

THE MERITS OF THE REGIONAL SEAS

PROGRAMME FOR SOUTHERN AFRICA

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(LLM) University of Cape Town

BY

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"More than a portrait of pollution, this is a portrait of people - from the artisanal fisherman in the Philippines to the Greek shipowner - who are dependent upon and who draw their livelihoods, from the world's seas. And it is a portrait of what the collective action of communities, governments and international agencies can accomplish"

From "Our Common Seas: Coasts in Crisis"
p3 by Don Hinrichsen

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ABBREVIATIONS

1. RSP - Regional Seas Programme
2. ICES - International Council for the Exploration of the Sea.
3. IMCO - Inter-Governmental Maritime Consultative
4. IMO - International Maritime Organization
5. UNEP - United Nations Environment Programme
6. UN - United Nations
7. EAR - East African Region
8. WACAF - West and Central African Region
9. BOD5 - The 5 day, 20 C, Biochemical Oxygen Denland (BOD5) test is widely used to determine the pollution strength of waste water in terms of oxygen required to oxidize or convert the organic matter to a non-putrescible end-product. The BOD5 is a bioassay procedure that measured the oxygen consumed by living organisms while utilizing the organic matter present in the waste water under conditions as similar as possible to those that occur in nature. To make results comparable, test has been standardized. The BOD5 test is one of the most important in stream pollution control.
10. GESAMP - Group of Experts on the Scientific Aspects of Marine Pollution.
11. SA - South Africa
12. PACOPOSOA - Prevention and Combating of Pollution of the Sea by Oil Act (2 of 1981 (SA)).

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I wish to thank my Supervisors, Professor DJ Devine and Jan Glazewski, for their guidance and constructive criticism.

However, the shortcomings of this work are my own.

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CHAPTER ONE

THE EVOLUTION OF THE REGIONAL SEAS PROGRAMME

1. INTRODUCTION

1.1 THE EVOLUTION OF THE REGIONAL APPROACH

Regional Programmes for the Protection of the Marine Environment began with agencies and organisations that were mainly scientific in nature. These early organisations were research - oriented and although they could recommend action they had no regulatory powers, nor could they initiate any action.

The oldest of such organisation is the International Council for the Exploration of the Sea (ICES) established in 1902. It was active in the North Atlantic and Baltic Sea areas carrying out scientific studies with investigations concerning exploitation of living and non-living marine resources. ICES later became involved with marine pollution studies and as a result set up a committee in 1960 to deal with it. In 1967 ICES set up a working group

"for the purpose of assembling factual data regarding substances harmful or potentially harmful to fisheries being discharged or likely to be discharged in the North Seas and adjacent seas".¹

This was one of the first signs of regional co-operation regarding the environment. Another such organisation was the Inter-Governmental Maritime Consultative Organisation (IMCO) now International Maritime Organisation (IMO).

Before the United Nations Environmental Programme (UNEP) came into existence, IMO, which by 1959 had received recognition as a specialised agency of United Nations (UN) was the only organisation in the field of protection of the marine environment. IMO was charged with the prevention and control of marine pollution from ships. It had a legal committee which was established after the Torrey Canyon disaster to prepare draft conventions to prevent and control oil pollution. IMO's legal committee was instrumental in drafting and implementing the following conventions, the 1969 Civil Liability Convention, the 1954 International Convention for the Prevention of Pollution and the 1971 Convention for the Compensation Fund for Oil Pollution Damage among others.²

These conventions all had the reputation of having being drafted as a reaction to a specific pollution disaster. It was therefore clear that the time had come for pollution control measures to be well thought out so as to be capable of dealing

with all kinds of situations, rather than with specific incidents after they had occurred. It was against this background that the IMO Working Group on Pollution was established to survey the entire range of problems regardless of the source.

This Working Group drafted recommendations for adoption by the UN Conference on the Human Environment in 1972. It was under the influence of these recommendations that the Conference made the following declarations. The first declaration upheld the concept of an environment of quality. It stated that

"man has the fundamental right to freedom, equality and adequate conditions of life, in an environment of a quality which permits a life of dignity and well-being and bears a solemn responsibility to protect and improve the environment of the present and future generations"³

and that governments should adopt

"effective national measures for the control of marine pollution including land based sources and concert and co-ordinate their actions regionally and where appropriate on a wider international basis."⁴

It was at the end and as a result of this very revealing conference that UNEP was created and charged with responsibility to "promote international co-operation in the field of environment and to recommend as appropriate policies for adoption".⁵ To be able to meet this responsibility, UNEP in 1974 initiated the Regional Seas Programme (RSP).

1.2 THE REGIONAL SEAS PROGRAMME

The RSP is an action-oriented programme that has divided the seas into 11 regions of 125 states. (See Figure 1 and 2(a) and (b)).

It deals with the causes and consequences of environmental degradation by formulating a comprehensive approach designed according to the needs of each region. Therefore each region has its own action plan which aims at promoting regional and legal agreements. The RSP aims at improving the management of the coastal areas by assessing the quality of the environment and the causes of deterioration.

The RSP has its own assessment component code named "Earthwatch".⁶ It co-ordinates activities with other organisations and states in order to arrange regional agreements successfully. The overall method to be adopted was defined by UNEP's Governing Council as

"promotion of international and regional conventions, guidelines and actions for the control over marine pollution and the protection and management of aquatic resources

the assessment of the state of marine pollution, of the sources and trends of this pollution, and the impact of pollution on human health, marine ecosystems and amenities

and co-ordination of the efforts with regard to environmental aspects of protection,⁷ development and management of marine and coastal resources

and to support the education and training efforts to make possible the full participation of developing countries in the protection, development and management of marine and coastal resources ...".⁸

The regional programmes are aimed at benefitting the states of that region and therefore the governments of the various regions are involved all the way. The actual implementation of the programme is done under the authority of the government, by national institutions, nominated by the government concerned. However, specialised UN bodies and relevant international bodies provide assistance where necessary. It was for this reason that UNEP established an RSP activity centre which co-ordinates the efforts of all those involved.

1.3 THE PROBLEM

This study deals with the problem of marine pollution. It outlines its complexity due to varied origins and effects hence the need for regional co-operation to deal with it. Marine pollution has been defined as

"introduction by man, directly or indirectly of substances or energy into the marine environment (including estuaries) resulting in such deleterious effects as to harm living resources, hazards to human health, hindrance to marine activities including fishing, impairment of quality for use of sea water and reduction of amenities".⁹

This definition has been adopted with little variation and incorporated into UNEP's RSP.

It has been generally accepted that the problem of marine pollution is a unifying one. Irrespective of where it occurs. There is need for regional co-operation in dealing with pollution.

It has therefore been correctly stated

"there is only one ocean and the world is now aware that the future of the ocean will brighten in environmental terms only when it is subjected to international law and regulations which are world wide in scope".

In order to understand clearly the realm of marine pollution it is important to examine the various categories of marine pollution and their effects. It is only with such examination that the task before the RSP can be appreciated. The sources, effects and types of pollutants vary greatly making it a more difficult problem. Pollution may be caused by shipping at sea and oil drilling explorations on the continental shelf. However, the main sources of marine pollution are land based resulting from pollutants introduced from land into the rivers and into the sea by direct coastal fall outs.

1.4 SOURCES OF MARINE POLLUTION

1.4.1 Shipping

This is a most common and most regular instance of marine pollution. Pollution from ships may be intentional as where they discharge oil ballast throw garbage overboard or dispose sewage. However, oil pollution is a major pollutant resulting from shipping activities, whether due to accidental oil spills caused by collision, or ordinary de-blasting procedures. Presently, the most convenient way of transporting oil is by sea.

It is therefore obvious that the only way to deal with the problem at this level is to avoid collisions, oil spills and to eliminate discharges of oily ballast and dumping from ships.

1.4.2. Dumping

Discharging and disposal of waste became increasingly popular between the 1950's and the 1960's. This was due to the relatively inexpensive nature of the exercise and the tightening of controls of dumping on the land.¹⁰ The main kinds of waste introduced into the sea are sewage, industrial waste, radio active matter and military materials. Agricultural run-off such as chemicals, fertilizers and pesticides are also a form of land based pollution.

1.4.3. Sea-bed activities

These are activities such as exploration and exploitation of the sea-bed for oil and gas. For example, pollution may result from the mining of manganese nodules in the international sea-bed area. Other pollution causing activities include collisions between ships and installations and the breaking of pipelines.

1.4.4. Atmospheric pollution

This accounts for three quarters of marine pollution. It includes power stations (nuclear included) built on the coast which discharge radio-active waste into the atmosphere.

Discharges from vehicle exhaust fumes, chimneys and agricultural chemical sprays released into the atmosphere are also eventually precipitated into the sea.

1.5 LONG-TERM IMPACT POLLUTANTS

Studies carried out recently under the auspices of UNEP have produced a list of pollutants that have a long lasting effect on the marine environment. These are the pollutants in the UNEP priority list.

