

UNITED NATIONS
ECONOMIC COMMISSION FOR AFRICA

MARINE POLLUTION PROBLEMS IN SOME
COUNTRIES OF AFRICA AND STRATEGIES FOR
INTERCOUNTRY CO-OPERATION IN ALLEVIATING
THESE PROBLEMS

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This report was prepared for ECA by consultant Prof. Frank X. Njenga, Faculty of Law, Moi University, Eldoret, Kenya. The opinions expressed here are those of the consultant. They neither reflect U.N. position, nor do they carry endorsement by the U.N. system.

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CHAPTER 1

EXECUTIVE SUMMARY

The importance of maintaining the ocean-environment-health in the overall goal of sustainable development has now become universally accepted. Long gone are the days when the oceans' absorbing capacity for the world refuse was considered to be inexhaustible. In the scheme of sustainable development, it is now realized that the world oceans occupying as they do over 70% of the biosphere must be considered as central to realizing the goal of the preservation of global environment in the process of rational development.

It is for this reason that the international legal obligations of states to protect and preserve the marine environment have been specifically provided for in the 1982 United Nations Convention on the Law of the Sea (UNCLOS), which devotes Chapter XII to the Protection and Preservation of the Marine Environment. The Convention further urges all states to cooperate on a global and regional basis in formulating rules and standards to protect marine environment from pollution.

The United Nations Conference on Environment and Development held in Rio de Janeiro which adopted Agenda 21 as the World Charter on ensuring sustainable development into the twenty first century was very cognizant of the central role that has to be assigned to the marine environment which forms an integral whole that is essential component of the global life support system. Thus Chapter 17 of Agenda 21 is devoted to "Protection of the Oceans, all kinds of seas, including enclosed and semi-enclosed seas, and coastal Areas and the Protection, Rational use and Development of their living resources". Chapter 17 contains a comprehensive programme articulating new approaches to marine and coastal area management and development at the national, subregional and global levels.

Africa is a continent completely surrounded by oceans offering both unique opportunities and challenges. The ocean around it has provided ocean routes for international navigation linking all parts of the world from time immemorial. The major modern tanker routes for oil pass around the continent with potential for calamities from major accidents. The ever growing coastal settlements and industrial waste by-products require concerted efforts if ecological disaster is to be avoided. Yet any single African country is limited in its capacity to effectively address these challenges.

As the UN body entrusted with the overall responsibility and stewardship for economic well-being of Africa, the Economic Commission for Africa (ECA) is conscious of its responsibility to assist Africa in meeting the challenges articulated in Agenda 21. Soon after the Rio Conference, ECA formulated the African Strategies for Implementation of Agenda 21 aimed at streamlining the large number of sectoral issues to meet the concerns of the continent. One

of these concerns is the problem of marine pollution in Africa and how this could be effectively controlled. The present consultant was engaged to carry out visits to selected African countries and discuss with the responsible officials and National Institutions on the problem of marine environment.

The present study therefore concentrates on making proposals on ameliorating the existing conditions of the marine pollution in each country visited. It should however, be noted that no country acting alone can effectively resolve its marine pollution problem given the interrelation of marine space. Therefore while country specific suggestion on marine problems are made, regional cooperation in approaching common problems is also emphasized.

While ECA has the overall mandate for economic development in Africa there are other UN agencies with specific responsibility internationally for some aspects of marine pollution. Any initiatives to be undertaken by ECA on this topic should therefore be in close cooperation with these agencies having global responsibility for particular activities. These include the following:-

UNEP

UNEP which is the principal organization for the protection of the environment operates a major ocean and coastal areas programme covering global environment, Regional Seas Programme(RSP) and Living Marine Resources Programme. The extensive RSP covers eleven regions of which the following are of direct interest to the African region. These are the Mediterranean Programme, Eastern African Region, West and Central African Region and the Red Sea and the Gulf of Aden.

IMO

IMO which is the principal organization responsible for shipping and marine environment protection, carries out extensive programmes through Marine Safety Committee (MSC), the Legal Committee, and the Technical Cooperation Committee (TCC). It also serves as the secretariat to the London Convention for the Protection of Marine Pollution by dumping of wastes and other matters - the London Convention. Unlike the three others (UNEP, IOC AND FAO) principal organizations concerned with ocean affairs, IMO does not have regional bodies or offices, but it provides, various marine regions with ship routing and traffic separation schemes, plays an important role in establishment and operation of regional oil combating arrangements within the UNEP-RSP and maintains an inventory of particularly sensitive areas in various regions. With UNDP support, IMO operates a number of training institutions and maintains regional and sub-regional advisors in Africa, Arab States, Asia and Latin America.

IAEA

Within its broader functions of accelerating the contribution of atomic energy to peace, the IAEA is an advisor to IMO London Convention and it is responsible for marine radioactivity studies in general. The IAEA is the only organization in the UN system operating its own laboratories, which have research and analytical capabilities that are used for environmental protection and sustainable development in this field.

IOC

The International Oceanographic Commission is the only Intergovernmental Organization solely charged with dealing with oceans, coastal areas and the whole marine areas and its resources. The purpose of the IOC is to promote Scientific investigation, systematic ocean observation, related ocean services and capacity building with a view to learning more about oceans and the nature of its resources so as to obtain knowledge for sound management and sustainable development.

1.2 TERMS OF REFERENCE

1.2.A. Programme

Providing Advisory Services, Data Collection, and Preparation of a Technical Publication on Marine Pollution Problems and Strategies for inter Country Cooperation in Alleviating those problems in line with the objectives of Agenda 21.

1.2.B. Activities

Under a short term Special Services Agreement (SSA) with the United Nations Economic Commission for Africa (UNECA) the consultant shall undertake missions to ten selected African countries to render advisory services on enhancing technical and managerial capabilities of marine science and technology institutions in those countries.

He will also collect data and information for a technical publication on marine pollution problems in these countries and on strategies for intercountry cooperation in alleviating trans-boundary marine pollution problems in line with the objectives of Agenda 21

1.2.C. Output

The Consultant shall prepare a consolidated mission report on advisory services thus provided, elaborating on issues being addressed, problems identified and recommendations offered. The Consultant shall also prepare the manuscript of a technical publication on marine pollution problems and strategies for intercountry cooperation in alleviating transboundary marine pollution problems.

CHAPTER II

2. COMMON PROBLEMS AT NATIONAL AND SUB-REGIONAL LEVEL OF THE COASTAL AND MARINE SECTOR IN COUNTRIES VISITED

In order to have a rational discussion on technical aspects of marine pollution in Africa, it is necessary to have a grasp of each country's coastal and marine sectors. The following brief description of these maritime areas is extracted from the Combined Mission Report on the understanding that this Study will be considered independently from this mission report. Each section is however not of uniform length reflecting the amount of information that was put at the disposal of the Consultant during his mission.

Although the Consultant did not succeed in carrying out his mission to South Africa due to factors beyond his control, he has been able to prepare a detailed presentation on the basis of documentary information received from that country.

2.1. ERITREA

It is important to understand some of the significant features of Eritrea's coast and marine resources in order to grasp the enormous problems and challenges which the new nation faces. Eritrea has the longest shore on the western side of the Red Sea. Its shore includes approximately 1200 km of continental coast, extending from Djibouti in the south to Sudan in the north and over 350 offshore islands, of which 210 islands of Dehalak Archipelago represent the rich biodiversity and delicate ecology.

The 1200 km continental coastal plain ranges from 20 - 60 km in width and constitute 59% of the country's land surface. It is however very arid in character and has no permanent rivers. The total coastal mainland population is estimated to be only 75,000 people of whom approximately 35,000 live in the southern port city of Assab, and approximately 20,000 live in Massawa - the other port city located at the centre of the coast. Another estimated 15,000 people lead a nomadic life in villages throughout the southern half of the coast and the 350 coastal and offshore islands. Only 10 of the offshore islands are inhabited, with a total population of about 2,600 mainly in Dehalak Archipelago.¹

The marine coastal areas and offshore islands contain extensive coral reefs which are still in pristine condition. Sea grasses and mangroves play a major role in ecological sustainability and biological diversity of the coastal margins. The coastal ecosystem provides essential shelter and food required for the breeding phases of globally significant and migratory fishery stocks,

¹

The facts produced here are taken from an on-going UNDP programme entitled "Conservation of the Coral Reef Biodiversity through Community-Based Resource Management"

marine mammals, sea turtles as well as breeding, nesting and wintering sites of many migratory birds. Many species of marine mammals including dolphins, tortoises, whales, and the endangered "dugongs" - "sea cows" - are to be found in these largely unexploited and so far unspoiled waters.

Because of the long liberation struggle, and the attitude of the previous regime which perceived the Eritrean coastal zone only in terms of military security, the region has remained almost completely unexploited. It contains one of very high biodiversity in marine life and abundant fishery resources which are yet to be fully explored. Recent fish surveys indicate a diversity of reef fish which is thought to include at least 40 species in 24 families on coral patches near Massawa and to over 250 species in 49 families on outer coral reef in Dehalak Islands. About 110 marine and shore bird species in 41 families have been recorded from the off shore Dehalak Islands and mainland islands, which congregate there due to the isolation and rich marine feeding grounds these islands provide.²

Due to the harsh climatic conditions and lack of fresh water or permanent rivers in the coastal areas, there is no significant agricultural activity. Human settlement is very small. Consequently land-based source of pollution is insignificant and the industrial activity in both Massawa and Assab is very small though it is likely to increase. Human settlement is however likely to be constrained for a long time to come due to lack of water. Consequently there is no significant land-based source of pollution except that of sewage and industrial and domestic wastes in the two coastal cities. Nevertheless, the fragile marine areas face great ecological threat from the sea particularly through oil transport by super tankers through the Red Sea.

The Red Sea itself is relatively a narrow body of water which is almost enclosed, with the Suez Canal as the only contact with the Mediterranean in the north and Bab el Mandeb Straits opening to the Indian Ocean. Yet the developed areas of the Red Sea have heavy oil-industry activities. Oil exploitation and exploration is also likely to feature prominently in Eritrea. The Red Sea is also a busy commercial and military traffic route for ships passing through the Suez Canal, not to mention the enormous oil tanker traffic destined to Europe and America from Saudi Arabian installations in Jeddah. The threat from oil pollution either from normal ship operations, ballasting or deliberate dumping from ships is great. Possibility of major accidental spills would cause enormous damage, particularly in such fragile ecosystem of limited oceanographic circulation and high endemism.

2.2 SENEGAL

Senegal is situated on the most westerly part of the African continent in the dry Sahelian region. It has a coastline of about 700 kilometers and its coastal waters within its Exclusive Economic Zone is endowed with one of the richest fishery resources in Africa. While most of

² See p. 7 of the above report

its nearly eight million inhabitants live in the rural areas in the hinterland, it has nevertheless important concentrations of coastal communities, mainly involved in artisanal fishery activities. Besides, Dakar with a population of about 1.5 million inhabitants is by far the largest city where most of the country's commercial activities and most of its industries are situated. The port of Dakar is also one of the busiest ports on the West African coast handling almost all the exports and imports of Senegal as well as those of Mali. The other important coastal towns are Saint Louis, Ziguinchor and Thiès, all of which have significant and fast increasing population concentration.

Agricultural activities and potential are largely constrained by poor rainfall in the Sahel region. There is however significant production of groundnuts or peanuts and there is an important groundnut processing plant in Dakar. The most important natural resource however in the coastal zone is fishery. While pollution associated with fertilizers and pesticides may be carried by rain waters or by the two major rivers - River Senegal and River Casamance - the contribution to marine pollution by agricultural activities is at present insignificant.

As could be observed during the mission, pollution of the Port Autonome de Dakar (PAD) which is very serious, emanates from various sources:-

a. **Solid Waste**

These originate from the residues and filth emanating from transit of goods and operation of ships. The wastes constitute of deteriorated packing materials and perishable goods which are to be found both on the land and in the water at the port.

b. **Liquid Wastes**

These constitute mainly of oils and other hydrocarbons originating from ships' engine cleaning or tank ballast.

c. **Other Pollution sources at Dakar**

All the sewage from the old part of Dakar is dumped into the Port without any treatment. This perhaps was not so serious when the town was established and when the population was small but it is an intolerable load for the port now. In addition, city drainage and storm run-off carries all sorts of filth to the port.

Besides, there are many large factories whose waste is canalized directly into the port. The consultant was informed that with the exception of SENELEX (the Electricity Company) all the other industries deposit their chemical and other liquid wastes into the port completely untreated.

The port is also the site for the various petroleum companies from where they load their products from ships. The oil pipes are old and many (particularly those in the water) have leakages. Negligence in handling the loading process often result in oil spillage.

Another important source of pollution is the Fisheries Port which is also located within the port. While the ultra modern fish processing factory which came into operation only about two years ago has its own purification plant for its wastes, the handling of fish and the fishing trawlers and boats discharging their stock contribute to the pollution in no small manner.

Deliberate and clandestine disposal of waste oil by ships in port is another major source of pollution. This is of course a punishable offence but it is extremely difficult to control particularly taking into consideration that the port of Dakar like many other African ports does not have any oil reception facilities.

2.3 GHANA³

The Republic of Ghana is located in the Gulf of Guinea between Côte d'Ivoire and Togo and covers an area of 240,000 km square, with a population of 15 million. It has a coastline of 550 km and it is well endowed with over 50 lagoons and estuaries ranging in size from less than 5 square km to over 300 square km. There is a narrow coastal plain behind which is a range of low abrupt hills. The south - western part of the country is densely forested and to the north of the country are bush, savanna and grasslands. The country is extremely well watered and it is principally drained by the Black, White and Red Volta rivers and the Oti river as well as several other smaller rivers.

The coastline is generally a low lying area not more than 200 m above the sea level with a narrow continental shelf extending outward for about 30 km. The coastal area is generally unsuitable for agriculture due to the sandy nature of the soil; and the small scale peasant cultivation of local staples involves only insignificant application of agro-chemicals. Consequently coastal agriculture does not contribute a significant amount to the marine pollution.

While on the whole, the coastal area is not heavily populated, the major concentration of population and industry is located in Accra-Tema Metropolitan area (ATMA) which in the last 80 years has grown from a population of no more than 20,000 to almost 2 million population in 1990. It is expected to be as high as 2.2 million by year 2010 given the current growth rate

³

For this part the consultant is indebted to Dr. Charles A. Biney - Acting Director of the Institute of Aquatic Biology who has conducted extensive research on land, air and water pollution in Ghana and who gave him a written brief on the subject.

of 3.0% per annum.⁴ This population is concentrated in an area constituting less than 1% of Ghana with a coastline totalling only about 56 km.

To add to the complexity of the population pressure on the marine environment in Accra-Tema area, most industrial activities worth nearly 60% of the total industrial output is concentrated here. About 30% (2,703 out of a total of 8,351 industries) are located in this metropolis. Major industries include food and beverages, textiles, metals, wood processing, chemicals and pharmaceutical, leather and vehicle assembly.⁵

MAJOR SOURCES OF POLLUTION

2.3.1 Sewage

The main contaminant responsible for degradation of the marine environment in Ghana is sewage of both domestic and industrial origin which to a great extent is discharged untreated into estuaries, lagoons and immediate (in-shore) areas. The most serious is the sewage in the Accra-Tema Metropolitan area which is served by two sewage systems. The central Accra sewage system is located east of the Korle lagoon and though it has a submarine outfall this has not been functioning as it is broken in places and it discharges untreated sewage directly into the lagoon which has been so polluted that it has become biologically dead. The other major system whose submarine sea outfall is also broken is for Tema and it discharges untreated sewage into the Ghana lagoon. There are several other smaller sewage schemes with treatment plants for some institutions such as hospitals, military establishments and housing estates, but most of them have not been functioning well.

