MANAGEMENT OF COASTAL AND OFFSHORE RESOURCES IN EASTERN AFRICA

Papers presented at the Workshop
held at the Institute for Development
Studies, University of Nairobi
April 26 - 29 1977

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Occasional Paper No. 28

1978

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INTRODUCTION

The subject of the Law of the Sea, which includes the broad and specific stipulations of rules for management of ocean space and its resources for the beneficial use of respective states and their citizens, has consumed more negotiating man-hours than any other subject, except war and peace, in international relations. The current negotiations which started informally in 1968 and formally in 1974 is epochal in that it is supposed to take into consideration future changes in economic interests, as well as changes economic and military technology. An equally important consideration is that the agreement is supposed to take into account the present and future vulnerability and fragility of the marine ecosystem and its resources.

Unfortunately, as the various negotiators emphasize their various economic, military, ecological or technological interests there are almost always, other corresponding interests that a given legal provision would infringe upon. So that there is constant fencing by the various country delegations in an attempt to protect their interests for all future times. The consequence is the extended debates and at the time of this writing the Seventh session of the Conference is going on in Geneva. Whatever will emerge at the end of the negotiations of the Third United Nations Conference on the Law of the Sea is still uncertain. It may or may not be successful in the sense of composing a comprehensive set of principles accepted by a large enough number of states to be signed as a treaty. The Seventh session of the Conference will resume at New York on August 26th 1978 to continue the work. In any event, the decision as to whether the negotiations should continue may well be taken by the United Nations General Assembly at its thirty-third session. There are delegations, especially from among the maritime and industrially advanced states, who believe that the long negotiations are delaying their ventures from exploiting marine resources and that the regime should revert to a free-for-the-able system which preceded the present negotiations.

The developing countries however, perceive the present problem of law of the sea negotiation as a part of the broad question of re-organization of international economic order. These states insist on a treaty package that gives a first, and perhaps compensatory, consideration to their economic interests; they would also like treaty provisions that protects their security interests instead of one that endorses the traditional freedom of the military powers and their reign over the ocean space, including coastal waters of the relatively powerless states. There are also such issues as the conservation of the marine environment and its resources which are the concern of most states developed or developing.

The details of these interests are dealt with in the draft treaty under categories such as: territorial sea; the exclusive economic zone; continental shelf;fisheries; scientific research; transfer of marine technology; and navigation. In the course of almost a decade of negotiations two basic things have occurred: firstly, there are certain concepts and principles which have evolved and which will be adopted by states even if no comprehensive agreement is signed. Secondly, whether or not an agreement is signed, as has been the intention of most negotiators, states will have to consider the strategies for management of marine resources to facilitate the realization of the long-term economic benefits therefrom. And management itself has two broad aspects; the first one being articulation of the principles of rights, obligations and procedures in form of legislations governing uses of the sea; the second one is the systematic implementation of the enabling legislations to ensure realization of the goals.

Management, especially in new areas as the marine environment is to most developing countries, require considerable deliberation and planning before implementation stage. Yet in most developing countries the deliberation, if any occurs, is totally inconspicuous. Very little is heard about actual planning or implementation of programmes for management and use of marine resources. Further, only a few individuals in policy-making positions are keen to get involved in public discussions of the range of national interests or the strategies for their realization.

The papers in the present volume were presented at one of the few public Workshops ever held on management of marine resources in Eastern Africa. Contributors included individuals from policy positions in Kenya and some from the University of Nairobi and University of Dar-es-Salaam. There are also three papers by individuals from the United Nations System. In our view the Workshop did not include participation of some very vital departments, such as Fisheries, Foreign Affairs and Environmental Secretariat, and to that extent it was incomplete in content. It is anticipated that this Workshop will be followed in the near future by another one with broader regional coverage and a wider range of participation by policy-makers within the region. Those involved in the negotiations may by that time, be in a position to say whether or not there will be a comprehensive treaty on the Law of the Sea. They may also say, at least in broad terms, the planned legislations and strategies for implementation.

Finally, we acknowledge with gratitude, the financial assistance from the Ford Foundation and UNESCO which have supported organization of the Workshop and production of the report.

CONSERVATION AND DEVELOPMENT OF COASTAL AND OFF-SHORE RESOURCES IN EAST AFRICA: AGENDA FOR RESEARCH

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INTRODUCTION

Individual states and the international community generally have invested enormous human and economic resources during the past nine years in an effort to negotiate an international agreement governing all uses of the sea. The protracted negotiations, undertaken by the Third United Nations Conference on the Law of the Sea (UNCLOS III)[1] and probably unprecedented in terms of man-hours (or man-years) expended, have still not found common grounds for agreement on all the key issues to enable the participating states to sign a treaty. The difficulty lies in the complex array of economic, political/security and aesthetic interests of individual states, and of the developing as opposed to the developed states, differ on matters of coastal and off-shore fisheries, fuel and non-fuel mineral resources, marine pollution, navigation by civilian and military vessels and scientific research. The failure to find commons grounds for agreement after the long negotiations would suggest that most states have clearly defined their national policies and a scope of interests from which they refuse to depart.

Whatever the ultimate outcome of the present negotiations at the Law of the Sea Conference, the individual states will need to continue to formulate national implementing regulations and strategies of management regarding the participation by the state and its citizens in marine affairs. These are preconditions for the ultimate enjoyment of the interests which the states have so assiduously discussed.

Kenya delegates to the negotiations have been among the most active and influential since the preparatory phases of the UNCLOS III. The concern implicit in their participation should not appear to be shallow fanfare at the

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1. The First U.N. Conference on the Law of the Sea was held at Geneva in 1958. It produced four conventions — the Convention on the Territorial Sea and the Contiguous Zone, 516 UNTS 205 (1964); the Convention on the High Seas, 450 UNTS 82 (1962); the Convention on the Continental Shelf, 499 UNTS 311 (1964); and the Convention on Fishing and Conservation of Living Resources of the High Sea, 599 UNTS 285 (1966) — and an Optional Protocol of Signatures Concerning Compulsory Settlement of Disputes.

See the general discussion in Fitzmaurice, 1959, p. 73, and Jessup, 1959, p. 243. The second conference met in Geneva in 1960 in an attempt to resolve the vital problems left by the 1958 session, but this one was a clear failure.

international level. Rather, it should also be reflected in the development of national marine policies, e.g., laws on conservation and harvesting of fisheries; prevention of pollution of harbours and coastal waters; development of the coastal tourist industry and recreation facilities; and the prospecting for and mining of fuel and non-fuel resources from the continental shelf.

The purpose of this paper is two fold. First, it will briefly outline the national and international interests at stake in the negotiations and relate them to Kenya and its neighbours where necessary. Secondly, key subject areas will be pointed out where research is necessary — either for systematic examination and collation of Kenya's existing regulations and management strategies, or to point out the lacunae in the development of policies and management, or both. The paper is therefore an outline for a long series of studies on what Kenya is doing, plans to do, or ought to do for the conservation and development of its coastal and off-shore resources.

THE PURPOSE OF DEVELOPING NATIONAL AND REGIONAL MARINE POLICIES

The changes in the interests of coastal and maritime states, and the increasing sophistication of technology which may facilitate the realisation of these interests, have necessitated the reformulation of national and international concepts and policies concerning the seas. The interests of many states have been focussed on the resources of the oceans, especially fish, mineral resources, especially oil, from the continental shelf, and manganese nodules from the ocean floor. These interests will be intensified by the presently increasing demand for sources of food proteins, foreign exchange and energy.

Apart from the urgent need for clearly defined concepts and standards for conservation and development of economically valuable coastal and off-shore resources, there are also security and political interests which require negotiation and agreement. The contrasting interests include, on the one hand, the power of the coastal states to check naval and civilian vessels which transit their coastal waters or straits to ensure that the vessels do not engage in any conduct detrimental to national interests; and on the other hand, the claim of the states where the vessels are registered for the absolute right to control all activities on or arising from their vessels.

If conflict is to be avoided, there is an obvious need for an agreement on the scope of the jurisdiction of coastal states for purposes of conservation, exploration and exploitation of the economic resources of the sea, as well as on the powers of those states to preserve their national

security. Similarly, there is an urgent need for the establishment of an orderly system for the conservation and exploitation of the fishery resources beyond the limits of national jurisdication.

What all this boils down to is that states - coastal, maritime or otherwise — assert their own interests over coastal and off-shore economic resources and state their security requirements to the extent that they have studied and determined the ways in which their interests will be optimised by contending claims. Thus the process of reformulating concepts for the uses of the sea, or finding new approaches for regulating uses of ocean space, requires initiative both at the national level, where national marine policies are identified and developed, and at international level, where the contending interests and claims are negotiated into an international agreement.

Both aspects of this process are currently being carried out to different degrees and in different regions, as the Third United Nations Conference on the Law of the Sea (UNCLOS III) attempts to conclude a comprehensive treaty dealing with all uses of the ocean space. The decision to convene this conference was taken by the United Nations General Assembly in December 1970 (Resolution 2750 (XXV)) when the international community was convinced that the existing rules of general international law and those codified in the four 1958 Geneva Conventions on the Law of the Sea were either inadequate or obsolete in certain essential subject areas. Three examples will illustrate this point. First, the Geneva Conferences on the Law of the Sea in 1958 and 1960 did not agree on the vital questions of the precise delimitation of territorial sea and the jurisdiction for important specific functions, such as coastal fisheries. Second, with regard to the continental shelf, the definition under the 1958 Geneva Convention on the Continental Shelf was based on the level of technology at that time which did not allow the exploitation of resources at depths greater than 200 metres; this has been overtaken by the development of technology since that time so that resources at almost at any depth of the sea bed can now be

exploited.[2] This means that any part of the seabed or ocean floor could be defined as continental shelf and might be appropriated by any technologically competent state or person. Thus, the definition was manifestly imprecise and fatally vague. Third, the existing regulations did not provide a system for orderly conservation, exploration and exploitation of the resources of the sea beyond the limits of national jurisdiction - wherever that might be. Moreover, the resources of the sea bed, such as manganese nodules which contain varying quantities of copper, cobalt and manganese, are not covered by the existing regime. At the past two conferences the negotiators focussed only on the uses of the sea within coastal zones and on the continental shelf; beyond that area only two major uses were of concern, navigation which was left absolutely free, and fishing which was largely of interest to the long-distance fishermen from developed countries and which was also left to be conducted on a laissez-faire basis.

The international community also recognised that as the technology for exploiting the resources in every area of the sea increased, so also did the chances of abuse through over-exploitation and depletion or pollution. It is obvious that fish do not heed the boundaries of national jurisdiction. For this reason, over-exploitation or poor conservation measures of coastal species in one area may easily result in adverse consequences for adjacent coastal states. For instance, Kenya cannot ignore the plans for fishing and the fishery conservation measures of Somalia and Tanzania, or for that matter of Madagascar and Mozambique in the south and the Arabian Sea states in the north. A similar problem applies to anadromous species which spawn in inland rivers and then set out to the open seas where they may be caught by fishermen who do not contribute to their conservation. Another clearly direct example is the case of pelagic or highly migratory species such as tuna. These species roam across oceans from one coast to another and may be caught by anyone anywhere. Therefore, their conservation requires international agreements to avoid the danger of over-exploitation or depletion and possibly in-ordinate benefits by some

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2. The development of the U.S. research ship Glomar Explorer originally believed to belong to the Hughes Corporation and later discovered to belong to the U.S. Central Intelligence Agency has been the best known example. The ship was used in an effort by the C.I.A. to recover a sunken Soviet naval submarine in the depths of the South Pacific.

There have been some experimental drilling projects at depths greater than 5,000 metres. See United Nations, Doc.E/4982/Rev.2, World Plan

of Action for Application of Science and Technology to Development 1971. p.116

states to the disadvantage of others. Lack of such internationally agreed upon fishing and conservation standards have been the cause of the well-known confrontations between long-distance fishermen from the United States and Ecuador and Peru, both coastal states which are among the World's leading exporters of tuna. The United States, for its part, has had some very serious conflicts with Russian, Polish and German long-distance fishermen in northwest Atlantic waters, especially on George's Banks off the New England coast. Americans argue that these long-distance fishermen not only deprive them of economic opportunities, but also that the non-coastal states recklessly ignore essential conservation standards and therefore threaten certain species with depletion - whether within or beyond the limits of national jurisdiction. In the western Indian Ocean waters, the long-distance fishing fleets are mainly from Russia, Taiwan, Korea, Japan and France. Experience already shows that these fishermen are not likely to heed some of the most important conservation requirements, because if resources are depleted in one part of the ocean long-distance fishermen can easily move elsewhere. The disadvantage is for the coastal states which may not have developed any long-distance fleets, as in the case of Eastern Africa. Their primary task is the conservation of the coastal and off-shore species in the region.

The fishery problem is in many ways analogous to that of marine pollution. When harmful materials or energy is released into one part of the sea, the results may be felt in areas remote from the original source. This applies to major oil spills such as the Torrey Canyon disaster of March 1967, or to the cumulative effect of many minor discharges resulting from deballasting, tank washing or valve failure. Ocean currents and tides carry the pollutants from one coastal area to another or from areas beyond national jurisdiction to coastal waters or shorelines of another state. These may have serious consequences for coastal fisheries or parks and recreation facilities, as was well dramatised on the British and French coasts following the Torrey Canyon tragedy. It may be recalled that in that instance a tanker collapsed about eitht miles off the coast of Cornwall in southern England. Its oil covered the tourist resorts of Cornwall and spread eastwards to cause serious damage on the coasts of Brittany and Normandy, about 225 miles away (Sweeney, 1968, p. 157).

The East Coast of Africa is even more seriously susceptible to similar kinds of problems: oil from the Middle East is almost all transported by tankers through the Indian Ocean to Europe, America and the Orient. This

makes the Indian Ocean the busiest oil tanker traffic route in the world. The fact that there has not been a Torrey Canyon - type of disaster in Eastern Africa is no consolation, because such a disaster could happen and the impact would be felt by more than one state. The coastal state would suffer in terms of their fishery resources and the destruction of oyster beds; they would lose income from tourism, and coastal parks,and recreation sites and harbour facilities would have to be rehabilitated.

Comprehensive regulations and strategies are needed to deal with deliberate discharges such as deballasting or tank washing and accidental spills such as valve failure or major spills of the Torrey Canyon type. Strategies should be developed for dealing with pollution originating within or beyond the limits of national jurisdiction. Regulations are developed partly at the national level and partly through international agreements such as those anticipated at UNCLOS III, which completed its sixth session in New York in May 1977.

THE OUTCOME OF THE THIRD UNITED NATIONS CONFERENCE ON THE LAW OF THE SEA

After about six years of preparation and now the fourth year of substantive negotiations, UNCLOS III has already had considerable impact on attitudes concerning national and international control and use of coastal and off-shore resources. The second (but first substantive) session in Caracas from June to August 1974 ended with a wide array of draft articles with alternate provisions. However, the third session in Geneva from 17 March to 9 May 1975 produced three'Informal Single Negotiating Texts', (ISNT) corresponding to the three main committees and subject areas covered by the negotiations.[3] The draft articles in these texts were composed to reflect what the committee chairmen regarded as general areas of agreement, thus eliminating alternate provisions of the the kind generated during the Caracas session. It was generally agreed by the conferees that the ISNT would form the basis of subsequent

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3. The Conference operates in three main committees: Committee I has the mandate to negotiate articles on the sea bed, the ocean floor and the subsoil beyond the limits of national jurisdiction; Committee II is negotiating articles relating to the areas of national jurisdiction, namely the territorial sea, the contiguous zone and the exclusive economic zone; Committee III is dealing with articles on the protection and preservation of the marine environment, marine scientific research and the development and transfer of technology. Towards the end of this Geneva session, the conference president requested the committee chairmen to prepare the Informal Single Negotiating Texts to reflect the general trend of agreement in their negotiations. The ISNTs for the three committees are numbered in Parts, U.N. Doc. A/CONF.62/WP.8/Part I-III, respectively. For the subsequent revised version, see U.N. Doc. A/CONF. 62/WP. 10 of 15 July 1977, called the Informal Composite Negotiating Text (ICNT).

negotiations and hopefully hasten the process towards the final treaty. The fourth session held at New York from 29 March to 7 May 1976 was meant to focus largely on the ISNT rather than introducing entirely new proposals. This New York session produced the revised versions of the ISNTs which were scrutinised by the participating governments in preparation for the next negotiating session. The fifth session met in New York from 2 August to 17 September 1976 and reviewed the ISNTs which were further discussed at the sixth session from 23 may to 15 July 1977. At this last session the ISNTs were consolidated into one Informal Composite Negotiating Text and presented to the participating governments for scrutiny before the seventh session to be held in Geneva beginning 28 March 1978.

