio-economic impacts which directly related to both land and marine based pollution. These include reduced income, loss of employment, loss of tourist and recreational opportunities, increased risk to human health and associate increased cost for medical treatment. This project thus intends to address the root causes that lead to these impacts that have a direct effect on the quality of life of coastal communities as well as marine environment. The root causes of pollution, hot spots and the resulting impacts in individual requesting countries are briefly reviewed.

In Cote d'Ivoire, the main sources of pollution of the coastal environment include domestic and industrial sewage and agriculture waste, but also. The immediate causes have been identified as domestic and industrial sewage disposal, insufficient sanitation, inadequate control of factory installations, agricultural activities and

sedimentation. There are few proper facilities to dispose of solid waste and collection of garbage is limited or non-existent. Inhabitants therefore use the Ebrie' lagoon as a dumping site resulting in the accumulation of solid waste on its beaches. The most commonly encountered forms of litter are plastics, metal cans, and less readily degraded forms of household refuse.

The root causes are population pressure, lack of political will and economic dependence of the local population. Others are lack of adequate financial resources, ineffective implementation and enforcement of regulations, inappropriate waste management and the lack of Environmental Impact Assessment for development projects and low public awareness.

The Ebrié Lagoon, which is considered a hot spot, is threatened by various pollutants including domestic sewage, garbage, industrial effluents and agricultural run-off. The major socio-economic impacts include the deterioration of human health (illness and deaths) as a result of increases in diseases such as cholera and typhoid and decline in fishery production. There are also negative impacts on tourism that employs thousands of coastal dwellers and forms the major foreign exchange earner in the country. A World Bank study indicates that pollution of the Ebrié Lagoon has led to a decrease in fishery production, estimated to be 557 million FCFA in 1998

In The Gambia, municipal solid waste consists mainly of household or domestic waste, street sweepings, commercial waste, market waste, and waste from drains. The most immediate causes of the problem of solid waste pollution and its management are mainly due to the lack of equipment for collection and disposal, lack of appropriate disposal facilities and the importation of low quality goods. The root causes are high population pressure, lack of awareness of the general public on solid waste management issues, poverty and negative traditional norms. The problem is not serious in Banjul, Kanifing and Tanbi Wetland complex. In Banjul, 34 mt of solid waste is generated daily, mainly by a transient population. Here, waste also arises from clinical and industrial sources. The collected waste is taken to a 3 ha landfill only about 200 m from the Atlantic coast, adjacent to a mangrove swamp. Tipped waste is raked manually to level the surface but there is no compaction. The waste is not covered and the site is not fenced. Similar conditions exist in the Kanifing Municipality, which is bordered by the Atlantic Ocean on the North-West and on the East by Tanbi Wetland Complex as well as in the Brikama and Western Divisions which cover about 75% of the coastal stretch of The Gambia, where even lower proportions of waste are collected. The principal impacts on the environment include pollution of groundwater, increase in wind-blown waste and visual intrusion. Socio-economic impacts are manifested in the inherent dangers posed to workers at landfill sites who do not have protective clothing as well as to scavengers including children. There are also negative effects on tourism which employs a large number of the coastal population.

In Ghana, municipal or domestic input is the most common source of solid waste into the coastal environment. Fundamental causes include poverty and population pressure. Other concerns include low private sector participation in the provision of sanitation facilities. The waste, composed of 70 to 80% organic matter, originates from households, markets, transport termini, restaurants schools and hospitals and contains, among others, plastics, food leftovers, paper, metals, glass, textiles, excreta, grass and wood cuttings, batteries and construction waste. In Accra, the environmental impacts on the Korle Lagoon and its catchment are gross pollution and changes and losses in biodiversity, including fish species and invertebrates. The main socio-economic impacts are increased diseases and loss of property and deaths arising from flooding events. There are also negative impacts on tourism.

The Mombassa Inshore Water Area in Kenya, an identified hot spot, suffers from microbiological and solid waste pollution, over-exploitation of fisheries and mangrove resources and destructive fishing practices, among others. The loss of mangrove swamps in Kenya has been attributed to land use changes, unsustainable harvesting practices and partial conversion as a result of spills and solid waste disposal. For example, domestic solid waste is not sorted prior to disposal resulting in hazardous and toxic contaminants getting into the mangrove environment. The social changes that affect the modification of habitats include population pressure, poverty and inequality, low level of education, and beliefs and values. The institutional drivers that exert pressure on the issue include institutional governance, little government commitment and limited civil society empowerment.

In Mozambique, flooding results in the deposition of solid wastes in the marine and coastal environment. Population growth has also added a new dimension to the demand for facilities such as those for waste disposal.

Solid waste constitutes a major environmental problem in the coastal areas of Nigeria especially in major coastal cities like Lagos, Warri and Port Harcourt. Due to rapid increases in the coastal population the volume of solid waste generated by residents have quadrupled in recent years. Facilities for disposing of solid waste have been over stretched hence mechanical clearing of solid waste has been rendered inadequate. In the Lagos Islands and other areas, human excrement is sometimes associated with solid waste dumps hence introducing health problems normally associated with human wastes.