2.3.2 Solid Wastes

Solid wastes including litter and plastics also constitute major contaminants on the coastal zone. While they are supposed to be dumped in land-fills or incinerated, this only account for a small fraction. Waste collection is erratic. Solid waste is thus common both in commercial and residential areas and much of it is to be found in open drains and ends up being carried by rivers and streams, urban drains and flood run-offs to the coast where it is common to find metal cans, plastics, logs and even abandoned fishing vessels. Solid wastes in forms of dry solids and sludge --- some containing toxic chemicals from the paint, textile, metal, synthetic, organic pharmaceutical and chemical industries also find their way into the lagoons through the drains. These emanate principally from the metal industry in forms of heavy metals, food and beverage

⁴ See Charles A Biney and Ruby Asamah(Mrs) - Assessment of Water, Air and Land Pollution Sources in Accra - Tema Metropolitan Area - Ghana, Institute of Aquatic Biology publication, July 1994

⁵ See Biney and Asumah op. cit p 4

industries mainly of organic waste in forms of fibre, yarn and sludge from waste water treatment, chemical containers and dyes.⁶

2.3.3 Oils and Other Hydrocarbons

Oils and other hydrocarbons originating mainly from petroleum loading terminals and other port operations, refinery operations, vehicle repair and assembly plants also end up in the ocean. International oil tankers-traffic and illegal ballasting along the Gulf of Guinea also contribute to marine coastal pollution. Prevailing currents and winds wash this oil waste onto the beaches in forms of tar balls which are quite common in some parts of the beaches.

2.3.4 Input from Rivers into the Coastal Zones

As was observed earlier Ghana has a number of major rivers whose catchment contain many activities including fish processing, crop farming in the vicinity of human settlement and sewage disposal which thus contribute further discharges from domestic wastes and agricultural runoffs. But on the whole most of the pollution from the rivers is localized in the estuaries or lagoons in which they discharge. The problem is not considered very serious but because of their size they contribute more water pollution loads than industrial effluent due to their higher discharge volumes.

2.3.5 Coastal Erosion

Coastal erosion has been identified as a major problem in the coastal zone of Ghana with rates exceeding 2 meters per year in critical areas. The causes relate to sea level rise, storm waves, inadequate supply of sediments resulting from damming of rivers, and sand mining. Exploitation of fish resources has also impacted on the coast through high demand for fuel wood for fish smoking which has resulted in extensive felling of trees and depletion of mangroves and loss of coconut trees along certain portions of the coastlines. The construction of major dams across such rivers as the Volta and Densu have resulted in subsequent change of hydrological conditions. These have resulted in loss of coastal lagoons which were replenished during the flood season, rapid development of sandbars in estuaries leading to changes in salt/fresh water boundaries and reduction in amount of sediments carried to the coast with detrimental effects to distribution of fishery resources and seaward spread of noxious aquatic vegetation.

2.4 NIGERIA

With an area of 923,763 sq miles, Nigeria is the most populous nation in Africa with a population of 120 million. It has a coastline of 850 km stretching from Benin to Cameroon. While the coastal zone of up to 200 metres elevation stretches considerable distance inland, it

⁶ See Birney and Asmah op. cit p 10 - 11

is not the most densely populated region of the country. It has however the most densely populated city - Lagos - with a population of nearly 7 million inhabitants and which until recently was the national capital with the greatest concentration of industries and the nation's economic life. There are also other important cities on the coast such as Port Harcourt in the Niger Delta where the oil industry is concentrated.

Siting of industries in Lagos has been influenced by proximity to local raw materials, access to seaport for importation of industrial raw materials, communication facilities, available labour force and access to market outlets for industrial products. It has been estimated that of the 4,000 or more industrial establishments in Nigeria, 70% are located in the coastal areas, Lagos alone having about 60% of all industries.⁷ Until recently, little thought was given to environmental considerations and to sewage from industrial and domestic sources which was mostly disposed off into lagoons which have limited circulation.

Another major source of marine pollution is oil production which accounts for 80% of external revenue of the country and for 30% of the GDP. The Niger Delta with its fragile ecosystem is the oil producing area of the country both on-and-offshore. Incessant oil spills of various magnitudes and improper disposal of oil exploration and production wastes have resulted in massive pollution of water and land, destruction of artisanal fisheries and generally adverse social and economic consequences. The continuous flaring of gas in Niger Delta since the commencement of oil industry forty years ago has contributed significantly to the "Green-house gasses" and to "Acid Rain" which has been reported in the area.⁸

Thus the major environmental problems facing the coastal zone are water contamination, habitat degradation, coastal erosion, fishery loss and air pollution. The major contaminants are industrial effluent and emissions and domestic sewage (released raw without treatment or in a few cases with partial, ineffective waste treatment facilities) into water land and air and solid industrial and domestic wastes, often disposed of in open land, wetlands or on the banks of the lagoons. Other sources of secondary importance include power plants, upstream riverine inputs and agricultural run off. It should be noted that the 67% of the drainage pattern is towards the sea.

Areas of coastal zone most affected by degradation include critical habitats such as wetlands, lagoons and mangrove, which serve as nursery grounds for many fish species.⁹ For a country which is heavily dependent on fish for protein needs, this situation calls for urgent remedial measures.

⁷ Oladde Osibanjo - "Environmental Consciousness for Nigeria National Development" FEPA Monograph 3 p. 96 edited by E. O. A. Aina and N. O. Adedipe.

⁸ Oladele Osibanjo opp. cit. p. 97

⁹ UNEP Report for the West and Central African Region on the Protection of the Marine Environment from Land Based-Sources-February 1995.

2.5 MAURITIUS¹⁰

The marine environment of the islands of St. Brandon and Agalega are relatively undisturbed. Except for fishing no other marine-based activity has been carried out so far. The islands were once important nesting sites for the green turtle *Chelonia mydas* and the Hawksbill turtle *Erectmochelys imgricata*. These species were threatened by over-exploitation and since, 1983, they have been declared protected species and their capture has been prohibited.

The adverse effects of human and natural disturbances on the coastal environment or the island of Rodrigues are severe. Along the years, indiscriminate deforestation has lead to denudation of the land and loss of fertile top soil to the sea. Soil erosion is a major problem on the island. Many bays and lagoons are, today, being threatened by the accumulation of terrigenous sediments. Inner channels and passage ways in the lagoons are clogged with mud, rendering them impracticable for navigation purposes by fishing boats.

Recent blasting of the reers for navigation purposes and dredging have adversely affected the coral reef and lagoon ecosystems. A high percentage of corals are dead. The environmental factors affecting the reef and lagoon ecosystems could lead to decrease in fishery productivity. There is no major industrial or tourism development on the island up to now.

Mainland Mauritius has been traditionally an agricultural country with sugar cane and tea as the main cash crops. However, during the past twenty-five years, especially as a result of the setting up of the Export Processing Zone, industrial activities have rapidly expanded to become the major foreign exchange earner of the country. The economic importance of tourism has also substantially increased during the past two decades, leading to heavy hotel development along beaches. Economic growth has brought along major impacts on the territorial and marine environment. Rapid development and pressure on the exploitation of the lagoon resources coupled with other economic activities are posing potential threats to the marine environment around Mauritius.

2.5.1 Sources of Marine Pollution

There is a widespread view that the estuarine-lagoonal and reef ecosystems are seriously threatened by pollution through land- and-sea-based activities. There is visual evidence of pollution in the coastal waters from industrial zones, around outfalls and areas of dense tourism development. Marine-based pollution is mainly generated through traffic in the harbour and pleasure-crafts activities in specific areas of the lagoon. The effects of pollution are particularly severe around estuaries. The lagoon, being bounded by the reefs, functions more or less as a semi-enclosed system and is also the ultimate sink for all land-based sources of pollution.

¹⁰

For this section, the Consultant is indepted to Mr. M. Munbodh, Principal of Fisheries officer, who put at his disposal a paper prepared by himself and Mr. Chineah, Head of Marine Science Division, on the status of the Marine Environment in Mauritius.

2.5.2 Waste Water from Industries

The Export Processing Zone Scheme which was launched in the early seventies provides a package of incentives to attract local and foreign investors. Since then, the development of the manufacturing sector has expanded rapidly. The rapid increase in the number of industries, since 1970, has prompted the Government to accelerate the setting up of industrial estates across the island.

Polluting industrial activities include dyeing, printing, battery-making, tanning, paint-manufacturing, etc. Industries in the urban areas discharge untreated waste effluents into sewers, reaching the sea via outfalls. Others discharge their wastes in small canals, rivers or absorption pits. Some dye houses have started to operate treatment plants and treat their effluent prior to discharging it into rivers, sewers or absorption pits. Frequent cases of fish kills have been reported from industrialized coastal regions and the principal causes of such mortality have been attributed to pollution by industrial effluent. It is to be noted that standards do exist for the discharge of industrial effluent in sewers or in surface water course, but efficient control cannot be exercised without laboratories sufficiently equipped for monitoring purposes. The Government is taking steps to provide the existing industrial estates with treatment plants.

2.5.3 Disposal of Sewage

There are three sewage plants (400m, 700m and 1006m) in the Port Louis area, discharging sewage into the sea. Discharge from these outfalls is one of the main sources of coastal pollution around Port Louis and has given rise to nutrient enrichment of the water leading to severe eutrophication. Dense algal blooms are common occurrences around them. The beaches in the vicinity are littered with large masses of dead algae. Siltation and suspended solid particles have resulted in the death of large coral colonies. The sewage pipe line at Point Moyenne does not extend into the sea. Floating sewage is often seen to travel along the coast with the tidal currents and part of it, from time to time, reaches the lagoon of the Flic en Flac public beach. Ear infections and inflammation of minor cuts incurred by swimmers in this have been reported.

2.5.4 Waste Water from Sugar Mills

There are nineteen sugar factories operating in the island, producing an average of 600,000 tonnes of sugar yearly. About 50% of these sugar factories are situated in the proximity of the sea, and in close vicinity of rivers. They start operation in June, lasting for six months every year. Liquid wastes from sugar factories are discharged directly into rivers, without undergoing any treatment, streams or the lagoon. The release of sugar industry wastes has given rise to localized environmental problems, resulting in considerable damage to aquatic life and degradation of the water quality. During the harvest season, certain areas of the lagoon are found to be polluted with soot, carbon particles, traces of oil and other waste discharge from

sugar factories. Mass mortality of fish is occasionally reported from these areas during the crop season.

2.5.5 Coastal Tourism Development

Coupled with the rapid industrialization of Mauritius, the economic importance of tourism has substantially increased in the past two decades. The number of international visitors has increased significantly from 180,000 in 1980 to 375,000 in 1993. Expanded tourism has led to the rapid construction of new hotels and other facilities along the shore-line. Tourism in Mauritius is mainly a sea-oriented activity.

The environmental problems that the coastal tourism development has posed to the marine environment are: release of domestic waste water, leakage from septic tanks, boating, skiing and anchor damage. Grand bay, a highly developed beach resort, could have significantly suffered from all these impacts. However, since surveys conducted in the bay have revealed that most of the corals are dead and it has been turned into a sand desert. In Trou aux Biches and Mont Choisy, which are also important beach resorts, enrichment of the lagoon has led to eutrophication, causing dense algal growth. Population blooms of the crown of thorns, Acanthaster planci and invasion of the beaches by jellyfish occur frequently. Several areas of the lagoons and back-reef are infected with sea urchins, mainly Echinometra mathaei species.

Damage to corals has also been associated with the proliferation of the crown-of-thorn starfish. At Trou aux Biches, it is reported that densities have increased from 30 per 10,000m square in 1971 to 416 for the same area in 1980. Yet, the sustainable development of tourism depends greatly on the state of health of the beaches, lagoons and coral reefs.

2.5.6 Agriculture Run-off

Agriculture occupies approximately 100,000 hectares of land in the mainland of Mauritius. 90% of it is planted under sugar cane and the rest under various types of crops. Modern agricultural techniques involve the use of large quantities of agro-chemicals such as fertilizers and pesticides for optimizing yields.

Mineral enrichment and pesticide contamination of the sea occur through surface leaching during rain and from the normal course of rivers flowing into the sea. Fish kills have been frequently reported in rivers and estuaries. Mineral enrichment has contributed to eutrophication of the lagoon, leading to proliferation of algae, and smothering of live corals.

2.5.7 Solid Waste Disposal

Domestic, commercial, industrial solid wastes collected in the Port Louis area are currently being disposed on a site at Roche Bois located near the shore to the north of Port Louis. Some 100 tonnes of solid wastes are discharged daily at the site and incinerated. Very

often the adjoining lagoon is heavily polluted with solid wastes such as old vehicle tyres, broken glass bottles, plastic containers, scrap metals and ashes. It is reported that the Roche Bois lagoon up to the Tombeau Bay region is in a degrading state, and is further being affected by a sewage contamination and industrial waste discharge. The Terre Rouge Estuary, adjacent to this dumping ground, is a feeding ground for migratory birds. It has been declared as a Bird sanctuary. Contamination of the area could pose a serious health problem to the birds.

2.5.8 Marine Based Pollution

Other sources of marine pollution are from crafts, yachts and boats. There is always the risk of oil waste being discharged directly in the marine environment and oil leakages from cargo ships, tankers and fishing vessels in the harbour and from pleasure crafts in certain parts of the lagoon.

The major sea route utilized by large crude carriers is along the west of Madagascar. A potential risk of crude being discharged in the high seas during cleaning operation or otherwise from such carriers exists. There are reports of oil being drifted from high seas and deposited along the east coast of Mauritius in the form of tar balls. Deposits were reported in 1978, 1987 and 1992. These could have been brought by the western flowing south-Equatorial current.

The biggest threat to the coastal waters of Mauritius comes from pollution arising from possible disasters such as shipwrecks causing oil spills or the spread of hazardous chemicals. An important case of marine pollution occurred in 1972 when the Egyptian vessel the "Tayeb" wrecked on the reefs around Port Louis, releasing some 200 tonnes of oil in the marine environment.

Conscious of the potential hazards to the marine environment in case of a major oil spill, the Government has elaborated a National Oil Spill Contingency Plan to deal with such emergencies occurring in the future.

2.5.9 Marine Transportation

In the past few years, Port-Louis harbour has witnessed substantial increase in maritime traffic and cargo handling activities and this trend is likely to continue in the coming years with the establishment of the Free Port Zone.

The total tonnage handled in the port significantly increased from 2,872,000t in 1990 to 3,358,900t in 1993. Import of petroleum products have shot up from 570,000 tonnes in 1990 to 620,000 tonnes in 1993. These increases have been the result of rapid industrialization of Mauritius. Export or bunkering of petroleum has remained more or less stable in the past --- amounting to 70,000 tonnes.

The total number of vessels calling into Port Louis during 1993 was 1264 and 1107 in 1990, out of which 356 were fishing vessels and 30 petroleum carrying tankers.

The discharge of petroleum cargo and bunkering activities represent a potential pollution threat to the marine environment. There is oil leakages during bunkering operation in the harbour, specially of diesel oil utilized by large foreign fishing vessels.

2.5.10 Port area Development

Over the past decade, Port Louis harbour, the only port of Mauritius, has undergone substantial development so as to cater for the increasing maritime activities. Land has been reclaimed within the port areas for the setting up of new facilities. A fishing port with a quay of length 60m, with working sheds and offices has been constructed in 1985 in the region of Trou Fanfaron. This work has involved the reclamation of some 6000 square meters of land and dredging to attain a depth of 5m. As an extension of the fishing port, a cold room with a stocking capacity of 250 tonnes has recently been added which has involved further dredging and land reclamation. The dredged materials were carried away on barges and dumped in the Port Louis Channel.

During the past months, some 63 hectares of sea-bottom have been dredged for deepening of the "Canal Anglais" passage by the dredger "Macro Polo." Some 600,000 cubic meters of sand have been dredged, and would be utilized by the construction industry.