Yet even if the UNCLOS III does not succeed, in the sense of concluding a comprehensive treaty as intended, the deliberations to date have developed certain key concepts and broad doctrines regarding uses of the sea and its resources which will influence the development of the marine legislations and policies of individual states. This will occur whether policies are developed by states unilaterally or in cooperation with other states. It would be useful at this juncture to give a summary of some of the central concepts and subject areas related to the control, conservation and use of marine resources. The discussion of four subject areas will draw largely from the revised INSTs. These areas are the exclusive economic zone, the continental shelf, fisheries and sea bed resources.

The Exclusive Economic Zone

The Conference seems to favour fairly comprehensive regulatory powers for the coastal states within what is well-known as the exclusive economic zone. This is clearly reflected in the Informal Composite Negotiating Text from the last session. The draft articles define the exclusive economic zone as an area of the sea beyond and adjacent to the territorial sea and extending outward to 200 nautical miles from the baseline from which the breadth of the territorial sea is measured(Carticle 56 of the ICNT, A/Conf. 62/ W.P. 10 of 15 July 1977). The provision specifies in Article 56 that within that zone the coastal state has, among other powers:-

(a) Sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the sea-bed and subsoil and the superjacent waters, and with regard to the activities for the economic exploitation and exploration of the zone, such as the production of energy from water, currents and wind;

(b) Jurisdiction as provided for in the relevant provisions of the present convention with regard to:

(i) establishment and use of artificial islands, installations and structures;

(ii) marine scientific research;

(iii) the preservation of marine environment;

(c) The rights and duties provided for in the present Convention.

The international acceptance of these principles has increased in the past few years, but the substantive provisions have not changed in any significant way since the concept of the economic zone entered the lexicon of the UNCLOS III negotiations in August 1971. At that time the concept was proposed by the Kenya delegation to the United Nations Committee on the Sea-Bed which was holding preliminary discussions in preparation for UNCLOS III. The concept was designed to offer a possible formula to meet what most states considered to be the special interests or rights of the coastal states over the resources of the coastal zones beyond the territorial sea. It was also an attempt to introduce straightforward distance criteria for measuring the extent of coastal state jurisdiction.

At that time the extension of coastal state jurisdiction outward to 200 miles for any purpose met with strenuous opposition from maritime states, especially from the United States (see discussion by Okidi on Economic Zone in this volume). Their reason was that the exercise of coastal state powers beyond a limited width of territorial sea would interfere with naval and merchant navigation and would reduce their long-distance fishing operations. On the other hand, the idea of a 200-mile exclusive economic zone had strong support from most of the developing coastal states, especially those in Latin America, where Chile, Peru and Ecuador had claimed jurisdiction over resources outward to 200 miles since late 1940s. Support for the idea increased also in Africa, Asia and the Caribbean to the extent that, by the end of the first substantive session of UNCLOS III at Caracas, the leader of the United States delegation wrote that with only a few exceptions, economic zone proposals have been proferred by all Conference groups including the United States (Stevenson and Oxman, 1975 p.16). It is ironic that the United States, formerly the arch opponent of the 200-mile zone, has now passed unilateral legislation extending its exclusive jurisdiction over coastal fisheries outward to 200 miles, while the international negotiations where the U.S. had earlier opposed the idea is still in progress (see International Legal Materials, 15 1976, pp. 634-650, and 16 1977, pp. 350-389).

If this unilateral measure by the United States reveals that country's arrogance in the realm of public diplomacy, it also suggests that international agreement on the 200-mile exclusive economic zone for coastal states is now a certainty. It suggests too that the coastal states should give close consideration to their national marine policies, and particularly to the development of legislation and strategies for the management of coastal resources within such a zone.

The ICNT provides that within the economic zone the coastal states will assume sovereign rights for the conservation, exploration and exploitation of resources, among other powers. This means then that only the coastal state, and no other entity, may authorise the exploration and exploitation of the resources of the exclusive economic zone. These trends at UNCLOS III have been further reinforced by the United Nations General Assembly Resolution 3016 on Permanent Sovereignty Over Natural Resources of Developing Countries adopted at the twenty-seventh session.[4] That resolution recalled the 1962 U.N. General Assembly Resolution on Permanent Sovereignty over Natural Resources and reaffirmed, in its paragraph (1) 'the rights of states to permanent sovereignty over all natural resources on land within their national boundaries, as well as those found in the sea-bed and the subsoil thereof within their national jurisdiction and in the superjacent waters (emphasis added).

The exclusive economic zone would be the area of national jurisdiction, and this resolution, like the ICNT articles, would entitle a coastal state to develop its own national legislation and management strategies in order to dispose of the resources as it desires. The provisions in the draft articles would also mean that if the coastal state does not exhaust the resources of the economic zone or if it does not harvest the renewable resources strictly up to the level of maximum sustainable yield, then the resources would remain unexploited. There are, however, three proposals or ideas which have arisen during the negotiations and should be discussed here.

The first proposal has been advanced and supported by the long-distance fishing countries and championed by the United States. It would require that a coastal state which does not exhaust the living resources within its economic zone up to the level of maximum sustainable yield would

4. The resolution was adopted on 18 December 1972, with votes of 102 in favour, none opposed and 22 abstaining. See text reprinted in International Legal Materials, 12 1973, p. 226.

permit access by foreign states and/or their fishermen to fish the stocks over and above of the coastal state's capacity to harvest (U.N. Doc. A/Conf. 62/W.P. 10, 15 July 1977, Article 62). This would mean that most of the developing coastal states, such as the East African states, which have not fully developed their capacity to exploit the coastal fishery resources would be obliged to permit such long-distance fishing countries as France, Japan, South Korea, Taiwan, the U.S. and the U.S.S.R. to enter their economic zones to fish. The converse arrangement is not likely to arise: there is very little possibility that the developing East African states will soon have the capacity to seek fishing opportunities off the coasts of these developed states, even if there were excess reserves of fish, which is also highly unlikely. It is obvious then that this proposal is designed to permit the developed long-distance fishing countries to have the best of both worlds: they would have the full opportunity of fishing in their own coastal waters and then proceed to coastal waters of the developing countries, while the latter would not have comparable opportunities.

It may be argued, however, that the coastal states would still benefit by allowing access to foreign fishing fleets if they could collect fees for licences from the foreign fishermen. In that case the provision for access in the treaty, and the resistance which this provision has met, are really insignificant (and unnecessary) since states usually make such arrangements with respect to other resources within their jurisdiction. If a state desires to hold back on the exploitation of its natural resources it should be free to do so, as, for example, the United States reserves certain oil-fields for strategic reasons. An attempt to coerce developing nations into giving access to foreigners to exploit resources within their jurisdiction seems totally unjustifiable and legally untenable.

The coastal state itself has sovereign rights to explore and exploit its own resources. Other states depend on the information which it has gathered to show if the maximum sustainable level of exploitation has been reached. Here again, it seems that if a coastal state has not developed the requisite technology for full exploration of its marine resources, it should decide whether or not to call upon another state or an international organisation, such as the F.A.O. and its subsidiary agency, the Indian Ocean Fisheries Commission, to aid in such an exploration. It seems that the extent to which a state exploits resources within its own jurisdiction for its own development is an entirely discretionary matter. Certainly, it does not help the individual state if it leaves its renewable resources unharvested, when some management arrangements with other states would benefit its development.

A second issue regards the preferential rights of access to neighbouring land-locked or other geographically disadvantaged states. This refer for example, to arrangements whereby Somalia, Kenya, Tanzania, Mozambique and Madagascar would, either individually or within a regional framework,[5] permit land-locked states such as Uganda, Malawi and Zambia to exploit resources within their respective economic zones. Such an idea was first emphasised by the Kenya delegate who proposed the concept of an exclusive economic zone. He told the United Nations Committee on the Sea-Bed that his country was prepared to give nationals of the fourteen land-locked countries of Africa, within regional or bilateral agreements, the same treatment that it gives its own nationals within the limits of national jurisdiction (U.N. Doc. A/AC. 3815 C. ISR./8, 1971, p. 38).
This view that the nationals of land-locked or other geographically disadvantaged states should share the resources of the economic zone on an equal basis with the nationals of the coastal states was also adopted by the Declaration of the Organisation of African Unity on the Law of the Sea.[6] While no precise stipulations for such rights have been agreed upon, the question has been raised repeatedly. By the end of the conference there will perhaps be only a general provision that the coastal states should negotiate with the land-locked and other geographically disadvantaged states in good faith, with a view to finding acceptable arrangements for granting the land-locked states preferential access to the resources of the exclusive economic zone. As any one of the coastal states develops its legislation, it must consider if and how to achieve such a goal. Individual coastal states ought also to confer with neighbouring coastal states to see if their legislation has any common ground for developing joint policies to extend special treatment to land-locked and other geographically disadvantaged states.

A third issue is the harvesting of resources that traverse the boundaries of adjacent coastal states. This applies directly to the coastal fishery stocks that may, for example, roam the East Coast of Africa from the Mozambique Channel to the Arabian Sea. For instance, Kenya and Tanzania have negotiated their

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5. Some land-locked countries, such as Zambia, have suggested that there should be regional economic zones, as distinct from coastal state economic zones pure and simple. Within the regional economic zones, states would have equal rights to economic resources. See discussions in Okidi's article in this volume.

6. The notion of equal sharing of resources within the economic zone has been held among the African states. The O.A.U. Declaration adopted by the Council of Ministers in May 1973 is reproduced as U.N. Doc. A/CONF.62/33 (1974). The Latin American states refer only to preferential treatment for land-locked and other geographically disadvantaged states.

territorial waters boundary in the Pemba Channel,[7] but this will never resolve the issue of fishery conservation for either state because the fish will not stay within the boundaries. More effective conservation measures for fisheries on the East Coast of Africa will have to be taken regionally, or bilaterally at the very least.

The issue of resources that traverse areas of national jurisdiction also arises in the case of certain mineral resources. The possibility for conflict is well-illustrated by the case of hydrothermal brines under the central rift of the Red Sea. Soon after these hot brines - rich in a number of minerals, notably, gold, copper, zinc and silver - were discovered the Kingdom of Saudi Arabia issued a decree asserting ownership of all the hydrocarbon materials and minerals existing in the sea-bed adjacent to its continental shelf.[8] The purpose was to lay full claim to all the resources unilaterally. In fact, however, Sudan, Ethiopia (and Eritrea) might all make claims to the same resources.

All this suggest clearly that, while the resources of the exclusive economic zone may be subject to control by the coastal state, that state would, for various reasons, either take into account the policies being developed by neighbouring coastal states or develop joint policies with other states. For example, a consideration of maritime legislation deloped by Kenya would of necessity include an examination of the corresponding legislation of the other East African coastal states. Such a study should be initiated as the period of conference diplomacy nears its end, in order to facilitate the development of strategies for rational management of coastal resources, whatever the outcome of UNCLOS III.

The Continental Shelf

One of the most difficult tasks facing UNCLOS III is to determine an acceptable legal definition of the continental shelf, that is, the outer limit of the continental shelf for purposes of coastal state jurisdiction. The opposing and rather rigid views of the negotiating states stem from the origins of the relevant doctrines. The important aspects of this situation will be outlined briefly here.

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7. See reports of the disputes in The East African Standard, 19, 23 and 24 September and 5 and 6 October 1970. The negotiations took place first at Mombasa in May 1971 and then at Arusha in August 1975. The agreement, which has not yet been made public, shall be brought to force by an exchange of notes between the two governments.

8. Royal Decree No. M-27, dated 7 September 1388 Hegira, reprinted in International legal Materials, 1969, p. 606.

The first time any state publicly laid claim to the continental shelf was in 1945 when, by the so-called Truman Proclamation, the United States unilaterally declared its rights to the living and non-living resources of its continental shelf. Although Press Truman did not specify the outer limit of the continental shelf, this action is generally blamed for having provoked a spate of unilateral claims by the Latin American states, some of which decided to extended their jurisdictions outward to 200 miles (see discussions by Garcia-Amador, 1974 p. 33, and Hjertonsson, 1973). Then during the 1958 Geneva Conference on the Law of the Sea a definition of the continental shelf was adopted which said that the shelf of a coastal state was a natural prolongation of the continental land-mass, extending to a depth of 200 metres, or to such further depth as the superjacent water permits the exploitation of the resources there within (see discussion

Thus, while the geographical shelf may generally average 200 metres in depth, the additional criterion based on exploitability was dependent on technological sophistication and therefore would change with time and the expansion of knowledge. In this case, the legal continental shelf might extend to cover the entire continental margin, that is, the continental shelf proper, the continental slope and the continental rise. Then one must address the problem of where the continental rise ends. Recently, the recovery of the sunken Soviet submarine in the lowest depths of the South Pacific has demonstrated that technology is available to exploit resources at most depths of the sea bed, which means that most parts of the sea bed are brought within the ambit of the legal continental shelf. This claim might sound absurd but it underscores the obsolesence of the present definition.

This vague definition of the continental shelf was reinforced by the opinion expressed, by way of dictum, by the International Court of Justice in the North Sea Continental Shelf cases (see judgement, I.C.J. Report, 1969, p. 22). Without providing any guidelines for the delimitation of the coastal jurisdiction, the Court submitted that the continental shelf was the natural prolongation of the continental land-mass, that the jurisdiction over resources therein belonged to the coastal state ipso facto and ab initio and that the state would choose whether or not to exploit these resources. If it chose not to exploit them, that is its own affair but no one else may do so without its consent.

At UNCLOS III, the failure to reach an agreement on the coastal state jurisdiction over the continental shelf has arisen from the rigid positions taken by the states which have wide continental shelves and their unbending adherence to the doctrines outlined above. They would like a rule to be

adopted which would extend the jurisdiction of the coastal state up to the end of the continental margin. The second position, adopted by states with an average width of continental shelf (or no shelf at all) is that the legal continental shelf should be co-terminous with the exclusive economic zone, that is, ending at 200 nautical miles. This would mean that a coastal states with a continental shelf extending to a width greater than 200 miles would forgo its interests over the excess area. This is the position which is favoured by the Kenya delegation to the Conference. The third alternative seeks a compromise between these two positions: it proposes that where the continental margin extends beyond 200 miles sovereign rights over the resources of the shelf should extend to the limits of the margin, but that this provision should be accompanied by a revenue sharing formula, an obligation to pay part of the revenue derived from the area beyond the 200-mile zone into an international treasury. The revenue would then be used to defray the costs of international administration related to the law of the sea, and the balance distributed to developing countries according to an agreed formula.

It seems that the third alternative offers an option which may ultimately appeal to coastal states, especially those with wide shelves. The central problem may arise from the determination of the proportion of the proceeds which should go to the international treasury.

These proposals do not, however, answer the question of the criterion for determining the outer limit of the continental margin, that is the outer limit of the natural prolongation of the continental land-mass. It has been proposed that each coastal state should determine the outer limit of its continental margin; then the boundary would be subject to review by an international group of experts called the Shelf Boundary Review Commission.

Whatever definition of the legal continental shelf is finally adopted it seems certain that every coastal state will need to determine the extent of its own continental shelf and adopt its own legislations and management policies regarding jurisdiction over the resources of the shelf. Needless to say, obtaining complete data on the continental shelf and off-shore sea bed areas is a long and costly process. Here again technological competence poses a serious problem, since only the states equipped with advanced technology could undertake these projects. A recent report pointed out that most areas of the oceans have not been surveyed thoroughly enough to produce a detailed picture of the bottom, adding in any case that out of 106 maritime countries only 37 were considered to have a competent hydrographic survey service, 16 have only inadequate service and 53 were without any facilities (U.N. Doc. E/4962/Rev. 2, 1971. p. 117). Although some bathymetric surveys have in fact been carried

out in parts of the East Coast of Africa,[9] the December 1975 meeting in Nairobi of the Governing Council of the newly established Regional Centre for Services in Surveying and Mapping declared that available data are rudimentary and that the Centre intended to carry out, among other things, bathymetric surveys along the coasts of Somali, Kenya and Tanzania, emphasising that with the Law of the Sea current, it is vital that the Contracting Parties become aware of the extent of their continental margins.[10]

Information arising from such vital surveys and maps of the continental margins would assist in further development of national policies and management of the continental shelf. For reasons that were stated earlier and reinforced by the suggestions of the Regional Centre for Services in Surveying and Mapping, when examining the legislation and policies being developed in Kenya one should also look at the policies being developed by adjacent coastal states which are also members of the Centre. This may assist in identifying the subject areas where the coastal states may eventually need to develop joint strategies of coastal zone management to avoid conflicts and ensure the maximisation of conservation and economic objectives.