The sectors associated with generation of solid waste are urbanization, street trading, leisure/tourism, industry and agriculture. Poor waste management policies and practices, inefficient collection and disposal as well as insufficient awareness and negative attitudes to the environment are some of the causes. The institutional drivers include inadequate data and infrastructure and ineffective legislation and enforcement. The root causes, which impinge on economic structure are increased urbanisation, inequitable distribution of wealth and opportunities, and non-use of economic instruments such as pollution charges and tradable emission permits to abate solid waste problem.

The environmental impacts include contamination of ground water due to leachates from solid waste dumps which reduces availability of fresh water. The related socio-economic waste are such as high cost for solid waste clearing loss of touristic value, loss of commercial activities by the coastal communities. There is also increased flooding and attendant loss of property and lives. The fiscal implication directly related to solid waste clearing for example in the Lagos runs to over ₦1,000,000:00 (about \$10,000.00) every day.

In Senegal, the Bay of Hann which is considered a hot spot has more than 42,000 inhabitants and 60% of the processing industries. It constitutes an important halietic resources as an unloading site. The main sources of pollution are therefore industrial solid waste as well as domestic throw outs. It is also seriously affected by acute sanitation problems. The level of degradation has reached surmountable levels (ranking second after Rio). Given the centrality of the Bay to the economy of the country in terms of industrial location, unloading site, residential location, the Government of Senegal has (Cabinet meeting in February 2002) has come out with a policy commitment for mid and long term rehabilitation of the Bay of Hann. This project will contribute towards realization of the national policy.

In South Africa, the problem of solid waste in coastal and marine areas is mainly associated with recreational areas and harbours. In the four harbours of False Bay for example, activities that affect the quality of the marine environment include poor waste disposal practices in the scrapping and cleaning of ships and littering. Storm water runoff may also carry and deposit solid waste on beaches. This problem is directly linked to the ever increasing coastal development in South Africa which is fuelled by underlying pressures such as the movement of people to the coast due to perceived opportunities for income generation.

In Tanzania, pollution has been identified as the major issue of concern. In Dar es Salaam, Tanga and Zanzibar, there are various types of pollution such as domestic, industrial, agro-chemical and solid wastes that have led to modification of mangrove ecosystems. One of the most pressing issues is the use of mangroves forests as rubbish dumps. Although, there has been no quantification of the impacts, there is clear evidence that coastal communities are affected in terms of income. There are direct costs to fishery, tourism, property and health and indirect costs to recreation and biodiversity. Urbanisation is the most dynamic underlying factor. In Dar es Salaam for example, about 70% of the population live in over 40 unplanned communities where uncontrolled disposal of wastewater and solid wastes is a common problem affecting water sources and living conditions. Outbreaks of water-borne diseases are thus frequent during the rainy season. Socially, the main underlying root causes are poverty and unequal distribution of wealth, inadequate public awareness and general lack of education. Institutionally, the issue is linked to such factors as inadequacy of long-term monitoring data, inadequate scientific/technical capacity, and inadequate enforcement of laws and in some cases absence of regulations.

In the regional context, the threat of solid waste to the integrity of the marine and coastal environment has been recognised by countries of both Abidjan and Nairobi Conventions where reviews of land-based activities have indicated that dumping of solid domestic waste leads to the degradation of coastal habitats

(GESAMP, 2001). Amongst strategies and measures proposed by both Abidjan and Nairobi Conventions are ensuring that solid domestic and industrial wastes are not dumped on or around sensitive coastal habitats such as mangroves, installing adequate solid waste disposal facilities and possible recycling. This is in line with Chapter 21 of Agenda 21, which advocates minimising solid wastes, maximising environmentally sound reuse and recycling, promoting environmentally sound waste disposal and treatment and extending waste service coverage. The Global Programme of Action for the Protection of the Marine Environment from Land-based Activities (UNEP, 1995) also recommends the establishment of controlled and environmentally sound facilities for receiving, collecting, handling and disposal as well as the reduction of the generation of solid waste and improvements in its management including collection and recycling. Furthermore, solid waste pollution is not necessarily confined to national waters. In the Gulf of Guinea, for example a strong littoral transport system may carry pollutants from point sources upstream to other countries along the coast creating region wide impacts which underscore system linkages throughout the coastal zone.

It is clear from the analysis of country specific problems and the regional perspective above, the causes and impacts of solid waste pollution in the coastal and marine environment are common in most Sub-Saharan countries. Solid waste management and final disposal solutions avoiding open dumping in vulnerable coastal ecosystem are therefore urgently needed throughout the region. Stemming from the commonalities in the causes and impacts, the solutions envisaged by the various countries are also similar. This project aims addressing the above identified causes in order to control pollution in general and specifically ameliorate the impacts resulting from solid and related pollution..

There are two overarching solutions to the problem of solid waste in the coastal and marine environment. The first is improved municipal and industrial waste management, which requires public and private investment. The second is to induce changes individual human behaviour through laws and regulations enforcement, pollution control and solid management-institutional capacity strengthening and building, improved education and awareness.