A second important site where dredging by "Macro Polo" has been carried out is at Mar Rouge, situated in the northern part of the harbour for construction of cargo handling systems, provision of storage complexes and a coral power station. This operation has involved the dredging of some 686,000 cubic meter of sediments, part of which has been transported to "Chien de Plomb" with a view to creating green space.

The dredging operation in the Port area might have produced effects on the marine environment. It was observed that sediments rich in organic matter were transported towards the Point aux Sables and the Tombeau Bay regions by currents. Mortality of fish has been reported from these two regions. It is presumed that the high Biological Oxygen Demand of the organic wastes depleted the oxygen content of the lagoon waters to a critical level, thereby contributing to fish kills. In all the cases of fish mortality, only small sized fish were affected.

2.5.11 Physical Disturbances

Coral reefs are the most biologically productive of all natural communities, marine or terrestrial. The coral reefs of Mauritius harbour some 36 genera of hermatypic corals. A total of 263 reef species of fish have been described. However, through human activities and natural disturbances, the coral reefs of Mauritius have been severely affected.

Cyclones have been the main causes for the extensive reef damages on the east and south coasts. Siltation is a problem in parts of the lagoons in Mauritius. In the south east from Grand River South East to Mahebourg region, and in the west in the Black River region, where almost all the mountain ranges are in proximity of the sea, soil erosion is a common happening. During cyclones and rainy periods, silt is transported to the lagoon and the coral reefs in these areas. Deposition of silt on the coral communities coupled with decrease in salinity affect the lagoonal coral patches and coral reef as a result of which smothering and death of corals could occur. Many coral habitats and coral reefs have further suffered from dynamite fishing and underwater spear gun fishing. Other types of physical disturbances from which the marine ecosystems have suffered include fish seining, sand and coral mining, illegal fishing methods, dredging, reef-walking and anchoring.

2.6 NAMIBIA

The Republic of Namibia which only achieved its independence in 1990 after a protracted struggle from the oppressive apartheid regime of South Africa has a land area of 824 000 km square but only a population of 1.4 million giving about 1.7 people per square kilometre. To the south Namibia borders with the Republic of South Africa, to the east with Botswana and to the north with the Republic of Angola and Zambia. To the west Namibia has one of the longest coastlines in Africa stretching for 1,400 km along the Atlantic Ocean and has already declared an exclusive economic zone extending to 200 nautical miles.

It is paradoxical that the harsh ecological situation of Namibia has contributed to its pristine maritime zone. Namibia is an arid country with hyper-arid zone stretching all along the coast. In the Namib desert is a narrow tract of land along the entire coast which is no more than 40 km wide and which cannot sustain human habitation. Mean annual rainfall varies from less than 25mm over the coastal Namib desert to 700 mm in the north east. The rate of evaporation from the open water is very high. In the north it is about 2.6m (40% in excess of rainfall) and in the south 3.7m (1,750% in excess of rainfall). It is thus not surprising that there are no perennial rivers within the interior of Namibia and the only major rivers draining into the marine environment are the Cunene River in the northern boundary and the Orange River in the southern boundary.¹¹ Thus there is hardly any land-based source of pollution into marine environment. The only population centres on the coastal zone are the three settlements in Swakopmund, Walvis Bay and Luderitz which are small towns with restricted potential for causing marine pollution. Besides, there is a reserved buffer area in the southern part of the coastal zone extending over 100 km for protecting diamonds where all movements of persons is restricted.

¹¹

See "Namibia Green Plan" presented to the UN Conference on Environment and Development.

Mining, which is big business in Namibia with rich mineral deposits of diamonds, silver, gold, uranium, copper, lead, zinc and graphite, is concentrated in the interior and has no effect on the marine environment. There is important salt mining activity in Swapokmund but this does not constitute any threat to the marine environment. There is a possibility of discovering rich oil reserves and natural gas on land or at sea and several off shore concessions for exploration have been licensed, but these have been subjected to stringent environmental impact assessment. Namibia has already in place one of the best oil spill contingency plans as a component of National Emergency Plan, which should provide an adequate response to any future spills including any from off-shore exploration and exploitation activity.

There has also been open cast diamond mining activity in the south near the Orange River mouth into the sea up to 290 metres beyond the high tide but this has not had any significant effect on the marine fisheries. Recently deep sea mining has been pioneered by De Beer Marine since 1990 using suction devices which suck the sub-sial containing diamonds and automated autonomous mining vehicle from a mother ship. This system enables mining at depths of over 100 metres while conventional dredging of sediments has generally been limited to 50 - 70 metres. The sediment of the ore is however deposited on shore and while there is a potential of affecting lobsters this has not so far been established but the Namibian-German environmental impact monitoring project has recently been initiated.¹²

The coastal waters of Namibia support very rich fishery resources. This is attributed to the cold Benguela currents which flow northwards along the coast and creates the phenomenon of regular upwellings which provide rich nutrients for biological production. The resultant rich fish resources also support an abundance of seabirds and seals.

The threat to Namibian marine environment is thus mainly from ocean vessels but the shipping route is well off the Namibian coast and the swift south westerly currents tend to blow whatever pollution from tankers ballast and other ship operations seaward. Consequently in terms of oil pollution from tanker and other ship traffic the coastline of Namibia can be regarded as low risk. However, there is a considerable number of fishing trawlers operating out of Walvis Bay and Luderitz that carry substantial quantities of fuel oil. Many of the larger vessels seasonally anchor off-shore just north of Walvis Bay. These may be the sources of localized pollution on the beaches. The main threat to Namibia marine environment however is from a major oil spill in case of an accident involving a super tanker. This has been the subject of a recently concluded Oil Spill Contingency Plan¹³.

¹²

see an article entitled "Diamond Mining and the Marine Resources" by Burge W. Odolfsen in "Namibia Brief" No. 18, June 1994.

¹³

See "Oil Spill Contingency Plan - Biological Considerations and Coastal Sensitivity Maps" -- compiled by M. J. O'Toole, Ministry of Fisheries and Marine Resources - July 1993

2.7 TANZANIA

The United Republic of Tanzania was created in 1964 with the Union of Tanganyika and Zanzibar. Tanzania is located on the east coast of Africa bordering the Indian Ocean with Kenya to the north and Mozambique to the south. The country has an area of 945,000 square kilometres of which Zanzibar with its associated islands comprises 2,400 square km. It has a combined coastline of about 1,000km. Mangroves and swamps cover an area of 196,000ha. along the coastline.¹⁴ Tanzania has two drainage systems, one in the west oriented to lake Tanganyika and the other with many rivers including Pangani, Ruvu, Rufiji and Ruvuma draining into the Indian Ocean.

Mainland Tanzania had a population of 22.5 million, while Zanzibar had 0.64 million according to 1988 census. The projection of the 1988 census for 2025 is 33 million. The current estimate is over 26 million. While at the population density on the mainland of about 26 people per square kilometre; it is not densely populated. It has significant population concentration in the three main coastal cities of Dar es Salaam which had a population of 1.4 million and Tanga with a population of 187,155 according to 1988 census. The population of Dar es Salaam population is estimated to be growing at the rate of 8% per annum causing severe strain on the infrastructure.

The three major ports in the country are Dar es Salaam, Tanga and Mtwara. They handle on an annual basis about 4.5, 1.5 and 0.5 million tons respectively in goods coming in and out annually. About one third of the cargo for Dar es Salaam, (1.6 million tons each year), are oil products imported and refined in Dar es Salaam. These products are used for domestic consumption as well as for the landlocked neighbouring countries - Burundi, Rwanda, Uganda, Malawi and Zambia - and for eastern Zaire.¹⁵ There is also very heavy and well organized traffic between Dar es Salaam and Zanzibar both in terms of cargo and passengers.

2.7.1 Major Threats on Marine Pollution

A great number of big tankers pass through off shore of the coast of Tanzania each day. According to UNEP, in any one day about 225 oil tankers move through the waters of the East African Region, making the area one of the busiest oil tanker routes in the world. These include both middle sized and Very Large Crude Carriers (VLCC) and they pose the biggest single threat to the marine environment in the region. So far, Tanzania has been lucky; there has not been

¹⁴

"See National Profile on Marine Pollution for Tanzania" - prepared by B.L.M Bakobi, Director of National Environment Management Council for Regional on Integrated Waste Management in Port Towns and Cities of Eastern and Southern Africa. - Dar es Salaam 26 - 30 June 1995.

¹⁵

See "Maritime Safety Development Programme for SADC Coastal States" p. 40 May 1995 by Nordic Consulting Group.

any major accident involving oil tankers. The only recently reported case was one marine pollution problem in 1994 but it did not result in any severe pollution damage. But a serious accident involving these gigantic tankers so close to the coast is a permanent threat facing the country.

Another major threat of pollution in the Tanzanian ports are oil and chemical spills – especially in case of grounding of an oil or chemical tanker, operational discharges and pumping of dirty oily waters by ships into the sea. Since there is no surveillance plan in Tanzania, there is inevitable disposal of wastes of all sorts at sea, and tar balls are not uncommon along the beaches.

The coastal zone outside the three major cities is not heavily populated and there is little agricultural activity and the use of fertilizers is minimal. So there is not much pollution from that source though the major rivers particularly in the north could contribute to marine pollution from the use of fertilizers and pesticides in the densely populated hinterland of the Kilimanjaro region. Even here however, the problem is not very serious.

The really serious source of pollution in Tanzania is from industrial and domestic wastes particularly in Dar es Salaam. Between 70 and 80 percent of the Tanzania industries are located in Dar es Salaam. The waste management legislation is obsolete and contains many loopholes. To compound the problem, enforcement is hampered by inadequate legislation, lack of well defined mandate, trained manpower, equipment and financial resources. Waste water from over 30 different factories with high polluting potential such as textiles, abbatoirs, breweries and chemical plants is discharged through the Mzimbazi river into the Indian Ocean carrying both organic and toxic industrial waste.¹⁶

It has recently been reported¹⁷ that 95% of the solid wastes collected in Tanzania are disposed of in open dumps. This include both domestic and industrial solid wastes generated in Dar es Salaam, seventy percent of which is disposed of in municipal dumps. Municipal waste water treatment plans are poorly operated and maintained and often have inadequate capacities. Dar es Salaam has nine waste stabilization ponds five of which are serving specific institutions. Currently these are not functioning. Three have been designated to treat industrial waste waters but they are not working properly. A survey of 72 industries in Dar es Salaam in 1993 indicated that 34 plants were discharging waste waters directly to coastal waters, seven were discharged to waste waters stabilizing ponds and the balance appeared to be disposing their waste waters on site. It is estimated that 90% of industrial waste water is discharged to the ocean untreated.

¹⁶

See Report of National Environment Management Council 1992 at p.4

¹⁷

"National Profile on Marine Pollution for Tanzania" op cit. p. 7

It is thus clear that the problem of both industrial and domestic disposal of waste water and sewage is very acute. About 17,250 tones (of noxious hazardous wastes per year mainly from hospitals and medical sources) are also disposed off at a site along with hazardous sludge originating mainly from paint industries. This clearly represents health hazard to the population.

2.8 KENYA

Kenya is situated astride the Equator on the East African coast between Somalia to the north and Tanzania to the south. It has a coastline of more than 500 km. There are two major rivers which drain to the coast - the Tana and the Athi rivers. The Tana river rises in the highland areas in the central part of the country and its major tributaries rise from the Nyahururu Range (formerly Aberdares), Mt. Kenya and the Nyambeni Hills. The river which is joined by other tributaries on its journey to the coast enters the Indian Ocean in Ungwana Bay (formerly Formosa Bay). The river drains some of the most fertile and intensively and extensively farmed land.

The Athi has its sources in the central part and specifically in the Nyahururu Range as well as Kaputei Plain which lie in the south western part of the country entering the Indian Ocean as the Sabaki river just near Malindi. The fertile land drained by the Athi river is not as extensive as that drained by the Tana but it has the misfortune of receiving most of the industrial waste and domestic sewage from Nairobi.

Total population in 1993 was estimated to be 24,968,000 with Nairobi having about 1,346,000, Mombasa 512,390 (1992) and Malindi about 20,000. The northern and north eastern parts are sparsely populated with population concentration mostly in the Central Highlands, the Rift Highlands, the Lake Basin and the narrow Coastal Belt. The coastal area carries a population of slightly over one million. The population is widely distributed but on the whole, the coastal zone is not densely populated except for Mombasa which has a population density of more than 200 per square kilometre. Agricultural activities at the coast are on the whole not intensive and the use of fertilizers and pesticides are not widespread.

2.8.1 Major Sources of Land based Sources of Pollution

Among the sources of land-based pollution into the ocean are sediments transported by rivers described above. It has been estimated by one expert that 55,000 tons of sediments annually is delivered by Athi River alone and the load has increased to well over two million.¹⁸ The Tana river contributes equally large amounts of sediments which result from poor agricultural practices, indiscriminate destruction of trees and vegetation and overgrazing. These activities result in massive soil erosion during the rainy season in the agricultural areas upstream. It is also to be expected that fertilizers and pesticides are also carried to the ocean from the

¹⁸

Onyweny, G.S. Water Development and Environment in Kenya quoted by Mr. F. Muslim in Kenya Report. UNEP Regional Seas Report Studies No. 49 at p. 32.

highland though no research seems to have been conducted on this. The deposit of sediments has led to increasing destruction of coral reefs around Malindi and northern coast thus impeding the development of Malindi Marine National Park and Watamu Marine National Park.

Agriculture based industries at the coast such as sugar processing in Ramisi have seriously compromised local fishery at the lower reach of the Ramisi river through discharge of its waters into the river largely untreated. There is also small scale mining operation of baryta north of Mombasa which uses sea water for production and processing which is normally released back into the sea. This would raise environmental concern as is said to have a high concentration of ore-metal.¹⁹

2.8.2 Waste Generation and Management

The growth of human settlement in the coastal areas particularly in Mombasa and to some extent in Malindi has been phenomenon with the increase in industrial and commercial activities and the growth of tourism and large tourist hotels and other facilities all along the north and south coast. This has resulted in increase of solid wastes both from industrial and domestic sources as well as from sewage. Solid waste has been divided into four categories.

d. Domestic Wastes

This is refuse generated in households and hotels and consists of biodegradable materials such as food remnants vegetables etc. and non-biodegradable materials such as glass and plastic materials.

e. Municipal Wastes

These are wastes from street sweepings and garden weeds as well as logs, leaves and branches of trees. Other wastes in this category include sludges from emptying soakage pits, septic tanks and road gullies as well as debris from building industry.

f. Trade and Industrial Wastes:-

These are wastes from industries and trade premises.

e. Special Wastes:-

This are wastes from hospitals and from chemical industries and offensive trades.

It is stated that according to Municipal Council Report (1991) per capita refuse production in Mombasa is 150 - 200 kg/year giving a total refuse production of 76,859 - 102,478 tones/year collected and dumped at official dump site - which represents 61 % collection, leaving the balance haphazardly scattered in the city.

In Mombasa all collected solid wastes are invariably disposed off by dumping in an uncontrolled manner in a landfill site at Makupa Creek, known as Kibarani. All types of waste (solid and liquid domestic, industrial and hazardous) are deposited without grouping/segregation by type at this landfill which is quite near the sea. No precautionary measures are taken to prevent leachate from polluting the adjoining creek or circumventing run-off during the rainy season.

Mombasa does not have adequate waste water treatment facilities. Nor does Nairobi which discharges its waste into Athi river which eventually empties/drains into the sea. Mombasa municipality has separate sewage systems for domestic sewage and for storm drainage. According to recent reliable information:-²⁰

"The sewage system for domestic waste serves about 17% of the population. The municipal sewage collection system is largely confined to Mombasa Island, where it covers about 40 - 50% of household, and western mainland, where about 75% of the household are sewered. In the northern and southern mainland areas, only small parts of the lands are sewered.