Marine Fisheries The subject of fisheries has been discussed mainly by Committee II whose task was to deal with the area of national jurisdiction up to and including the exclusive economic zone. As a consequence, a large part of the provisions regarding fisheries have dealt with questions already discussed in this paper.

It will be recalled that the ICNT contained general provisions giving coastal states sovereign rights over the fishery resources within the exclusive economic zone. This was coupled with an obligation to allow foreign states to harvest excess stocks. The same basic principles should

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9. Cilek has also prepared a substantive Bibliography of Coastal Geology of Tanzania which he presented to the seminar and Scientific Workshop on Cooperative Investigation of the North and Central Western Indian Ocean. The two papers are now being prepared for publication by UNESCO.

10. See Minutes of the Second Meeting of the Governing Council of the Regional Centre for Services in Surveying and Mapping, held at Nairobi Dec. 19-20 1975, p.3. The Centre is a specialised technical organ of the U.N. Economic Commission for Africa and is only currently consolidating its facilities and recruiting staff to begin operation this year. It is anticipated that the Centre will cover Uganda, Kenya, Somalia, Tanzania and Malawi in its surveying and mapping of land and coastal zones.

be understood with regard to specific species of fish governed by the rules of the exclusive economic zone but whose movements are not confined to the zone. In this section we shall consider fish resources according to their major classifications. These are sedentary species, that is organisms which at the harvestable stage either are immobile on or under the seabed or are unable to move except in constant contact with the seabed or the subsoil. (U.N. Doc. /aCONF. 62/W.P. 10, 15 July 1977, Art 77 (4));demersal or coastal species; anadromous species, or fish that spawn in the upper reaches of rivers, then as soon as they reach a sufficient stage of maturity return to the sea and frequently roam beyond the economic zone of the state of origin; and the pelagic or highly migratory species.

The sedentary species, which include lobsters and fish which are normally found on the continental shelf, would present very little problem if there were agreement on the outer limit of the continental shelf and the economic zone. At present, creatures of the continental shelf are considered to belong to the coastal state if they are within the 200-mile economic zone. On the other hand, there is no agreement yet on the scope of the coastal state's rights and duties over sedentary species on the continental shelf beyond the economic zone.

The coastal species such as herring, trout and mackerel also fall largely within the exclusive economic zone. Their concentration and abundance is generally associated with the abundance of the planktons — the oceanic micro-organisms on which they feed. Available maps show that the highest concentration of these micro-organisms occurs within a few hundreds of miles of the coasts. These stocks naturally roam over the coastal waters or economic zones of more than one state, however. In this regard the draft article 63 of the ICNT provided that 'these States shall seek either directly or through appropriate subregional or regional organizations to agree upon measures necessary to coordinate and ensure the conservation and development of such stocks ....' The article adds that:-

> Where the same stocks or associated stocks of species occur both within the exclusive economic zone and in areas beyond and adjacent to the zone, the coastal State and States fishing for such stocks in the adjacent area shall seek either directly or through appropriate subregional or regional organizations to agree upon the measures necessary for the conservation of these stocks in the adjacent waters.

Both provisions are pertinent to the situation in the western Indian Ocean. To date, there is no established permanent consultative arrangement among the states of the western Indian Ocean to ensure rational utilisation of the coastal fishery resources. Kenya and Tanzania may eventually agree on some limited consultation to deal with fishing in the Pemba Channel, as mentioned above, but this would still be of limited scope. A more comprehensive framework should include at least Kenya, Somalia and Tanzania but more reasonably the full coastal region from the Arabian Sea to the Mozambique Channel.

As regards the coastal fish stocks which also roam beyond the exclusive economic zone, the situation in the western Indian Ocean is difficult because it involves foreign states almost entirely. In a study done for the F.A.O., Hayasi (1971, pp. 2, 7) reported that Japanese, Russian and Taiwanese long-distance fishing fleets have been operating in the area since early 1950s . Some of these states have demonstrated their long-standing interests in the Indian Ocean through membership in the Indo-Pacific Fisheries Council, formed in 1948.[11] The management of the coastal stocks which occur within and beyond the economic zone will require a complete rethinking of the regional framework, so as to take full account of the interests of the coastal states within the region. The continuing stormy confrontation between Iceland and the U.K. illustrated how difficult it can to be to try to cut off long standing fishing opportunities, however cogent the economic reasons given by the coastal state.[12]

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11. For the text of the 1948 agreement sea the United Nations Treaty Series, 120 1952, p. 59. The treaty was revised in 1961; the revised text is in the United Nations Treaty Series, 418 1961, p. 348. Members are France, the Philipines, Burma, the U.S. Sri Lanka, Australia, China (Taiwan), the U.K., Pakistan, Korea, Japan, New Zealand and Vietnam.

12. After Iceland extended its fisheries jurisdiction to 50 miles on 1 September 1972, the U.K. filed an application with the International Court of Justice. See International Court of Justice, Application Instituting Proceedings (filed with the Registry of the Court on 14 April 1972), Fishing Jurisdiction (The United Kingdom of Great Britain and Northern Ireland v. Iceland). While the Court was still considering the issue, a series of armed confrontations between the naval units of the two countries took place.

In its final judgement the Court did not rule on whether Iceland had violated international law. The Court held that Iceland's unilateral measure was not opposable by the U.K. because the two states had an agreement regardi fisheries in that area. The Court directed that the parties were under duty to negotiate a system of fishing which was equitable to both. See Fisheries Jurisdiction Case (United Kingdom v. Iceland), ICJ Reports, 1974, pp. 22-27. The dispute had not been resolved at the time of writing. See some comments on recent events in The Guardian Weekly, 16 May 1976, p. 10. The British naval frigates originally sent to escort British fishermen within Iceland's 200-mile zone were withdrawn on 31 May 1976.

The case of anadromous stocks such as salmon presents a unique problem because the states of origin maintain that they have pre-emptive rights over the stocks. The ICNT provides in its draft article 66 that the coastal states in whose rivers the anadromous stocks originate shall have the primary interest in the stocks and a responsibility to prescribe conservation standards and regulatory measures. Under the draft articles, fishing for the anadromous stocks outside the economic zone is prohibited except where such a rule would cause demonstrable economic dislocation to the state which has traditionally fished the stocks in those areas. The article requires that regulations in the areas outside the economic zone should be enforced through regional arrangements involving the states of origin and other interested states.

The final type of fish considered by the UNCLOS III is the pelagic or highly migratory species such as tuna. These species migrate from one coast of the ocean to another, spending much of the year in international waters beyond the limits of national jurisdiction. Ideally,the conservation and harvesting of these stocks should be controlled by an international authority such as the one proposed for sea bed resources discussed below. However, the Conference has never considered treating fish in the international area as a common heritage to be conserved, harvested and sold for revenues going into a common treasury. Instead, fish outside the economic zones are for the benefit of whoever catches them.

In general, the Conference the Conference favours establishment of regional organisations to coordinate the conservation and harvesting of fish resources and perhaps also provide a regulatory framework within which the participating states can jointly supervise fishery activities. This means then that the Conference might only make general provisions as it has done so far and leave the detailed negotiations of regional fishery agreements to the participating states.

This situation presents a special challenge to the countries around the Indian Ocean in general, and to the East African states in particular. As stated earlier, the highly migratory species in the Indian Ocean have been harvested almost entirely by non-Indian Ocean states. A general framework was established by the Indo-Pacific Fisheries Council in 1948, with major revisions in 1961, but none of the East African states is a party to these agreements. Hayasi reported that Japanese long - line fleets began operating in the Indian Ocean in 1952, while Koreans and Taiwanese fleets started fishing for tuna there in 1964.

At present it is well-known that the Japanese and Koreans have extensive fleets with factory ships operating in most parts of the Indian Ocean.

When one considers the fishing industry as a source of food protein and foreign exchange, and fishing as a labour-intensive activity if properly planned, the importance of the participation of the East African coastal states, and of a re-assessment of the operation of foreign fleets become obvious. It is even more important when we consider that the foreign states often lack the incentive to enforce strict conservation measures. When stocks are depleted, foreign fishermen readily change their fishing grounds.

The challenge to the coastal states is therefore to determine their basic national policies, and to formulate legislation and procedures that will protect their own needs and interests in the region. Any study of a national fishery industry should also examine the development of legislation in the neighbouring states and assess where the policies are or should be aligned on a regional basis. Then strategies for management should be assessed to maximise regional and national benefits.

The Sea Bed Resources This category refers to the resources of the sea bed beyond the continental shelf and beyond the limits of the exclusive economic zone. This implies in general that the resources in question are beyond the limits of any national jurisdiction and are designated as the common heritage of mankind. It is perhaps fair to say that concern for the rational exploitation of these resources was the single most important factor leading the world community to convene UNCLOS III. Questions concerning the precise legal boundary of this international area, and who may exploit its resources, are, without doubt, some of the most difficult issues before the Conference (See the discussion by Adede, 1975).

Even though there has never been a universal agreement on the precise delimitation of the area of national jurisdiction, there has always been a general agreement that there exists an international area beyond the limits of any national jurisdiction. This area is now known as res communis, or the common heritage of mankind, subject to control and use by the international community generally. The existence of such an area was clearly recognised in 1969 when the United Nations General

Assembly adopted its Resolution 2467A, by which the U.N. Committee on the Sea Bed was created, and Resolution 2467C which called for the establishment of an international structure to organise and control the exploration and exploitation of these resources. This was reiterated in the solemn Declaration of Principles Governing the Sea Bed and Ocean Floor, adopted by the U.N. General Assembly on 17 - December 1970 (Resolution 2749 (XXV) reprinted in International Legal Materials, 10 1971, p. 220). The fundamental assertion in the Declaration is that this res communis is not subject to appropriation by any person or state; in other words, it is not a res nullis or a no-man's-land where any person or state can acquire territory. It was further declared that the resources of the area would be used for the benefit of the international community as a whole, taking into consideration the special interests of the developing countries. In fact, the U.N. General Assembly adopted a special resolution - the Moratorium Resolution (2574D, adopted on 15 December 1969 and reprinted in International Legal Materials, 9 1970, p. 422) — calling upon all states to desist from any exploration or exploitation of the resources of the area until the appropriate international machinery is established. These are the fundamental principles on which the draft articles 2-8 of ISNT, Committee I are based.

There is clear unanimity among the participants in UNCLOS III that the sea bed beyond the economic zone and the continental shelf will be an international area. Committee I of the Conference has the responsibility for seeking an agreement on how the international community can best organise and exploit the resources of this area, which consist largely of manganese nodules. There is also general agreement that an International Sea-Bed Authority will be established through which member states will administer the area, manage its resources and control all other activities in or resulting from the area, including the distribution of revenues from the resources to benefit the developing countries.[13]

Originally, there were major disagreements about the degree to which this International Authority would actually control activities of states harvesting the resources of the area. Negotiators strongly disagreed on the question of whether the Authority should itself be given the power and resources to carry out exploitation of these resources, so that any states or their citizens who desired to carry out similar activities would be able to do so only on the basis of contracts or other forms of association with the

13. See the Report of the - U.N. Secretary-General, 'Possible Methods and Criteria for the Sharing by the International Community of Proceeds and other Benefits Derived from the Exploitation of the Resources of the Area Beyond the Limits of National Jurisdiction', U.N. Doc. A/AC.138/38, 15 June 1971. See also U.N. Doc. A/CONF. 62/ WP. 8/Rev. 1/Part I, articles 26, 48, 49 and 50.

Authority. This position is favoured by the developing countries (Group of 77) which have had adverse experiences with the free operation of multinational corporations and prefer planned and controlled economic activities. Their position is that the Authority itself should carry out the exploitation of these resources and should control the rate of production and marketing of the minerals. It is also argued, particularly by the developing states whose economies are highly dependent on the land - based production of the same minerals available from the sea bed, that if production and marketing of these minerals from the sea bed is not controlled, excess production might disrupt the market and cause them serious economic dislocations.

An opposing position is taken by developed states which support 'free market' economic policies, aggressively led by the United States. Simply put, the U.S. position is that the Authority should derive revenues only from licenses. Most U.S. policy-makers consider the discussions of the developing countries a waste of time. Legislators in the U.S. have already introduced bills in their Congress which, if passed, would authorise and protect U.S. citizens who are ready to select economically attractive sites and begin mining in the international sea bed area. Some U.S. Senators have said, in fact, that they should go ahead and adopt national legislation and withdraw from any further negotiations at UNCLOS III.[14]

Should the United States adopt this legislation, it would perhaps spell the demise of any agreement on orderly and internationally controlled mining of the resources of the international sea bed area. The technologically advanced countries would begin competing to capture mineral sites in a manner reminiscent of the former colonial acquisition of territories.

A middle viewpoint has been voiced at the negotiations (see U.N. Doc. A/CONF. 62/W.P. 8, 15 July 1977, Annex II). Yet even though there is general agreement about the existence of the international sea bed area, the lack of further agreement creates a situation in which individual states may, and in fact should,begin thinking what policy options they will adopt whether or not a treaty is actually reached. If an International Sea-bed Authority is established by treaty, the individual developing states should consider possible

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14. Such is the view of, for example, U.S. Senator Paul Fanin who said before the Senate Committee chaired by Senator Lee Metalf:-
Let us not be distracted by expressions of 'cautious optimism', promises of intersessional work - work which is seldom productive - and the scheduling of ever-more sessions of the LOS Conference into the year 1977. The job must be done in this Congress, In the 93rd Congress, your bill S. 1134, was reported by the full Senate Interior Committee. Let us begin by taking definite action on your bill S. 713 in this Congress. U.S. Congress, Hearing before the Subcommittee on Minerals, Mineral Fuels, of the Committee on Interior and Insular Affairs, 94th Congress, 4 June 1975, Part 3, p. 1167.)

sources of technology and especially the training of local experts, to facilitate their participation alongside the Authority. If no Authority is established, every state must act independently and should consider the training of local people and examine ways of gaining from the sea bed resources. The western Indian Ocean states have accepted, in principle, the need to establish a regional Oceanogrphic Support Centre whose function would be, among other things, to train marine scientists up to the master's and Ph.D. level (see 'Report of the Sub-group on Coastal Physical Oceanography' issued at the Seminar and Scientific Workshop on Cooperative Investigation of the North and Central Western Indian Ocean held at the UNESCO, regional office in Nairobi, 25 - 31 March 1976).

SUGGESTED RESEARCH TOPICS

The strategy of an individual state action may fall under two broad categories: 1) To identify the range of its own national interests vis a vis the interests of other states and the international community at large, and to incorporate these interests within a national legislative framework, and 2) To develop national management strategies for the implementation of the legislative principles in such a way as to avoid conflicts with other states. The provisions of the legislative enactments will show the extent to which a state is prepared to carry out the management, conservation, exploration and exploitation of the marine resources for the good of the national population. These two major activities of the individual state - legislative and managerial —— each reguire information which can be generated by appropriate research.

The Study of the Development of Marine Policies and Legislation

The purpose of this type of research is to ascertain the extent to which a country or countries under study have thought out and defined their marine policies - and how the policies are embodied in their legislative framework. It should include primarily the collection and collation of the legislative texts and policy instruments related to the conservation and development of coastal and offshore resources. We know, for example, that Kenya's major policies on fisheries are contained in the Fish Industry Act, 1968, and that legislation on the continental shelf was adopted by Parliament in 1975.

All legislation should be collected on the following subjects:-

1. Delimitation of the territorial sea
2. Rights and duties within the contiguous, resource or economic zones and the delimitation of such zones

3. The control of pollution in the exclusive economic zone by substances and materials from ships

4. The control of pollution of the sea from land-based sources, including pollution in estuaries

5. Marine fishery industry

6. Mining and mineral rights on the continental shelf

7. Mining and mineral rights in the sea bed legislation protecting ports and harbours

8. Legislation protecting ports and harbours

9. Coastal and off-shore parks and recreation facilities

10. Shipping and merchant marine legislations, especially the conditions for awarding national flags to ships

11. Scientific research in the territorial sea and the economic zone.

It has been emphasised in this paper that the rational management of marine resources, especially in the areas of fisheries, pollution control and the exploitation of liquid minerals, requires a bilateral or regional approach. As already noted, this view was strongly emphasised at the Seminar on Cooperative Investigation of the North and Central Western Indian Ocean in which Kenya scientists participated. Each of the coastal states in Eastern Africa, while developing its own policies, should study the corresponding policies of the neighbouring coastal states. For example, if legislation is collected from Kenya on the topics listed above, an effort should be made to obtain corresponding texts at least from Somalia, Tanzania, Mozambique, Madagascar, Mauritius and the Seychelles. Texts may also be collected from Uganda, Zambia and Malawi, land-locked states which may be interested in regional arrangements such as those proposed by the Kenya delegates at the UNCLOS III discussions on the exclusive economic zone.