1.5.1 Petroleum hydrocarbons

It may be thought that pollution by petroleum is mainly from ships. This is not the case, even taking into account the dramatic oil spills caused by oil spill disasters. The total amount of oil introduced into the sea is estimated to be 6.113 million tonnes of which, 2.133 million comes from sources involved in transportation by ships and only 0.2 million are a result of tanker accidents. Land based sources such as rivers introduce approximately 1.6 million tonnes yearly, while natural seeps

introduce 0.6 million. An equal amount reaches the sea through the atmosphere. The remaining amount results from coastal oil refineries and coastal municipal waste. These figures refer to the 1970's and 1980's. Therefore, although the transportation of oil by sea and the volume of oil spills has increased over the last 10 years, it can be presumed that even if the figures have changed the proportions for each source will remain basically the same.

1.5.2. Halogenated hydrocarbons

These originate mainly from land use of chlorinated hydrocarbon pesticides in agriculture and forestry. Rain causes them to be washed into rivers or into the atmosphere and ultimately into the sea. Chemicals such as polychlorinated biphenyls (PCB's) raised by industries are released into the atmosphere or into rivers and end up polluting the sea. Around 1972, hydrocarbons such as DDT's and PCB's were reduced. However new pesticides harmful to the marine environment took their place.

1.5.3. Metals

Pollution from metals are from land based sources. Mining operations, smelting activities and manufacturing processes cause iron, manganese, copper, zinc, etc. to pollute the sea through the atmosphere and rivers flowing into the sea.

1.5.4. Radionuclides

These reach the sea through fall outs during the testing of nuclear weapons. This was curtailed by the Treaty Banning Nuclear Weapon Tests in the Atmosphere, Outer Space and Under Water of 1963. Therefore the problem of radionuclides as pollutants has been steadily declining. However, countries not signatories to the treaty continue to carry out these tests. Radio active releases into the atmosphere through peaceful use of radioactivity is comparatively small.

This is because nuclear power reactors when operating normally release an insignificant amount of radionuclides (unless there is an accident). However, with technological advances in the use of nuclear power for energy, the entry of radio active materials into the sea may increase substantially.

1.5.5. Persistent solids

These includes plastics and other solid wastes which apart from having a harmful effect on the ocean ecosystem may be a danger to navigation. Solid waste as opposed to ordinary sewage waste form a small proportion of refuse introduced into

the sea. However, the use and production of plastic is increasing and this may escalate the problem.

1.6 EFFECTS OF MARINE POLLUTION

1.6.1 Living marine resources

Effects of pollution on fish species at sea are not yet clearly documented although it is generally accepted that it has a negative effect on them. The only documented and reported effects are those found among the Baltic seals which suffered reproductive failure as a result of pollution. It was later confirmed that these seals had high levels of DDT's and PCB's in their tissues. Pollution of the coastal area affects marine life seriously. An example would be anadromous fish species which use the estuaries and other parts of the coastal zone as nursery grounds before proceeding to sea.

Anadromous and catadromous species also spawn in the estuaries. Coastal activities resulting in pollution could completely destroy these species. This explains why many stocks of oysters on both the Atlantic and Pacific coasts of North America and the Salmon species, once abundant in the East Coast of Europe, were depleted.¹¹ This is because long before the effects of pollution on the fish stocks are felt at sea the ones in shore will already have been severely affected.

1.6.2 Ecosystems

The effect of pollution on the marine ecosystem is slow and insidious and varies according to the different types of ecological settings. For example the impact of pollution on the Arctic and Antarctic environment can be far more serious than in tropical and sub-tropical regions.

1.6.3 Human health and amenities

Pollutants are absorbed by marine organisms and become more concentrated as they move up the food-chain, thus affecting growth, mortality and reproduction of marine life. It is in some cases unsafe for humans to eat fish containing these substances. In the 1950's in Minimata Bay, Japan, several people died or suffered blindness, muscular weakness and brain damage after eating mercury contaminated fish.¹²

Sewage effluent is a universal and major source of marine pollution. It has been reported that small amounts of sewage are easily broken down by the sea and rendered innocuous but large amounts lead to decomposition and de-oxygenation of

water. When water is de-oxygenated fish eggs will not hatch and fish larvae will not be able to develop into adult fish. Adult fish will also be unable to move to oxygenated waters. Sewage can also cause tides of toxic phytoplankton which kills marine life. Fish stocks, especially oysters, clams, and mussels tend to concentrate the bacteria and viruses from sewage when feeding. The consumption of such fish, raw or partially cooked, which has been exposed to untreated sewage can lead to the transmission of viral diseases such as hepatitis.

Social amenities such as swimming and other recreational users may be affected. Polluted water may contain micro-organisms that are harmful to man and which may result in serious diseases such as typhoid, cholera, respiratory infections and gastro-enteritis. Apart from being unsightly, sewage may have an offensive odour which may completely prevent the use of the coastal area as a recreational ground.

All these effects go to prove that pollution of the sea must be controlled due to the far reaching and serious effects on man and marine life. The RSP is therefore invaluable in dealing with the above - mentioned problems.

1.7 PURPOSE

The aim of this paper is to highlight and examine how the RSP is working to alleviate the problem of marine pollution. This will form the basis for the argument that South Africa should be included in the RSP. This is in the light of the recent political developments and changes taking place which will soon see South Africa re-admitted to participation in the UN generally and UNEP specifically.

1.8 SCOPE AND FORMAT

This dissertation will have 3 chapters within which there will be various sub titles.

Chapter 1 will be in the form of a proposal and will serve as an introduction to the paper. It will have various sub headings, namely the introduction, the problem, the purpose and the methodology. The introduction will discuss the origins and development of a regional approach which finally led to the RSP. The problem stated will relate to marine pollution. The purpose explains the reason behind the study which it aims to achieve.

The methodology will outline where the research was conducted and where the material was obtained.

Chapter 2 will discuss in great detail how the RSP works using two selected regions. It will highlight the successes and drawbacks encountered in initiating and working the RSP in these regions. The two regions are the East African region and the West and Central African region. Both regions are specifically selected as they surround South Africa. These two regions will enable me to study the appropriateness and feasibility of the South African region adopting a similar convention in view of SA's imminent return into active UN membership. Chapter three will analyse the RSP and the merits it holds for South Africa and how it should be implemented. It will argue that South Africa's lengthy coastline of 3 000 kilometers which forms the dividing line between two of the great oceans of the world is threatened by the problem of marine pollution, since it is a major oil tanker route. It will look into the possibility of South Africa being included into the existing region discussed in Chapter 2. Alternatively, it will examine the possibility of a South African region owing to South Africa's unique climate.

1.9 METHODOLOGY

Library research from UNEP and GEM libraries in Nairobi was used to compile this paper. The bulk of the information came from articles and material obtained from the Oceans and coastal Areas Programme Activity Centre of UNEP. Secondary information was also obtained from the UCT Law Library and the Institute of Marine Law, UCT.

FOOTNOTES:

1. UNEP Regional Seas Reports and Studies No 1 "Achievements and planned development of UNEP's Regional Seas Programme" 1.
2. Ramakrishna K, "Environmental Concerns and the New Law of the Sea" Journal of Maritime Law and Commerce 16(1) (1985) 3.
3. United Nations Conference on the Human Environment Principles (1972), cited in Soni 1985, 256.
4. United Nations Conference on the Human Environment Principles, Recommendation No 52 (1952) cited in 1985, 6.
5. Ibid 4.
6. Ibid 1, 13-4, 53.
7. Ibid 1, 3.
8. Ibid.
9. GESAMP (IMO/FAO/UNESCO/WMO/WHO/IAEA/UN/UNEP Joint Group Experts on Scientific Aspects of Marine Pollution) "Reducing Environmental Impacts of Coast Agriculture". Reports and Studies GESAMP (47), 35.
10. Churchill RR & Lowe AV The Law of the Sea 2nd ed (1988) 19, 243.
11. UNEP Regional Seas Reports and Studies No 25 "Marine Pollution in East Africa", 5.
12. (n10) 244.

CHAPTER TWO

THE EAST AFRICAN REGION

2.1 COMPOSITION OF THE REGION

The East African region comprises of four mainland countries, four island states and the surrounding waters which fall within the jurisdiction of these states. It begins from Somalia on the horn of Africa, continues to Kenya and Tanzania on the East Coast of Africa and extends to Mozambique in the South West. It also includes islands in the South West Indian Ocean namely the Comoros, Mauritius, Seychelles and Madagascar, all of which encompass several smaller islands (Refer Figure 3).¹

Mozambique, Somalia, Madagascar, Kenya and Tanzania have broadly speaking, similar geographical characteristics. They consist of

"alternating regimes of beaches, rocky outcrops with fringing coral reefs and large estuarine areas characterised by delta formation and extensive growth of mangrove".²

However, specific characteristics differ in each area as we shall see.

It is important to examine the different geographical characteristics in order to understand the effects of land use practices and human occupancy on the marine environment.

2.1.1 Mozambique

Mozambique has a continental type coastline like Kenya, Somalia and Tanzania, but it is unique in that

"nowhere on the East African coast more than in Mozambique is the effect of great river systems felt on the coastal and marine environment ... most of the coast lies on the Mozambique channel ...".³

This has resulted in the deposition of large volumes of riverine sediments thus facilitating the growth of mangrove forest. Despite these distinct features, Mozambique may still be regarded as a continental type coastline.

2.1.2 Tanzania

Tanzania is characterised by its distinctly

"sandy beaches, rocky outcrops, and developing fringing coral reefs ... and extensive growths of mangroves near the mouth of large rivers such as the Rifi and the smaller intermittent rivers".⁴

Agriculture is practiced along the coast but its potential is not as good as in other parts of the country.