2. Objectives and Expected Results

The goal of this project is to improve solid waste management and control pollution in general in order to protect human health as well as to enhance the quality of the coastal and marine environment in Sub-Saharan Africa. It focuses on urban sources because they are the largest contributors to solid waste pollution in many of the affected countries. The immediate objectives are as follows:

1. To reduce quantities of solid waste reaching the marine and coastal environment and eventually have garbage free rivers, lagoons and coastal shores through establishment of suitable management practices including reuse and recycling.

To enhance recycling and reuse, increased participation of stakeholders will allow for cost effective separation of the various components of solid waste and creation of markets for reclaimed items. Incentives should also be provided for the private sector to acquire equipment for reusing of plastics, paper, metal and rubber.

For effective monitoring and evaluation, it is necessary to collect baseline information on the types and quantities of waste reaching a hotspot or sensitive area.

Expected Results

- Quantities of solid waste from target areas to be disposed of significantly reduced.
- Reuse and recycling of materials form initial solid waste increased.
- Private sector participation in solid waste collection, reuse and recycling

2. To put in place an efficient and effective solid waste collection and safe disposal system and facilities in the selected coastal areas.

Even with successful waste minimization, there will still be the need to dispose of solid waste from the densely populated coastal cities and urban areas. There will be no need for treatment of solid waste in connection with this project since most of the domestic and commercial waste do not normally contain large quantities of toxic materials. Since the capacities in the Municipals are not sufficient and also because the

collection principle is expected to operate on the polluter pay principle, the involvement of the private sector is necessary for the successful achievement of the objective.

Expected Results

- Facilities for solid waste collection and disposal provided and or expanded in target areas.
- The aesthetic quality of coastal and marine areas improved.
- Diseases related to poor solid waste managed generally reduced.

3. To build capacities at municipal and community levels and public awareness creation for maintenance and rehabilitation of the solid waste treatment facilities. This includes the capacity to develop partnership with the private sector.

In addition to the efforts to improve waste management practices, countries need to develop and improve their plans and programmes to reduce the problem of solid waste proliferation. Enhancement of capacity of the relevant institutions, both public and private, will thus lead to increased capacity to generate and exchange information, enforce regulations, conduct research and monitor and evaluate mitigation measures. To sustain the project, research has to be conducted in order to develop improved, socially-acceptable and cost effective techniques for waste recycling and reuse and associated management practices. Training activities coordinated at the regional level will allow for the harmonization of methodologies for monitoring and evaluation of project activities.

To reduce the disposal of waste in an uncontrolled manner increased public awareness is essential. Since municipal and mainly domestic sources are the most important, the success of the project will be dependent on its acceptance by the general public. For effective awareness creation, it is important to stress the advantages of a preventive waste management approach that can lead to improved incomes for, especially, the unemployed and contribute to national and regional efforts to reduce the incidence of disease and poverty.

Expected Outputs

- The capacity of institutions involved in solid waste management improved.
- Effective waste pollution control environment in place: i.e. Policies, regulations and laws on solid waste collection, disposal and management enacted and or enforced, at least, in target areas.
- Informed public and stakeholders community on the need for and its responsibility towards suitable management of waste.
- Management and information system for pollution control and planning in place.
- Participation of all stake holders in solid waste management activities increased.

3. Project Components/Activities

Component 1

Reduction of the quantities of solid waste reaching the marine and coastal environment through institution of suitable and sustainable solid waste management practices including reuse or recycling

Activities that need to be undertaken under this component are:

- 1.1 Conducting surveys to determine the types and quantities of waste in selected pilot project areas and assess their potential for recycling or reuse.
- 1.2 Training individuals and organisations in methods for reuse and recycling of solid waste such as composting for urban farming, cottage industries and energy generation.
- 1.3 Monitoring and evaluation of the project on a regular and consistent basis to ensure that the expected results are delivered as well as initiating corrective action where incorrect course of actions has developed.

Component 2

Installation of an efficient and effective solid waste collection and disposal system and facilities in the targeted coastal areas.

The necessary activities are:

- 2.1 Install garbage containers for citizens in residential and public areas for the purposes of appropriate collection.
- 2.2 Invite and facilitate the private sector businesses in environmentally-sound waste collection, separation, transport, disposal and reuse or recycling.
- 2.3 Using Environmental Impact Assessment procedures, identify, construct and make operational suitable waste disposal sites.

Component 3: Building capacities at municipal and community levels and public awareness creation for maintenance and rehabilitation of the solid waste treatment facilities. This includes the capacity to develop partnership with the private sector.

Essential activities include:

Capacity Building for planning at municipal and local level

- 3.1 Implementation of awareness and education campaigns for the general public, industry, and municipal authorities on the need to reduce waste generation and the need for environmentally sound disposal and reuse;
- 3.2 Increasing local planning and management capacity to avoid location of waste-dump sites near coastlines or waterways or to avoid litter escape to the marine and coastal environment;
- 3.3 Technical assistance to enable the municipals to set mechanisms to privatise the waste collection, sorting and recycling
- 3.4 Provide equipment to support information exchange and research into improved or new techniques for solid waste management and for monitoring of the effectiveness of project activities.

Capacity Building in the legal framework

- 3.5 Identification, inventory taking and harmonisation of the existing legislature
- 3.6 Introduction of appropriate legal measures to reduce and control the generation and disposal of solid wastes; which includes institutional co-ordination and harmonisation for legislation enforcement and monitoring that will also involve environmental activists.