Marine Resource Management Studies A study should be made of what a country is doing or ought to do, in order to realise the benefits of its marine resources, while avoiding the possible adverse consequences of expanded marine activities. The scope of studies undertaken in this area will depend largely on the legislating which has been enacted on the topics listed above. In other words research is needed to ascertain what country actually does to implement its national or regional policies and regulations.

Such studies will be continuous and diverse, in that they will examine the issues of development and management over time. Follow-up studies will be needed in order to assess the interaction between the development of marine activities and other areas of national concern, including the impact on coastal populations.

The following broad areas of study may be discerned:-

Fishery Industry

1. Survey and charting of fishery resources
2. Development and regulation of equipment
3. Development of fishing vessels - motor, steam, rowing and sail
4. Measures to protect fishing grounds from more efficient foreign fleets (Note the experience during the development of the Common Fisheries Policy in 1970 by the European Economic Community and the resistance by Italy, France and Norway.)
5. Effects of changing fishing technology on the coastal fishing communities
6. The arrangement of joint ventures with foreign fishing interests (e.g., Kenya Fishing Industries as a joint enterprise of Ataka and Taiyo of Japan and Kenya Maritime Co. and I.C.D.C. of Kenya)
7. Aquaculture and biological conservation projects
8. Patterns of conflict management or avoidance (Note for example the Pemba Channel fishing dispute with Tanzania in 1970-71.)
9. Procedures for dealing with states which have been fishing in the sea area now to fall within the limits of the exclusive economic zone. (Consider options for phasing out or joint ventures with Soviet, Japanese, Taiwanese and Korean fishermen.)
10. Fish processing and marketing facilities at the national, regional and international levels
11. The role of the EAMFRO and locally available laboratory facilities

12. Cooperation with international organisations concerned with fishery activities (e.g. FAO, UNEP, UNESCO, IOC, ECA).

The Regulation of Scientific Research in Coastal Waters carried out by National and Foreign Scientists

Coastal and Off-shore Parks and Recreation Facilities

1. The impact of expanded coastal tourism and recreation on coastal populations
2. Parks and recreation versus conservation measures.

The Continental Shelf and Sea-bed Resources

1. Programmes for coastal and off-shore hydrographic surveys and charting
2. Programmes for prospecting and drilling for solid and liquid minerals in the continental shelf and the sea bed
3. Possible environmental consequences of drilling for minerals in the coastal zone
4. Possible economic and social consequences for the coastal populations of expanded mining activities.

Pollution Control in Harbour, Coastal and Off-shore Areas

1. Procedures for the control of effluents discharged from coastal urban and industrial centres
2. Procedures for the control of pollution from other land-based sources
3. Procedures for dealing with accidental and deliberate discharges at harbours and off-shore terminals
4. Arrangements for handling major spills from ships, such as the Torrey Canyon disaster. This would include an investigation of available vessels, spraying equipment and detergents approved by marine biologists; available bombs such as were used by the Royal Air Force and the Royal Navy in the case of the Torrey Canyon in 1967;
the possible role of the Kenya Navy, Army and Air Force;
coordination with other regional states;
arrangements with developed or maritime states for assistance in the case of a major spill; and
arrangements for consultation with competent international organisations, such as IMCO, UNEP, FAO, IOC and UNESCO, in case of a major catastrophe to deal with aftermath of the discharge.

Shipping and the Level of Investment in the Shipping Industry

Specific Administrative Procedures for Dealing with Volations of the Legislation

Training Programmes for Local Marine Scientists

1. Local training facilities (existing and planned)
2. Available local marine scientists
3. Those still in training locally
4. Those in training abroad
5. The role of international agencies and the support received from multilateral programmes such as TEMA in the IOC.
6. Procedures for exchange of training information with other regional or international institutions or states.

Management of Other Coastal or Off-shore Installations

Conservation and Use of Coastal Mangrove Vegetation

(Mangrove trees are widely burned for charcoal.)

Additional topics for research will become evident as more information is gathered in these areas. Studies initiated now will lay the groundwork for a continuing series of developmental and management studies in the 1980s. Comprehensive work in these areas should be multi-disciplinary, involving a number of capable researchers in appropriate disciplines to provide a comprehensive body of information for the rational development of marine policy in an individual country and on a regional or international basis.

PRESENT AND FUTURE PERSPECTIVES ON MARINE AFFAIRS IN KENYA

By

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Technology

INTRODUCTION

The Science and Technology Act (No.3 of 1977) was recently passed by Parliament, thereby establishing machinery in the form of the National Council for Science and Technology (NCST) to advise the Kenya government on a national science policy and coordinate related matters. One of the basic tasks which the NCST will carry out towards the goal of formulating a national science policy will be the identification and costing of projects. This will give the NSCT an insight into the state of any branch of science and technology in the country. In the case of marine sciences the NCST, operating on an ad hoc basis, appointed a Working Party of experts in November 1975 to examine the need for a Marine Resources Institute in Kenya. Involvement in this exercise has given the NCST a genral view of the state of marine activities in the country. This short paper is not a presentation of the report of the Working Party, but it contains the highlights of what was found during the investigations.

THE RESOURCES OF THE KENYA MARINE ENVIRONMENT

The coastal area under consideration includes Kenya's coastal strip, the territorial sea, the exclusive economic zone and the continental margins. The marine environment in this discussion is taken to include the littoral zone, the waters of the sea and the sea-bed. Within this area, fisheries constitute the main readily indentifiable marine resource. However, as exemplified by the range of topics being discussed in this seminar, the marine environment is a diverse one. Other potential marine resources of the Kenya coast are marine algae, fossil corals, marine forests (mainly mangroves), mineral resources, tidal energy, wind energy, and the water itself as a communication medium and as a source of aesthetic value.

THE CURRENT STATE OF MARINE AFFAIRS IN KENYA

Basically, there are four interlinking processes associated with

exploitation of marine resources: identification, estimation, exploitation and conservation. Presently these processes are at such low levels in Kenya as to make rapid expansion of the utilisation of marine resources unlikely. Realising this, the Scientific Workshop held in Nairobi in March 1976 under the Intergovernmental Oceanic Commission (IOC) recommended that in order to be able to take part fully in the Cooperative Investigation in the North and Central Western Indian Ocean (CINCWIO) it was necessary to develop the national marine infrastructure of the East African States.

Let us briefly look at the marine activities going on in Kenya and attempt to pinpoint the constraints and problems that call for solutions.

Identification and Estimation

Much still remains to be done in surveying Kenya's marine resources Annual production figures and the informed opinion of those dealing with the marine dealing with the marine environment are not yet sufficiently reliable to indicate the true extent to which marine resources are present in Kenya's waters. The identification and estmation of stocks of fisheries and possible mineral resources, and the carrying out of hydrographic and other oceanographic surveys seems to be beyond the capacity of present Kenyan marine establishments, mainly due to the usual budgetary and technological constraints of personnel and funds. To perform these tasks satisfactorily requires sophisticated facilities, equipment and vessels.

The Fisheries Department has been carrying out some surveys on fisheries but this work needs further inputs of personnel and equipment if it is to progress rapidly.

Prospecting for off-shore oil and gas is presently beyond national resources in terms of money and technology and is presently being carried out by foreign oil companies. About twelve months ago there were seven consortiums exploiring for oil in Kenya. Four have ceased operations and only three are remaining. The three remaining are Texas Pacific Kenya Inc., Wainoco Kenya Ltd. and Total Exploration Ltd. The Licences for the first two i.e. Texas Pacific and Wainoco, cover exploration on land and part of the immediate shallow sea waters. The Total Licence covers a section of the deep offshore waters lying mainly in the 200-miles economic zone. It should be noted that companies tend to team up to explore a given licence area, and also foreign companies are required to include at least one local company in exploration and prospecting: Hence the use of the term'consortiums'.

It cannot as yet be said whether oil will be found in Kenya. However, it is worth noting that most of the exploration which was abandoned was on dry land and now emphasis is shifting towards the marine area. Reports of companies that have ceased exploration and prospecting are deposited in the library of the Department of Geology and Mines and they are available to bona fide readers, with permission from the Department. Reports on on-going exploration and prospecting are confidential and available only to relevant government authorities .

On information received from the East African Harbours Corperation, there appears to be a world-wide shortage of hydrographic survey personnel, and to date only a small portion of the Kenya coastline has been charted and that was in the 1950s. There have been practically no surveys of mineral resources or the potential for wind and solar energy utilisation at the coast, though some surveys have been carried out on algae, turtles and mangroves.

Research.

Some of the survey activities mentioned above could be classified under research. Apart from these activities however, there are other large areas of research which have been left unattended. These include, inter alia, ecological research, environmental quality control, present and potential productivity of the creeks, mariculture, use of sea weed fertiliser and the economics of exploitation of the marine resources. The East African Marine Fisheries Research Organisation (EAMFRO) which is primarily a research organisation has had no laboratory facilities for some time. This, added to the fact that their research ship had become old and unserviceable, means that they have not been able to make progress in their research. In general then, there is a great need for marine research in Kenya.

Personnel and Training

Several establishments, such as the Fisheries Department, the East African Harbours Corperation, the African Marine and General Engineering Company (AMGECO) and the Mombasa Polytechnic, have some limited provisions for training lower cadre marine personnel. The University of Nairobi has undergraduate programmes in natural sciences and engineering from which a few graduates are recruited into marine occupations and acquire technical skills through on-the-job experience. Atpresent there are no provisions in Kenya for training in the marine sciences per se at the higher graduate and

and technical levels. This lack is reflected in the low level of research activities going on in the marine sciences field.

Exploitation

A look at the fisheries production statistics at the coast from 1973 to 1975 (Tables 1 to 4) shows that fish production growth has been slow. This has been attributed to the low level of fishing technology among the fishermen as well as transport and marketing problems. The low level of fishing technology has meant that the fishermen are unable to fish in deep or rough waters. At present foreign vessels are vigorously exploiting Kenya's deep-sea fisheries. The amount of deep-sea fisheries brought to the Kenya Fishing Industries (KFI) is shown in Table 5. These figures are comparable to those of inshore fisheries production as shown in Tables 1 to 4. The deep sea fish are caught mostly by foreigners take away, though this is thought to be considerable. Better roads, sea communications and refrigeration facilities need to be developed to solve the transport problems. The elimination of fish dealers as middle men, the strengthening of the co-operative movement and the establishment of a fish processing factory at the coast have been suggested as other possible means of improving market conditions. Only 12 per cent of the fishermen at the coast are members of the Fishermen's Cooperative Societies, as shown in Table 6.

The Kenya government has rightly invested a great deal of resources in the harbour facilities in Mombasa. The increasing traffic (figures for 1965 to 1974) calls for continued expansion of the harbour and additional facilities for ship repair. The Kenya government has plans to establish a second harbour, but this may take some time. AMGECO, with strong financial backing from the government, is constructing a dry dock capable of taking ships of up to 20,000 tons. This will be the only ship repair facility between Bombay and Durban and will call for increased training of manpower.

The Kenya Development Plan for 1974-78 indicates that with time tourism is expected to become the country's biggest foreign exchange earner and one of the major employers. According to the government's Economic Survey of 1976, estimated tourist expenditure rose by 26 per cent, from K£26.5 million in 1974 to K£33.4 million in 1975. Rising costs and a severe recession in tourist-generating countries have affected the growth of international tourism, and it is noted the Economic Survey that under the circumstances the fact that tourism in Kenya grew moderately in 1975

represents a considerable achievement, even though overall progress fell below the 1974-78 Development Plan targets. The number of visitors to Kenya increased by 5 per cent while visitor-days grew by 12.5 per cent from 4.41 million in 1974 to 4.96 million in 1975, mainly as a result of the large increase in numbers of visitors staying for as long as a month in the country. The tourist visitors travelled to three main destinations, Nairobi, the coast and the game parks. Figures available from 1966 to 1974 (see Table 7) show that nonresidents occupy more beds in coast hotels than in all up-country hotels taken together, excluding Nairobi. This shows that apart from the wildlife attraction, holiday-makers stay longer in Kenya because of the coastal recreational facilities. The completion of the Mombasa International Airport will now enable visitors from the tourist-generating centres of the world to fly directly to the coast. Tourism should also be enhanced by the creation of the Diani Beach Complex. The growth in tourism at the Kenya Coast has been forecast at 9 per cent per annum. This will entail an increase of 15,000 hotel beds by 1994. but also will require the improvement of present services and facilities, such as sports fishing, boating facilities, water supplies, infrastracture (sea and land), pollution control, and also protection of the culture and moral fibre of the indigenous population from the impact of the tourists.

Mangroves are exploited for many economic purposes at the coast and are also exported to the Middle East. Mangroves act as shoreline stabilisers and provide a habitat for juvinile stages of some commercially important prawns and fishes. Mariculture could be developed around the mangrove swamps in Lamu. The mangroves need protection from oil pollution and research into ways of controlling the mangrove borer.

Salt is presently produced by dessication at Ungwana Bay north of Malindi by Kenya Salt Manufacturers Ltd., Fundisha Salt Works Ltd. and Ngomeni Salts Ltd. We were not able to find out the total production from these companies.

Two more prospective companies have applied and have been allocated further areas for salt production at Ungwana Bay, indicating a large potential for salt production and marketing.

Fossil corals are at present being exploited by the Bamburi Cement Factory for cement production. Oil, a potential resource,has not yet been discovered in Kenya's waters, as mentioned earlier, but with the continental shelf falling within Kenya's exclusive economic zone, prospecting for oil in this area should continue to be encouraged.

Other resources which have been shown to be of substantial economic value and which are available but have not been exploited at the coast are seaweeds and solar and wind energy. In general then, much still remains to be done in terms of the exploitation of Kenya's marine resources.

Conservation and Pollution Control

The Development Plan of 1974-78 states:

> The Marine Conservation and Restoration Programme will increase its monitoring and control of the pollution of the sea and shoreline by oil, effluents from factories and ships, and municipal waste; protect the mangrove swamp area from dumping and indiscriminate cutting; increase measures to prevent the use of explosives for fishing; regulate more closely the removal for the curio trade of live marine inverterbrates; and restore and protect the marine turtle and dugong populations of the coast until they are adequate to be used again for food under proper conservation measures. The Government will also seek to obtain international agreements and improvements in international law relating to the use of the seas and their products and pollution of the marine environment. (p. 194, Section 9.14(iv)

With regard to the marine conservation and restoration programme described in the plan, the government has taken several steps:

In 1974, the government commissioned the Norconsult A/S to carry out a sewerage and waste disposal study for Mombasa. The study is now complete and its findings will be implemented in due course.

Mangrove swamps are gazetted and cutting is controlled by the Forestry Department on a sustainable basis. The export of live and dead marine vertabrates and shells for the curio trade has been banned. A marine park is planned for the Lamu area to protect the marine turtle and dugong population. This will be in addition to the parks already established at Kitue/Mpunguti near Shimoni and the one at Watamu near Malindi.

Kenya has been actively taking part in the United Nations Law of the Sea Conferences which is the proper forum for seeking international agreement and improvements in international maritime laws. Although the positions taken by Kenya in the International Law of the Sea Conferences are not outlined in the Development Plan, they can now be taken as national planning policies which have crystallised in the 1974-78 period. The reference in the 1970/74 Development Plan (p.294) to plans to expand Kenya's fishing activities to 200 to 300 miles from the shore and the fact that an off-shore oil exploration agreement was made with Total in 1972 show that Kenya was already thinking in terms of the 200 -mile economic zone the late 1960s and early 1970s. The 1974/78 Development Plan (p.194 Sec.9.14(vi)) expresses Kenya's interests as follows: 'The Government will also seek to obtain international agreements and improvements in international l... relating to the uses of the seas and

their products and pollution of the marine environment'. Some of the specific details have not been elaborated but this statement and the previous actions of the government represent national policy in these matters. Also a number of issues have only become apparent since the 1970-74 Development Plan was written.