2.1.3 Kenya

Kenya's coast has fringing coral reefs along a distance of 1-2 kms offshore except around the mouths of the Uмба and Ramisi rivers and in Malindi town.

The flooding of the Sabaki and Tana rivers in Malindi has led to a build-up of sediments on the beaches resulting in mangrove growth. Mangrove growth is also found along the mouths of the Uмба and Ramisi rivers for the same reasons.

Kenya's coastline is heavily populated, an estimated one million people living on its 450 kilometers. Approximately one third of these live in Mombasa which is the major seaport. Agricultural produce includes food such as cassava, maize, cowpeas and rice along with export crops such as cashews, coconuts, pineapples, cotton and sisal.

2.1.4 Somalia

Somalia has a much longer coastline than Kenya. It stretches for approximately 3200 kms. About 1 000 of these border the Gulf of Aden in the north and the rest the Indian Ocean. This coastline is a typical East African coast with fringing reefs and sandy beaches occasionally interrupted by rocky outcrops.

2.1.5 Madagascar

Madagascar's coastline is also a typical continental type coast, except that the climate and topography of the adjacent upland systems are widely divergent. Its north-west coast has extensive mangrove growth while the east coast has extensive fringing reefs and coral sand barriers.

2.1.6 Seychelles, Mauritius and Comoros

These three islands are all volcanic islands and their geography is very similar, but the Comoros have a more rugged topography in comparison to Mauritius. Seychelles, on the other hand, has a rugged granitic topography and its islands lie on a relatively broad continental shelf.

2.2 MARINE POLLUTION IN THE AREA

Pollution in the East African region mainly originates from land based sources (See Figure 4, 5 & 6).⁵ This is specifically due to the densely populated settlements on the Coastal region seen in the fact that six major cities in the region are on the coast. Social amenities such as sewage disposal, tend to be inadequate as the population increases. Industrial policies in the region have no regard for the marine environment and would therefore allow the dumping of chemicals and toxic waste into rivers, lagoons, estuaries or the sea. Oil pollution is also a major problem.

It is mainly caused by oil refineries on the coast which handle imported crude oil for onward transportation inland. Oil spills at harbours and discharge of waste oil by the refineries are a major threat to the coastal environment and to living marine resources.

Pollution in the area has also been attributed to

"poor agricultural practice, mismanagement and over-exploitation of forest resources and has resulted in severe soil erosion ... coral reefs and associated biota have been damaged or destroyed through resulting siltation".⁶

Developments such as harbour construction and human settlement projects increase the problem of siltation.

Hence it is clear that socio-economic development in the area without due regard to protection of the environment has resulted in degradation.

2.3 SOURCES OF MARINE POLLUTION IN THE EAST AFRICAN REGION

2.3.1 Industrial pollution

Industrialisation in the area is relatively low. Many of the existing industries are however situated on the coast because harbour facilities for importation or exportation of raw materials of raw materials are readily available there.

Polluting industries, such as breweries and slaughter houses, which discharge organic waste are found in all countries of the EA region. With the exception of the Comoros, textile factories are found in all countries while a cement factory operates in Kenya. Most of these factories discharge their wastes directly into rivers or coastal waters without first treating them. Industrial policy

"is geared towards providing employment and satisfying domestic needs ... little attention seems to be given to the question of pollution ... moreover there are no effluent guidelines for discharge criteria of industrial wastes".⁷

Pollution problems related to industrial waste have already been felt in some of the countries. For example, in Mauritius discharge of effluents with high organic content from sugar cane industries has resulted in a high level of fish mortality due to the depletion of oxygen in the rivers.

In Mozambique, although no reports of damage to marine ecosystems by effluents from textile and cement factories have been made, such damage cannot be ruled out. Tanzania with its 30 different industries including textiles, breweries and chemical plants has a more serious pollution problem than any other country in the region.

For example the distillery at Mbozi disposes of approximately 36 000 litres of molasses a day into Dar-es-Salaam harbour. Wastes from chemical factories discharging organic and toxic wastes and sewage disposals have seriously polluted the Msimbazi river. The variety and nature of pollutants have adversely affected the marine ecosystems the area.

Kenya has very few medium-scale industries. According to a report by the Kenyan government⁸ these industries are agrarian in nature and discharge a low volume of untreated waste into the sea. Thus they have not caused any significant problem. However, things have changed over the last few years due to rapid industrialisation in the area and if this continues it may soon become a problem.

The Comoros, like Kenya, do not yet have a serious industrial pollution problem. The only major industry in the region is the production of an essence from Ylang Ylang plant leaves.

Waste generated by this industry is small and direct discharge into the sea is highly diluted by sea water rendering it harmless. Seychelles is another low industrial activity area.

The only industrial pollutant is sawdust from two furniture factories in the area. This sawdust is dumped into the bay. It causes depletion of oxygen and is therefore detrimental to aquatic life. The factories also discharge used-up wood preservative liquor which contains high levels of copper and arsenic. Although the quantities are

relatively small, they are potentially harmful. It has been scientifically proven that fish contaminated with copper, when eaten by man can be extremely harmful.

Somalia has very few industries on its coast. Mogadishu however has a pollution problem which if unchecked could reach dangerous levels. An abattoir located on the coast slaughters 500 animals per day and discharges raw effluent containing blood, intestinal wastes and suspended solids into a treatment pond. Due to lack of maintenance, however, this waste ends up leaking into the sea. The leakages have resulted in pollution of coastal waters and attraction of sharks close to the shore.

2.3.2 Solid waste

The nature and types of solid waste vary from country to country. In Kenya solid waste is dumped into the Makupa Creek which is the government approved site. It is intended for reclamation purposes.

However, this tipping site has not been operated according to generally accepted environmental principles and standards. Actions such as open air burning of waste and landfill leakages continue to pollute the surrounding waters.

In Tanzania a tipping site is operated on the banks of the River Luhanga near Dar es Salaam. It is a tributary of the Msimbazi river which eventually discharges into the sea. The solid wastes dumped into the site inevitably reach the sea causing serious pollution. Similar pollution problems resulting from such activities exist in Mauritius, Seychelles and the Comoros.

2.3.4 Sewage wastes

Although sewage purification plans exist in the countries of this region, sewage disposal still poses a major pollution threat. This is because where such facilities exist they are quickly rendered inadequate due to the rapidly increasing population and expansion of coastal settlements (Ref Figure 6 & 7).⁹ In Dar-es-Salaam and Maputo, parts of the beaches are so badly polluted that they have completely destroyed the flora and the fauna. Maputo Bay for example, has been closed off to public bathing and fishing for environmental health reasons.¹⁰

In the other regions minor and localised pollution is present but the water is still safe for recreational uses. However, if the problem goes unchecked then it may have serious effects on the use and environment of the sea.

2.3.5 Agricultural waste

Agriculture is an important activity in the countries of the EA region. Intensive land use has led to the use of pesticides and fertilizers to improve production. These chemicals eventually pollute the sea through land run off during the rainy season. Reports from the ministries of Agriculture and Fisheries in the regions say that

"DDT is used extensively for spraying of cotton fields around Magarini in Malindi ... Nampula, Bemba and Manapo in Mozambique".¹¹

2.3.6 Pollutants carried by rivers

Rivers are a main means of transportation of land-based pollutants. The impact of such pollutants on the environment depends on the volume discharged by rivers. Rivers flowing through electric power stations carry oil, waste and poly-chlorinated biphenyls (PCB's) used for insulation of oils in electric transformers. Sewage, industrial and agricultural waste introduce toxic organic and inorganic substances into the sea.

It is therefore clear from the above that activities inland have a severe effect on the marine environment since all waste eventually ends up in the sea via the rivers.

2.3.7 Oil pollution

Petroleum pollution is another environmental threat in the region. Except in the Comoros, Seychelles and Mauritius all countries in the region have oil refineries at the coast (See Figure 8).¹² Oil tankers en route between the Middle East and Europe are another potential source of oil pollution. This has sometimes resulted in oil spills in the region.

Lubricating oil from garages disposed in an unethical manner has also contributed to this kind of pollution. Oil tar discharged into the Msimbazi river in Dar-es-Salaam has destroyed the mangrove habitat and biota in the Msimbazi Creek. Since no studies regarding oil pollution have been carried out in the region it has been difficult to assess impact effectively. However, it is obvious that it is a problem.

2.3.8 Construction and dredging

With the expansion of coastal settlements and maritime trade, pollution due to construction and dredging is inevitable. Port and harbour development have seriously affected the coastal environments in these regions.

A good example is the expansion and development of Mombasa's Kilindini harbour. The deepening of the entrance to the harbour involves major dredging operations which cause suspension of sediments and hence interference with the penetration of light into coastal waters. This adversely affects fisheries and corals. Similar constructions are already taking place in Mozambique's Beira and Port Mutsamudu harbour in Comoros. Pollution problems resulting from such activities are localised in nature but if they occur in every country in the region, however, they may end up becoming a regional problem.

2.4 THE INITIATION OF RSP IN EAST AFRICA

The development of an action plan is made by the governing council of UNEP. However, the initiating of activities is made by one or more states, which are members of UNEP's Government Council, falling under that region. In the East African region it was first suggested by Kenya and Nigeria. In 1980 UNEP responded by organizing an exploratory mission.