There are two treatment plants for sewage disposal which are located on the island at Kizingo and the west mainland at Kipevu. The Kizingo plant was designed as a primary treatment facility, and discharges into Kilindini Creek. Kipevu plant was designed as a secondary treatment facility and discharges into Kilindini Creek. Neither plant is operating properly and raw sewage is being discharged directly into the creek."

Thus it is clear that the treatment is inadequate both in terms of coverage and operation. It is reported that 59% of the population use pit latrines while the rest use septic tanks whose sludge is disposed of in the local landfill often in an uncontrolled manner. The storm drains also discharge the urban runoff into the sea.

There is also considerable amount of sewage from the large number of beach hotels. Except for two which have installed their own sewage treatment plants, the rest use septic tanks and sewage soakage pit system which are often allowed to overflow into the sea.

2.9 SOUTH AFRICA

REPORT ON POLLUTION PROBLEMS IN SOUTH AFRICA

As the Consultant was unable to carry the mission programme in South Africa due to circumstances beyond his control, explained, in the Combined Mission Report, the information contained herein is obtained from published reports made available to him. It would be useful therefore, to highlight some aspects of marine pollution about South Africa since the solutions attempted there may be of considerable benefit/importance to the other countries of Africa. The information contained here has been obtained from the following sources:-

- Report of the Committee of Inquiry into a National Maritime Policy for the Republic of South Africa - August 1993.
- Marine Safety Development Programme for SADC Coastal States and Malawi, May 1995 - NORDIC CONSULTING GROUP
- Regional Workshop on Integrated Waste Management for Port Towns and Cities in Eastern and Southern Africa, DAR ES SALAAM 26 - 30 JUNE 1995.
- Coastal Oil Spill Contingency Plan - Cape Zone - DEPARTMENT OF ENVIRONMENTAL AFFAIRS FEB, 1994

The declared goal of the South African Maritime policy have been articulated in the Floor Committee Report as being achievement of optimum development assets for the benefit of the nation. The objectives of the National Maritime Policy are:-

- to promote maritime industries, associated with activities and well being of the maritime community;
- to defend the country's maritime interests;
- to protect the natural beauty, biotic diversity and ecosystems of the marine and coastal environments;
- to use the renewable and non-renewable marine resources to the optimum;
- to ensure a healthy maritime environment.

The central role of preventing pollution of the sea by oil; including action to be taken to minimize the impact of an oil spill is the responsibility of the Department of Transport, while the Ministry of Environmental Affairs is responsible for combating pollution of the sea by oil, including protection and cleanubg up measures once the oil has been spilt into the sea.

2.9.2 Description of Coastal/Marine Zone of South Africa

South Africa has a total land area of 1,223,200 km square with a 3,100 km coastline both on the Western Indian Ocean and Southern Atlantic Ocean. It shares borders with Mozambique on the Indian Ocean and Namibia on the Atlantic Ocean. To the North West it shares borders with Mozambique, Zimbabwe, Botswana and Namibia. South Africa is made up of a narrow coastal belt framing a high plateau which rises from 1,000 metres to 1,200 metres up the sea level. The two major rivers are the Orange and the Limpopo.

South Africa is semi-arid with a total population of 40.7 (1995) million with the majority (65.5) of the population living in urban areas. Among the major towns are the port cities of Durban with a population of 3.1 million, Cape Town - 2.5 million, Port Elizabeth - 0.9 million, East London 0.9 million. Other significant ports are Richard's Bay with a population of 70,000 and Saldhana Bay with a population of 20,000.

South Africa is a highly industrialized country with a gross domestic product (GDP) of US\$ 77,883 million and GDP per capita of US\$1,919.²¹ Agriculture accounts only for 11% while industry accounts for 35% with others/services/ accounting for 54%. Due to its past apartheid policies there is a vast difference in income distribution and many communities which have sprung near industrial cities through uncontrollable urbanization have inadequate waste treatment facilities and poor sanitation.

Rapid urbanization and expansion of informal settlement in coastal urban centers, industrialization as well as a growing tourism industry are causing increased pollution of coastal waters. It is estimated that more than three quarters of marine pollution comes from land based sources through ocean, contaminated storm water discharges, and land run-off leachate containing fertilizer and pesticide residues.

Oil spills, ballast discharges from ships and effluents from mariculture industry are potential threats to marine environment. Off-shore accidents of oil tankers are common and result in oil spill which are a constant risk due to heavy seas traffic and adverse weather conditions particularly around the Cape. South Africa has some of the most dangerous waters in the world in terms of navigation hazards. It has also very sensitive estuaries and complex a marine ecosystem which call for comprehensive and strict anti-pollution measures.

2.9.2 Waste Generation and Management

South African's huge industrial sector generates a lot of wastes. This was estimated to amount to 460 million tons in 1991. This includes hazardous wastes from industrial establishments and mining activities which were estimated to amount to 1.9 million tons per year

including medical wastes. Several of the sea hazardous wastes contain cyanides and other constituents which require chemical treatment before they can be disposed in landfill.

There are stringent provisions in the Environment Conservation Act (189) for disposal of hazardous wastes which requires them to be dumped at licensed facilities. Most of the industrial wastes including hazardous wastes are handled by private companies at their own landfill sites. However, incidence of illegal dumping of wastes is a common place.

It is stated that approximately 95% of all municipal wastes in South Africa is disposed of on land, either in open trenches or in sanitary landfills. There is limited recycling of the packaging industry. While most formal urban areas have sewer systems with primary and secondary treatment before discharge into rivers or sea, it is estimated that in 1993, 21 million people did not have adequate sewerage facilities. This represents 31% of urban population including dense informal settlement and 85% of the rural population.²²

Seventy to eighty percent of marine pollutions emanate from land-based sources of pollution. Marine disposal of industrial and sewage effluents is regulated by permit, and occurs through 65 off-shore pipelines - 22 sewage, 31 industrial and 10 mixed. Only eight of these are longer than 500 m but contribute over 85% of the total discharge. The total identified waste discharged as industrial effluents into off-shore areas amounts to 196,300 tons annually while 53,000 and 22,500 of treated sewage wastes are discharged into the surf zones and estuaries respectively. Uncontrolled storm runoff contributes a further 1196,600 tons annually.

There has been a marine research programme since 1974 which monitors all major pipelines as well as a national database which collates all related data. Research so far has shown that the major off-shore pipelines accounting for most of the effluent discharged were found to be operating satisfactorily.²³

With respect to marine pollution from ships which refers to oil, sewage, garbage, ballast water and antifouling paints, or the ship's cargo which may enter the marine environment as a result of accidents, there are Ports and Harbour Regulations which implement the relevant provisions of MARPOL and are applicable to all the seven major ports and harbours. As for ballast water, South Africa conforms to the International Guidelines for Prevention of Introduction of Unwanted Aquatic Organisms and Pathogens from Ships' Ballast Water and Sediment Discharges.

22

National Profile on Marine Pollution Prevention and Management prepared for the Regional Workshop on Integrated Management on Ports Towns and Cities in East and Southern Africa Dar es Salaam June 1995 at p.2

23

See National Profile op. cit. at p. 8

2.9.3 Oil Spill Contingency Plan

The Oil Spill Contingency Plan has been developed under the prevention and combating of the sea by oil Act (No.6 of 1981). Since 1986, the responsibility of ensuring that appropriate actions were taken to minimize the impact of an oil spill was transferred to the Ministry of Environment.²⁴ The Department of the Environment is therefore responsible for coordinating the Oil Spill Contingency Plan and clean up measures. The Department of Transport Affairs responsibility is limited to actions required while the oil is within the confines of the ship.

The Department of the Environment is responsible for:-

- the coordination and implementation of coastal protection and the clean up measures during an oil spill incident;
- The control of Kuswag Vessels and aircraft;
- the control of all dispersant spraying operations;
- the maintenance of dedicated oil spill equipment held by the Department stocks;
- the compilation of Local Coastal Oil Contingency Plans.

In order to structure the action to be taken in the event of an oil spill, various plans have been compiled, each dealing with a particular aspect of the spill situation. although each component is referred to as a plan, each should be read in conviction with the others, as the composite of the Oil Spill Contingency Plan which has become effective in February 1994. These are as follows:-

- Master Plan which is an overall plan setting out the policies to be followed and providing an overview of the actions by the two Departments and other authorities in preparing and implementing the necessary action in the event of threat of an oil spill.
- Plan for Control of Shipping Casualties which sets out the requirement of the Department of Transport in case of salvage.
- Plan for Combatting Oil Spilled at Sea which details the response action that is to be taken at sea.

- Plan for Independent Installations which details the response to be taken in the event of an oil spill at or near a specific installation.
- Local Coastal Plan which details the action to be taken when there is oil impacting on shoreline and which confirms that the impact has occurred. The coastline from the Orange River mouth to Mozambique is divided into a number of Zones each of which has its own specific Local Coastal Plan.

For prevention of oil spills, South Africa is divided into the Western Zone controlled by Cape Town and the Eastern Zone controlled by Durban. In order to minimize loss of time for handling a response, all incidents are reported by the Zone Chief to the Shipping Directorate and the Department of the Environment.

2.9.4 Applicable National and International Conventions

At least 37 national statutes administered by numerous government departments have a bearing on land-related waste generation and pollution. The most significant of these are the Environmental Conservation Act (Act 73 of 1969), the Water Act (Act 54 of 1966 and amendments), Health Act (Act 63 of 1977), the Hazardous Substances Act, (Act 15 of 1973) and the Occupational Health and Safety Act (Act 181 of 1993).

Legislation governing pollution of the marine environment generally conforms with international law conventions to which South Africa is a party as well as with UNEP's Code of Practice of 1993 and the Basel Convention.

South Africa is a party to the following Conventions:-

- International Convention on Civil Liability for Oil Pollution Damage, 1969.
- International Convention relating to Intervention on the High Seas in case of Oil Pollution Casualties, 1969;
- Convention for Dumping of Wastes and Other Matters (London Convention 1972);
- International Convention for Prevention of Pollution from Ships (MARPOL 1973/78);
- International Convention for the Prevention of Pollution of the Sea by Oil 1954/1969;
- International Convention for the Establishment of the Fund for Compensation for Oil Pollution Damage (1971 and Protocol 1976).

It is thus clear that South Africa takes seriously the prevention combating marine pollution. This is hardly surprising. It is realized that between 1965 and 1981 there were 491 shipping accidents registered of which 128 involved tankers.²⁵

CHAPTER III

3. EFFORT TOWARDS IMPLEMENTATION OF AGENDA 21 AND THE PROTECTION OF THE MARINE ENVIRONMENT AT NATIONAL LEVEL

Chapter 17 of Agenda 21 on the Protection of Oceans expressly recognizes the rights and obligations of States as reflected in the provisions of the 1981 Convention on the Law of the Sea which provides the international basis for the protection and sustainable development of the marine and coastal environment. These are spelled out in Part XII of the Convention. The LOS Convention established for the first time in a binding treaty forms the primary obligation of States "to protect and preserve marine environment" (article 192) which was earlier enunciated in Principle 7 of the 1972 Stockholm Declaration and which has now become part of customary international law. The Convention, while recognizing the sovereign right of State to exploit its marine resources, balances that right with the obligation to protect the marine environment. It is expressly stipulated in article 193 that:-

"States have the sovereign rights to exploit their natural resources pursuant to their environmental policies and in accordance with their duty to protect and preserve the marine environment."

For the purpose of carrying out this duty, article 194(1) further stipulates that:-

"State shall take, individually or jointly as appropriate, all measures consistent with this Convention that are necessary to prevent, reduce and control pollution of the marine environment from any source, using for this purpose the best practicable means at their disposal and in accordance with their capabilities, and they shall endeavour to harmonize their policies in this connection." (Emphasis added)

The clause "best practicable" was added in recognition of the difficult economic and technological situation faced by developing countries particularly the African States who would not be in a position to use the most modern means to prevent their activities whether on land or at sea from causing pollution. This however does not amount to a license for any state to conduct its activities without concern as to the deleterious effect it may have on the marine resources of other States. This is clearly brought out in article 194(2) which states that:-

"States shall take all measures necessary to ensure that activities under their jurisdiction or control are so conducted as not to cause damage by pollution to other states and their environment, and that pollution arising from incidents or activities under their jurisdiction or control does not spread beyond the area where they exercise sovereign rights in accordance with this convention."

This is now a well recognized principal of international law the infraction of which involves state responsibility.²⁶ The obligations of States are clearly spelt out in the first four section of Part XII dealing respectively with General Provisions, Global and Regional Cooperation, Technical Assistance and Monitoring and Environmental Assessment. It should be appreciated that most of the African Coastal States have ratified the Law of the Sea Convention - (Eritrea and South Africa are the exceptions among the countries visited) and their activities must be guided by consideration of these provisions which are now considered as embodying rules of generally accepted international law.

The consultant strongly recommended that Eritrea and South Africa ratify the convention. and Eritrea is likely to do so. South Africa adheres to the provisions of the convention but it is still examining the scope and the implication of chapter X dealing with rights of land-locked states and the freedom of their Transiting ships before finally ratifying the convention.

This is so, despite the fact that the principles and rules related to the marine-based pollution introduce remarkable changes into the environmental law of the sea existing prior to the UNCLOS III which have direct implications for navigation in the vast areas encompassed by Exclusive Economic Zone. Part XII treats most extensively all forms of pollution be it from land (accidental or operational) from ships. These aspects were very controversial during the negotiations. What is however reflected in Part XII represents a careful compromise reached between major flag states advocating unrestricted freedom of the sea, and developing countries advocating modification of this freedom by recognizing certain environmental powers of the coastal states.²⁷

Chapter 17 of Agenda 21 specifies two programme areas of direct relevance to protection of the coastal marine areas from pollution. There are:-

- Integrated management and sustainable development of coastal areas including Exclusive Economic Zones;
- Marine Environment Protection.

3.1 INTEGRATED COASTAL ZONE MANAGEMENT (ICZM)

Objectives under the Integrated Management Programme are set out in, paragraph 17.5 outlining the following series of actions:-

²⁶ See in this regard the Trail Smelter Case, Corfu Channel Case and Lake Lannoux Arbitration

²⁷ See Barbara Kwiatkowska - The 200 Mile Exclusive Economic Zone in the New Law of the Sea P. 170

- a) Provide for an integrated policy and decision making process, including all involved sectors, to promote compatibility and balance of uses;
- b) Identify existing and projected uses of coastal areas and their interactions;
- c) Concentrate on well defined issues concerning coastal management;
- d) Apply preventive and precautionary approaches in project planning and implementation, including prior assessment and systematic observation of the impacts of major projects;
- e) Promote the development of methods, such as national resources and environmental accounting, that reflect changes in the value resulting from uses of coastal and marine areas, including pollution, marine erosion, loss of resources and habitat destruction;
- f) Provide access, as far as possible for concerned individuals, groups and organizations to relevant information and opportunities for consultations and participation in planning and decision-making at appropriate levels.

It is submitted that the key to resolving the long term marine pollution problem lie in adopting Integrated Coastal Zone Management (ICZM) approach as advocated in Chapter 17 of Agenda 21. Piece-meal sectoral approach to development which emphasizes on immediately visible benefit to the "developer" without taking into account the cost to other uses and the longterm impact to fragile ecosystem will only accelerate the already visible degradation of the marine environment. This was recognized in the recently held International Conference on Coastal Zone Management which states the following:-

"Integrated Coastal Zone Management has been identified as the most appropriate process to address current and long-term management issues, including habitat loss, degradation of water quality, changes in hydrographic cycles, depletion of coastal resources and adaptation to sea level rise and other impacts of global climate change..."