It is envisaged that pilot projects will be conducted in a maximum of two locations, hot spots or sensitive areas, in each of the participating countries. In Table 2 under section 11 a summary of work plan and the expected time frame is given.

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

At regional level

Most countries in Sub-Saharan Africa can join or benefit from this project because of the similarities in the standard of living and conditions pertaining to solid waste management. In West and Central African countries such as Guinea, Sierra Leone, Togo, Benin, Cameroon, Congo and Angola waste disposal is a major problem just as in countries participating in this project. There is also the problem of transboundary transport of solid waste by littoral currents which requires that effective solutions to solid waste management be planned at a holistic level. At best, those countries that are at present not participants, can share in the experiences gained and apply them in the next phase of the African Process or on their own, with regional and international support.

The project directly addresses the programmes of the Nairobi and Abidjan Conventions. A summary of the Regional Programme of Action for Eastern Africa (EAF) indicates that solid domestic waste is a problem at the regional level (GESAMP, 2001). Thus within the objectives of reducing litter impact on the environment, specific activities have been recommended for Construction of appropriate disposal sites; Management of dumping sites; Training of Personnel; Recycle of waste and mass communication.

In addition to the Nairobi and Abidjan Conventions, several other project objectives will be enhanced. These include the Privatisation of Municipal Waste in East Africa and Sustainable Waste Management for African Countries. Both are implemented by UNCHS – HABITAT and aim to strengthen regional capacity for solid waste management through involvement of the private sector.

The Global Programme of Action for the Protection of the Marine Environment from Land-based Activities, also recognising that solid waste or litter is a problem in the coastal and marine environment has a proposed target to establish controlled and environmentally sound facilities for receiving, collecting, handling and disposing of solid waste from coastal area communities and to reduce significantly the amount of litter reaching the marine and coastal environment by the prevention or reduction of the generation of solid waste and improvements in its management, including collection and recycling of solid waste (UNEP, 1995). Recommended national actions, policies and measures include (i) Introduction of appropriate measures - which could include regulatory measures and/or economic instruments -to encourage reduction in the generation of solid wastes; (ii) Installation of garbage containers for citizens in public areas for the purposes of appropriate collection and/or recycling; (iii) Formulation and implementation of awareness and education campaigns for the general public, industry, and municipal authorities on the need to reduce waste generation and the need for environmentally sound disposal and reuse; and (iv) Increasing local planning and management capacity to avoid location of waste-dump sites near coastlines or waterways or to avoid litter escape to the marine and coastal environment. In addition, regional actions should include promotion of cooperation for the exchange of information on practices and experiences regarding waste management , recycling and reuse and cleaner production.

In West Indian Ocean, the GEF project proposal on Land Based Activities has strong linkages to this project. The requesting countries are Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa and Tanzania. The Project named Addressing land-based activities in the West Indian Ocean (including TDA and SAP updates) – WIOLaB is a three years project with a total cost of US \$ 7.823 million. The WIOLaB project has three main objectives:

- (i) Reduction of stress to the ecosystem by improving water and sediment quality
- (ii) Strengthening regional basis for preventing land-based sources of pollution and
- (iii) Developing regional capacity and institutions for sustainable less polluting development.

The WIOLaB focus on the Global Program for Action is expected to result in National Plans of Action for abating land based sources of pollution, as well as a regional protocol for Existing Environmental Convention (Nairobi Convention) with Annexes. Broad stakeholder participation and private sector cooperation form another strong focal points of this project.

The African Process solid waste pollution project addresses several other countries than those in WIOLaB, namely the western African coastal countries. Another added component is that of preventive methods of solid waste management through creation of business opportunities out of waste (re-use, recycling, incineration). In addition the African process has already generated invaluable information on the hot and sensitive spots, the WIOLaB stands to benefit from the available data-base for its project. The African Process POL 1 project has therefore direct linkages to the WIOLaB in West Indian Ocean countries in the sense that the two are complimenting each other. To the West African coastal participating countries no project such as WIOLaB is in place, thus all components apply.

There are several other past, ongoing and planned activities associated directly or indirectly with solid waste management in Sub-Saharan African countries. These are summarised in Table 2 below. To avoid or minimise duplication of efforts, different sections of the project such as surveys, creation of public awareness, research and development of technologies will be required to link with other relevant activities and agencies to obtain information, guidelines and advice.

At National Level

Several initiatives have been taken by governments of the various countries to control the problem of solid waste pollution. This project aims at complementing the individual countries initiatives.

In Cote d'Ivoire efforts where, within the framework of the National Environmental Action Plan, two new Outline Laws, Code of the Environment and Water Code, have been promulgated to address water pollution and water management issues respectively. Recently, the government has established a National Environment Fund, National Agency for the Environment and an Environmental Impact Assessment Bureau. In all cases, the expected results will be supportive of national development objectives. In Cote d'Ivoire, the results will enhance the recently initiated Sanitation Programme for the City of Abidjan which includes rehabilitation and protection of the Ebrie Lagoon. It will also support efforts to expand private sector

participation in urban management as well as activate the various NGOs involved in environmental protection who are financially-handicapped.