The mission was expected to

"assess each states interest in participating in a regional programme,... to consult with governments with a view to identifying activities that could usefully be included as part of a comprehensive action plan..... and to discuss with governments the steps to be followed which might successfully lead to the early adoption of an action plan.....".¹³

The mission members from the various UN organisations were expected to give a report on environmental problems in the region related to their specific field. According to the report, apart from the problem of funding, all states were willing to support the programme. It was from this assessment that UNEP prepared a report on the "Marine environment in the Indian Ocean and its pollution".

UNEP, subsequently in Sept. 1982 convened another workshop in Seychelles which involved experts from the region. It was set

" - to give experts from the region the opportunity to comment upon the sectoral and overview reports and, if appropriate, to present material on issues of regional concern that might not have been adequately addressed in the reports..... to formulate the first draft of an action plan which would identify priority problems of regional concern; and ... to advise the executive direction of UNEP on the further development of an action plan....".¹⁴

The experts from the workshop drew up a priority programme for action which included

"... conservation of marine and coastal ecosystem and wild fauna and flora..... support and training for monitoring and research related to the sources, levels and effects of pollutants;... contingency planning in cases of marine pollution emergencies ... fisheries related projects, environmental impact assessment, environmental education and coastal erosion".¹⁵

The workshop further suggested that negotiations for a regional programme for conservation, protection and management of the marine environment be commenced. A protocol on preservation of the wild flora and fauna was initiated as well as cooperation plans for combating marine pollution. The latter was to be adopted together with the action plan.

UNEP encouraged the linkage of the three because it would provide,

".... a framework for harmonizing national legislation, new legislation relating to

environmental problems, high level consultation among participating Governments on implementation of the regional programme; ... establishment of guidelines for coordinating environment programmes and institutions at the regional and sub-regional level. promotion of accession by non governments within the region to existing global and regional conventions relevant to the environmental concerns of the region;

establishment of a financial framework for continuous coordinated action for the protection of the central and marine environment of the region".¹⁶

After the Seychelles workshop the EAR countries began to concentrate on negotiating legal agreements and arrangements to be made in regard to regional programme. This was undertaken by choosing three experts from each state to prepare reports on the following:-

- (a) national legislation relevant to the marine and coastal environment.
- (b) Natural resources and conservation.
- (c) Socioeconomic activities that may have an impact on the marine coastal environment.

These experts worked in close collaboration with a consultant from FAO visiting each region and giving advice on how the reports should be done. As a result a report on the "Legal Aspects of Protecting and Managing the Marine Environment of the East Africa region"¹⁷ was published. The report analysed the existing

national legislation in each region and identified the gaps and weaknesses that existed. It also set to advise the different states on the legislative requirements that a convention under the RSP would require so as to promote the harmonization of environmental legislation in the region. The following year another report aimed at providing ready information needed for the negotiation of the protocol, on protected areas conservation in the East African region was published by UNEP.

With all these reports at hand UNEP was then ready to prepare a text of an action plan for the EA region.

2.5 THE EAST AFRICAN ACTION PLAN

After several months of preparation the East African Region was finally designated as a Regional Seas Programme region.¹⁸ The main components of the action plan were environmental assessment, environmental management, environmental legislation, financial arrangements and technical support.

Environmental assessment is necessary in order to understand the needs of each area. It considers development in the area and what influence it has on the quality of the environment. This way programmes under the action plan will deal with the problem from the source i.e. if rapid development and population increase is the cause of environmental degradation it will deal with it accordingly.

The second component of the action plan is environment management. It is considered the key to sustainable development. Therefore whereas an assessment will identify development a major cause of pollution, this second component will ensure that all development is environmentally sound. This also includes cooperation among the States in pollution emergencies.

National and regional legislation under the action plan is also strengthened and received from time to time in order to keep up with the new developments. All legislation must also be harmonized so that better controls are achieved. This is especially important with migratory species where conservation efforts must be uniform with those neighbouring states. If not, the efforts will be frustrated.

Supporting measures such as training programmes for personnel, campaigns of public awareness and education on protection of the marine environment is also essential.

Of all the essential components of the action the most important is financial. In order to implement an action plan successfully large sums of money have to be devoted to the region. During the early stages of implementation, international funding is vital. Thereafter, once the regional convention comes into force, governments will begin to make contributions since they will then be legally bound as contracting parties. This financial commitment that comes with the programme has delayed the action plans. For example, the East African action plan cost US\$ 850 000 million to develop. A further US\$ 2 million is needed to complete it.

FOOTNOTES:

1. UNEP Regional Seas Reports and Studies No 8 "Marine Pollution in the East African Region" (1982) 15.
2. UNEP Regional Seas Reports and Studies No 6 "Marine and Coastal Areas Development in the East African Region", 1982, 1.
3. Ibid.
4. Ibid 1.
5. (n1) 14.
6. Ibid 3.
7. Ibid 15.
8. Ministry of Local Government Report (1987) - Kenya.
9. (n1) 23.
10. Ministry of Health Report (1980) Mocambique.
11. (n1) 26.
12. UNEP Regional Seas Reports and Studies No 18 "The Regional Seas Programme: Workplan")1982) 3.
13. UNEP Regional Seas Reports and Studies No 51 "Socioeconomic activities that may have an impact on the marine and coastal environment of the East African Region: National Reports" (1984) 4.
14. UNEP Regional Seas Reports and Studies No 50 "Marine and Coastal conservation in the East African Region: National Reports" (1984) 84.
15. UNEP Report (1982).
16. (n14).
17. FAO/UNEP Report (1983).
18. UNEP Governing Council - Decision 18/13C of 29 April 1980.

CHAPTER THREE

THE WEST AND CENTRAL AFRICAN REGION

3.1 THE REGION

The West and Central African Region (WACAF) covers twenty one coastal states stretching from Mauritania in the north to Namibia in the south and covering nearly 30% of the entire African continent. (See Figure 7)¹

In total the region is 9 million sq km and has been divided into 3 zones due to its large size. The Coastline is 6500 km in length. This region is unique due to its diversity, which ranges from dunes to marshy delta lands, mangroves and steep cliffs. The coastal shelf has an average width of 30 to 50 km but has a length of only 4 km along Angola/Zaire and it increases to about 70 km in the Gulf of Guinea. The region's climate also varies greatly from the Sahara desert in the north to a humid tropical belt which contains two of Africa's largest rivers, the Niger and the Congo in Zaire then to the Kalahari desert again in the south.

3.2 CHARACTERISTICS OF THE REGION

The geology of the region came about as a result of the alteration of glacial and interglacial periods of the continents. It is for this reason that we find drowned coasts between Guinea and Sierra Leone. Cameroon and the countries north of it also have entirely different characteristics with sedimentary formations and sandstone deposits rich in oil.

3.3 SOURCES OF POLLUTION IN THE REGION

3.3.1 Industrial pollution

Pollution control measures in the region are usually not available or inadequate. The major sources of pollution are rivers that flow into the sea carrying industrial waste from factories inland. Such industrial waste is discharged into the rivers during normal operations and as a result of accidental losses. Industrial waste is not the only pollutant that alters the marine environment.

Other industrial activities contribute to the problem. For example it has been reported that

"Beach sand mining for construction and industry does not usually introduce any pollutants to the marine environment but it can cause severe beach erosion which leads to destruction of mangroves."²

The one major source of industrial pollutants in the region is the textile industry which discharges more than 30% of all the polluting substances containing 16% BOD5. This problem is particularly serious in areas where discharges are directly into lagoons. Other industries include beer, soft drinks and spirits. Industries such as mining and processing minerals into fertilizers also discharge considerable amounts of pollutants which include suspended solids containing chemicals. These kinds of pollutants amount to 65% of the total industrial pollution. (Ref Figure 10)³

In comparison to Europe, US and Japan, industrial contamination in the WACAF region has not reached dangerous levels. However if unchecked it may become a big problem.

A UNIDO report indicated that of all industries in the area, few treat their effluents before discharging it. As a result, the coastal waters of major urban centres with industries are clogged with waste. One example is the cement factory in Gabon and Togo which contaminates the nearshore waters turning them pallid grey.

3.3.2 Municipal sewage

This is the most common source of pollution in all regions. Municipal sewage as understood here, contains domestic wastes, organic matter, micro-organisms like bacteria, viruses and parasitic worms. Oil and metal may also be present since municipal drainage systems may be mixed with industrial wastes thus adding chemicals to the sewage.

Areas with inadequate or no sewage facilities account for most municipal pollution. Where there are no such facilities, sewage is dumped directly into the sea. This problem is aggravated in the region by rapid population increase - 8 to 10% of whom live in the towns and villages on the coastal zone generating a direct input of domestic sewage to the coastal zone.⁴

The growing tourist industry contributes to the problem of inadequate sewage facilities since it increases the actual population in the areas frequented by tourists. According to a UNIDO/UNEP Report 1982 a considerable amount of BOD 5 and suspended solids are discharged into the ocean in these areas. (See Figure 8)⁵

3.3.3 Agricultural waste

This is mainly due to fertilizer and pesticide run-off from agricultural lands around the coastal region. With improved agricultural methods and increase in world-wide

demand for agricultural products, use of fertilizers has increased tremendously. The use and production of these fertilizers eventually has deleterious effects on the marine ecology. It leads to pollution through agricultural run off via rivers that flow into the sea. Fertilizer-producing industries in Senegal have an output of 110 000 tonnes/year while Ivory Coast has 85 000 tonnes/year, a high percentage of which ends up in the sea.