Some of the African countries visited have realised the urgency to implement integrated coastal zone management to reverse the severe degradation of the marine environment in the process of accelerated economic development. The ICZM if properly planned and vigorously implemented would have the benefit of anticipating and responding to longterm concerns and needs while addressing current challenges and opportunities. However, for an ICZM approach to succeed, it cannot be imposed haphazardly. All the 'stakeholders' must be directly involved so that the plan is not only understood and appreciated by all affected but it is supported by adequate data including their cost and benefit implications. Thus all the government ministries and departments involved in the development process, the municipal and local authorities, the

scientific community, involved NGOs, local communities, including youth and women groups. Before the adoption the ICZM it is essential to hold a series of seminars and/or workshops at local, regional and national levels so that the final programme is a concensus of all the competing and conflicting interests.

The International Conference on Integrated Coastal Zone Management identified the following basic elements of ICZM which should be included in the programme:-

- Identification of priorities and problems in consultation with local interests;
- Identification of opportunities for the future development of coastal-related functions;
- Local and/or national policy and other initiatives to address coastal problems, with clear goals that are understood and supported by the public;
- Legislation and/or institutional arrangements at local, national and, where applicable, regional levels including means and/or authorities for coordination;
- Programme development, integration and implementation over the short-medium-and-long-term including guiding principles, functional planning of land use and terrestrial and marine resource use and analysis of natural resources and socio-economic systems;
- assessment of environmental impacts of development and other coastal activities;
- Education, public awareness and equitable process for the participation of stakeholders;
- system for collection, verification, retrieval, access and management of data and information;
- trained professional, supporting and extension staff;
- programme review and modification including feedback mechanisms into all elements of ICZM;
- wide application of precautionary approach according to the capability of each state; and
- financial resources for multi-year planning, capital investment, and operation and maintenance expenses.

It is clear therefore that what is called for is a move away from haphazard ad hoc development projects, to clearly articulated programmes which take into consideration identified priorities for integrated coastal zone management. Obstacles are however likely to be encountered from vested interests, single-sector oriented bureaucracies, inadequate assessment of coastal and marine resources and competing interests and lack of priorities. Funding is also a major problem. There are also many problems associated with land tenure and other social factors in various countries which may inhibit integrated management.

One of the areas of pressing urgency is to build up national capability to implement integrated coastal zone management which requires multidisciplinary skills. Institutional mechanism is necessary to assess the needs and potential benefits as well as to monitor and assess the programme, collect data and provide active support to the local communities is needed.

It is clear that very few countries in Africa are at the moment ready on their own to conceptualize and implement such ICZM. The ECA could play a useful catalytic role in mobilizing the necessary expertise and funding of initial projects such as regional seminars and workshops where essential elements of ICZM could be fully discussed. Such regional seminars etc could be followed by an international conference involving representatives from Africa states as well as experts invited by ECA where national and regional experiences could be exchanged.

Another critical area here is the building of indigenous capacity. It is encouraging that this need has already been well articulated by the ECA in the Assessment of the Performance of the Africa Economy in 1993 and Prospects for 1994. In that document the former Executive Secretary of ECA has made the following pertinent observation on the economic performance which is equally applicable to this area of ICZM:

"A vital missing ingredient that has often been responsible for Africa's poor economic performance is lack of adequate indigenous capacity in several critical areas of human, institutional and infrastructure development. Capacity building is an unavoidable and complex undertaking, which will need to be sustained over the long term with significant financial outlay and proper treatment of the debt issue. Capacity building is a solid platform from which Africa can be launched on the path of sustainable development and a more equitable distribution of income for the steady reduction of poverty."

It will be impossible to contain and reverse the coastal and marine degradation if the poverty and destitution of the local communities is not addressed. Integrated Coastal Zone Management is one of the best ways of achieving this objective.

It should also be emphasized that ICZM cannot be effective if it is only directed at the national front. The land/ocean interface which creates the need for integrated coastal zone management also creates the need for regional and international cooperation due to the inevitable

transboundary ramifications of this interaction. It is therefore imperative for effective coastal management to include regional cooperation.

One of the essential components of fair integrated coastal zone management is a compulsory environmental assessment policy with clearly established procedures. Several African countries including Ghana,²⁸ Namibia,²⁹ and Nigeria³⁰ have initiated comprehensive national environment policy which include Environmental Impact Assessment legislation. These make it mandatory for any person undertaking any activity which may have significant adverse effect on the environment to present an environmental impact assessment study for consideration before the activity is authorized.

It is important that such environmental assessment policy be considered as fair and equitable to the business community while at the same time it is effective for the protection of the marine environment. Such a policy should avoid unnecessary bureaucratic red tape and should at the same time afford all the parties likely to be affected by the activity a fair opportunity to be heard before a decision to approve or reject a proposal is taken. The procedure should above all be manifestly transparent and decisions taken should be subject to a review procedure and if necessary to appeal before the national courts.

Obviously each country would have to work out its own policy as determined by its perceived needs in the light of its problems. The consultant wishes however to annex a copy of Namibia's Environmental Assessment Policy as an example of what element in his view should be incorporated to come up with a sound workable policy. The Namibia Policy is the most recent having been published in January 1995. It was developed and refined (through a lengthy process) through cross sectoral multidisciplinary consultations and negotiations involving not only all the concerned government ministries and agencies but also local and international professional bodies and consultants as well as the Norwegian Agency for International Development and Swedish International Development Agency. It would thus provide a good model for African countries what may be evolving a strategy for Environmental Assessment not only for the coastal and marine area but also for general purposes.

28 Ghana - Environmental Protection Agency Act, 1994 PART II - Enforcement and Control

29 Namibia Environmental Assessment Policy

30 Nigeria - Environmental Impact Assessment Decree 1992

CHAPTER IV

4. PROTECTION OF THE MARINE ENVIRONMENT

The 1982 Convention on the Law of the Sea defines the marine pollution in art.1(4) as follows:-

"Pollution of the marine environment" means introduction by man, directly or indirectly, of substances or energy into the marine environment, including estuaries, which result or are likely to result in such deleterious effects as harming living resources and marine life, hazardous to human health, hindrance to marine activities, including fisheries and other legitimate uses of the sea, impairment of quality of use of sea water and reduction of other amenities...."

This in turn was adopted from the definition of IMO/FAO/UNESCO/IMO/IAEA/UN/UNEP Joint Group of Experts on Scientific Aspects of Marine Pollution (GESAMP) with only underlined phrases as additions.

As pointed out in Chapter 17 of Agenda 21, land based sources contribute 70% of marine pollution while maritime transport and dumping at sea contribute 10% each. Sewage, nutrients synthetic organic components, sediments, litter and plastics, metals etc. are identified as the main contaminants posing the greatest threat to marine environment. In most of the countries visited sewage was identified as the major contaminant which is source of nutrient and contributing large amount of organic matter which cause deoxygenation. Other nutrients from urban waste waters, industrial discharges and agricultural runoffs act as biostimulants causing additional health hazard in that they carry pathogenic organisms that can cause diseases in human beings from contamination of seafood and beaches.

Industrial effluents may also build up too high concentrations and may represent risk to human beings through contamination of seafood. Synthetic organic compounds particularly pesticides and certain industrial chemicals which are fat-soluble, persistent and largely non-biodegradable may accumulate in sediments and in marine mammals, birds and predators, and enter in the food chain.

Plastic litter is also of major concern because of its persistence and buoyancy. Synthetic nets are now widely used in fishing industry and discarded nets continue to trap animals by "ghost" fishing, and straps and rings entangle sea mammals and fish. Other plastic materials of all sorts accumulate on the beaches.

4.2 SEWAGE DISPOSAL

With respect to the protection of the marine environment, the problem of disposal of domestic sewage and industrial liquid waste is even more acute in all the African coastal cities and towns than that posed by solid wastes. Chapter 17 of Agenda 21 in paragraph 17.27 recommends the following, as priority actions to be considered by States:-

- a) Incorporating sewage concerns when formulating or reviewing coastal development plans, including human settlement;
- b) Building and maintaining sewage treatment facilities in accordance with national policies and capabilities and with available international cooperation;
- c) Locating coastal outfalls so as to maintain an acceptable level of environmental quality and avoid exposing shell fisheries, water intakes and bathing areas to pathogens;
- d) Prompting environmentally sound co-treatments of domestic and compatible industrial effluents, with the introduction where practicable, of controls on the entry of effluents that are not compatible with the system;
- e) Promoting primary treatment of municipal sewage discharged to rivers, estuaries and sea, or other solutions appropriate to specific sites;
- f) Establishing and improving local, national, sub regional and regional (as necessary) regulatory and monitoring programmes to control effluent discharge, using minimum sewage effluent guidelines and water quality criteria by giving, due consideration to the characteristics of receiving bodies about the volume and type of pollutants.

As has been seen from the mission report, with the possible exception of South Africa, none of the African countries visited come anywhere near to meeting those goals. Mauritius however with the initiation of its National Sewage Management Plan in 1990 has a clear strategy which on completion in 2012/2013 should have in place an effective solution to sewage problem. As for the other countries, a strategy is solely needed since at present almost, all sewage is invariably disposed off untreated into the ports, rivers, estuaries and lagoons. This is an urgent problem. To prompt the African countries to action it is recommended that a regional Seminar for Africa on Sewage disposal be convened by ECA with participation and presentation of papers by varying experts on innovative and affordable sewage disposal methods.

4.3 MARINE POLLUTION FROM SHIPPING AND SEA BASED ACTIVITIES

In Agenda 21, it is stated that approximately 600,000 tons of oil enter the oceans each year as a result of normal shipping operations, accidents and illegal discharges. The total amount of oil entering the marine environment is however considerably higher than this. As the study by GESAMP entitled Impact of Oil and Related Chemicals and Wastes³¹ had indicated there is increasing evidence that the input of oil from landbased sources has so far been underestimated; and enclosed and semi-enclosed coastal areas receive far higher amounts than has been indicated. In global estimates, the amount is 2.35 million tons of which 15% comes from natural oil seepage. Anthropogenic sources include chronic discharges from storage facilities and refineries, discharges from tankers and other shipping along the major shipping routes, accidental oil spill and rupture of pipelines. Other sources include river-borne discharges, discharges from industrialized municipal areas, off shore oil production, and from the atmosphere.

Contrary to popular belief experts assert that oil spill have negligible effect on fish population though juvenile fish and crustaceans may be more vulnerable. Adult fish have the ability, and do, in fact swim away from oil slicks. They say that even major accidents have had little long lasting effect on fisheries. Marine wildlife such as turtles, seabirds and mammals are however highly vulnerable. Diving and surface dwelling populations of seabirds and sea otters also are highly vulnerable to oiling.

The enormous growth of offshore oil and gas industry and its steady advance into deeper waters has raised concerns about the impact of its activities on the marine environment, fisheries and other legitimate uses of the sea. While some countries such as Nigeria have large offshore exploitation and exploration almost all other African coastal states have some exploration activities or are contemplating to have such activities. The main discharges in oil activities are drilling-muds and cuttings, production water storage, displacement water and ballast water. Others include cooling water, deck drainage, domestic sewage, well treatment fluids, produced sand, desalination waste and pipeline treatment fluids. There may also be problems from rupture of transportation pipes and blowouts.

GESAMP report has found the pollution potential of exploration and exploitation to be localized around the well head and to involve mainly the tainting of some fish in the immediate vicinity, particularly from the discharge of oil-based mud and cuttings from the exploration drilling. However such taintings have not been found to be long lasting. It is nevertheless suggested that such activities should always be subjected to Environmental Impact Assessment.

The GESAMP experts point out that petroleum causes longterm effect on shallow, near shore areas and coastlines and their habitats which may take long time to recover from the

effects of oil spills. Tropical coastal ecosystems such as mangroves and coral reefs as well as seagrasses of all locations are particularly vulnerable and sensitive due to greater retention of oil and the exposure of many species in their early life stages year round. Damaged coastline may prematurely erode and important habitats may be permanently lost. This information is very important in the preparation of sensitively maps and atlases which are crucial in the preparation of Oil Spill Emergency Contingency Plans.

4.4 OIL CONTINGENCY PLANS

Oil Contingency Plans are particularly important in deciding on the priorities and actions to take in case of a major accidental spill. It should be noted in this regard that of the countries visited very few have completed drawing sensitively atlas for the whole of their coastlines. The countries that have such maps are South Africa, Mauritius and Namibia. Urgent assistance is required to assist all African coastal states to have such maps which are sine qua non for the preparation of Oil Spill Contingency Plan (which should be the goal for each Coastal State to have). It was encouraging to note that each state visited was conscious of the need for oil Spill Contingency Plan and some such as Namibia, Mauritius, Kenya and South Africa already have such plans, though, except for South Africa they are only adequate for minor spills within the port or in the territorial waters. Plans for establishing such plans were at advanced stages in Ghana, Nigeria and Tanzania.

It is indeed important for each country to have its own oil/chemical response centre which is the goal for Oil Spill Contingency Plans. However, assistance is urgently needed to ensure that they have the requisite trained personnel and equipment. Given the heavy financial outlay needed very few countries will be in a position to have fully equipped response centre with the necessary reconnaissance and surveillance equipment. It is therefore strongly recommended that there should be established fully fledged regional or sub-regional chemical/oil pollution response centers in various sub-regions of Africa, with all the necessary equipment and personnel, with remote sensing capability and aircraft for surveillance which would detect and monitor any spill in the region on daily basis. Infact, Seychelles has proposed a project for the establishment of such a regional centre for eastern Africa. This was submitted to IMO in 1991 and has the support of the States in the sub-region. The technical support of the ECA would also be most welcome in this regard.

It is encouraging to note that at the global level, due to measures required by international conventions on prevention of oil pollution the input of oil in the marine environment from maritime operations has decreased during the past three decades. In its report, GESAMP has stated that the entry into force of MARPOL 73/78 Annex 1 in 1983 has had a substantial positive impact in decreasing the amount of oil that enters the sea from transportation activities (input decreasing from 1.47 million tons in 1981 to 0.54 in 1989).³²

CHAPTER V

5. INTERNATIONAL CONVENTIONS ON MARINE POLLUTION

As it is evident from the foregoing country reports each coastal state in Africa is subjected to actual or potential threats of catastrophic dangers from marine pollution from ships either through deliberate discharges, ballasting operations or normal operation discharges. Although accidents particularly involving oil tankers have on the whole been rare internationally, Africa has so far been lucky not to have been affected in a major incident except in the "Katina P" incident of Mozambique in 1987. The threat posed to fisheries particularly lobsters and to the tourist industry in case of a major accident could be phenomenon given the volume and size of oil tanker traffic between Middle East and Europe. This is especially worrying in Eastern and Southern Africa coast where the major shipping routes are close to shore.

Marine pollution knows no maritime boundaries and consequently international approach is required in combatting it. No matter how well drafted, national legislation even if effectively enforced cannot be adequate in protecting the national marine environment. It is therefore strongly recommended that each coastal party actively participate in international measures particularly those under IMO, and become party to international conventions negotiated under its auspices. Many queries were raised with the Consultant concerning the cost-benefit of becoming party to these conventions. Legitimate fears were raised concerning the ability both in terms of financial and material costs of these countries in meeting the obligations to be undertaken by state parties as well as the very real problems of enforcement, given the lack of trained personnel and equipment. The answer in the opinion of the consultant lies in international assistance to enhance capacity building and international regional cooperation to pool resources of these countries to enable them meet their obligations. It is also necessary to create broader awareness of those conventions for many of them confer potential benefit far outweighing the cost of the responsibilities to be assumed by states in becoming parties to these instruments. It cannot be over-emphasized that only state parties can avail themselves of any of the benefits under the conventions. A brief analysis is therefore given below of some of the most relevant convention on marine pollution and on liability and compensation in case of marine pollution damage.³³

5.1 INTERNATIONAL CONVENTIONS FOR THE PREVENTION OF MARINE POLLUTION OF THE SEA BY OIL, 1954, as amended in 1962, 1969 and 1971
Adoption: 12 May 1954
Entry into force: 26 July 1958

One of the earliest indications of marine pollution as a problem requiring international control was pollution of the sea by oil.