A National Marine Anti-pollution Committee has been formed, composed of representatives from the National Environment Secretariat, Office of the President; Police Airwing, Office of the President; Provincial Commissioners Office, Mombasa, Office of the President; Kenya Navy, Ministry of Defence; Fisheries Department, Ministry of Tourism and Wildlife; Water Department, Ministry of Water Development; The Merchant Shipping Superintendent, Ministry of Power and Communication; Oil marketing companies (one representative for all of them), East African Oil Refineries; E.A.H.C.; Mombasa and Hotel Keepers Association, Mombasa.

The functions of the Committee are:-

a. To formulate an oil spill contingency plan for application in the event of a serious or major spill in Kenya;

b. To institute measures for effective monitoring, discovery, reporting, cleaning up and containing the spread of pollution;

c. To developm Kenya's marine anti-pollution capabilities;

d. To keep abreast of new technonogical advances for marine anti-pollution equipment and to review the contingency plan accordingly;

e. To advise the competent Kenyan authorities on the acquisition marine anti-pollution clean up and containment equipment;

f. To institute measures to ensure the maintenance of such equipment as required;

g. To advise the Kenya shipping industry on implementation of various regional or international conventions or agreements concerning marine pollution; and

h. To stimulate and streamline co-operation and co-ordination between government, port authorities and the Shipping Industry with regard to the protection of the marine environment.

The Committee is still fairly new, but it is hoped that with these

objectives and membership it should be able to have an appreciable impact on marine pollution at both the national and the regional levels.

Although Kenya's coastal waters are not as polluted as some beaches in other parts of the world, large tar-balls have been observed on the Kenya coast and oil and ship wastes from ships many miles out in the sea are carried by the East African current and end up along the East African coast. In addition, there is increasing pollution from factories and towns and due to soil erosion. Thus Kenya requires a pollution monitoring programme. It should also be noted that Kenya has not had facilities to deal with a major pollution hazard such as a burst oil tanker, although this situation is expected to be remedied in the near future.

THE FUTURE OF MARINE AFAIRS IN KENYA

Thus we have seen that management, research, training and exploitation of marine resources have lagged in Kenya. Due to the realisation of this situation, there have been a number of proposals recently for activating marine programmes emanating from different quarters such as, among others, the Fisheries Department, the University of Nairobi, the National Museum, EAMFRO and different UN bodies. The Fisheries Department plans to strengthen its research department; the University of Nairobi has plans to start courses in marine sciences; the National Museum has plans to establish a marine museum which will also have a research component; EAMFRO is about to complete a new research laboratory and acquire a new research ship; and different UN bodies have responded favourably to a programme of strengthening national marine infrastructures, a task which the IOC is about to undertake.

All these programmes must be co-ordinated. An integrated institution should be established with research and training functions. Such an institution should be established with research and training functions. Such an institutions could initially have departments of fisheries, ecological studies, envrionmental quality control, sea transport and communications, and economics. The economics department should evaluate the research conducted by the other departments and advise on the economic exploitability of marine resources. The costs of setting up a well staffed and equipped institute as envisaged above have been estimated to be as follows (1976 prices and local salaries);-

Capital costs	K£740,000 (US$1,772,000)
Recurrent costs (p.a.)	K£260,000 (US$623,000)

These estimates do not include the capital cost of a medium-size research ship would be in the region of K£2million.

These costs could come down considerably if some of the present resources of the countries in the eastern coast of Africa were brought together.

Such an institute would be semi-autonomous, managed by a governing council of government and University officials and funded through one of the government ministries. It should be noted here that the NCST cannot operate such an institute, as the NCST, as presently constituted, is only an advisory body. However, the programmes for the institute would have to be reviewed by the NCST Research Advisory Committees.

SUMMARY

The full economic potential of the Kenya coast is not known. There is an urgent need to carry out comprehensive surveys and research on the resources of the coast. The few surveys made have indicated a wealth of biological resources, some of which are currently being heavily exploited by foreigners. Geological surveys have yet to be initiated. Demands for marine services, such as boat building, ship servicing, tourist facilities, harbouring and landing facilities and pollution monitoring, are on the increase.

The national institutions lack the necessary manpower, funds and equipment to carry out adequate marine research, exploitation, conservation and training, in addition to their current responsibilities. The current consensus among U.N. agencies and East African governments seems to be that national marine institutions in these countries are weak and need to be strengthened, so that the countries can enhance the exploitation and conservation of their marine resources as well as participate more fully in a regional integrated programme. The costs of establishing a Marine Resources Institute in Kenya which would be able to fill most of the present gap in marine studies has been estimated at K£ 740,000 capital costs, excluding a research ship, and K£ 260,000 recurrent costs. There is also a serious, immediate need to increase fisheries production from indigenous fishermen by exploring ways of enabling them to fish in the deep-sea waters and streamlining marketing.

TABLE 1: TOTAL PRODUCTION OF FISH AND SHELLFISH - COAST PROVINCE - 1973 - 1975

Table 1: Total production of fish and shellfish in Coast Province, 1973-1975

	1973		1974		1975	
FISH	Metric Tons	Shs	Metric Tons	Shs	Metric Tons	Shs
Freshwater Fish	1,188	1129,541	2098	2796427	1715	2383,101
Demersal fish	2,505	3,768,409	2,132	4,970,208	2,154	5,283,483
Pelagic fish	291	213,188	301	1,113,643	345	1,670,581
Sharks	267	305,663	230	385,148	293	530,805
Mixed	399	598,301	371	666,811	478	902,213
Not acc. for	-	-	504	1,037,586	883	2,098,500
TOTAL	3,462	4,885,561	3,538	8,173,396	4,153	13,485,582
CRUSTACEA						
Spiny lobsters	61	395,658	57	558,912	57	640,377
Prawns	131	793,539	87	300,667	49	267,514
Crabs	16	23,177	13	41,484	17	75,609
Not. Acc. for	-	-	52	233,324	100	825,850
TOTAL	208	1,212,374	209	1,134,387	223	1,809,350
MISCELLANEOUS						
Game fish	85	53,139	88	55,000	67	272,496
Oysters	2	52,803	3	65,531	4	55,332
Oyster Shellgrit	130	63,236	115	63,484	72	38,880
Beche-de-mer	49	45,700	61	1,88,439	111	1,515,930
Squid	1	2,300	1	2,656	2	2,724
TOTAL	267	217,178	268	375,110	256	1,885,362
GRAND TOTAL	5, 125	7,444,654	6,113	12,[illegible],320	6,347	16,563,395

Source: Fisheries Department, Mombasa.

Table 2. Total production of marine fish and shellfish by areas, Coast Province, 1975

FISH	LAMU		KILIFI		MOMBASA		SHIMONI		TOTAL	
	Metric Tons	Shs	Metric Tons	Shs	Metric Tons	Shs	Metric Tons	Shs	Metric Tons	Shs
Demersal fish	819	1,390,421	258	7776,232	558	1,727,391	519	1,389,439	2,154	5,283,483
Pelagic fish	20	67,047	161	694,247	146	820,422	18	38,865	345	1,670,581
Sharks	35	75,819	88	136,530	104	231,234	66	87,222	293	530,805
Other	-	-	104	241,262	246	506,430	128	154,521	478	902,213
Not. acc. for	236	354,000	165	497,000	285	798,000	197	449,600	883	2,098,500
TOTAL	1,110	1,887,287	776	2,345,271	1,339	4,083,477	923	2,169,547	4,153	10,485,582
CRUSTACEA										
Spiny lobster	34	365,562	9	119,353	8	81,860	6	73,602	57	640,377
Prawns	13	23,112	12	84,098	13	101,199	11	59,105	49	267,514
Crabs	1	2,774	5	34,177	3	20,154	8	18,504	17	75,609
Not acc. for	27	218,700	6	53,350	56	448,000	11	105,800	100	825,850
TOTAL	75	610,148	32	290,978	80	651,213	36	257,011	223	1,809,350
MISCELLANEOUS										
Game fish	-	-	27	122,826	32	113,275	8	36,395	67	272,496
Oysters	-	-	1	13,993	3	36,339	-	-	4	55,332
Oyster Shellgrit	-	-	-	-	72	38,880	-	-	78	38,880
Oeche-de-mer	-	-	-	-	111	1,151,330	-	-	111	1,515,930
Squid	2	2,724	-	-	-	-	-	-	2	2,724
TOTAL	2	2,724	23	141,819	218	1,704,424	8	36,395	256	1,885,362
GRAND TOTAL	1,187	2,500,159	836	2,778,068	1,637	6,439,114	972	2,462,953	4,632	14,180,294

Source: Fisheries Department, Mombasa.

Table 3. Total production of marine fish and shellfish Coast Province, 1974

	LAMU		KILIFI		MOMBASA		SHIMONI		TOTAL	
	Metric Tons	Shs	Metric Tons	Shs	Metric Tons	Shs	Metric Tons	Shs	Metric Tons	Shs
Demersal fish	822	1,378,604	247	805,323	508	1,476,635	555	1,309,646	2,132	4,970,208
Pelagic fish	5	17,416	143	562,390	132	430,500	21	103,337	301	1,113,643
Sharks	29	83,655	66	112,383	85	123,864	50	65,246	230	385,148
Others	2	6,670	73	202,775	216	365,040	75	92,326	371	666,811
Not acc.for	116	177,018	136	341,496	118	267,152	134	251,920	504	1,037,586
TOTAL	974	1,663,363	670	2,024,367	1,059	2,663,191	835	1,822,475	3538	8,173,396
CRUSTACEA										
Spiny lobsters	38	357,364	4	57,895	6	53,895	9	90,282	57	558,912
Prawns	28	27,685	9	51,194	45	163,044	11	58,744	87	300,667
Crebs		154	4	17,209	-	-	9	24,121	13	41,404
Not acc. for	23	106,743	3	18,864	21	82,257	5	25,460	52	233,324
TOTAL	83	491,946	20	144,638	72	299,196	34	198,607	209	1,134,387
MISCELLANEOUS										
Game fish	-	-	55	34,375	21	13,125	12	7,500	88	55,000
Oysters	-	358	2	57,103	-	8,070	-	-	3	65,531
Oysters Shellgrit	-	-	1	5,027	115	58,457	-	-	115	63,484
Beche-de-mer	61	188,439	-	-	-	-	-	-	61	188,439
Squid	1	2,656	-	-	-	-	-	-	1	2,656
TOTAL	62	191,453	58	96,505	136	79,652	136	7,500	268	375,110
GRAND TOTAL	1,119	2,346,762	748	2,265,510	1,267	3,042,039	881	2,028,582	4,015	9,682,893

Source: Fisheries Department, Mombasa.

Table 4. Total production of marine fish and shllfish Coast Province, 1973

	LAMU		KILIFI		MOMBASA		SHIMONI		TOTAL	
	Metric Tons	Shs	Metric Tons	Shs	Metric Tons	Shs	Metric Tons	Shs	Metric Ton	Shs
FISH										
Demersal fish	1,091	1044,305	258	402,480	532	1,297,016	624	1,024,608	2,505	3,768,409
Pelagic fish	4	4,492	99	36,729	165	122,760	23	49,207	291	213,188
Sharks	29	16,904	33	42,850	149	197,872	56	48,037	267	305,663
Mixed	2	3,747	97	159,565	235	423,705	65	11,284	399	598,301
TOTAL	1,126	1,069,448	487	641,624	1,081	2,041,353	768	1,133,136	3,462	4,885,561
CRUSTACEA										
Spiny lobsters	48	294,528	2	12,503	5	45,415	6	43,212	61	395,658
Prawns	19	37,145	5	26,660	84	636,384	23	93,350	131	793,539
Crabs	2	2,200	1	1,100	-	-	13	19,877	16	23,177
TOTAL	69	333,873	8	40,263	89	681,799	42	156,439	208	1,212,374
MISCELLANEOUS										
Game fish	-	-	57	21,147	20	14,880	8	17,112	85	53,139
Oysters	-	-	2	41,118	-	11,685	-	-	2	52,803
Oyster shellgrit	-	-	-	-	130	63,236	-	-	130	63,236
Beche-de-mer	49	45,700	-	-	-	-	-	-	49	45,700
Squid	1	2,300	-	-	-	-	-	-	1	2,300
TOTAL	50	48,000	59	62,265	150	89,801	8	17,112	267	217,178
GRAND TOTAL	1,245	1,451,321	554	744,152	1,320	2,812,953	818	1,306,687	3,937	6,315,113

Source: Fisheries Department, Mombasa

Table 5. Deep-sea fish brought to Kenya fishing industries, 1973-75.

SPECIES	QUANTITY (Metric Tons)		
	1973	1974	1975
Albacore	2,172	1,685	191
Big-eye tuna	1,060	1,583	463
Blue-fin tuna	5	7	9
Yellow-fin tuna	2,568	2,301	512
Black marlin	148	277	39
White marlin	-	85	20
Blue marlin	91	-	-
Striped marlin	-	-	-
Red marlin	93	151	41
Sail fish	119	230	54
Skip jack	-	-	14
Sword-fish	166	222	61
Shark	111	27	33
Mako shark	155	212	30
Others	254	404	88
TOTAL	6,942	7,184	1,555

Source: Fisheries Department, Mombasa.

Table 6. Number of fishermen and fishing co-operative members in Coast Province by district.

DISTRICT	ESTIMATED NUMBER OF FISHERMEN	CO-OPERATIVE MEMBERS
LAMU	2,400	448
KILIFI	1,500	99
TANA RIVER (KIPINI)	164	21
MOMBASA	1,000	36
KWALE	2,600	341
TOTAL	7,664	945

Source: Fisheries Department, Mombasa.

Table 7. Hotel Beds Occupied by Visitors[a] 1966-1974 ('000 bed nights).

	Nairobi	Coast	Coast Hinterland	Masai Land	Nyanza Basin	Western	Central	Northern	Total Beds Occupied
1966	299.8	164.0	24.7	24.0	2.5	1.0	38.5	-	554.4
1967	336.6	202.1	26.3	31.3	3.4	0.6	40.0	-	640.3
1968	367.4	241.0	29.5	42.6	4.5	0.8	38.9	1.2	725.8
1969	419.5	306.6	38.1	50.4	5.1	1.0	53.5	2.1	876.5
1970	535.2	423.4	50.4	60.3	8.9	0.6	67.6	1.9	1,148.3
1971	650.7	540.5	65.6	74.0	8.4	1.2	89.5	2.0	1,431.9
1972	762.8	665.8	77.8	87.2	8.2	1.8	110.6	3.5	1,717.7
1973	775.5	709.0	82.6	101.1	5.8	2.5	114.4	4.6	1,795.4
1974	790.6	833.9	82.9	106.9	4.1	2.4	128.2	3.0	1,952.0

a. Foreign visitors refers to all visitors other than East African residents.

Source: Kenya Central Bureau of Statistics, Statistical Abstract 1975.

LEGISLATIVE DEVELOPMENT IN KENYA CONCERNING THE TERRITORIAL SEA AND THE CONTINENTAL SHELF

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This paper discusses two legislative Acts in Kenya, the Territorial Waters Act of 1972 and the Continental Shelf Act of 1975. It is the first in a series of studies which will examine the development of legislation and policies related to the control of coastal and off-shore resources in Eastern Africa. This study focusses on key concepts in the statutes and analyses the texts in order to identify potential strengths and weaknesses. Where appropriate, recommendations are made to fill any lacunae and provide the comprehensive legislative framework necessary for the effective management of coastal and off-shore resources.

THE TERRITORIAL WATERS ACT, 1972

Kenya has a coastline measuring 247 miles from the Somalia to the Tanzania border. It is along this coastline that the 1972 Act of Parliament extended the territorial jurisdiction outward from the old distance of three miles to a distance of twelve miles. This breadth is measured from a base-line along the low water mark, or where applicable from a straight line which closes the indentations of the coastline. This means thatall waters within the base line or the straight line along the indentations are regarded as internal waters of the coastal state. As we shall see below, under international law the scope of jurisdiction of the coastal state over internal or inland waters is more comprehensive than that over the territorial waters. It is interesting to note in this regard that Section 4(2) of the Kenya legislation defines the territorial waters to include 'any part of the open sea' that the territorial sea includes any inland waters of Kenya.

In a schedule, the Territorial Waters Act stipulates the course of the base line from which the twelve miles of territorial waters are to be measured. Where the coasts are adjacent to the territorial sea of a foreign country (such as in the Pemba Channel), the breadth of the territorial sea is to be limited according to the equidistance principle which should apply as specified at the 1958 Geneva Convention on the Territorial Sea and the Contiguous Zone (United Nations Treaty Series, 516 1964, Article

12(1, p. 205). The scope of Kenya's powers of jurisdiction of under this legislation and the evidence that may be evoked to support the proprierty of these powers so exercised are discussed in this paper.