In the Gambia, a solid waste management is currently being implemented nationally. This includes development of solid waste management legislation funded by the government and the Basel Convention Secretariat. The research results from the IDA/Government funded solid waste study on characteristics of waste generated will serve as valuable input in the development of solid management strategies and approaches (recycling, composting, incineration and land filling. The small scale prototype incinerator also in the Gambia funded by the DFID, that is capable of incinerating 10 tons of waste per day serves as an example that can be replicated in other countries by the private sector.

Recently in The Gambia, Peace Corps Volunteers have began training interested persons to reuse plastic bags, weaving purses and bags from them which could be sold to the public as well as tourists. This could form a source of income for some people and in the process help to reduce the amount of plastic bags thrown away in dump sites. Another activity is the burning of discarded groundnut shells by women farmers who use the ash as soil conditioner. These vegetable growers also evacuate more than five tons of the shells per growing season as mulch for their crops. The current project will enhance the initiatives. The project results will directly support the Government's efforts to poverty alleviation, capacity building and enhance waste reuse and recycling activities.

In Ghana, the results of the project will contribute to the sustainability of the Korle Lagoon Ecological Restoration Project on which more than US\$ 40 million have been spent by the Government. The newly established Densu Management Board, tasked to rehabilitate the River Densu Basin, will also be a beneficiary.

In Nigeria, laws and regulations have been enacted in conformity with international agreements such as GPA/LBA and WACAF. However, the laws are ineffective mainly as a result of inadequate necessary facilities (including finance), insufficient highly skilled manpower and inadequate basic data necessary for planning. Two factors are however important in this country. Firstly, extensive scavenging occurs in and around solid waste dumps and some people actually make a living from the practice. The practice could therefore be organized and legitimized hence providing a means of livelihood for a segment of society. Secondly, the amounts of solid wastes being larger than what the government can cope with, has necessitated the involvement of private collectors by the Lagos State Government. Such a move will reduce unemployment to some extent. The project strengthens the attempts by the Lagos State Government to expand the involvement of the private sector in solid waste management and poverty reduction initiatives.

In South Africa the project is directly linked with the DEAT ongoing activities, Poverty relief programmes and the on-going implementation of the White Paper on Integrated Pollution and waste Management.

In Tanzania, the results will contribute to a rejuvenation of the Mangrove Management Plan as well strengthen broader involvement of the private sector in municipal waste collection, reuse and recycling.

In all the participating countries the project elements of awareness creation and community involvement is essential for sustainable solid waste management especially the reduction of generation of the waste.

An overview of some linkages in the region are given in table 1 below.

Table 1: Linkages with Other Projects

Agency/Institution	Summary of Activities	Countries Involved
United Nations Centre for Human Settlement	1. Privatisation of municipal services in East Africa. A governance approach to human settlements management. 2. Sustainable Waste Management for African countries. The project's objective is to strengthen regional capacity for solid waste management, through developing waste management programmes that include concepts such as waste minimisation, recycling and reuse, and informal sector micro-enterprises that link income generation to environmental protection.	Kenya, Tanzania, Uganda Ghana, Kenya, Zambia
DFID and WEDC	Promoting compost as a business for urban poor; Capacity building for primary collection of solid waste. Appropriate systems of waste disposal for low-income countries; Developing appropriate and low-cost vehicles for primary collection of solid waste;	Research projects
IDRC - Canada	Reusing organic solid waste in urban farming in African cities	Research project
SIOCAM: Strategic Network for Ocean and Coastal Management	Industrial Water Pollution Control in the Gulf of Guinea Large Marine Ecosystem. The project establishes and equips network of scientific and monitoring institutions and trains officials about pollution assessment and environmental management. Research on ecosystem, creation of a Geographic Information System, policy analysis, and consensus building at the national levels will also take place. Integrated Management of the Bengula Current Large Marine Ecosystem The aim is to enhance national and regional efforts to move towards sustainable integrated management Initial action will include establishment of a mechanism for regional cooperation, a review of the existing knowledge of the status and threats and development of a Strategic Action Programme.	Cote d'Ivoire, Benin, Cameroon, Ghana, Nigeria Namibia Angola, Namibia, South Africa
African Development Bank	The Coastal Protection Project in Gambia. The project involves assessment of the state of the environment and development of policies and recommendations for mitigation.	Gambia
The Agence Française de Développement Group – AFD	Travaux d'assainissement pluvial dans la ville d'Accra	Ghana
Norwegian Environmental Assistance – NORAD and the Ministry of the Environment	South Africa Environmental Co-operation Program. The scope is to contribute to the improvement of the quality of life to assist in creating a situation where national, provincial and local governments are in a position to effectively implement the mandate for environmental management and tourism.	South Africa
Swedish International Development Cooperation Agency*2 (SIDA)	Coastal Zone Initiative. Priorities for action include Integrated Coastal Zone Management (ICZM) to provide a framework for approaching the complex set of social, economic and environmental issues which traditional sectoral approaches to development have proven unable to address.	East Africa
UNDP	<u>Kenya National Cleaner Production Centre. This new centre shows Kenya's industries how to cut pollution from a number of sectors, such as agricultural products pharmaceuticals, municipalities and tourism.</u>	Kenya
Global Environmental Facility	<u>Biodiversity conservation and marine pollution abatement.</u>	Seychelles
WIO-LaB	<u>Project Proposal: Addressing land-based activities in the West Indian Ocean (including Transboundary Diagnostic Analysis (TDA) and Strategic Action Programme (SAP updates))</u>	Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, South Africa and Tanzania