³³

The discussion of the conventions is based on the paper prepared by IMO entitled "FOCUS ON IMO - A Summary of IMO Conventions" 2 January 1995

In 1954, the International Convention for the Prevention of Pollution of the Sea by Oil was adopted. It has now been superseded by MARPOL - 73/78 (see below) but is described here because of its historical importance.

Depositary responsibilities for this Convention were passed to IMO when it was established in 1959. As one of its first tasks, the Organization carried out a worldwide enquiry into the general extent of oil pollution, the availability of shore reception facilities and the progress of research on methods of combating the increasing menace. The results of this survey led IMO to convene a conference in 1962, which extended the application of the 1954 Convention to ships of lesser gross tonnage, and which enlarged the prohibited zones.

The Convention prohibits the deliberate discharges of oil or oily mixtures from all seagoing vessels, except tankers of under 150 tons gross and other ships of under 500 tons gross, in specific areas called 'prohibited zones'. In general, these extend at least 50 miles from all land areas, although, zones of 100 miles and more were established in sensitive areas like the Mediterranean sea, the Adriatic Seas, the Gulf, the Red Sea, the coasts of Australia, Madagascar and some others.

The Contracting Parties undertake to promote the provision of facilities for the reception of oil residues and oily mixtures without causing undue delay to ships. The Convention prescribes that every ship which uses oil fuel and every tanker shall be provided with a book in which all the oil transfers and ballasting operations shall be recorded.

The oil record book may be inspected by authorities of any Contracting Party.

Contracting Parties have the right to inform another Contracting Party when one of the latter's ships contravenes the provisions of the Convention. The Government so informed shall investigate the matter and, if satisfied that sufficient evidence is available, case/court proceedings to be taken. The reporting Government and IMO shall be given the result of such proceedings.

Any contravention of the provisions of the Convention shall be an offence punishable under the law of the 'flag' State. Penalties for unlawful discharge outside that State's territorial sea shall not be less than penalties which may be imposed for the same infringements within its territorial sea. The Contracting Governments agreed to report to the Organization the penalties actually imposed for each infringement.

Although the restrictions imposed by the 1954 Convention were very effective, the enormous growth in oil movements during the 1960s made it necessary to introduce more stringent regulations.

This Convention has now been overtaken by MARPOL 73/78 which incorporates new provisions which have become necessary in the light of the enormous increase in oil movement and the development of new technology. It is therefore now of historic importance, and there

is no point in ratifying it for states which have not already done so.

5.2 CONVENTION ON THE PREVENTION OF MARINE POLLUTION BY DUMPING OF WASTES AND OTHER MATTER, 1972.

Adoption: 13 November 1972

Entry into force: 30 August 1975

The Inter-Governmental Conference on the Convention on the Dumping of Wastes at Sea, which met in London in November 1972 at the invitation of the United Kingdom, adopted this instrument, generally known as the London Convention.

The Convention came into force on 30 August 1975 and IMO was made responsible for the Secretariat duties related to it.

The Convention has a global character, and presents a further step towards the international control and prevention of marine pollution. It prohibits the dumping of certain hazardous materials. It also requires a prior special permit for the dumping of a number of other identified materials and prior general permit for other wastes or matter.

'Dumping' has been defined as the deliberate disposal at sea of wastes or other matter from vessels, aircrafts, platforms or other man-made structures, as well as deliberate disposal of these vessels or platforms themselves.

Wastes derived from the exploration and exploitation of sea-bed mineral resources are, however, excluded from the definition. The provision of the Convention shall also not apply when it is necessary to secure the safety of human life or of vessels in cases of force majeure.

Among other requirements, Contracting Parties undertake to designate an authority to deal with permits, keep records, and monitor the condition of the sea.

Other articles are designed to promote regional co-operation, particularly in the fields of monitoring and scientific research.

Annexes list wastes which cannot be dumped and others for which a special dumping permit is required are attached her. The criteria governing the issuing of these permits are laid down in a third Annex which deals with the nature of the waste material, the characteristics of the dumping site and method of disposal.

Thus this Convention is of paramount importance to all coastal states in preventing illegal offshore dumping of all kinds of wastes. It does not have onerous requirements which would inhibit ratification by any coastal state however small. The requirements of designation of an authority to deal with permits in the Contracting States is not difficult. Provisions encouraging

regional cooperation are of particular importance to developing countries to facilitate monitoring and enforcement.

So far, 73 countries with 68.42% of world tonnage have ratified the Convention. It is strongly recommended that any African country which has not yet done so should ratify the Convention.

5.3 INTERNATIONAL CONVENTION FOR THE PREVENTION OF POLLUTION FROM SHIPS, 1973 as modified by the Protocol of 1978 MARPOL 73/78

Adoption: 2 November 1973

Entry into force: 2 October 1983

Despite the action already taken by IMO to deal with oil pollution, far-reaching developments into modern industrial practices soon made it clear that further action, was required.

Accordingly the IMO Assembly decided in 1969 to convene an international conference to draft a convention for placing restraints on the contamination of the sea, land and air by ships. That Convention was adopted in November 1973.

It covers all the technical aspects of pollution from ships, except the disposal of waste into the sea by dumping, and applies to ships of all types, although it does not apply to pollution arising out of the exploration and exploitation of sea-bed mineral resources.

The Convention has two Protocols dealing respectively with Reports on Incidents involving Harmful Substances and Arbitration, and five Annexes which contain regulations for the prevention of various forms of pollution:

- a) pollution by oil;
- b) pollution by noxious liquid substances carried in bulk;
- c) pollution by harmful substances carried in packages, portable tanks, freight containers, or road or rail tank wagons, etc.;
- d) pollution by sewage from ships; and
- e) pollution by garbage from ships.

This Convention as amended by the 1978 Protocol which introduces most welcome measures to prevent the oil tankers from polluting the marine environment through flushing their tankers, and jettisoning the ballast with oily waters into the sea which has been very common

in the past. It incorporates new technical standards for tanker construction which should be most welcome to African States particularly on the West Indian Ocean which have been victims of this practice as can be seen from the prevalence of tar balls on their coast.

The ratification procedure itself is not complicated but technical assistance is necessary for most countries in implementing and enforcing the convention. The Contracting State parties are required to install oil reception facilities at port and this is expensive in most cases. IMO and other international organizations should be prepared to render the necessary assistance to African countries to establish such facilities as well as train the necessary personnel for enforcement. The African countries need not be unduly worried about the technical aspects of the tanker construction standards since hardly any of them are involved in such construction. But they will reap enormous benefit from the diminishing pollution of the marine environment through the strict compliance of such standards in oil tankers construction as it incorporates the 1973 provisions.

So far, 91 states with 92.46% world tonnage have ratified the MARPOL 73/78. It should be noted once again that for those countries which have not already done so, they need only to ratify the 1978 Protocol.

5.4 THE PROTOCOL OF 1978

Adoption: 17 February 1978

Entry into force: 2 October 1983

The International Conference on Tanker Safety and Pollution Prevention held from 6 to 17 February 1978, resulted in the adoption of a number of important measures, including Protocols to SOLAS, 1974. The Conference decided that the SOLAS Protocol should be a separate instrument, and should enter into force after the parent convention.

In the case of MARPOL, however, the Conference adopted a different approach. At that time the principal problems preventing early ratification of the MARPOL Convention were those associated with Annex II

The changes envisaged by the Conference involved mainly Annex I and it was therefore decided to adopt the agreed changes - and at the same time to allow Contracting States to defer implementation of Annex II for three years after the date of entry into force of the Protocol (i.e. on 2 October 1986). By then it was expected that the technical problems would have been solved.

The Protocol makes a number of changes to Annex I of the parent convention. Segregated ballast tanks (SBT) are required on all new tankers of 20,000 dwt and above (in the parent convention SBTs were only required on new tankers of 70,000 dwt and above). The

Protocol also requires that SBTs be protectively located - that is they must be positioned in such a way that they will help protect the cargo tanks in the event of a collision or grounding.

Another important innovation concerned crude oil washing (COW), which had recently been developed by the oil industry, and which offered major benefits. Under COW, tanks are washed not with water but with crude oil (the cargo itself). COW is expected as an alternative to SBTs on existing tankers and is an additional requirement on new tankers.

For existing crude oil tankers a third alternative was permissible for a period of two to four years after entry into force of MARPOL 73/78. This is called dedicated clean ballast tanks (CBT) and is a system whereby certain tanks are dedicated solely to the carriage of ballast water. This is cheaper than a full SBT system since it utilizes existing pumping and piping. When the period of grace expires it requires the use of other systems.

Drainage and discharge arrangements were altered in the Protocol, and regulations for improved stripping systems were introduced.

Some oil tankers operate solely in specific trades between ports which are provided with adequate reception facilities. Some others do not use water as ballast. The TSPP Conference recognized that such ships should not be subject to all MARPOL requirements and they are consequently exempted from the SBT, COW and CBT requirements.

It is generally recognized that the effectiveness of international conventions depends upon the degree to which they are obeyed and this in turn depends largely upon the extent to which they are enforced. The 1978 Protocol to MARPOL therefore introduced stricter regulations for the survey and certification of ships.

This procedure in effect meant that the Protocol had absorbed the parent convention. States which ratify the Protocol must also give effect to the provisions of the 1973 Convention: there is no need for a separate instrument of ratification for the latter. The 1973 MARPOL Protocol should therefore be read as one instrument which is usually referred to as MARPOL 73/78.

So far 91 States accounting for 92.46% of world tonnage have ratified MARPOL 73/78

5.5 INTERNATIONAL CONVENTION RELATING TO INTERVENTION ON THE HIGH SEAS IN CASES OF OIL POLLUTION CASUALTIES, 1969

Adoption: 29 November 1969

Entry into force: 6 May 1975

The Torrey Canyon disaster of 1967 revealed certain doubts with regard to the powers of States, under public international law, in respect of incidents on the high seas. In particular,

questions were raised as to the extent to which a coastal State could take measures to protect its territories from pollution where a casualty threatened that state with oil pollution, especially if the measures necessary were likely to affect the interests of foreign shipowners, cargo owners and even flag States.

The general consensus was that there was need for a new regime which, while recognizing the need for some State intervention on the high seas in cases of grave emergency, clearly restricted that right to protect other legitimate interests. A conference to consider such a regime was held in Brussels in 1969.

The Convention which resulted affirms the right of a coastal State to take such measures on the high seas as may be necessary to prevent, mitigate or eliminate danger to its coastline of related interests from pollution by oil or the threat thereof, following upon a maritime casualty. The coastal State is, however, empowered to take only such action as is necessary, and after due consultations with appropriate interests including, in particular, the flag State or States of the ship or cargoes in question and, where circumstances permit, independent experts appointed for this purpose. A coastal State which takes measures beyond those permitted under the Convention is liable to pay compensation for any damage caused by such measures. Provision is made for the settlement of disputes arising in connection with the application of the Convention.

The Convention applies to all seagoing vessels except warships or other vessels owned or operated by a State and used on Government non-commercial service.

Thus, this is a Convention designed to protect the coastal State faced with imminent threat of marine pollution as a result of a major accident off its coast. The right is however carefully restricted to protect the interest of the flag state and third parties and should only be used sparingly. Any intervention outside the ambit of the Convention, particularly by non-State parties, is prohibited. However, ratification of the Convention does not entail any expenses to the coastal state.

So far, 63 states with 64.99% of world tonnage have ratified the Convention.

5.6 INTERNATIONAL CONVENTION ON OIL POLLUTION PREPAREDNESS, RESPONSE AND CO-OPERATION, 1990.

Adoption: 30 November 1990

Entry into force: 13 May 1995

In July 1989, a conference of leading industrial nations in Paris called upon IMO to develop further measures to prevent pollution from ships. This call was endorsed by the IMO Assembly in November of the same year and work began on a draft convention.

The purpose of the convention is to provide a global framework for international co-operation in combating major incidents or threats of marine pollution. Parties to the convention will be required to establish measures for dealing with pollution incidents, either nationally or in co-operation with other countries. Ships are required to carry a shipboard oil pollution emergency plan, the contents of which are to be developed by IMO. Operators of offshore units under the jurisdiction of Parties are also required to have oil pollution emergency plans or similar arrangements which must be co-ordinated with national systems for responding promptly and effectively to oil pollution incidents.

Ships are required to report incidents of pollution to coastal authorities and the convention details the actions that are then to be taken. The convention calls for the establishment of stockpiles of oil spill combating exercise and the development of detailed plans for dealing with pollution incidents. Parties to the convention are required to provide assistance to others in the event of a pollution emergency and provision is made for the reimbursement of any assistance provided.

The Convention provides for IMO to play an important co-ordinating role.

Very few African coastal states have a well developed National Oil Spill Contingency Plans which could effectively deal with any major accident. With the exception of South Africa which has established a Comprehensive Coastal Oil Spill Contingency Plan which became effective in February 1994, none of the African Coastal States have any effective means of dealing with any large scale major emergency accident involving large oil tankers. Nigeria is in the process of establishing such an National Oil Spill Contingency Plan as are a few other countries but how comprehensive such plans are going to be is not known. Some like Kenya's are restricted to small incidents happening in port or in territorial waters.

International cooperation in case of a major incident is thus the only realistic approach that African countries can hope to save them if a major oil spill occurred off their coast. The Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC) seeks to promote cooperation in combating major incidents and inter alia takes into account the experience gained within existing national arrangements in dealing within such incidents. This Convention is one which should be of major importance to African States particularly those bordering on the Red Sea and on the western Indian Ocean where eastern and southern African countries are situated. This is the major oil transportation artery and the risk of an oil spill is high. An estimated 450 million tons of oil per year goes through the area from Middle East around South Africa annually. An additional 22 million tons transit the region en route to East Africa and South Africa. This transport involves approximately 1200 Very Large Crude Carriers (VLCC with 200,000 tons and above) and 4000 medium sized tanker with an average of 60,000 tons (This data was presented by the representative in Mauritius during a Conference on 24-28 April 1995 on ratification of IMO Conventions on Marine Pollution)

The OPRC Convention requires State parties to put in place the necessary measures to help in meeting Oil Spill Emergencies - which will be expensive. But through regional cooperation and with the assistance of International Organization and other donors, this requirements should not be an insurmountable problem to the ratification of this Convention.

So far the Convention has been ratified by 19 States with 13.17% of world tonnage.

5.7 INTERNATIONAL CONVENTION ON CIVIL LIABILITY FOR OIL POLLUTION DAMAGE, 1969

Adoption: 29 November 1969

Entry into force: 19 June 1975

A major legal issue raised by the Torrey Canyon incident of 1967 related to the basis and extent of the ship or cargo owners' liability for damage suffered by States or other persons as a result of a marine casualty involving oil pollution.

The aim of the Civil Liability Convention is to ensure that adequate compensation is available to persons who suffer oil pollution damage resulting from marine casualties involving oil-carrying ships.

The Convention places the liability for such damage on the owner of the ship from which the polluting oil escaped or was discharged.

Subject to a number of specific exceptions, this liability is strict; it is the duty of the owner to prove in each case that each of the exceptions should in fact operate. However, except where the owner has been guilty of actual fault, he may limit his liability in respect of any one incident to slightly over \$US 125 for each ton of the ship's gross tonnage, with a maximum liability of \$US 14 million for each incident.

The Convention requires ships covered by it to maintain insurance or other financial security in sums equivalent to the owner's total liability for one incident.

The Convention applies to all seagoing vessels actually carrying oil in bulk as cargo, but only ships carrying more than 2,000 tons of oil are required to maintain insurance in respect of oil pollution damage.