The Act lays down no specific functions, activities or objects that are subject of control. It is, therefore, reasonable to assume that the powers of Kenya to control any functions or objects within the territorial sea may be understood within the provisions of general international law and treaty provisions, especially the 1958 Geneva Convention on the Territorial Sea and Contiguous Zone to which the Kenyan Act makes reference.

Generally, the territorial waters are understood to constitute the national domain of the coastal state, that is, part of the open sea within which the coastal state may enact laws and enforce regulations as it would on its inland territory. But this construction is not entirely correct; it is qualified by the provision of the right of innocent passage allowed to foreign ships. Article 14 of the 1958 Geneva Convention on the Territorial Sea and Contiguous Zone states that ships of all States, whether coastal or not, shall enjoy the right of innocent passage through territorial sea. The Convention adds in Article 16 (1) that the coastal State may take measures necessary to the prevent passage which is not innocent.

This rule was adopted by the International Law Commission (ILC) in its 1956 draft articles and was subsequently accepted by the 1958 Geneva Convention. Article 15 (3) of the ILC draft articles, which corresponds to Article 14(4) of the 1958 Convention, states that the passage is innocent so long as a ship does not use the territorial sea for committing any acts prejudicial to the security of the coastal state or contrary to the present rules of international law. In the official ILC commentary to the article, it is specified that in order for the right to be claimable the passage must in fact be innocent and the coastal state is may take steps to verify its innocent character.

The range of activities which a state may consider prejudicial to its peace, security and good order is large and unspecified. Among prejudicial activities may be included the conduct of military exercises or surveillance, commercial surveillance, warlike gestures toward the coastal state,[1]

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1. Note, for example, in the Corfu Channel case where the International Court of Justice found that while British warships had the right of innocent passage, their behaviour in positioning guns on the boats and engaging in mine-sweeping constituted a violation of Albanian sovereignty. See the 'Corfu Channel Case,' I.C.J. Reports, 1949, pp. 4, 33-35.

the discharge of polluting effluents, and fishing. It was reported, for example, that during the latter days of President Sukarmo's regime in Indonesia foreign powers supporting local anti-Sukarno groups shipped arms into Indonesia's territorial waters and transferred them to the insurgents. Obviously, such ships were not engaged in innocent passage. This type of problem might be experienced by more coastal states in future, especially the weaker nations when they fall out of favour with a large military power.

Even though activities with economic or aesthetic implications may be prejudicial to national interests, it is questions of defence which have been of particular concern to coastal states. It is debatable whether a foreign military vessel can be considered innocent by its very nature. This author would argue that a military vessel or craft, including a submarine, is inherently not innocent. Therefore, when such a vessel intends to pass through the territorial waters of a coastal state the officers of the commissioning state should obtain the prior express permission of the coastal state. Such a requirement could legitimately be included in the text of a coastal state's territorial waters act because this is an issue with very far-reaching implications concerning which international law has been vague. It is not mentioned in the Kenya legislation.

Moreover, there is a tendency for international conventions on the law of the sea to exempt government ships, including naval vessels, from the application of the treaties. This makes it all the more important that the national legislation should specify how local authorities intend to deal with military and non-military vessels of foreign (friendly or unfriendly) governments navigating their territorial waters. Such a statutory provision might also specify the conditions under which a foreign vessel is considered to be operating jure emprii i.e., engaged in official rather than commercial activities,

It also happens sometimes that a coastal state, for defence purposes, will specify areas within the territorial sea which are declared closed to foreign navigation either temporarily or permanently. Examples are the provisions contained in Article 18 of the 1963 Regulations adopted by the National Defence Council of the German Democratic Republic (U.N. Legislative Series, 1975, p. 18) and the Territorial Waters and Continental Shelf Decree of 1973 of Ghana (U.N. Legislative Series, 1975 p. 23). For Kenya a rule to close certain areas of the territorial sea to navigation may relate to the national marine parks, rather than to concerns about defence. No entry is permitted into the two large marine parks, Kitue-Mpunguti on the southern coast near Shimoni and the Watamu-Malindi (Casuarian Point) north of Mombasa, without express permission from the Department of Wildlife Conservation and Management (see the paper by Asaya in this volume)

The point here is that no passage through these areas would be innocent. It would be useful if special provision were made in the territorial waters legislation referring to the government's intention to declare some parts of the waters closed for purposes of defence or conservation. Then foreign navigators who plan an innocent passage through territorial waters may be warned to inquire whether, and in what locations, such areas have been designated.

Two other activities occur with some frequency and may be prejudicial to the interests of coastal states. One is pollution: a ship which discharges polluting effluents while crossing territorial waters is not innocent. The threat of pollution, especially in coastal waters, has become a menance to the economic and aesthetic wellbeing of the coastal states. It is a danger to coastal fishery resources, and also, in Kenya, a serious threat to the tourist industry which depends on clean beaches (see comments in F.A.O., 1971, p. 55). In recent discussions with the author, Kenyan fishermen stated that they had frequently seen oil floating on the water in amounts indicating there had been major spills; in other cases the amount of oil seen has been relatively small, suggesting that it might have resulted from deballasting or tank flushing beyond the territorial waters and has drifted toward shore by the action of the waves and currents. This oil may also have been discharged within the territorial sea by ships approaching or leaving harbour. A ship found deballasting or tank flushing within the territorial sea is certainly not innocent.

The second type of prejudcial conduct is fishing within the territorial sea. Again, Kenyan coastal fishermen recently related that they frequently see Japanese, Korean and Chinese fishing boats operating within ten miles off Kenya's coast. Such activities are not only in violation of the rules of innocent passage through the territorial sea, but are also a violation of Kenya's Fish Industry Act of 1968.[2] This of course raises a management question which has to do with Kenya's capacity to enforce its laws, including the ability of the Kenya Navy to effectively patrol the waters and to bring offenders to book in the courts.

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2. Section 9 of the Fish Industry Act, 1968 (Chapter 378 Laws of Kenya) states, among other things:-

> (1) Without prejudice to any regulations made under this Act, no person shall catch or assist in catching fish in territorial waters otherwise than under and in accordance with the terms of a licence issued to him under this Act and for the time being in force.

Subject to these qualifications, a coastal state is required by international law to permit passage through its territorial waters. The rights of foreign ships are restricted to innocent passage, which does not include anchoring or otherwise staying in the waters except in the case of force majeure i.e. distress due to weather or accident.

These rights of innocent passage are what, properly construed, differentiate the scope of powers of the coastal state over territorial waters from jurisdiction over inland waters. There is no equivalent right of passage through inland waters. A state's inland waters include those encompassed by the baseline along the coast, as well as rivers and lakes. The state which claims inland waters may exercise the same jurisdiction as over its land territory. Where such inland waters are shared among neighbouring states, as in the case of Lake Victoria, the rules governing the use of internationally shared resources and the legal maxim sic utere tuo ut alienum non laedas (so use your own resources that it does not harm the interests of others)will apply. No third state may sail in the inland waters as they would in the territorial sea. Thus the definition of Kenya's territorial waters to include 'any inland waters of Kenya' is, at best, misleading.

Because of the nature of ocean water a question may easily arise during a court proceeding as to whether an alleged act or omission occurred within territorial waters. In Kenya , the Act provides that proof rests with the Minister for Foreign Affairs. Section 3 states that...a certificate to that effect signed by or on behalf of the Minister for the time being responsible for foreign affairs shall be received in evidence and be deemed to be signed without further proof, any such certificate shall constitute prima facie proof of the facts certified therein'. That is to say, even though the Attorney General is the chief legal officer of the Republic, the question of the location of an act within or beyond the territorial waters relates to the conduct of foreign relations and therefore falls within the province of the Minister for Foreign Affairs.

THE CONTINENTAL SHELF ACT, 1975

The Kenya Continental Shelf Act (No. 3 of 1975) came into effect on 4 April 1975. It represents one of the many national efforts during the last three decades to declare and define a coastal state's territorial claims over the marine resources adjacent to its coast. The continental shelf, considered to be a natural prolongation of the continental landmass of the adjacent territory, was first subject to national claims in 1945 when the United States set the precedent by a presidential proclamation which asserted that

country's jurisdiction over living and non-living resources on the continental shelf.[3]

The interest of coastal states in the continental shelf has increased since then, especially with discoveries of hydrocarbons and other mineral deposits. The discovery of mineral deposits at various depths has stimulated national research efforts and the development of technology geared to the exploitation of these resources. At the same time, questions have been raised concerning what should be the outer limit of the coastal states' rights over the continental shelf. This is one of the most intractable questions currently before the Third United Nations Conference on the Law of the Sea (see the first paper by Okidi in this volume). The Kenya legislation defines the continental shelf to mean:-

> The seabed and subsoil of the marine areas adjacent to the coast of Kenya, but outside the territorial waters, to a depth of two hundred metres or, beyond that limit, to where the depth of the superjacent waters admits of the exploration and exploitation of the natural resources of the said areas.

This definition is essentially a direct quote from the 1958 Geneva Convention on the Continental Shelf, which has been under strong criticism ever since it was adopted.[4] The criticism arises from the second part of the criterion for the delimitation of the continental shelf, which states, "... beyond that limit to where the depth of the superjacent waters permits of the exploration and exploitation of the natural resources of the said areas".

The 200 metres depth referred to in the first part of the definition is a useful criterion for delimitation since it is generally accepted that this is the average depth of the continental shelf; it is also legally precise as it is relatively easy to determine through bathymetric delineation. On the other hand, the criterion based on the ability to exploit the submarine resources depends entirely on the technological sophistication of a particular state at a given time. At the time of the 1958 Convention, the delegates did not believe that the technological capacity to exploit under water resources would ever extend very far below 200 metres. Yet many observers soon realised that this technology would be improved quickly, given strong incentives - in this case, the interests of the states

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3. For the text of Presidential Proclamation No. 2667 of 28 September 1945, United States, 1945, p. 12303.

4. For the text of the Convention, see United Nations Treaty Series, 449 1964, p. 311. For comments on the Convention, see Gutteridge, 1959, p. 102.

in the resources of the continental shelf and the sea bed.

These interests were heightened with the discovery of hydrocarbon deposits at various depths in the sedimentary layers of the continental shelf and manganese nodules, rich in copper, manganese, cobalt, silver and other minerals, in the sea bed. By the end of 1960s, a group of United Nations experts reported that experimental drilling projects were being carried out at depths greater than 5,000 metres (U.N. Doc. E/4962/Rev. 2, 1971, p. 116). At present it is believed that technology is available to exploit resources at any depth of the continental shelf or the sea bed. This was confirmed in 1975 when the United States 'research ship', G lomar Explorer, originally believed to belong to Hughes Corporation and later proven to belong to the U.S. Central Intelligence Agency, was used to recover a sunken Soviet naval submarine from the depths of the South Pacific Ocean (Rubin, 1975, p. 855). The evidence confirmed that with presently available technology exploitation of underwater resources is possible at any depth, thus including any part of the sea bed as continental shelf according to the definition of the 1958 Geneva Convention on the Continental Shelf and the Kenyan legislation. These developments render the definition in both instruments worthless for determining the outer limit of the continental shelf subject to the exclusive jurisdiction of a coastal state.

The need for a more useful criterion for the delimitation of the outer limit of the continental shelf has been recognised at UNCLOS III since the negotiations began in 1968, but agreement on a criterion has been difficult precisely because of the national interests already mentioned. Some coastal states, especially those with the wide shelves (e.g., Argentina, Australia, Brazil, Canada, Indonesia, Norway, New Zealand, the Soviet Union, Japan and the United Kingdom) would like to enjoy exclusive jurisdiction over the entire continental margin, that is, the continental shelf itself, the continental slopes and the continental rise. This would comprise the entire natural prolongation up to the point where the sea bed begins. The second option, which is favoured by the Kenya delegation at UNCLOS III, would make the legal continental shelf of the coastal states co-terminous with the exclusive economic zone which ends at 200 miles,[5] irrespective of whether that includes the entire continental margin plus part of the seabed or only

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5. See the comments of Frank X. Njenga, Kenya's delegate and represetative on Committee II of UNCLOS III in United Nations, 1975.

part of the continental shelf.

Opponents of the first option argue that the formula would be imprecise because the end of the continental margin is hard to determine, given the fact that debris which are assumed to originate from the continental landmass extend into the sea bed. It may also be argued that since the margin is the wealthiest part of the underwater area, part of it should be left to the international community. As part of the negotiation of the new law of the sea, individual states should agree to forego certain economic advantages in order to benefit the poorer states and the international community within the framework of the United Nations. Thus, it is argued that any states whose continental margin extends beyond 200 miles should be content with exclusive jurisdiction over resources within the 200-miles limit, and beyond that limit they should share the income derived from submarine resources within the international community according to a formula to be agreed upon. Such a fund would be used to defray the cost of administering the law of the sea, and the balance would go to development aid programmes administered by the United Nations.

Kenya adopted the legislation in 1975, long after the weaknesses of the 1958 definition were recognised. In fact, even though Kenya's continental margin has not been fully charted it appears that Kenya would have a wider jurisdiction by following the 200-mile definition. Taking a 200-metres isobath as a base, Alexander has calculated that if Kenya extends its jurisdiction to the outer limit of the continental margin it will control only 10,000 to 20,000 square nautical miles, while if the 200 - mile criterion is followed Kenya will control an area between 20,000 and 200,000 square nautical miles (Alexander, 1973, pp. 21 and 39-40). The general trend at the UNCLOS III favours the adoption of the 200-mile exclusive economic zone; the majority of the delegations also favour the coastal states' 200-mile jurisdiction over the continental shelf. It is the group of coastal states with continental shelves extending beyond 200 miles that still insist on the extension of the exclusive jurisdiction to the end of the continental margin.

Given the fact that the concept of a 200 - mile exclusive economic zone is virtually unanimously accepted at UNCLOS III, it seems reasonable that Kenya's legislation could have defined the continental shelf as the sea bed and subsoil of the submarine area adjacent to Kenya's coast extending outward to a distance of 200 nautical miles from the baseline by which the territorial sea is measured. Such a definition would be qualified by a proviso that where the coastline is adjacent to a neighbouring state and the distance between the

two territories is less than 400 nautical miles, then Kenya's jurisdiction over the continental shelf should extend to a median line equidistant from the respective baselines, unless a formula more equitable than equidistance is deemed desirable.[6] This in fact, may be the generally accepted principle as the UNCLOS III draws to a close. The states insisting on exclusive claim over the entire continental margin (wherever that may be) without any provision for revenue-sharing are likely to be a small minority.

The jurisdiction of Kenya over the resources of the legal continental shelf is exclusive, as declared in Section 3 of the legislation. That is the extent to which international law allows coastal states to exercise powers over the continental shelf, whatever its agreed outer limit may be. The principle is expressed in Article 2 of the 1958 Geneva Convention on the Continental Shelf which states, inter alia:-

> (1) The coastal State exercises over the continental shelf sovereign rights for the purpose of exloring it and exploiting its resources.
>
> (2) The rights referred to in paragraph 1 of this article are exclusive in the sense that if the coastal State does not explore the continental shelf or exploit its resources, no one may undertake these activities, or make claim to the continental shelf, without the express consent of the coastal State.
>
> (3) The rights of the coastal State over the continental shelf do not depend on occupation, effective or notional, or on any proclamation.

The provisions of this article were elaborated in the judgement of the International Court of Justice in the North Sea continental shelf cases. In the Court's opinion:-

> the rights of the coastal State in respect of the continental shelf that consitutes a natural prolongation of its land territory into and under the sea exists ipso facto and ab initio, by virtue of its sovereignty over the land and as an extension of it in an exercise of sovereign rights for the purpose of exploring and exploiting its resources. In short, the right is here an inherent right (ICJ Report, 1969, para. 62).

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6. Note that in the North Sea Continental Shelf Cases (Federal Republic of Germany/Denmark; Federal Republic of Germany/Netherlands) the International Court of Justice ruled that the principle of equidistance had not become a principle of international law and that it was at most de lege ferenda and not at all de lege lata or as an emerging rule of customary international law. Parties may adopt the principle only where they mutually agree. See ICJ Report, 1969, para. 62.

The emphasis in the Convention and the Court's opinion is placed on sovereign rights for exploration and exploitation of the natural resources. Other states and their nationals are prohibited from undertaking any similar activities. Even the installations which a coastal state itself may erect on the shelf are to be only those used for exploration and exploitation of the natural resources. And where such installations are constructed, the Convention prohibits that they should interefere with other uses of the sea, especially navigation and fundamental oceanographic or scientific research carried out with the intention of open publication' (Article 5, para. 1).