5. Demonstrative Value and Replicability

The project offers a good opportunity to demonstrate strategies for waste management, control of pollution and protection of coastal and marine environments. This is achieved through the development and operation of environmentally sound solid waste management (collection, sorting and recycling) facilities and the pilot operation of developed technologies. In this respect the project offers useful lessons for replication in other cities/towns and both in rural and urban areas.

The project can be replicated in many coastal African countries as the problems of waste disposal are similar.

6. Risks and Sustainability

Project sustainability will rest on the overall commitment of central and local governments and their institutions to protect the environment against pollution from disposal of solid waste. In addition sustainability will also be influenced by the communities' acceptance and willingness to pay for the services rendered by the various municipalities and the private sector. It is also assumed that adequate markets will be found for products to be recycled or reused and the private sector will generate sufficient profits to justify their continued involvement in solid waste processing. Thus the training and surveys to assess the types and quantities of solid waste as well as the awareness campaign component of the project are essential for ensuring the sustainability of this project.

The provision and operation of waste management facilities need to be financially self-sustainable and should involve the private sector. Low incomes of the population and lack of requisite manpower and resources to manage the facilities could pose serious threats to sustainability of such facilities. It is envisaged that local authorities such as Municipal Authorities and District Assemblies will accept ownership of the pilot projects and budget for operation and maintenance of facilities to supplement charges that will be paid by the local populations. Returns on initial investment could also be ploughed back to maintain facilities.

The incorporation of the private sector in the solid waste management through subcontracting and opening up of business opportunities in collection, sorting and recycling is essential in this respect as it will add to enhanced sustainability of the project. Thus when well promoted this project has high chance of being financially self-sustainable at least at full cost recovery. Training of the institutions that manage waste will include personnel from district and municipal authorities, NGOs and community based organisations.

To increase the level of sustainability, regulatory measures to control pollution and monitoring of both compliance and enforcement coupled with institutional co-ordination need to be put in place.

7. Stakeholder Participation

- The parent ministries responsible for local governments, natural resources management and environment protection and lands and housing will play key role in overseeing the project implementation. Specifically the national Environment Authorities and agencies will take lead in legislation establishment and enforcement.
- The Governments of participating countries will contribute both financially and in kind to the implementation of this project
- Local communities involvement is crucial both to the successful implementation and sustainability of the project. They will participate in the collection and sorting activities as these provide alternative sources of income and hence contribute to poverty alleviation.
- Technology development and research institutions will have to participate in order to develop and pilot as well as supervise the appropriate technologies

- The low income countries and their poor population are not capable of raising sufficient capital funds required for this project. The international community and donor agencies will be approached and requested to provide financial support as well as technical support for the implementation of the project.
- Private sector participation in actual running of businesses in garbage collection, sorting and recycling is one of the best practice to enhance the sustainability of the project.

A variety of stakeholders from the participating countries are mentioned in table 2 below:

Table 2: Examples of Stakeholders

Country	Examples of stakeholders
Ghana	Ministry of Local Government and Rural Development, Accra Metropolitan Authority District Assemblies, Environmental Protection Agency, Water Resources Commission, Landlords/House owners, Ministry of Tourism, NGOs, Academia
Nigeria	Federal and States Ministries of Environment, Health, Works and Housing Environmental Protection Agencies, National Conservation Foundation, NGOs and Communities in coastal areas
Tanzania	Ministries of Natural Resources Management and Tourism, Health and Lands and Settlement, President's Office for Regional Administration and Local Government, City and Municipal Councils, Technology Development and Research Institutions of University of Dar es Salaam and Ministry of Industry and Trade, Coastal communities

8. Project Management and Implementation Arrangements

8.1 Regional Arrangements

At regional level there shall be a Regional Co-ordinating cum advisory Office (RCO) that will be responsible for the regional co-ordination of the project. It will be a very lean unit with a maximum of three experts, who will be in charge of monitoring of all technical, socio-economic and regional aspects of the project implementation progress, regional monitoring and impact assessment.

8.2 National Arrangements

Within countries, no new institutions will be formed since the project is considered as building on existing capacity and activities to manage solid waste. National Coordination Office (NCO), headed by a Coordinator from the Executing Agency, will be constituted to oversee project implementation and link up with the RCO. The NCO will consist of representatives of the various stakeholders involved in the actual implementation of the project such as Municipal or District authorities, central government, private sector, NGO, regulatory authority, researchers and individuals. Frequent meetings by the NCU will serve to improve and strengthen linkages between the various institutions. To minimise overlapping requests and approaches, linkages with other projects and activities will be initiated by the RCO and passed on to NCOs as required. As indicated in the beginning, specific countries have identified their respective organs for implementation as follows:

- In Cote d'Ivoire is the Centre for Oceanographic Research
- In the Gambia, National Environment Agency will co-ordinate the project
- In Ghana the Accra Metropolitan Authority will assume the co-ordinating responsibility and the District assemblies will in Densu Basin be involved in the direct implementation.
- In Kenya, The Mombasa Municipal Council will assume the overall responsibility of the project
- In Mozambique the Directorate for the of Environment Management will be responsible for the overall project management and implementation.
- For Nigeria, it is the Federal Ministry of Environment that will be manage and oversees the actual implementation via municipal authorities in the implementing big cities.