This does not apply to warships or other vessels owned or operated by a State and used for the time being for Government non-commercial service. The Convention, however, applies in respect of the liability and jurisdiction provisions, to ships owned by a State and used for commercial purposes. The only exception as regards such ships is that they are not required to

carry insurance. Instead they must carry a certificate issued by the appropriate authority of the State of their registry stating that the ships liability under the Convention is covered.

The advantages of this Convention to the coastal state are obvious. Much care is taken, and, however small the risk of major accidents may be, accidents can always happen and if they impact on the coastal zones, they may be catastrophic to fisheries, mangroves, coral reefs and tourism. This Convention provides for compensation even though this is limited.

Every Coastal State should become a party because the benefits are only available to State parties and their nationals. So far, 91 States with 87.14% world tonnage have ratified the Convention.

5.8 INTERNATIONAL CONVENTION ON THE ESTABLISHMENT OF AN INTERNATIONAL FUND FOR COMPENSATION FOR OIL POLLUTION DAMAGE, 1971

Adoption: 18 December 1971

Entry into force: 16 October 1978

Although the 1969 Civil Liability Convention provided a useful mechanism for ensuring the payment of compensation for oil pollution damage, it did not deal satisfactorily with all the legal, financial and other questions raised during the Conference.

Some States objected to the regime established, since it was based on the strict liability of the shipowner for damage which he could not foresee and, therefore, represented a dramatic departure from traditional maritime law which based liability on fault. On the other hand, some States felt that limitation figures adopted were likely to be inadequate in cases of oil pollution damage involving large tankers. They therefore wanted an unlimited level of compensation or a very high limitation figure.

In the light of these reservations, the 1969 Brussels Conference considered a compromise proposal to establish an international fund, to be subscribed to by the cargo interests, which would be available for the dual purpose of, on the one hand, relieving the shipowner of the burden imposed on him by the requirements of the new convention and, on the other hand, providing additional compensation which under the 1969 Civil Liability Convention was either inadequate or unobtainable.

The Conference recommended that IMO should prepare such a scheme. The Legal Committee accordingly prepared draft articles and the Convention was adopted at a Conference held in Brussels. It is supplementary to the 1969 Civil Liability Convention.

The purposes of the convention are:-

1. To provide compensation for pollution damage to the extent that the protection afforded by the 1969 Civil Liability Convention is inadequate.
2. To give relief to shipowners in respect of the additional financial burden imposed on them by the 1969 Civil Liability Convention such relief being subject to conditions designed to ensure compliance.
3. To give effect to the related purposes set out in the Convention.

Under the first of its purposes, the Fund is under an obligation to pay compensation to States and persons who suffer pollution damage, if such persons are unable to obtain due compensation from such owner or it is not sufficient to cover the damage suffered.

Under the Fund Convention, victims of oil pollution damage may be compensated beyond the level of the shipowner's liability. However, the Fund's obligations are limited so that the total payable to victims by the shipowner and the Fund shall not exceed \$US 30 million for any one incident. In effect, therefore, the Fund's maximum liability for each incident is limited to \$US 16 million.

Where, however, there is no shipowner liable or the shipowner liable is unable to meet his liability, the Fund will be required to pay the whole amount of the compensation due. Under certain circumstances, the Fund's maximum liability may increase to not more than \$US 60 million for each incident.

With the exception of a few cases, the Fund will be obliged to pay compensation to the victims of oil pollution damage who are unable to obtain adequate or any compensation from the shipowner or his guarantor.

The Fund's obligations to pay compensation is confined to pollution damage suffered in the territories including the territorial sea of Contracting States. The Fund is also obliged to pay compensation in respect of measures taken by a Contracting State outside its territory.

The Fund can also provide assistance to Contracting States which are threatened or affected by pollution and wish to take measures against it. This may take the form of personnel, material, credit facilities or other aid.

In connection with its second main function, the Fund is obliged to indemnify the shipowner's liability under the Liability Convention. This portion is equivalent to \$US 100 per ton or \$US 8.3 million, whichever is lesser.

The Fund is not obliged to indemnify the owner if the damage is caused by his wilful misconduct on if the accident was caused even partially because the ship did not comply with certain conventions.

The Convention contains provisions on the procedure for claims, rights and obligations, and jurisdiction.

Contributions to the Fund should be made by all persons who receive oil by sea in Contracting States. The Fund's organization consists of an Assembly of States, a Secretariat headed by a director appointed by the Assembly, and an Executive Committee.

The benefits of this Convention particularly in providing additional compensation from the FUND is obvious. Also where no shipowner responsible can be traced, the victims of pollution will have some financial remedy under the FUND. Besides, no direct financial implication arises for state parties since the contributions to the FUND are mainly by the oil companies who receive oil by sea. All coastal states should therefore ratify the convention.

So far 64 states with 63.87% of world tonnage are parties to the Convention.

CHAPTER VI

6. REGIONAL COOPERATION

As has been emphasized on several occasions in this study, regional cooperation in combating marine environment is not only ideal but indispensable given nature of marine pollution. No country can effectively control marine pollution by concentrating on national efforts however effective. Most of the measures such as stockpiling of equipment for dealing with a major oil spill disaster are so expensive as to be beyond the means of any one African coastal state. It will be more effective if countries in a region or sub-region could pool their resources for such oil spill contingency. They should however have their own national oil contingency plan to deal with small oil spills at port or in territorial waters.

While it may appear that dealing solid waste of sewage is essentially a national problem, when this is ineffective and results in marine pollution it becomes a general problem. While the primary responsibility to deal with pollution problems in the country remains that of the state concerned, this does not in anyway diminish the need for cooperation between states and perhaps to learn from the experience of neighbours.

6.1 UNEP SEA PROGRAMMES

One of the best examples of regional cooperation is through UNEP Regional Seas Programme, which at present include eleven regions. In relation to Africa there is the Mediterranean Region, West and Central African Region, Red Sea and the Gulf of Aden Region and Eastern African Region. The Regional Sea Programme is conceived as an action oriented programme having concern not only for the consequences but also for the causes of environmental degradation encompassing a comprehensive approach to combatting environmental problems through the marine and coastal areas. Each regional action plan is formulated according to the needs of the region as conceived by the Governments concerned. It is designed to link assessment of the quality of the marine environment and the causes of its deterioration with activities for the management and development of the marine and coastal environment. The action plans promote the parallel development of regional legal agreements and action oriented programme activities.³⁴

Nevertheless there has been considerable activities undertaken or proposed by WACAF some of which have already been initiated. They were highlighted in the Report of the Executive Director of UNEP to the meeting of Contracting Parties of WACAF.³⁵

³⁴ UNEP: Achievements and planned Development of UNEP's Regional Sea Programme and comparable Programmes sponsored by other bodies. UNEP Regional Seas Reports and Studies No. 1, UNEP 1982

³⁵ See UNEP(OCA) WACAF 195/54 Rev 1. Report of the Executive Director, Third meeting of Contracting Parties to the Convention for Cooperation in the Protection and Development of the Marine and Coastal Environment of the West and Central African Region.

These include the following projects in the implementation of various of WACAF programme:-

- WACAF/1 : Organization of a Regional Seminar for the Prevention, Monitoring and Control of Marine Pollution in cases of emergency in cooperation with IMO. Two activities took place during 1989 and 1993 ie.:
 - a) Seminar on waste management and release of wastes at sea which took place in Abidjan during 1989 - 1993. The main aims were to focus on the progress made in reducing marine pollution, the dissemination of knowledge on the prevention of marine pollution due to releases and the promotion of control of marine pollution by other sources.
 - b) With regard to coordination of national contingency plans, in order to improve the ability of states to respond to accidental marine pollution either individually or collectively as a region, a Memorandum of Understanding between UNEP and IMO was signed for updating the Ghana-Gambia national Contingency Plans.
- WACAF/2 : Continued support to the Marine Pollution Monitoring and Control Programme in cooperation with FAO, IOC, WHO, and IAEA. Under this programme which involves monitoring of pollution of marine environment of West and Central Africa several workshops have already been held.
- WACAF/3 : Development Programmes for Monitoring, Controlling and Coastal Erosion. Under this programme a Memorandum of Understanding was signed between UNEP and the Organization of Africa Unity (OAU) under which a pilot project for coastal erosion control was setup in Benin in 1991.
- WACAF/4 : Development of Environmental Impact Assessment Programmes for particular Coastal Sites. No progress seems to have been made implementing this project due to lack of financial resources.
- WACAF/5 : Assistance to States in Development of National Environmental Legislation and its harmonization with Abidjan Convention in cooperation with FAO and IMO. This project is yet to be carried out due to lack of funds.
- WACAF/6 : Seminars on the application of the Manual on Methodology for Inventory and Control of Coastal Erosion in cooperation with UNESCO. No activity was carried out on this area between 1989 - 1993.

- WACAF/7 : Establishment of a Regional Documentation Centre on Coastal Erosion. No activity was carried out in this area between 1989 - 1993.
- WACAF/8 : Identification, Establishment and Management of Specially Protected Areas in Cooperation with IUCN. In 1991, an assessment of critical marine and coastal habitats, from the point of view of sustainability of large marine ecosystems in West and Central Africa were carried out by IUCN in West Africa and by IOC in Central Africa.
- WACAF/9 : Determination and Distribution and Status of Manatees in Cooperation with IUCN. Under this programme several activities have been carried out.
 - a) A report on distribution and status of manatees in West Africa was prepared in 1993; Manatees are a genus of herbivorous swimming mammals up to 12 feet of rivers and coasts of tropical Americas, West Indies and West Africa widely hunted for food and or their blubber
 - b) UNEP organized a training course on the conservation of marine mammals in the West African Region in Ghana in 1992.
 - c) A report on support of cetacean monitoring station in north-west Africa was prepared in 1993 under a Memorandum of Understanding with a group of cetacean experts from IUCN.

The West and Central Africa States concluded the Convention for cooperation in the Protection and Development of Marine Coastal Environment of West and Central African Region (WACAF), in March 1981, together with the Protocol concerning cooperation in Combatting Pollution in case of Emergency. WACAF has an ambitious Plan of Action which however has been difficult to implement due to lack of funds. It however remains the most potent instrument of cooperation in combating pollution and environmental degradation in West and Central Africa.

The Convention and Protocol entered into force on 5th August 1984, sixty days after the deposit of the sixth instrument of ratification.

By 1993 the following 10 West and Central African Countries had ratified or acceded to the Convention i.e Cameroon, Congo, Cote d'Ivoire, Ghana, Guinea, Nigeria, Senegal and Togo. The consultant urged Namibia to ratify but received only lukewarm response. It does not appear that Namibia is convinced of the advantages such accession could bring.

EASTERN AFRICA REGIONAL PROGRAMME

The Eastern Africa Regional Seas Programme was adopted by the States of the region in June 1985. The Final Act of the conference include the following instruments:-

- Action Plan for the Protection, Management and development of the Marine and Coastal Environment of Eastern African Region;
- The convention for the Protection Management and Development of the Marine and Coastal Environment of Eastern African Region;
- The Protocol concerning Protected Areas and Wild Fauna and Flora in the Eastern African Region;
- The Protocol concerning cooperation in combating marine pollution in cases of Emergency in the Eastern Africa Region and
- Four conference resolutions, three of them dealing with the programme priorities and the institutions and financial arrangements related to the implementation of the Eastern African regional programme.

The goals and objectives of the Action Plan are given as follows:-

- a) To promote the sustainable development and sound management of regional marine and coastal resources by:
 - i) Enhancing consultations and technical co-operation among the States of the region;
 - ii) Emphasizing the economic and social importance of the resources of the marine and coastal environment;
 - iii) Establishing a regional network of the co-operation on concrete subjects/projects of mutual interests for the whole region;
- b) To establish general policies and objectives and to promote appropriate legislation for the protection and development of the marine and coastal environment on a national and regional level;
- c) To prevent Pollution of the marine and coastal environment within the region originating from activities within the States of the region or from operations primarily subject to the jurisdiction of extra-regional states;
- d) To provide for the protection and rational development of the living resources of the region, which are a natural heritage with important economic and social values and potential, through the preservation of habitats, the protection of species, and careful planning and management of human activities that affect them;

- e) To strengthen and encourage, through increased regional collaboration, the activities of institutions within the region involved in the study of marine and coastal resources and systems;
- f) To improve training and assistance at all levels and in all fields relating to the protection and development of the marine coastal environment;
- g) To stimulate the growth of public awareness, at all levels of society, of the value, interest, and vulnerability of the region's marine and coastal environment.⁻⁶

The Action Plan also contains provisions for environmental assessment, environmental management, environmental legislation, institutional and financial arrangements and supporting measures. Unfortunately the Convention has not yet received adequate number of ratification but it is understood that Tanzania has already presented the necessary documents for approval to the Cabinet. Once this is approved, the Convention will thereafter enter into force.

Once it is in force, it is hoped that this Convention would prove to be an important instrument for regional cooperation in Eastern Africa. The Convention was adopted by the nine countries of the region i.e. France (Reunion), Madagascar, Mauritius, Mozambique, Seychelles, Somalia, United Republic of Tanzania and the European community.

6.2 IMO AND REGIONAL COOPERATION

In 1988 the International Maritime Organization (IMO) prepared its own Global Strategy for the Protection of the Marine Environment following UN General Assembly resolution 42/186 and 42/187 which called on UN agencies to evaluate their programmes in the light of the UNEP report entitled "The Environmental Perspective to the year 2000 and Beyond" and the World Commission on Environment and Development (WCED) report "Our Common Future". Subsequent to the Global Strategy the IMO launched a programme of technical assistance on a regional or sub-regional basis to implement regional strategies and action plans for marine environment protection.

East Africa was identified by IMO as one of several "Areas of Concern" due to lack of progress in becoming parties to IMO Conventions on the protection of the marine environment. After broad consultations undertaken by an IMO sub Regional Consultant, Mr. J. P. Muindi with the countries in the region as well as the regional bodies a Strategy and Action Plan for the Protection of the Marine Environment in the Coastal States of Eastern and Southern Africa

(SPMEESA) was adopted.³⁷ Apart from the states concerned consultations were held with the following regional organizations in the process of adoption of the Strategy of Action:-

- Preferential Trade Area Secretariat for Eastern and Southern Africa (PTA)
- Southern Africa Transport and Communications Commission (SATCC). This is a body of the Southern Africa Development Coordination Conference (SADC)
- Ocean and Coastal Area Programme Activity of the United National Environment Programme (UNEP/OCA-PAC)

The overall goal of the regional strategy is to maintain, protect and enhance the quality of marine environment in Eastern and Southern Region. Specifically the Strategy for the Protection of the Marine Environment of Eastern and Southern Africa (SPMEESA) are to ensure that:-³⁸

- a) operational discharges from shipping activities within the region are minimized, are properly disposed of and are regulated by the appropriate international Conventions (MARPOL 73/78) and the Convention for the Protection, Management and Development of the Marine and Coastal Environment of the Eastern African Region and its related protocols;
- b) all countries and territories of the region develop and practice effective marine pollution emergency response plans and capabilities in accordance with the requirement of the OPRC 1990. These should be linked into regional and sub-regional marine pollution response plans in accordance with the Protocol concerning Co-operation in Combating Marine Pollution in cases of Emergency in the East African Region.
- c) marine pollution from dumping at sea is prevented mainly through the implementation of the London Convention.
- d) the provisions of other relevant conventions are implemented. These include those dealing with liability and compensation for marine pollution (CLC 1969 , FUND 1971 and their respective Protocols) as well as the INTERVENTION 1969 Convention and its Protocol; and

³⁷

Strategy and Action Plan for the Protection of the Marine Environment in the Coastal states of Eastern and Southern Africa, published by Port Management of Eastern and Southern Africa in 1995. The author is grateful to Mr. J. P. Muindi, IMO Sub Regional Consultant for East and Southern Africa who prepared the report and allowed him to refer to it in the study.