However, compared to other regions, the WACAF area has not become an environmental concern. The major problem is found only in estuaries and lagoons where there is very little water movement.

Despite this, it still poses a problem to the marine life in the region. Practically all the fish, crabs and shrimp in the coastal areas are exposed to pesticides which penetrate the organism along with water and food.

3.3.4 Population growth and human activity

The average growth rate in the region is about 3% per annum. A quarter of the population reside on the coast and this will increase as the cities develop. All the major cities of the WACAF region except Kinshasa in Zaire are on the coast. As these cities expand they outstrip the public services hence leading to degradation of the environment.

It has sometimes been argued that the WACAF coast is relatively big and is still sparsely populated in comparison to the East African and the South African coast. However with industrial development proceeding at a fast pace, pollution due to overpopulation is a potential problem. According to the 1980 UNIDO survey, wastes of human origin constitutes 80% of all waste discharged into the sea.⁶ This is mainly because the cities of the region have inadequate, if any, sewage facilities and treatment plants. Although some treatment plants are being planned or constructed, discharges continue into nearby estuaries and lagoons.

3.3.5 Oil pollution

The main sources of oil pollution in the WACAF region is from production, refining and shipping activities. Under-water drilling produces an estimated 0.08 million tonnes per year and about 0.06 million per year is lost due to major accidents, blowouts and spillages during the drilling activity.

According to a 1982 GESAMP report, about 15 000 to 20 000 tonnes of oil is on the surface of the North Atlantic Ocean. This is mainly due to deballasting operations, refinery discharges and losses from pipelines. The best recent estimate of the total input of petroleum to the marine environment is about six million tonnes. Further reports state that pollution by petroleum hydrocarbons is increasing in the coastal waters and beaches of the Gulf of Guinea and the adjacent area. It has also been reported that some sand beaches along the West African coast have been fouled by oily patches, the most significant being around Sierra Leone.

The problem is bound to increase as underwater drilling operations increase especially considering the fact that potential for further discoveries of oil and gas in the region, is high. Oil pollution from shipping has also increased with the tanker traffic transporting crude oil to Europe.

According to the 1978 Portmann report, three quarters of the nations have high levels of oil on the beaches mainly due to off- shore tanker traffic.

3.3.6 Coastal erosion

Coastal erosion has been quoted as being the most serious environmental problem facing West Africa. This has caused coastal villages to move further inland as the sea reclaims their land. Agricultural land is also being claimed by the sea. This problem has reached alarming proportions in small countries like Togo where the sea has advanced 380 metres in only 15 years and the coast is being lost at a rate of 20 metres a year. International scientists are paying attention to the problem and it is hoped that it will be effectively combated under the Regional Seas Programme.

3.3.7 Hazardous wastes

The West African Region has been constantly used by international waste-handling firms as a dumping ground. It is therefore no wonder that reports such as this are common,-

"In 1988, the small coastal town of Koko, in Nigeria, made headlines when local residents suddenly developed unexplained skin rashes and suffered bouts of vomiting, diarrhoea and headaches.

The symptoms were traced to a dump site where investigators discovered that 4 000 tonnes of toxic chemicals wastes, left there by an Italian waste company, was leaking poisons into the air and water."

According to a Greenpeace international report, the following represent attempted shipments or shipments of waste into West Africa:

- "Guinea recently cancelled a five year contract to take 15 million tonnes of pharmaceutical and tanning wastes from Europe; when it discovered that 15 000 tonnes of toxic flyash had been dumped on Kana Island by an American waste firm, the government filed an official protest with the state department and the wastes were eventually returned
- Sierra Leone has accepted toxic incinerator ash from the US containing calcium and Mercury.....
- The government of Benin has agreed to take 5 million tonnes of industrial waste each year from US and Europe.....
- Liberia is considering offers to take hazardous wastes, including contaminated earth, from West Germany.....
- Gabon has agreed to accept radioactive wastes from uranium mining in Colorado, USA.....
- The Congo cancelled a deal to accept one million tonnes of chemical wastes from Europe and the USA.....
- Angola has agreed to dispose of unspecified quantities of toxic waste from Europe."⁸

From the above reports it is clear that West Africa is targeted for dumping because the governments do not have strong environmental policies. The Regional Action plan for WACAF is therefore a solution to these increasing threats to its environment.

3.4 ACTION PLAN FOR THE WEST AND CENTRAL AFRICAN REGION

The WACAF action plan concentrates on three main areas: pollution control, fighting coastal erosion, developing a contingency plan for combating oil spills and strict regulation concerning dumping of hazardous wastes.

The countries of this region met in Abidjan in 1981 and adopted a draft action plan for the region. It called for

"a detailed survey of industrial and agricultural pollutants discharged directly and indirectly into the sea".⁹

The survey is concerned with pollution as to the type, quantity and source so as to enable the WACAF countries manage pollution successfully.

It was agreed by the countries that a joint group on municipal, industrial and government planning assessment be constituted to evaluate the trends and needs of the region.

One of the functions of this joint group was to provide a systematic review of national and industrial development plans along with assessment of their impact on the environment. Afterwards appropriate measures either to eliminate or to reduce damaging environmental effects would be adopted together with long-range plans of action to control pollution.

3.5 CONCLUSION

Looking at the various pollution problems in the region, municipal waste is at present the most frequent, while dumping of hazardous waste is the most serious and dangerous. The problem of hazardous waste is due to lack of strong policies on the issue, whereas the municipal waste problem is due to lack of adequate treatment facilities.

The only possible solution is therefore to have strict controls on pollution issues at a regional level under the RSP. Construction of sewage facilities should also be placed in such a way that it can cater for the increasing population. With all the states participating in the RSP, this will now be possible to achieve as they will be bound to adhere to the set standards as contracting parties to the regional programmes.

FOOTNOTES:

1. UNEP Regional Seas Reports and Studies No 37 "Environmental Management Problems in Resource Utilization and Survey of Resources in the West and Central African Region".
2. GESAMP Report 1980 from UNEP Regional Seas Reports and Studies No 46 "Marine and Coastal Environment of the West and Central African Region and the state of pollution", 42.
3. UNEP Regional Seas Reports & Studies No 46, 52.
4. UNEP Regional Seas Reports & Studies No 42, 54.
5. UNIDO/UNEP Report, 55, Table 14.
6. UNIDO/UNEP Report (1982) 108.
7. Hinrichsen D "Our Common Seas: Coasts in Crisis", 58.
8. (n7).
9. UNEP/UNDP - Regional Seas Report and Studies No 2 "Survey of Marine Pollutants".

CHAPTER FOUR

THE MERITS OF THE RSP FOR SOUTH AFRICA

4.1 INTRODUCTION

The success of the RSP wholly depends on the co-operation and involvement of all coastal countries. The sea is a common heritage and has no physical boundaries - hence it has rightly been described as a "common bowl". Whatever is discharged into the sea on one coast will flow into the coastal waters of another country. Hence ocean pollution in one area will affect other areas. It was reported that

"Toxic chemicals such as pesticides dumped into the Atlantic may very well end up in the South Atlantic or Antarctica. Radioactive waste tossed into the South Pacific may find it's way into the food chain of the Indian Ocean fisheries or even that of the Arctic. DDT residues were found embedded in the fat of Antarctic penguins and seals thousands of kilometers away from the potential source....."¹

It is therefore obvious that the RSP will not achieve its objectives unless all coastal countries are involved. It is fruitless to have an effective action plan in the East African Region, while the neighbouring region of SA does not have similar control measures. If the other coastal states do not have similar policies then the purpose of the action is defeated as waste will inevitably spread from the region that has no stringent RSP controls.

This being the case, it is of utmost importance that SA joins the RSP programme.

The RSP has the potential to succeed in the EAR and WACAF regions. This success may be slowed or completely reversed if SA is not involved in controlling pollution in the area. It was with such a situation in mind that it was stated by Peter Thacher that

".....marine pollution problems are global in scale, and the most efficient way to solve them might be through cooperative programmes at the regional level....."²

The success of the RSP does not depend of the effective programmes in each individual country but the implementation of the programme in every coastal region. When we reach a stage where every country is involved then it will be easier to improve our control measures according to the changing circumstances of each area. It is only then that the problem of marine pollution will be under control. With the setting up of a programme for SA the whole of the southern half of the African continent will have coastal pollution control.

In other words the success of the programme in this part of Africa depends on SA's inclusion in it.

4.2 MARINE POLLUTION IN SOUTH AFRICA

4.2.1 Shipping

The Cape coast has been a major shipping route for many years, because it is the only route that accommodate big tankers. Therefore as the demand for oil increases , so does the volume of traffic. This route is, however, very hazardous due to the strong winds prevailing in the area. This increases the chances of large and dramatic oil spills from accidents involving oil tankers. An estimated 150 million tonnes of oil a year is transported past the SA coast by tankers of an average size of 250 000 tonnes. These ships

"present the coastal state with the probability of very serious pollution by virtue of it's proximity."³

Apart from oil spills due to accidents, oil may be spilled into the sea due to leakages and operational discharges. Under the RSP, SA would have a policy to combat and control oil pollution by ships. SA already has comprehensive legislation on combating of oil pollution from ships (commonly known as PACOPOSOA). This Act would be integrated into the regional seas action plan for South Africa when the latter comes into being. It would be strengthened further by regional cooperation.