- For Senegal, the project will be under the Office of Environment and Classified Establishment.
- For South Africa, the Department of Environmental Affairs and Tourism (DEAT) in the Coastal Provinces will manage the project.
- In Tanzania: The Municipal Councils of Dar es Salaam, Zanzibar and Tanga will implement the project in the targeted areas while the overall coordination will be vested in the National Environment Council.

Central government will be responsible for provision of resources to serve as counterpart to external sources. The regulatory organisations will be responsible for enactment and enforcement of regulations while municipal authorities, NGOs and the private sector are involved in environmentally sound waste collection, reuse or recycling and disposal. Surveys and training will be conducted by researchers and other experts from both public and private sectors. The mechanisms for participation of communities will involve public education and enforcement of laws and regulations. Identified NGOs will be specifically invited to participate in various project activities.

With respect to human resources, the project will require coastal zone management experts, sanitary engineers, ecologists, hydrologists, socio-economists, legal experts, information technologists, EIA consultants, small-scale enterprises specialists accountants and gender specialists. Materials required include garbage bins, sewage trucks, specialised trucks for poor densely populated areas, training and educational aids, facilities for information management, monitoring and transportation.

9. Project Component and Activity Financing

The project will be initiated with surveys to determine types and quantities of solid waste in the selected hotspot or sensitive area (Activity 1.1). This is expected to last for one quarter and cost US\$ 10,000 per project area.

Activity 1.2, training in relevant technologies in re-use and recycling and disposal of solid waste will start in the second half of year one and last for 2 and half years. It is estimated that it will cost about US \$2,000,000 per project area.

Monitoring and evaluation of project (Activity 1.3), will be conducted during the last quarter of each year. The cost of this activity in each project area is estimated at US\$ 25,000. It must be explained that while monitoring is considered an integral part of the project and will therefore be a continuing activity, evaluation of the success of the project will be achieved based on the results of monitoring.

All the three activities in Component 2 relate to provision and expansion of facilities for collection and disposal of waste, these will take place at the beginning of the third quarter and last for one year. Except the facilitation of private sector which will last for one and half years. This is a capital intensive component of the project will require an estimated US\$ 500,000 per project area.

Activities related to capacity building, institutional strengthening and public awareness will start right from the initiation of the project.

Activity 3.1 – public awareness and training will begin in the second quarter of the 1st year. Training of individuals and organisations in methods for waste reuse and recycling is estimated at US\$ 250,000. It will start in the second half of year one and will last till the end of the third year.

Drawing up of proper coastal areas utilisation including planning for waste management disposal will take place in the first half of year one, last for 3 quarters and is estimated to cost US 30,000 per project area.

The provision of equipment for information gathering and exchange will take place during the 2nd half year and last for six months. Estimated costs for each project area are US\$ 200,000 respectively.

The inventory taking of existing legislation in each individual project area is estimated to start from the second quarter of year one and last of one quarter. It is estimated to cost US\$ 10,000 per project area. The development and effecting as well as monitoring of compliance of enacted legislation is expected to be an on going activity throughout the project. It will start in the third quarter of the project and continue to end of the project. It is estimated to cost US\$240,000 per project area.

It is envisaged that the national governments should be able to contribute 10% of the total cost of each project in kind (Table 4). With respect to external sources, since no specific agencies have been identified at present, they have been grouped as one.

Table 4: Project and Components Financing in US\$

Sn	Components/Activity	External Sources of Funds			National Government(s) 10%		TOTAL US\$
		Source1	Source2	Source 3	Cash	In-kind	
Component 1: Reduction of waste generation		211,500				23,500	235,000
A 1.1	Survey waste quantities and characteristics	9,000				1,000	10,000
A 1.2	Training in relevant technologies and practices – demonstration sites	180,000				20,000	200,000
A 1.3	Monitoring and Evaluation	22,500				2,500	25,000
Component 2: Installation of effective and efficient solid waste systems and facilities		450,000				50,000	500,000
A 2.1	Install garbage containers in residential and public	315,000				35,000	350,000
A 2.2	Facilitate private sector participation in collection, sorting, reuse, recycling and disposal including demonstration sites	45,000				5,000	50,000
A 2.3	Suitable waste disposal sites construction	90,000				10,000	100,000
Component 3: Capacity Building at regional and national levels and Awareness creation for sustainable solid waste management		612,000				68,000	680,000
A 3.1	Public awareness, education and Training on solid waste collection, re-use, recycling and disposal	225,000				25,000	250,000
A 3.2	Planning and technical assistance at management level	45,000				5,000	50,000
A 3.3	Provision of equipment for information gathering and exchange	180,000				20,000	200,000
A 3.4	Inventory of legislative provisions including status of ratification of international conventions	9,000				1,000	10,000
A 3.5	Development of standards and legislation including compliance monitoring	162,000				18,000	180,000
TOTAL COST PER PROJECT AREA		1,363,500				141,500	1,415,000

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

The total cost per project area is estimated at US \$ 1,415,000. For the at least **2** hot spots and **8** eight participating countries the grand project cost will be US \$ 22,640,000. This amount is however subject to confirmation of interest in the project by the eight participating countries by a way of Government endorsement which involves financial and human resources commitment. Currently only two government endorsements namely, from Ghana and Nigeria are in place.