A further point of interest in the Kenyan legislation is the procedure for verifying whether an act or omission occurred within the continental shelf. Section 6 of the Act stipulates that where such a matter is in dispute, a certificate signed by or on behalf of the minister responsible for natural resources shall be deemed to constitute prima facie proof of the facts. Understandably, the opinion of the Minister for Natural Resources is given this weight because the continental shelf is part of the natural resources by virtue of the doctrine of natural prolongation of the continental landmass.

Nevertheless, there is another side to this issue. The resources contained in the continental shelf might properly come under the jurisdiction of the Ministry of Natural Resources but the delimitation of the outer limit of the continental shelf is subject to international agreement, as is clear from the present negotiations in Committee II of UNCLOS III. The act of delimitation is necessarily a unilateral act because only the coastal state is competent to undertake it, /but/ the validity of the delimitation with regard to other States depends upon international law.[7] It may be suggested, therefore, that the views of the ministry responsible for international relations, negotiations and agreements should be given equal weight in matters concerning location within or beyond the continental shelf. At the very least, there should be a statutory requirement that in dealing with such issues the Ministry of Natural Resources should compose its views in consultation with the Ministry for Foreign Affairs.

These are the general principles governing the legal status of the continental shelf. However, it should be noted that negotiations at UNCLOS III are designed to define in greater detail the implications of these principles

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7. See the judgement of the International Court of Justice in the Fisheries Case (United Kingdom v. Norway), ICJ Reports 1951, pp. 115-132.

and, where appropriate, to specify imitations on the rights and responsibilities of the coastal states or of other parties. These anticipated definitions will make the scope of these rights and obligations more complex, and the coastal states should take account of this in framing their own legislation. The following three topics are examples of areas where the coastal states could further specify the details of their powers over the continental shelf.

Scien Research on the Continent l Shelf: Kenya's legislation makes no reference to scientific research on the continental shelf. It may be assumed that scientific research is governed by general international law or by conventions to which Kenya is a party, and in fact Kenya signed the 1958 Geneva Convention on the Continent Shelf on 20 June 1969. As noted above, this Convention requires coastal states to premit fundamental oceanographic or scientific research carried out with the intention of open publication on their continental shelves.

But this provision for freedom of scientific research, which was evidently inserted at the bidding of the technologically and industrially developed states,[8] is open to challenge by the less developed coastal state . The developing countries generally argue that in practice there is no meaningful distinction between pure or fundamental scientific research and research with a view to industrial or commercial application. Therefore, they argue, the coastal state which has the exclusive jurisdiction over the resources of the continental shelf should also have t to allow or refuse any scientific research. In the words of Kenya's chief delegate at UNCLOS III:-

> Together with the great majority of other developing countries, the African States find no basis for the distinction between pure and applied research, the former to be unrestricted and the latter to be subject to the consent of the coastal state when conducted within limits of national jurisdiction. Marine scientific research is an intrinsic part of management, protection, and conservation of the marine living and non-living resources. In order to ensure that the coastal State derives maximum benefit from the marine resources of the zone under its national jurisdiction and to ensure security of the coastal State, scientific research activities in the zone must be under direct control of the coastal State (Njenga, 1975, pp. 10-11).

It is widely felt among developing countries that the coastal states' industrial and security interests are threatened by scientific research carried out on the continental shelf. A few examples of these views will illustrate the point.

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8. For a reflection of the interests of the developed countries,

W.T. Burke, Marine Scientific Research and International Law. (Law of the Sea Institute, University of Rhode Island, Occasional Paper No. 8 Spet. 1970) and C. Maechling, "Freedom of Scientific Research: Stepchild of the Oceans" Virginia Journal of International Law Vol. 15 Spring 1975 pp. 539-559.

Addressing UNCLOS III, Vargas of Mexico stated categorically that the distinction between pure and applied scientific research was artificial and /that/ basic and applied research were simply stages in the same process (United Nations, 1975, p. 342). U Tun Myat of Burma emphasised that'... past experience had shown that marine scientific research was not completely immune to the dictates of politics and business'. His delegation therefore felt that prior consent of the coastal State was a basic prerequisite to the conduct of scientific research anywhere on the continental shelf (p. 338). The delegate from Sudan contended that while conceptually it was possible to draw a distinction between pure research and research aimed at commercial application, the'two aspects were so inseparably interrelated that to draw a non-existent artificial distinction would be detrimental to both.' He added that marine scientific research in areas of national jurisdiction of a coastal state should be subject to prior consent of that state, and that these rights of the coastal state should be protected by strict observance of its /national/ laws and regulations' (p. 337). Finally, Madagascar was of opinion that 'foreign researchers did not always restrict themselves to pure research; usually their research was directed at discovering and exploiting new raw materials or was related to military or paramilitary considerations'. Its delegation therefore rejected the distinction between pure research, to be carried out freely, and applied research or research with military aims, to be controlled (p. 335).

These views gained strong support when it was confirmed that the Glomar Explorer, which was originally believed to be a research ship exploring for manganese nodules in the sea bed, in fact belonged to the U.S. Central Intelligence Agency and was on a military expendition to recover the remains of a sunken Soviet submarine (Rubin, 1975). Thus, it may not only be argued that there is no clear distinction in practice between pure or fundamental research and research for commercial application, but also that some activities may pose as pure scientific research aimed at publication, when in fact they are military or strategic operations.

The jurisdiction of the coastal states over scientific research on the continental shelf was clearly stated in the Informal Composite Negotiating Text (ICNT) which came out of UNCLOS III at the New York Session in July 1977. The relevant articles stipulate that the'Coastal States... have the right to regulate, authorize and conduct marine scientific research in their exclusive economic zone and on their continental shelf...', adding that such research shall be conducted with

the consent of the coastal State' (U.N. Doc. A/Conf. 62/W.P.10, 15 July 1977, Article 247).

It would be easy for military 'researchers' to also produce a paper for 'open publication', along with other classified reports which may be detrimental to the interests of a coastal state. The requirement of coastal state consent may be one way of reducing industrial or military espionage. It could be argued that the developing coastal states lack the technology necessary to uncover the possibility of espionage when they grant consent to researchers, but they should still have the option to exercise their discretion. Certainly research to ascertain the contents of the continental shelf could be useful to the coastal state at some stage in its development. If the coastal state is to have the powers to control scientific research on the continental shelf, then it should stipulate clearly the laws, regulations and procedures which apply to its own nationals and to foreign researchers.

Underwater Cables and other Installations on the Continental Shelf

The coastal states have been granted the exclusive jurisdiction for the exploration and exploitation of resources on the continental shelf. Therefore, though the coastal states may not prevent the placing of installations for 'internationally recognized technical functions' (however that may be defined), they should be able to refuse the laying of cables or other installations in particular areas under their jurisdiction if this would conflict with their plans for the exploration, conservation or exploitation of resources.[9] The definition of installations in the relevant Kenyan legislation refers only to moored vessels and 'any structure whether permanent or temporary...which is being or is intended to be used for or in connection with the exploration or exploitation of natural resources'. This does not include communication cables, it does not necessarily include oil pipelines or off-shore harbour facilities, and certainly it does not include military surveillance installations such as those generally referred to as Sound Survaillance Systems (or SOSUS) which are used for sensing the movements of submarines or other vessels or objects. In view of this range of installations which may be placed on the continental shelf, the Kenyan legislation should articulate with reasonable clarity the kinds of installations it may permit and under what circumstances they may be constructed.

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9. For an illustration of the potential interactions of various marine activities, See United Nations, 1972, **of the Sea E/5120. Report of the Secretary-General p. 35.**

Marine Pollution

If a coastal state has the right to enjoy the resources of the continental shelf, it can be argued that the state should also have the power to take effective conservation measures which protect the resources from damage. This does not amount to generally impeding such activities as scientific research or the laying of underwater cables and installations. Rather, in consenting to any of these activities, conservation measures should be considered, and any activity likely to result in harmful effects to the marine environment in general or to any particular flora and fauna should not be allowed. Indeed, paragraph 1 of Article 5 of the 1958 Geneva Convention on the Continental Shelf states that exploration of the continental shelf and the exploitation of its resources must not, among other things, interefere with fishing or the conservation of the living resources of the sea, and this has been interpreted to allow a coastal slate to prohibit activities causing pollution (See Hardy, 1973, pp. 239, 246).[10] This general statement should be put into proper context by incorporating it into the laws of the coastal states. By enforcing the international rule prohibiting pollution, a state may be deemed to act on behalf of the international community, since the damage which may be caused on its continental shelf may have ecological repercussions in other areas of the sea.

CONCLUDING REMARKS

All three of the issue discussed here might become involved in the exploration and exploitation of oil resources. At present drilling for oil is the most attractive activity in coastal areas and scientific research, construction of installations and pipeliness and the possibility of pollution are all involved. The Kenya Continental Shelf Act, 1975 makes no provision at all for the exploration and exploitation of petroleum in the continental shelf. Certainly as UNCLOS III nears its end the coastal states must begin considering seriously the various management questions related to off-shore resources. At this point Kenya should begin expanding the scope of its legislation to provide support for the necessary management strategies.

Either of two procedures may be suggested. First,a detailed protocol in the form of subsidiary legislation could be adopted for each of the three subject areas described here. Such protocols would deal with the conditions

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10. See Michael Hardy, "Offshore Development and Marine Pollution",Ocean Development and International Law: Journal of Marine Affairs, Volume I No. 3 (1973) pp. 239, 246.

and procedures for exploration and exploitation of resources in the continental shelf, the requirements for conducting scientific research by nationals and non-nationals, and the rules regarding the construction of installations and cables on the continental shelf for various purposes. The second procedure would be to repeal the 1975 Act and to replace it with more comprehensive legislation including the subject areas discussed above. This second approach may be preferable because the range of new regulations might be extensive enough to justify an overhaul of the entire text of the 1975 legislation.

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THE KENYA DRAFT ARTICLES ON EXCLUSIVE MARITIME ECONOMIC ZONE CONCEPTS: ANALYSIS AND COMMENTS ON THE ORIGINAL PROPOSAL

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THE ECONOMIC ZONE CONCEPT - KENYA PROPOSAL

The concept of the exclusive economic zone, as proposed by Kenya, was first introduced to the United Nations Committee on the Sea Bed in August 1977 (UN Document A/AC.138/SC.II/SR.8 of 3 August 1971, p. 54). Since then, it has been developed, alongside with other preferential zone proposals, as a possible formula to meet what many of the states consider to be the special interests of coastal states over the resources of the sea adjacent to their territorial sea.[1] Kenya later refined the concept and submitted it to the Committee on the Sea Bed with the title 'Draft Articles on Exclusive Economic Zone Beyond the Territorial Sea'[2] as a compromise between the special needs and interests of the coastal states and the declared international principle of sharing the ocean resources by all states, whether coastal or landlocked.[3] In order to meet these two objectives, the Draft directs that that the coastal states shall first enter into regional arrangements for the regulation and management of resource use within the Zone. Secondly, the coastal states shall, by entering into multilateral and bilateral agreements, permit land-locked states to exploit resources within the economic zone.

In this paper we shall examine the implications of the Kenya Draft Articles, particularly with reference to the allocation of rights and obligations of the coastal states vis-a-vis the land-locked states over the economic resources of the economic zone. The rights and obligations of other foreign users of the area for economic and non-economic purposes will also be examined. In the final section we shall discuss the development of international support for the concept of an exclusive economic zone which seems to have been accepted by an overwhelming majority of the delegations to the Third United Nations Conference on the Law of the Sea (UNCLOS III).

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1. The Concept of Patrimonial Sea as defined by the Special Conference of Caribbean Countries at Santo Domingo de Guzman in June 1972, is significant in this regard. In actual fact, there is no difference between the two concepts. For the complete text see International Legal Materials, 11 (4) July 1972,pp.892-3.
2. Originally issued on 7 August 1972 as AC/AC,138/SCII/L.10. Reproduced in International Legal Material, 12 (1) January 1973, pp. 33-35.
3. 'Declaration of Principles Governing the Sea-Bed and the Ocean Floor and the Subsoil Thereof. Beyond the Limits of National Jurisdiction'. United Nations General Assembly Resolution 2749 (XXV) of 17 December 1970, paragraphs 1, 5 and 7. Reproduced in International Legal Materials, 10 (1) January, 1971,p.9.

DELIMITATION OF THE ZONE

Article I of the Kenya Draft Articles presumes, as a basic fact, that the territorial sea of the coastal states is limited to twelve nautical miles from appropriate baselines. Then the article proceeds to declare that all states have a right to determine the limits of their jurisdiction over the seas adjacent to their coasts and beyond the territorial sea 'in accordance with criteria which take their own geographical, geological, economic and national security factors'. It is within this area that the coastal state have preferential interests, and it is called the economic zone.

Although the article allows for various criteria to determine national jurisdiction over an economic zone, namely geographical, geological, ecological and national security factors, the states are not free to determine where these criteria will be applied. For instance, a coastal state may consider that its economic interests over fisheries should extend to 300 miles, while its national security interests extend to only 100 miles. Or to take a more topical issue, a coastal state which is geologically favoured with a 600-mile wide continental shelf may want exclusive jurisdiction over all the resources of the shelf for economic, ecological, biological or geographical reasons. However, these claims are not as easily made as Article I may seem to suggest.

Article VII of the draft states that 'The Economic Zone shall not in any case exceed 200 nautical miles, measured from the baselines for determining territorial sea'. No reason is given, however, for setting the limits of a nation's geographical, geological, biological, ecological, economic and national security interests at precisely 200 nautical miles. Stated differently, why should 200 miles be the maximum distance for the protection of those national interests, and not a larger or even a smaller area such as, say, fifty miles which was earlier claimed by Iceland (Iceland, 1972[b], p.9).

The criteria which the coastal states choose for delimitating the economic zone must be 'reasonable' by certain general standards so that their claim will be universally acceptable. Yet it may be difficult for other states to appreciate country's needs and the interests which influence the criterion for delimitation of the economic zone. To give an example, Iceland based her 1972 decision to extend the fishery zone on factors similar to those enumerated by Kenya. The Icelandic government said, 'The coastal state should itself determine the extent of its coastal jurisdiction over

fisheries on the basis of relevant local considerations. In Iceland these considerations would coincide with the continental shelf area, which, e.g., at depth of 400 meters would be approximately 50 - 70 miles from the coast'. (Iceland, 1972[a], p. 8). She decided on a fifty-mile fishery zone.

The point to note here is that even when Iceland government demonstrated that the coastal fisheries' products constituted approximately 81.8 per cent of the nation's export trade, thus being the conditio sine qua non for the national economy, the fifty-mile limit adopted by the 'Resolution of the Althing on Fishery Jurisdiction'[4] (15 February 1972) proved to be unacceptable to countries which traditionally fished in the 'adjacent' seas, notably, the United Kingdom, Belgium and the Federal Republic of Germany. As soon as Iceland took the decision to exclude all foreign fishermen from the 50-mile zone the U.K. moved swiftly to instigate proceedings against it with the International Court of Justice.[5]

This controversy over the Icelandic fisheries is particularly relevant to our study because it is recent, it is based on Iceland's fairly obvious economic interests of Iceland and the 50-mile area is fairly small considering the width of the ocean area between Iceland and the coasts of the contending parties.

In the case of the Kenya proposal, the head of the delegation to the session of the U.N. Committee on the Sea Bed in the summer of 1971 attempted rather unsatisfactorily to justify why his delegation chose 200 miles as the delimitation of the area. In an intervention, F.X. Njenga said that, 'It was the view of the Kenya delegation that the greatest breadth of the continental shelf, anywhere in the world, at 200 metres, should be the limit of national jurisdiction to be applied uniformly for all States

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4. The Icelandic Althing (Parliament) resolved unanimously that, effective not later than 1 September 1972, the state would extend fisheries jurisdiction to fifty miles. For the text of the Resolution, see International Legal Materials, 11 (3) May 1972, pp. 643-4.

5. International Court of Justice, Application Instituting Proceedings (filed in Registry of the Court on 14 April 1972), 'Fishing Jurisdiction' (United Kingdom of Great Britain and Northern Ireland v. Iceland). Note that in view of the previous treaty arrangements between the two countries the Icelandic legislation was not opposable to Britain. In the opinion of the Court, Iceland was under obligation to grant preferential treatment, based on equity, to the applicant. See the judgement delivered on 25 July 1974 in I.C.J. Reports, 1974, especially paras. 67 ff. The Court did not rule on the legality of the Icelandic measure under general international law, an evasion which is strongly criticised by Judge Ignacio-Pinto in his dissenting opinion.

irrespective of the superjacent waters of the coastal state' (U.N. Document A/AC.138/SC.I/SR.8 of 27 July 1971, p. 38). He added in the same statement that in the opinion of his delegation this calculation would give a breadth of about 200 nautical miles from the baseline for the territorial sea. But how does this estimate compare with other opinions on the width of continental shelves? Is it reasonable to suggest that at 200 metres isobath the greatest breadth of the continental shelf is 200 nautical miles?