4.2.2 Human settlements along the coast

The unchecked increase of human settlements along the coast of SA has contributed to the degradation of the coastal environment in this area. In South Africa most of the residential settlements are along the coast. In the Cape region 90% of the population lies within 100 km of the coast. Construction of residential houses along the coast has also affected the coastal ecosystem. For example estuaries which have always been important as the breeding grounds for marine life have been turned into residential grounds, hence destroying it's ecological importance. It is said that

"...virtually all of the 365 estuaries around the coastline have been altered or affected by human activities to some extent, the Mwatalume estuary was up to 6 metres deep and extended 4 kilometers inland, the mouth at the southern end was relatively stable and life abundant, conditions changed after the expansion of sugar farms to the banks of the river and ultimately on to the floodplain. The natural vegetation holding the banks were (*sic*) destroyed, opening the way for massive siltation ... Today the estuary has

been reduced to a lagoon some 700 metres long and no deeper than 1.5 metres".⁴

The foregoing is just one of the many examples of the results of increased human settlement along the coast.

Such a situation can be prevented under the RSP policy of having environmentally sound development. It entails encouraging development around the coast only if it does not alter and degrade the existing marine environment. Alternatively a conservation policy which prohibits and/or limits development in certain areas can be used to prevent such eventualities.

4.2.3 Municipal waste

Pollution by municipal waste is a direct result of unsustainable population increase. In South Africa 800 million litres of effluent per day are discharged into the sea via 60 pipelines at various points along the coast.⁵ Although these discharges are authorised by the Department of Water Affairs under special conditions, they have continuously led to the degradation of the marine environment. This is mainly because such pipelines are badly managed or situated in the wrong areas. Half of these pipelines are situated near bays which do not have a high volume of movement of water so that the sewage is not effectively diluted. This is worsened by the fact that all the major towns⁶ are situated on bays, and their pipelines discharge into the bays. Another reason is that the pipelines are not built far enough into the sea. As a result, the pollutants tend to accumulate around certain physical features and remain highly concentrated in nearshore waters.

In Cape Town there have been cases where pipelines have broken at the beaches causing serious pollution. This happened at Greenpoint three years ago. The pipeline has now been repaired. However, degradation to the beach is still visible and odors still affect the area.

In the False Bay area of Cape Town at least 60 million litres of industrial effluent is discharged into the nearshore waters per day and 41 storm-water outfalls occur. These outfalls are reported...

"to be highly contaminated with pathogenic viruses and bacteria. Some of them also have levels of suspended solids, nitrates, nitrites and lead that are considerably higher than generally accepted standards".⁵

The problem is aggravated by polluted rivers such as the Eerste River which "carries runoff from agricultural land and sewage effluent from Stellenbosch".

4.2.4 Industrial chemicals

Chemicals and waste discharged into the sea from industries are a major cause of degradation of the marine environment. For example around the Natal coast high levels of DDT and PCB's has been found in the dolphins that feed in that area.

In Port Elizabeth discharge of industrial waste has caused the high level of bacteria and viruses found in the marine life that breed in that area. This is not only harmful to marine life but also to humans who consume them.

Other findings show that the nuclear station situated near Cape Town discharges water at a higher temperature than normal into the nearshore waters. Although the effects of this have not been studied it is obvious that it has a negative effect on marine life and coastal environment in the surrounding area.

4.3 SOUTH AFRICAN REGION

It is proposed that the SA region should include Namibia, Angola, Mozambique, Madagascar and South Africa (See Figure) the former two presently under the WACAF region and Madagascar and Mozambique under the EA region.

All four countries already have working action plans. It would be of great convenience if SA cooperates with them. If SA had to form its own region it may be more difficult than coordinating with countries with existing action plans. It would therefore make the cooperation easier by including these countries in the SA region.

4.4 PROPOSED ACTION PLAN FOR THE SOUTHERN AFRICAN REGION

The steps taken in the development of an action plan have already been outlined in the preceding chapters.

An action plan aims at setting out first and foremost policies that..."promote sustainable development and sound management of regional marine resources..." South Africa already has legislation on conservation and environmental protection. The fundamental principles underlying this existing legislation may be integrated into the action plan.

Another major objective of the proposed action plan would be to prevent pollution of the marine environment. Again South Africa has numerous Acts. For instance the Water Act and the PACOPOSOA aim at preventing pollution from municipal sewage and oil respectively. These Acts and other relevant ones may be used in formulating a pollution prevention policy for the action plan.

Apart from the two above mentioned objectives the action plan has to have certain components. The action plan for the East African region also has these main component policies namely, environmental management, environmental legislation, financial arrangements and supporting measures.

Environmental assessment in most regions is still incomplete but is being encouraged under the various action plans for the region. South Africa is one of the few African countries which is way ahead in research. It has done extensive research on its marine environment for many years. This is mainly because it is involved in offshore mining and is a major shipping country with four major ports. It would therefore be able to provide an environmental assessment which entails adopting the FAO principle of 1988 on sustainable development. It defined it as

"the management and conservation of the natural resource base and the orientation of technological and institutional change in such a manner as to ensure the attainment and continued satisfaction of human needs for present and future generations. Such sustainable development (in agriculture, forestry and fisheries sectors) conserves land, water, plant and animal genetic resources and is environmentally non degrading, technically appropriate, economically viable and socially acceptable".

South Africa's research may also be useful to the neighboring WACAF and East African regions. Nevertheless research in the area has to be strengthened. Social needs and society structures must be given consideration in making plans for the environment around areas with high populations. The action plan should aim at achieving a policy that supports socioeconomic development. The environment should not be protected at the expense of development. It is therefore a question of development versus environment. The two must be carefully weighed so that environmental concerns are not phased out to give way to more pressing economic and development needs. This will be ensured by policy intervention at national and regional levels, so that development does not cause negative ecological change.

From the foregoing it is clear that South Africa will benefit greatly from the RSP. South Africa has much to offer the programme given its considerable progress in coastal research. It will contribute to the existing research data on the coastal environment.

The country as a whole will also benefit since the RSP will lead to improved coastal zone management efforts. As a whole it will strengthen regional cooperation and environmental standards.

Again South Africa has a fairly workable environmental management policy. It has been able combat oil spills successfully on many occasions. However there is need to check industrial development around the coast. Environmental legislation to this effect needs to be part of the action plan. The existing environmental legislation can be improved to meet the RSP standards.

4.5 CONCLUSION

From the foregoing it is clear that the problems and sources of marine pollution in SA are similar to those in the EAR and WACAF regions.

In all three regions marine pollution is mainly due to human population and activities along the coast. Human settlement leads to the generation of municipal waste which has to be deposited in the sea.

Development by man and the need for industrial produce has increased the number of industries along the coast. As a result these industries produce waste which ends up in the sea.

In all three regions each of these activities causes pollution either due to lack of control measures or lack of or inadequate facilities to ensure proper disposal and treatment of waste deposited in the sea.

Nevertheless, industrial and sewage pollution in this region does not, or has not yet, created a significant problem. Regional cooperation will therefore ensure that with rapid industrial development the problem does not reach uncontrollable heights.

From the foregoing findings on the status of the marine environment, it is obvious that SA will benefit from the RSP. Since SA has existing coastal zone management programmes it will easily adopt them into its action plan.