10. Monitoring, Evaluation and Dissemination

Internal/external monitoring and evaluation will play a significant role during implementation to ensure that the experience gained through pilot projects, consultancies and meetings informs project management and decision-making. In addition, important external factors, such as the quality of the environment, would also be monitored to ensure the project outputs and purpose remain relevant and achievable.

General indicators of project achievement will include the number and types of databases created on solid waste in the coastal and marine environment, the number and quality of education and public awareness campaigns undertaken as well as the number of individuals trained and engaged in reuse and recycling of solid waste (Table 5). Others are the number of facilities made available for waste collection and disposal and the extent of participation of the private sector.

The monitoring and evaluation of project activities will be undertaken by the National Coordination Unit (NCU), which will be made up of representatives of the key stakeholders as indicated in Section 8 above. The NCU will meet at the end of each year to review project activities and undertake field visits, where necessary. Standardised procedures for monitoring and evaluation of the implementation of the proposed activities will be developed by the Regional Coordination Unit. These procedures will facilitate effective implementation of the planned activities by supporting identification and documentation of successes, failures and lessons learnt, and by identifying needed adjustment and improvements. Evaluation would also include follow-up appraisal of behavioural change of beneficiary populations. The RCU will meet at the end of the 2nd year for a mid-term review and the end of the 4th year for an end of project review.

11. Work Plan and Time Frame

The project is expected to take a total of 4 years. The timing for each activity is given in table 4 below.

The respective explanation has been provided under section 9.

12. Logical Framework Matrix

Table 5: Logical Framework Matrix

Goal	Objectively Verifiable indicators	Means of Verification (Monitoring Focus)	Critical Assumptions and Risks
Improve solid waste management.	Human health protected. Aesthetic quality of the coastal and marine environment enhanced.	Visits to project areas Reviews by national and regional monitoring teams.	Continued commitment from SSA Governments
Objectives/Outputs			
1. Reduce quantities of solid waste disposed of. 1.1. Quantities of solid waste to be disposed of significantly reduced. 1.2. Reuse and recycling of materials increased. 1.3. Participation of all stake holders in solid waste management increased.	Change in quantities of solid waste for final disposal. Change in quantities of solid waste reused or recycled. Demonstration sites for re-use and recycling in place Reduced poor dumping of solid waste. Number of environmentally acceptable sites constructed and used	Project records and reports. National reports. Monitoring and evaluation reports. Number of demo sites constructed Survey and field visits	Adequate human and financial resources committed by Governments. Markets for re-cycled products found Acceptance and cooperation by the local community granted
2. Provide/expand facilities for collection and safe disposal of solid waste. 1. Facilities for solid waste collection and disposal provided and or expanded. 2. Aesthetic quality of coastal and marine areas improved. 3. Diseases related to poor solid waste disposal decreased	Number of facilities provided or expanded. Number of private sector agencies involved. Number of diseases related to poor solid waste disposal reduced	Filed surveys Project records and reports. National reports. Monitoring and evaluation reports. Hospital reports	Sustained change in public attitude Markets for re-cycled products found Adequate human and financial resources committed by Governments.
1. Capacity Building of Institutions and Awareness Creation in solid waste management. 1. Public informed on suitable waste management practices: re-use, recycling 2. Planning capacities for pollution control in place and technical assistance provided	Number of individuals or groups involved in waste reuse / recycling activities. Coastal Pollution control and	Training reports Field visits civil Project records and reports. National reports. Monitoring and evaluation reports.	Training well designed and delivered Adequate human and financial resources committed by

<p>3 Management Information system on solid waste management developed and in place.</p> <p>4. Policies, regulations and laws on solid waste collection, disposal and management enacted and or enforced, at least, in target areas.</p>	<p>management plans in place</p> <p>Number of equipment and facilities for information processing and exchange</p> <p>Adequate regulations enacted or enforced.</p> <p>Increased cooperation between national and regional institutions.</p>	<p>Inspection of the established system</p>	<p>Governments.</p>
--	--	---	---------------------

12. References

GESAMP, 2001. Protecting the Oceans from Land-based Activities – Land-based sources and activities affecting the quality and uses of the marine coastal and associated freshwater environment. Rep. Stud. GESAMP No. 71, 162 pp.

UNEP, 1995. Global Programme of Action for the Protection of the Marine Environment from Land-based Activities. Rep. Intergovernmental Conf., Washington, DC, 37pp.

World Bank, 1995. Africa: A Framework for Integrated Coastal Zone management, 139