³⁸

Strategy and Action Plan op cit p. 9

- e) the implementation of conventions is facilitated through the gathering of baseline information, the identification and assessment of marine pollution problems and the development of appropriate remedial solutions.

This ambitious Strategy which was to be implemented between 1993 and 1996 has identified certain specific items which are currently in the process of implementation. These include the following:-

- Integrated Waste Management in Port Towns and Cities.
- Survey/Study on Port Reception Facility Requirement and Costs
- The Development of a Harmonized Regional System for Ship surveying and inspecting;
- Establishment of a Regional Emergency Response Centre;
- Development of a Regional System for Marine Pollution Surveillance;
- Regional Seminar/Workshop on Environmentally Sensitive Area Mapping Preparatory to the Preparation of Environmental Sensitivity Maps;
- Regional Seminar/Workshop on Ratification of International Conventions Relevant to Protection of the Marine Environment;
- Regional Seminar on the Integration of International Maritime Law into National Marine Environmental Protection.
- Coordination of the SPMEESA and the Provision of Technical Services and Support.

This is an ongoing programme of regional cooperation which deserves full support by ECA. It is hoped that as far as the Eastern and Southern region is concerned, any initiative the ECA might wish to take on marine pollution would be in coordination with IMO. Since the problems faced in Eastern and Southern Africa in connection with marine pollution are identical with those in west and central Africa, it is hoped that IMO will institute a similar strategy if it has not already done so.

6.3 SADC AND REGIONAL COOPERATION

It should also be mentioned that SADC has received financing from NORAD to initiate a Maritime Safety Development Programme for its coastal States and for countries bordering lake

Malawi.³⁹ The first phase entitled Fact Finding and Development of Activities was completed in May 1995 by NORDIC CONSULTANT GROUP. While the project is primarily aimed at the Maritime Safety, it nevertheless looks at marine pollution problems in each member state and it recommends that each country should endeavour to improve the situation through bilateral and multilateral agreement. It thus commends the Regional Strategy for the Protection of the Marine Environment initiated by IMO whereby the Port Management Association of Eastern and Southern Africa has been assigned a coordinating role.

ANNEX I

NAMIBIA'S ENVIRONMENTAL ASSESSMENT POLICY

The Government of Namibia:-

RECOGNIZING that Environmental Assessments (EA's) seek to ensure that the environmental consequences of development projects and policies are considered, understood and incorporated into the planning process, and the term **ENVIRONMENT** (in the context of IEM and EA's) is broadly interpreted to include biophysical, social, economic, cultural, historical and political components;

DECLARES the following ENVIRONMENTAL ASSESSMENT policy for Namibia:

1. All listed policies, programmes and projects, whether initiated by the government on the private sector, should be subjected to the established EA procedure as set out in Appendix A. A list of policies, programmes and projects requiring an EA is set out in Appendix B.
2. The EA procedure will, as far as is practicable, set out to:
 - i) better inform decision makers and promote accountability for decisions taken;
 - ii) consider a broad range of options alternatives even addressing specific policies, programmes and projects;
 - iii) strive for a higher degree of public participation and involvement by all sectors of the Namibian community in the EA process;
 - iv) take into account the environmental costs and benefits of proposed policies, programmes and projects;
 - v) incorporate internationally accepted norms and standards where appropriate to Namibia;
 - vi) take into account the secondary and cumulative environmental impacts of policies, programmes and projects;
 - vii) ensure that the EA procedure is paid for by the proponent. In certain cases, such as programmes initiated by the State, it is recognized that the Government is the proponent and will meet the costs of and independent EA;

- viii Promote sustainable development in Namibia, and especially ensure that a reasonable attempt is made to minimize anticipated negative impacts and minimize the benefits of all developments;
 - ix) be flexible and dynamic, thereby adapting as new issues, information and techniques become available.
3. This policy recognizes the inherent need to incorporate adequate provisions to achieve "reduction-at-source" in the areas of pollution control and waste management.
 4. The costs of EAs shall be borne by the proponent who is also responsible for ensuring that the quality of the EA and the EA Report are of an acceptable standard.
 5. The proponent (both Government and Private Enterprises) shall enter into a binding agreement based on the procedures and recommendations contained in the EA report. This will help ensure that the mitigatory and other measures recommended in the EA, and acceptable by all parties, are complied with. This agreement should address the construction, operational and decommissioning phases as applicable, as well as monitoring and auditing.
 6. In terms of the ENVIRONMENTAL ASSESSMENT ACT, an Environmental Commissioner shall be appointed by the Ministry of Tourism, and housed in the office of the National Planning Commission.
 - 6.1 The Environmental Commissioner shall be responsible for administering the EA process as described in Appendix A. This will include legislation, establishing the procedural framework for the process in consultation with the proponent, screening, evaluation and review procedures as appropriate.
 - 6.2 The Environmental Commissioner shall report to an Environmental Board which shall be constituted in terms of the Environmental Assessment Act, and shall consist of senior representatives from various Ministries and other organizations as appropriate. The Board shall be vested with powers to co-opt individuals and specialists where required. In addition to initial screening, the Board shall be responsible for reviews so as to ensure that EA's are of a consistently high standard.
 7. Decisions taken by the Commissioner and/or the Board shall be subjected to appeals according to the normal legal principles and appeal procedures in Namibia.
 8. A record of all decisions by the Board shall be kept. Such records, as well as EA reports, shall be registered, and shall be made accessible and available for public enquiry. The proponent will however, have the right to request confidentiality on specific

information as appropriate.

9. The EA procedure will, at the cost of the proponent, include the ongoing monitoring of policies, programmes and projects after they have been implemented, to ensure that they conform with the recommendations in the EA report as well as the agreement between the proponent and the Environment Board.

ENVIRONMENTAL ASSESSMENT PROCEDURE

1. SUBMISSION OF POLICY, PROGRAMME OR PROJECT

This is the start of the process, when the proponent (be it government or private enterprise), submits a proposal to the Environmental Commissioner, located in the National Planning Commission.

2. REGISTRATION

The Environmental Commissioner officially registers the policy, programme or project proposal, and ensures that the proponent fully understands the EA procedure which needs to be followed. The Commissioner supplies the proponent with the necessary documentation, general guidance, contacts, and any other support which will facilitate a smooth EA process.

3. DEVELOP PROPOSAL

Because Environmental Assessments are designed to, inter alia, (a) facilitate integrated and improved planning during all stages and (b) ensure that the decision-making process is informed and streamlined, for which purpose the following steps are required at the earliest stage:

- notify neighbours and other interested and affected parties;
- establish policy, legal and administrative requirements and procedures framework;
- establish the need for the development, and evaluate this against local, national and international needs on various time scales;
- notify and consult with interested and affected ministries;
- identify and consider alternatives;
- identify and consider issues, opportunities and constraints of alternatives;

- consider migratory options;
- consider management plan options;
- consider fatal flaw & risk analyses, and worst case scenarios;
- consider secondary and cumulative effects within the region.

The above activities are the responsibility of the proponent, but are planned jointly by the proponent, the Commissioner and the Board, who engage in a consultative process at this stage. Through these initial discussions, alternatives, affected parties, potential impacts and benefits, issues, migratory and optimization possibilities, etc., can be identified. Furthermore, a specific framework which clearly spells out roles, responsibilities and procedures should be established.

4. CLASSIFICATION OF PROPOSAL

In consultation with the proponent and his/her consultants, the Board decides on whether this policy, programme or project requires an EA or not. The list of Activities in APPENDIX B should be used to guide this decision. If it is felt that the policy, programme or project is not likely to result in significant impacts and/or that sufficient plans to maximize benefits have already been included, there will be no need for a formal assessment. Alternatively, the Commissioner and/or Board may decide that an EA is required, and they will then discuss the Terms of Reference for the study with the proponent. During this stage, provision is made for individuals and organizations to voice their objections on the proposal.

For large projects, a pre-feasibility study is usually undertaken. Based on the findings of this, a more detailed feasibility study may be conducted. The Terms of Reference for the detailed feasibility study should be established during the pre-feasibility study.

5. ENVIRONMENTAL ASSESSMENT

It should become clear during the **registration or classification of proposal** stages whether there will be significant impacts, and if an EA is necessary or not. There are three main components to an EA.

(i) Scoping

This determines the extent of, and approach to the investigation, and should endorse the Terms of Reference established earlier. The proponent (and his/her consultant), in consultation with the Environmental Commissioner, relevant authorities, interested and

affected parties, determines which alternatives and issues should be investigated. Procedural frame work and report requirements should be followed, It is the responsibility of the proponent to ensure that all the above are given adequate opportunity to participate in this process.

The Scoping process should indicate the following:-

- the authorities and the public that are likely to be concerned and affected;
- methods to be used in informing and involving concerned and affected parties;
- opportunities for public input;
- specific reference to disadvantaged communities regarding the above;
- the use of advisory groups and specialists;
- the composition of the EA team and their Terms of Reference;
- the degree of confidentiality required.

If the proposal is likely to affect people, the proponent should consider the following guidelines in Scoping:-

- the location of the development in relation to interested and affected parties, communities or individuals,
- the number of people likely to be involved,
- the reliance of such people on the resources likely to be effected,
- the resources, time and expertise available for scoping
- the level of education and literacy of parties to be consultant,
- the socio-economic status of affected communities,
- the level of organization of affected communities,
- the degree of homogeneity of the public involved,
- history of any previous conflict of lack of consultation,

- social, cultural or traditional norms within the community,
- the preferred language used within the community.

(ii) Investigation

– The investigation includes literature, research and field work, and is guided by the scoping decisions. It is intended to provide the Board with enough information on the positive and negative aspects of the proposal, and feasible alternatives, with which to make a decision.

(iii) Report

The report consist of the following:

- Executive summary
- Contents page
- Introduction
- Terms of Reference
- Approach to study
- Assumptions and limitations
- Administrative, legal and policy requirements
- Project proposal
- The affected environment
- Assessment
- Evaluation
- Incomplete or unavailable information
- Conclusions and recommendations
- Definitions of technical terms

- List of compilers
- Acknowledgements
- References
- Personal communications
- Appendices

It should also include:-

- Management plan
- Monitoring Programme
- Environmental Agreement
- Audit proposal

6. NO FORMAL ASSESSMENT

If a policy, programme or project is unlikely to result in significant impacts, and plans for maximizing benefits are adequate, then the proposal can proceed without an EA. In the unlikely event of strong opposition to the development at this late stage, the Commissioner could solicit further opinions from specific ministries, specialists, interested and affected parties and the general public. Based on the response, the proposal is either sent back for more information (especially if there is serious uncertainty or significant information gaps), or approval to proceed is confirmed.

7. REVIEW

Once completed, an Environmental Assessment report is submitted to the Environmental Commissioner for review. The Commissioner will review the document with the assistance of local and/or outside experts, sector Ministries, and any other organizations/individuals as considered necessary. The cost of external review shall be borne by the proponent. The recommendations of the Commissioner shall be presented to the Environmental Board which will make a decision on recommendation as appropriate. Such decision shall be recorded and made known to the proponent.

8. CONDITIONS OF APPROVAL

Once a policy, programme or project has been approved, the Board, in consultation with the proponent, may set a number of conditions. Such conditions may provide for the establishment of a management plan, which specifies tasks to be undertaken in the construction, operational and decommissioning phases of the development. By mutual agreement, a monitoring strategy and audit procedure will be determined at this early stage so that the proponent can make necessary budgetary provisions. Provision is also made for an Environmental Agreement, whereby penalties for not adhering to the Conditions of Approval are agreed upon.

9. RECORD OF DECISION

Whether or not a proposal is approved, there should be a record of decision. This Record of Decision should be made available by the Commissioner to any interested party, including the public. Any Conditions of Approval must be reflected in the Record of Decision.

10. APPEAL

The decision-making process provides an opportunity for appeal through the Commissioner and/or the Board. Besides appealing to the decision-making authority, appellants should be allowed access to a court of law if malpractice is suspected.

11. IMPLEMENTATION OF PROPOSAL

Once approved, the policy, programme or project may be implemented in accordance with the Environment Agreement.

12. MONITORING

An appreciable monitoring programme should be required for all approved proposals. Aspects to be covered in Monitoring include verification of impact predictions, evaluation of migratory measures, adherence to approved plans, and general compliance with the Environmental Agreement. The responsibility for ensuring that appropriate monitoring takes place lies with the Commissioner, while the proponent shall be responsible for meeting the costs.

13. AUDITS

Periodic assessments of the positive and negative impacts should be undertaken. These will serve to provide instructive feedback on the adequacy of planning during the Develop Proposal stage, the accuracy of investigations in the Environmental Assessment stage, the

wisdom of the decisions taken during the **Review** stage, and the effectiveness of the **Conditions of Approval** and **Monitoring Programme** during the **Implementation** stage. An audit thus an independent reassessment of the policy, programme or project after a given period of time.

International cooperation in case of a major incident is thus the only realistic approach that African countries can hope to save them if a major oil spill occurred off their coast. The Convention on Oil Pollution Preparedness, Response and Cooperation (OPRC) seeks to promote cooperation in combating major incidents and inter alia takes into account the experience gained within existing national arrangements in dealing with such incidents. This Convention is one which should be of major importance to African States particularly those bordering on the Red Sea and on the Western Indian Ocean where eastern and southern African countries are situated. This is the major oil transportation artery and the risk of an oil spill is high. An estimated 450 million tons of oil per year goes through the area from Middle East around South Africa annually. An additional 22 million tons transit the region en route to East Africa and South Africa. This transport involves approximately 1200 Very Large Crude Carriers (VLCC with 200,000 tons and above) and 4000 medium sized tanker with an average of 60, 000 tons. This data was presented by the representative of IMO in Mauritius during a Conference on 24-28 April 1995 on ratification of IMO Conventions on Marine Pollution.

The OPRC Convention requires State parties to put in place the necessary measures to help in meeting Oil Spill Emergencies - which will be expensive. But through regional cooperation and with the assistance of International Organizations and other donors, this requirements should not be an insurmountable problem to the ratification of this Convention.

So far the Convention has been ratified by 19 States with 13.17% of world tonnage.

ANNEX II

LIST OF RATIFICATION OF MARINE POLLUTION
AS OF SEPTEMBER 1, 1995

ERITREA

IMO CONVENTIONS 58

GHANA

IMO CONVENTIONS 58
MARPOL 73/78
INTERVENTION CONVENTION 69
CLC CONVENTION 69
FUND CONVENTION 71

KENYA

IMO CONVENTIONS 58
MARPOL 73/78
MARPOL ANNEX III
MARPOL ANNEX IV
MARPOL ANNEX V
LDC CONVENTION 72
CLC CONVENTION 69
FUND CONVENTION 71

MAURITIUS

IMO CONVENTION 58
MARPOL 73/78
MARPOL ANNEX III
MARPOL ANNEX IV

MAURITIUS (Cont.)

MARPOL ANNEX V
CLC CONVENTION 69
CLC PROTOCOL 76
FUND CONVENTION 71
FUND PROTOCOL 76

NAMIBIA

IMO CONVENTION 58

NIGERIA

IMO CONVENTION 58

CLC CONVENTION 69

LDC CONVENTION 72

FUND CONVENTION 71

OPRC CONVENTION 90

SENEGAL

IMO CONVENTION 58

INTERVENTION CONVENTION 69

CLC CONVENTION 69

OPRC CONVENTION 90

SOUTH AFRICA

IMO CONVENTION 58

MARPOL 73/78

MARPOL ANNEX V

LDC CONVENTION 72

LC AMENDMENT 78

CLC CONVENTION 69

UNITED REPUBLIC OF TANZANIA

IMO CONVENTION