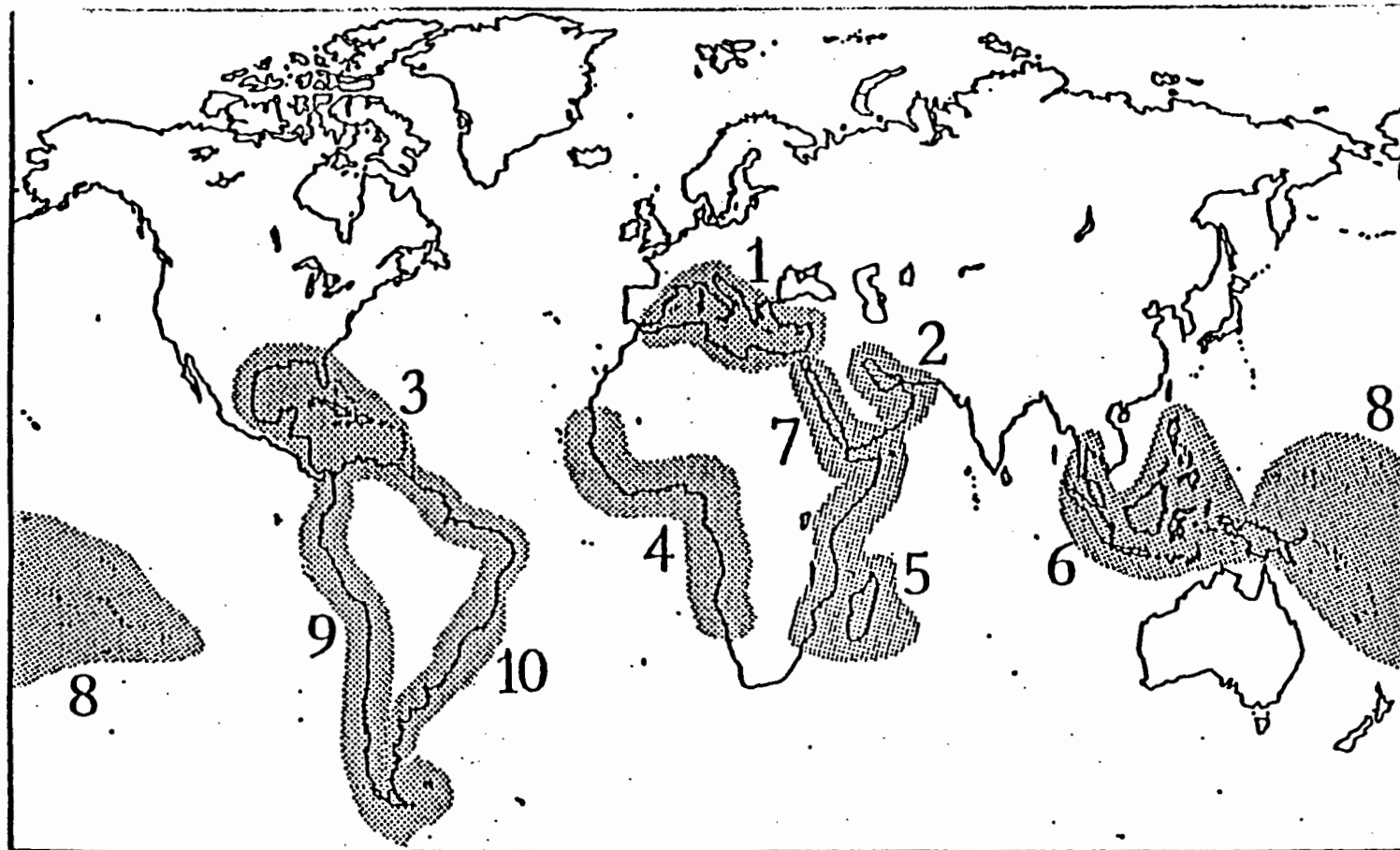
FOOTNOTES

1. Hinrichsen D, "Our Common Seas: Coasts in Crisis", 4.
2. Ibid.
3. Devine DJ, "The Cape's False Bay: A possible Haven for Ships in Distress?" (1990-1) 16 SAYIL 1.
4. Francis M and Glazewski JI, Chapter 13 "The Oceans" in Going Green: People, Politics and the Environment in South Africa J Cock & E Koch (Eds), Oxford University Press, (1991), 193.
5. Ibid 167.
6. Ibid 168.

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18. UNEP Regional Seas Reports and Studies No 50 "Marine and Coastal Conservation in the East African Region: National Reports" (1984).
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22. GESAMP Report (1980) from UNEP Regional Seas Reports and Studies No 46 "Marine and Coastal Environment of the West and Central African Region and the state of pollution".
24. Hinrichsen D, Our Common Future: A Reader's Guide (1987).
25. Manuel F and Glazewski JI, Chapter 13 "The Oceans: Our Common Heritage" in Going Green: People, Politics and the Environment in South Africa J Cock & E Koch (Eds), Oxford University Press, (1991), 193.
26. UNEP/UNDP - Regional Seas Report and Studies No 2 "Survey of Marine Pollutants".

FIGURE 1: GEOGRAPHIC COVERAGE OF UNEP REGIONAL SEAS PROGRAMME



- | | |
|------------------------------------|--|
| 1. Mediterranean Region | (Action Plan adopted, 1975; Regional Convention signed, 1976) |
| 2. Kuwait Action Plan Region | (Action Plan adopted, 1970; Regional Convention signed, 1970) |
| 3. Caribbean Region | (Action Plan adopted, 1981; Regional Convention: in preparation) |
| 4. West and Central African Region | (Action Plan adopted, 1981; Regional Convention signed, 1981) |
| 5. East African Region | (Action Plan preparation initiated) |
| 6. East Asian Region | (Action Plan adopted, 1981) |
| 7. Red Sea and Gulf of Aden Region | (Action Plan adopted, 1982; Regional Convention signed, 1982) |
| 8. South-West Pacific Region | (Action Plan prepared for adoption in 1982) |
| 9. South-East Pacific Region | (Action Plan adopted, 1981; Regional Convention adopted, 1981) |
| 10. South-West Atlantic Region | (Action Plan preparation initiated) |

FIGURE 2(a): PARTICIPANTS IN UNEP'S REGIONAL SEAS PROGRAMME

1. MEDITERRANEAN REGION

Algeria	Israel	Morocco
Cyprus	Italy	Spain
EEC	Lebanon	Syrian Arab Republic
Egypt	Libyan Arab Jamahiriya	Tunisia
France	Malta	Turkey
Greece	Monaco	Yugoslavia

2. KUWAIT ACTION PLAN REGION

Bahrain	Kuwait	Saudi Arabia
Iran	Qatar	United Arab Emirates
Iraq	Oman	

3. WEST AND CENTRAL AFRICAN REGION

Angola	Ghana	Nigeria
Benin	Guinea	Rep. of Cameroon
Cape Verde	Guinea-Bissau	Sao Tome and Principe
Congo	Ivory Coast	Senegal
Equatorial Guinea	Liberia	Sierra Leone
Gabon	Mauritania	Togo
Gambia	Namibia	Zaire

4. WIDER CARIBBEAN REGION

Antigua and Barbuda	EEC	Netherlands
Bahamas	Grenada	Panama
Barbados	Guatemala	St. Lucia
Belize	Guyana	St. Vincent and the Grenadines
Colombia	Haiti	Suriname
Costa Rica	Honduras	Trinidad and Tobago
Cuba	Jamaica	United Kingdom
Dominica	Mexico	United States of America
Dominican Republic	Nicaragua	Venezuela
France		

5. EAST ASIAN REGION

Indonesia	Singapore
Malaysia	Thailand
Philippines	

6. SOUTH-EAST PACIFIC REGION

Colombia	Panama
Chile	Peru
Ecuador	

FIGURE 2(b):

7. RED SEA AND GULF OF ADEN REGION

Democratic Yemen	Palestine (PLO)	Sudan
Djibouti	Saudi Arabia	Yemen
Jordan	Somalia	

8. SOUTH PACIFIC REGION

American Samoa	Kiribati	Solomon Islands
Australia	Marshall Islands	Tokelau
Commonwealth of the Northern Mariana Islands	Nauru	Tonga
Cook Islands	New Caledonia	Tuvalu
Federated States of Micronesia	New Zealand	United Kingdom
Fiji	Niue	United States of America
France	Norfolk Island	Vanuatu
French Polynesia	Palau	Wallis and Futuna
Guam	Papua New Guinea	Western Samoa
	Pitcairn Island	

9. EASTERN AFRICAN REGION

Comoros	Madagascar	Seychelles
France	Mauritius	Somalia
Kenya	Mozambique	United Republic of Venezuela

10. SOUTH-WEST ATLANTIC REGION

Argentina
Brazil
Uruguay

11. SOUTH ASIAN SEAS REGION

Bangladesh	Pakistan
India	Sri Lanka
Maldives	

FIGURE 3: THE EAST AFRICAN REGION

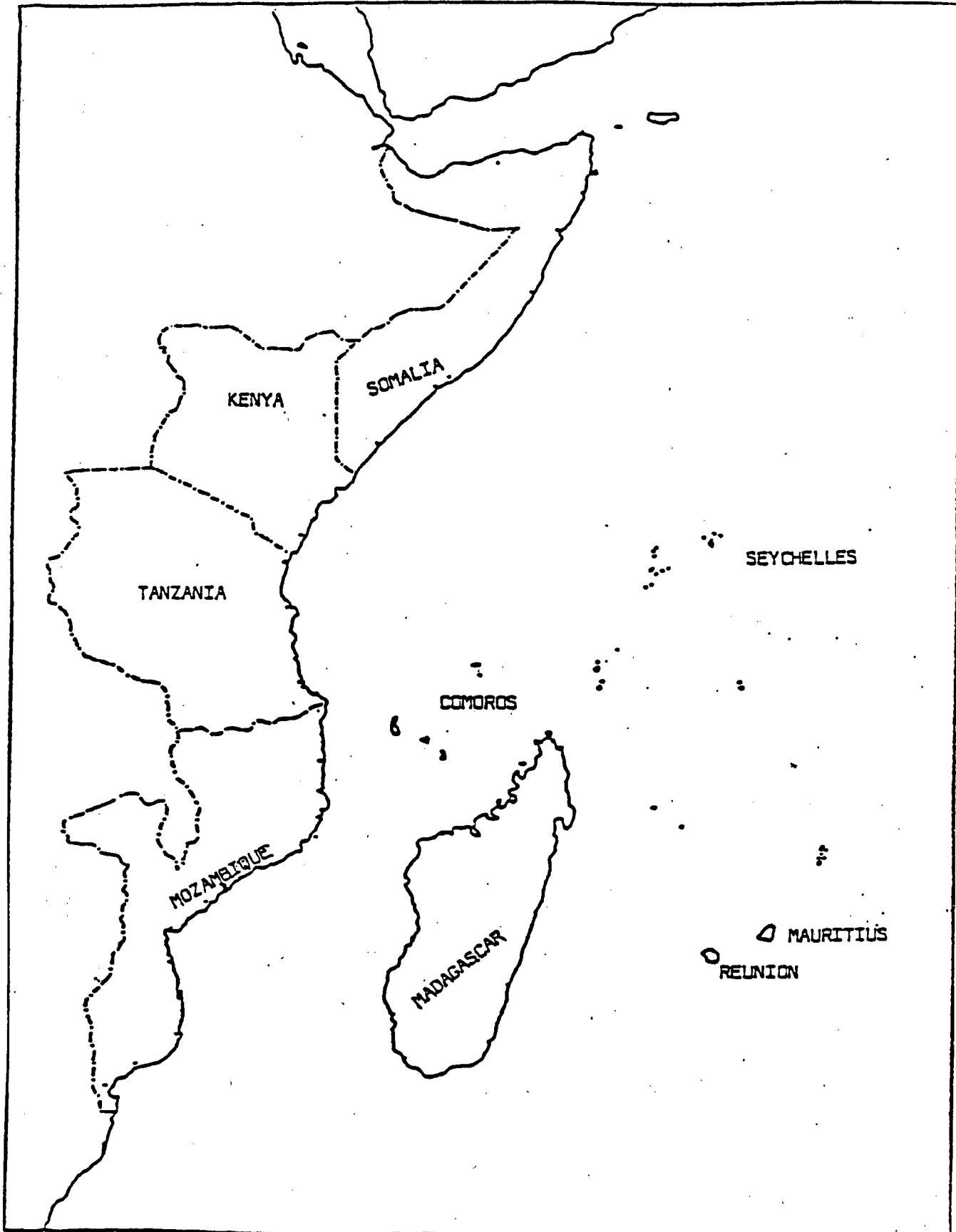


Table 11 : Available information on recorded oil spills in the region

Country	Spillage	Damage caused	Quantity of oil involved (tonnes)
Somalia	-	-	-
Kenya	accidental spill from oil tanker, BRITISH CAVALIER off Mombasa Harbour in 1975 and 4 incidents of refined product spillage from refinery	-	97
Tanzania	accidental spill from oil tanker at harbour on 9/1/81	Mangrove forest near harbour affected	50-100
Mozambique	2 major & 14 minor crude oil spills recorded in the harbour	Mangroves affected	-
Seychelles	crude oil from Royal Fleet Tanker grounded 8 miles NE of Mahé in 1976	-	-
Mauritius	the TAYEB grounded on the reefs of Mauritius	-	2,000

FIGURE 5: ESTIMATED DISCHARGE OF DOMESTIC SEWAGE FROM MAJOR CITIES ON THE COASTS (ESTIMATED 20 kl/capita/year)

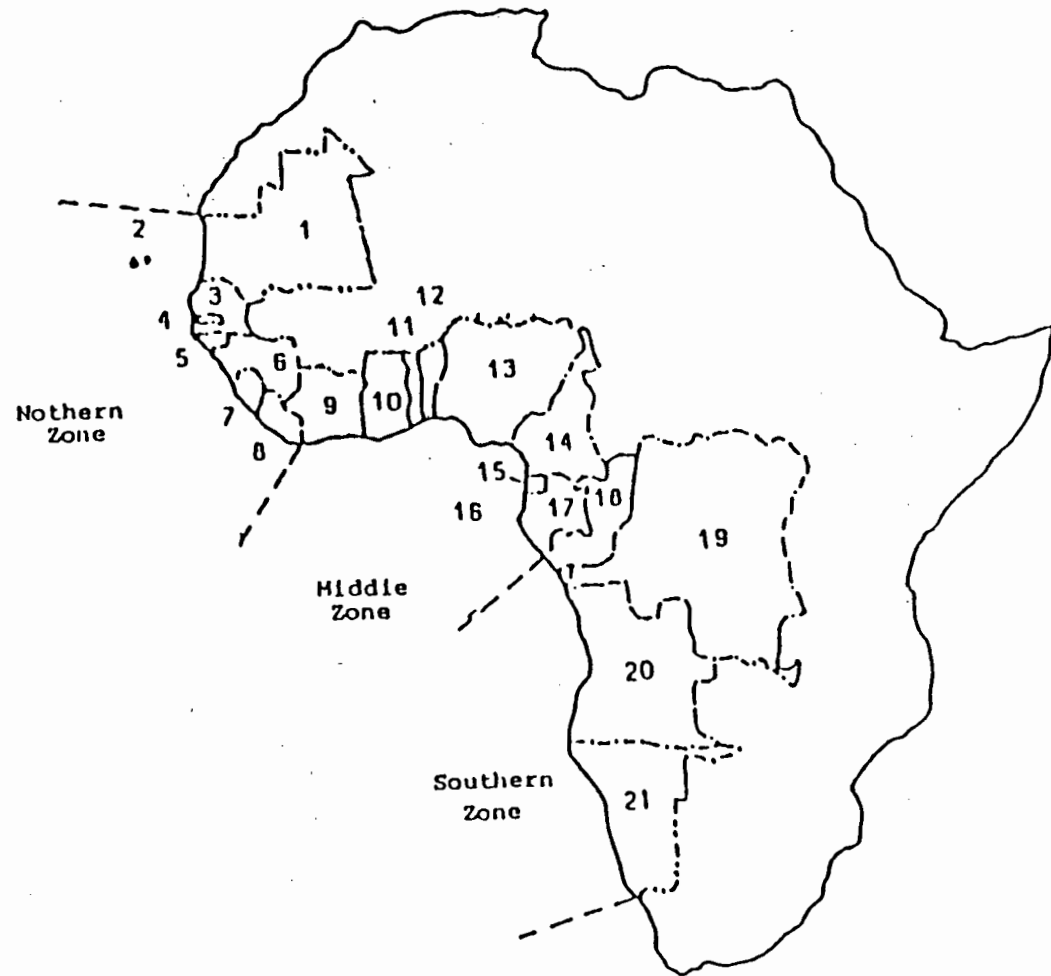
Country-City	Population (Estimated) 1980	Length of Coastline Expressed in Km.	Population Sewered	%	BOD ₅ ton/yr.	BOD ₅ Km coastline ton/yr.
Kenya	15,300,000	500				
Mombasa	440,000		88,000	20	1760	3.52
Malindi	14,000					
Lamu	6,000					
Regional/Total	460,000		88,000	19	1760	3.52
Tanzania	17,540,000	800				
Dar es Salaam	760,000		112,500	15	2250	2.81
Tanga	100,000		10,000	10	200	0.25
Lindi	30,000					
Regional/Total	890,000		122,500	14	2450	3.06
Mozambique	10,200,000	2500				
Maputo	770,000		77,000	10	1540	0.62
Beira	220,000		55,000	25	1100	0.44
Quelimane	100,000		10,000	10	200	0.08
Nampula	100,000		10,000	10	200	0.08
Pemba	30,000		3,000	10	60	0.02
Regional/Total	1,220,000		155,000	13	3100	1.24
Comoros	400,000	350				
Moroni (G.Comores)	16,000					
Moheli	4,500					
Anjouan	10,000					
Regional/Total	30,500					

FIGURE 6:

Country-City	Population (Estimated) 1980	Length of Coastline Expressed in Km.	Population Sewered %	BOD ₅ ton/yr.	BOD ₅ Km coastline ton/yr.
Madagascar	8,500,000	4000			
Tamatave	60,000		9,000 15	180	0.05
Majunga	70,000				
Tulear	40,000				
Diego-Suarez	45,000		4,500 10	90	0.02
Regional/Total	215,000		13,500 6	270	0.07
Mauritius	936,000	200			
Port Louis	250,000		150,000 60	3000	15.00
Plaines Wilhems					
Curepipe	57,000		40,000 70	800	4.00
Besu-Bassin/ Rose-Hill	72,000		50,000 70	1000	5.00
Phoenix	36,000		25,000 70	500	2.50
Regional/Total	415,000		265,000 64	5300	26.50
Seychelles	65,000	600			
Victoria	25,000		6,250 25	125	0.21
Regional/Total	25,000		6,250 25	125	0.21
Somalia	3,850,000	3000			
Mogadishu	400,000				
Merca	55,000				
Kismayo	60,000				
Berbera	50,000				
Regional/Total	565,000				
GRAND TOTAL	3,820,500		650,250 17	13,005	

FIGURE 7:

- | | | |
|----------|-----------------------|-------------------|
| Northern | 1. | Mauritania |
| | 2. | Cape Verde |
| | 3. | Senegal |
| | 4. | Gambia |
| | 5. | Guinea Bissau |
| | 6. | Guinea |
| | 7. | Sierra Leone |
| | 8. | Liberia |
| <hr/> | | |
| Middle | 9. | Côte d'Ivoire |
| | 10. | Ghana |
| | 11. | Togo |
| | 12. | Benin |
| | 13. | Nigeria |
| | 14. | Cameroon |
| | 15. | Equatorial Guinea |
| 16. | Sao Tome and Principe | |
| 17. | Gabon | |
| <hr/> | | |
| Southern | 18. | Congo |
| | 19. | Zaire |
| | 20. | Angola |
| | 21. | Namibia |



Countries and zones of the WACAF region