K.O. Emery, senior scientist and an oceanographer from Woods Hole Oceanographic Institution, concurs with the United States Commission on Marine Science, Engineering and Resources that the average width at 200 metres depth is only 50 nautical miles. Emery further reports that at the depth of 2,500 metres isobath, which would include the base of the continental slope, the average width of the continental shelf is only 100 nautical miles, (Emery, 1970, p.220), though other scholars have differed rather strongly on this point. Edward D. Brown from University College, London, estimates that the 2,500-metre isobath is closer to 200 nautical miles from the shore (Brown, 1970, p. 44). Luke W. Finlay agrees with Brown, but for another reason: He recognises that several Latin American countries have presented a fait accompli by establishing their claim over 200 miles of the sea and they would not be willing to join in any international consensus for a smaller area (Finlay, 1970, p. 52).

These arguments, of course, do not link the national claim for 200 nautical miles with any claim over the continental shelf as a natural prolongation of the continental land mass. The Latin American states which first claimed 200 miles of the sea, Chile, Peru and Ecuador, have not made this connection because on their coasts the width of the continental shelf is negligible. On the other hand, the countries on the eastern coast of Latin America, such as Argentina and Brazil, have a broad shelf area, but they have not made this connection either. Argentina has a continental shelf which extends to the Falkland Island, about six hundred miles from the coast; Brazil's continental shelf is about 350 miles at its widest point.[6]

Kenya cannot base the 200-mile economic zone on the width of her continental shelf, nor on the shelves of either of her coastal neighbours, Somalia and Tanzania. The appendix to this paper shows an estimated profile of the continental shelf on the east coast of Africa from Cape Guardafui to

6. The author is indebted to K.O. Emery for these estimates. Neither Argentina nor Brazil has published the exact width of their continental shelves. However, estimates can be made from bathy-metric maps. One of the best maps available for studies of the law of the sea is the Boundaries Separate Seabed Area of Sharply Contrasting Topographic Gradients, prepared by the U.S. Office of the Geographer, Department of State, Washington,D.C., Serial No.512523,pp.11-17.

the mouth of the River Ruvuma, and nowhere along this coast does the shelf exceed 100 kilometres, or about 63 nautical miles. The average breadth along the Kenya coast is less than 20 kilometres, or about 13 miles.

Available evidence does not seem to locate the 200-metres isobath at 200 nautical miles as the average or greatest breadth of the continental shelf. The justification of the choice of 200 miles as the width of the e economic zone must therefore be sought elsewhere. Indeed, the 200-miles figure has been widely adopted as the criterion for delimitation of the coastal jurisdiction, particularly in Latin America where no attempt has been made to justify it. As Finlay pointed out in the statement quoted above, most states realise that the Latin American states will not accept a reduction in their present claims. Yet this is no reason for all states to adopt the 200-mile limit, though infact this seems to be what is happening.

One of the strongest original supporters of limited coastal state jurisdiction was Ambassador Arvid Pardo of Malta who initiated the current Law of the Sea debates at the United Nations in 1967. What is striking is the change in Pardo's position, as he came to accept and justify the limit of 200 nautical miles for coastal states as 'national ocean space':-

> ...the majority of coastal states cannot extend their jurisdiction beyond 230 to 270 miles from the coast and that claims of coastal State Jurisdiction beyond 200 miles from the coast are rare and usually of an indirect nature. Thus the maximum limit of coastal state jurisdiction which need be suggested is somewhere between 200 and 270 miles from the coast. Taking into account the general interest of the international community to keep the widest possible area of the ocean space open to the non-discriminatory access of all, and the fact that some coastal States have already proclaimed that their jurisdiction extends to the 200 miles from their coasts, my delegation has come to the reluctant conclusion that, to avoid prolonged debate and haggling, it is necessary to establish a distance of 200 miles from the nearest coast as the aouter limit of the coastal State jurisdiction in ocean space. (U.N. Document A/AC.138/53 of August 1971, Articles 36-38 and 56-61, reproduced in the General Assembly Official Records Twenty-Sixth Session, Supplement No. 21 (A/8421), pp. 105-193 and quoted in McGill Law Journal (Montreal), 17 (4) 1971, pp. 634-5, emphasis added).

Ambassador Pardo's statement underlines the point that proponents of the 200 mile limit are frankly influenced in their choice by the fact that several states have claimed jurisdiction upto that distance and they do not

envisage that those states would accept a lesser distance. Further, he points out that the 200-mile limit could be exceeded by a large number of coastal states and that, given national interests, coastal states would ordinarily opt for greater distances. However, because of the general interest of the international community which the states have supported by repeated United Nations resolutions, coastal states are reluctant to exceed the 200 miles limit.[7] A third point in Ambassador Pardo's statement is that, although it is possible for coastal states to extend their jurisdiction out to 270 miles, they do not have to claim the maximum distance. With respect to certain inter-national interests, coastal states at present seem to recognise a necessity, if not an obligation, to forego the benefits which might accrue from the wider area of national jurisdiction.

From the foregoing it seems likely that prevailing national economic interests and established claims are responsible for the selection of 200 nautical miles as the limit of national economic jurisdiction in the ocean space. Njenga's suggestion that the 200-mile limit generally corresponds with the 200 metre isobath is not supported by scientific opinion. Moreover, there is no indication that, even if the 200 miles coincided with 200 metres isobath, the states would be inclined to accept claims based on such a criterion. This is illustrated by the Icelandic fisheries controversy.

Although the outer limit of the continental shelf of Iceland at a depth of 400 metres averages 50 to 70 miles from the coast (Iceland, 1972a, pp. 18,32), and although that country chose to delimit its jurisdiction at 50 miles, even this limited distance was not acceptable to Belgium, Great Britain and other countries.[8] The complaint against Iceland was based on the foreign countries' traditional fishing interests, even though the estimated distance between Iceland and the British Isles is over 350 nautical miles.

The position adopted by Britain and Germany concerning Iceland's action suggest another difficulty for the Kenyan scheme. Njenga had suggested to the U.N. Committee on the Sea Bed that the width of the economic zone'should be uniform for all countries', with adjustments made only in the case of archipelagoes (U.N. Document A/AC.138/SC.I/SR.8 of 27 July 1971, p.38). The issue of the effect of the extension of the economic zone on existing fishery

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7. U.N. General Assembly Resolution 2749 (XXV) of 17 December 1970 gives a comprehensive summary of the principles which the members adopted concerning the sea bed and ocean floor beyond the limits of national jurisdiction.

8. The International Court of Justice issued orders regarding interim measures of protection and the question of the Court's jurisdiction regarding the applications of Great Britain and Germany on 17 and 18 August 1972. See International Legal Materials, 11 (5) September 1972.

agreements should definitely have been covered in the Draft Articles. It will be an issue for East African countries, for instance, where the plans for the termination or phasing out of the Indo-Pacific Fisheries Council will influence efficacy of the new regime. None of the African states is a party to the Council's 1961 Agreement which covers the Indian and Pacific Oceans.[9]

To give effect to the criteria chosen by coastal states for an economic zone, the contending interests of other countries must be considered and included in the negotiations. The efficacy of legislative decisions by coastal states regarding the economic zone will depend on acceptance by other states which have previously enjoyed the resources within the 'adjacent' sea.

POWERS OF THE COASTAL STATES WITHIN THE ECONOMIC ZONE

Article II of the Draft Articles provides that the primary benefit of the economic zone shall be for the people of the coastal state. To ensure that this goal is met, the coastal state 'shall exercise sovereign rights over the natural resources for the prupose of exploration and exploitation' (emphasis added). Further, the article provides that 'within the zone they /coastal states/ shall have exclusive jurisdiction for the purposes of control, regulation and exploitation' of such resources and may take measure to prevent and control pollution.

The rights granted to the coastal states are only over living and non-living natural resources. Other resources which could be obtained from the economic zone are probably very few, the notable examples are perhaps sunken ships or other such objects. What may be subject to dispute are archeological artifacts whose origins are doubtful, considering that ocean currents are capable of transporting such objects from long distances over an extended period.

What is more important in the Kenyan scheme is that the coastal states shall enjoy sovereign rights and exclusive jurisdiction over all the natural resources of the economic zone. In juridical terms, exclusive jurisdiction refers to such jurisdiction as is exercised only by the party upon

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9. United Nations Treaty Series 1961, 418, p. 348. Members of the IPFC are France, Philippines, U.S.A., Burma, Sri Lanka, Australia, Cambodia, Indonesia, Thailand, India, Netherlands, China (Taiwan), U.K., Pakistan, Morea, Japan, New Zealand and Vietnam. The original agreement was concluded in 1948. See United Nations Treaty Series, 120 1952, p.59. It was revised in 1961.

whom it is conferred. That is, these powers are not shared with any other state. The power granted to control, regulate and exploit the natural resources of the zone and for conservation and pollution control, as provided by Article II, is simple and conclusive.[10] To draw an analogy from the opinion of the International Court of Justice in the North Sea Continental Shelf Cases, where the rights are 'exclusive' the coastal state may choose whether or not it will explore or exploit its resources, and 'that is its own affair, but no one else may do so without its express consent' ('North Sea Continental Shelf Cases - Judgement', I.C.J. Reports, 1969, p.22).

No problem exists in international law if the coastal state does not choose to explore and/or exploit the resources within her jurisdiction. However, where the exercise of the coastal state powers involves limitation on other states, for instance, in order to prevent and control pollution, serious controversies can be averted only if the standards enjoy regional or global acceptance. Or where such limitations involve actual exploitation of resources, the conflicts may resemble the Icelandic fisheries issue discussed above.

There are also subjects of potential interaction in maritime activities which may lead to serious conflicts. For example, aquaculture versus dredging, general waste disposal versus biological conservation, dredging versus shell-fishing, and dredging versus drilling, which may be classified as mutually exclusive.[11]

Where interactions are perceived to be harmful or mutually exclusive, the Kenya Draft Articles empower the coastal state to legislate in order to control and prevent adverse efforts within its economic zone. This is similar to the Canadian government's decision in 1970 declaring an 'anti-pollution' zone up to 100 nautical miles from her Arctic coast, imposing penalties and civil liabilities for violations and authorising comprehensive regulation and inspection of vessels to prevent pollution.[12]

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10. See similar emphasis by the Court in the 'Fisheries Case', I.C.J. Reports, 1951, p.132. Ecuador, whose 200-mile claim has not been recognised by the United States, has repeatedly arrested and held U.S. fishing vessels. This is the best known case of enforcement of a unilateral extension of coastal jurisdiction, now a matter of public record.

11. See for illustration 'Uses of the Sea', a study prepared by the U.N. Secretary-General, U.N. Doc. E/5120, 28 April 1972, p. 35.

12. The text of the legislation is reprinted in International Legal Materials, 9, 1970, p. 543. See also the comment by Henkin, 1971, pp. 131-136.

The United States reacted publicly and sharply, criticising Canada for acting unilaterally instead of pursuing change by international agreement (see Henkin, 1971, p.131). Was it the fact that the action of Canada was unilateral that infuriated her neighbour or was it the substantive action which the United States considered a real threat to her interests in the Arctic Ocean area? Most probably, both factors contributed to the United States' attitude. Nevertheless, the Canadian authorities argued that they saw no prospect for satisfactory agreement through international machinery, so they decided on the unilateral action (Henkin, 1971, p.131).

Indeed, the United States would most probably have been adverse to the Canadian idea if the subject had been bought before an international forum, which is the kind of problem which the economic zone proposal faces at the international negotiations. Historically, the United States has based its objections to forms of control beyond the limited territorial sea on the notion of 'creeping jurisdiction', developed by the U.S. Department of Defence (see Krueger, 1971, p. 652). They maintain that any claim for functional control of ocean space beyond national jurisdiction leads to successively greater national claims. The example often cited to support this contention is Peru's successive claims to: '200 miles fishing conservation zone (1947), a 200 mile petroleum concession area (1952), a 200 mile area of exclusive sovereignty (1952), a 200 mile coastal air space zone (1965), and finally a 200 mile area of 'Dominio' (1969)' (Krueger, 1971, p.652).

The significant point in the United States' position was expressed by Leigh Ratiner, then Chairman of the Defence Advisory Group on Law of the Sea (U.S. Department of Defence):-

> With respect to the question of what might be termed creeping jurisdiction from international authority into the waters and possible air space involved, I think that underlying our thinking in the Department of Defence is a fundamental policy decision -- we would prefer to trust the international community as a collective, than the coastal states acting individually. There are risks that the international community will attempt to control the oceans for all purposes, and the air space above. We think these risks are less than the risks of coastal State control over the same areas, as time goes by (in Alexander, 1970, p.331).[13]

This statement is the basis of the U.S. objection to the unilateral assumption of off-shore controls by coastal states, such as the Canadian action, and was likely to lead to an objection to the powers which the Draft Articles

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13. Mr. Ratiner has since moved to the U.S. Department of the Interior where he is still deeply involved with establishment of the United States position on this question.

confer on the coastal states over the economic zone.[14] The provision for exclusive jurisdiction in order to control and regulation the use of resources and to carry out conservation measures will almost inevitably interfere with the activities of certain maritime powers, and they naturally prefer not to grant such powers to the coastal states.

As may be evident from these examples, the exercise of the powers under Article II cannot be accomplished 'without prejudice to the exercise of freedom of navigation, and freedom to lay submarine cables and pipelines' as provided by Article III. The present laissez-faire regime of the seas permits any state to exercise almost unlimited freedom to carry out these activities beyond the territorial sea and the contiguous zone extending outward to 12 miles (Art. 24 (2) of the 1958 Geneva Convention on the Territorial Sea and the Contiguous Zone, United Nations Treaty Series, 516 1964, p.205). The establishment of the economic zone at 200 miles, far beyond the territorial sea, with the powers conferred on coastal states by the Draft Articles, will, in practice, seriously curtail these freedoms.

The second aspect of the powers conferred on coastal states is the exercise of sovereign rights over the natural resources in the zone. These rights are perfectly consistent with those just discussed regarding exclusive jurisdiction for purposes of control. In fact, the two aspects of the powers are complementary. The nearly absolute sense of exclusive jurisdiction is necessary for the protection and preservation of the resources over which a state has sovereign rights.

This still does not explain fully what the exercise of severeignty over natural resources, as provided in the Draft Articles, implies. On this subject the standard reference document is the United Nations General Assembly Resolution on Permanent Sovereignty Over Natural Resources adopted on 14 December 1962 (1803 (XVII) in U.N. G.A.O.R. Supplement No. 19 (A/521) Seventeenth Session, pp. 15-16). In substance, this resolution affirmed the principle of national ownership of natural resources within an individual territory and the rights of all states to freely dispose of their natural

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14. Note, however, that the U.S. Government has come out in practical support of the concept by adopting its own 200-miles fisheries jurisdiction. See International Legal Material, 15 1976, pp. 634-650 and 16 1977, pp. 350-389.

resources and wealth. That is as much a right as any sovereign state can have within the national jurisdiction. But is this any different from the sovereign rights which a coastal state may exercise, by virtue of the provisions of the Kenya Draft Articles, within the economic zone? The draft made it clear that the coastal state shall exercise both sovereign rights over the resources and exclusive jurisdiction for purposes of exploration and exploitation. No other meaning is provided in the draft and no indication that the meaning deviates from that provided in the United Nations General Assembly Resolution on Permanent Sovereignty.

A new and more direct resolution was adopted by the United Nations General Assembly at its Twenty-seventh session.[15] This new resolution 'reaffirmed' under paragraph (1) 'the rights of states to permanent sovereignty over all their natural resources, on land within their international boundaries, as well as those found in the sea-bed and the subsoil thereof within their national jurisdiction and in the superjacent waters'. The zone proposed by Kenya is placed by the Draft Articles under national jurisdiction within the meaning of this 1972 General Assembly Resolution. This amounts to actual assimilation of the zone into the territorial body of the state, at least for purposes of natural resources and the accompanying provision for regulation and management. One might even argue that the land-locked states do not have any more rights to the resources of the zone than any state has to the land-based resources of any other state, coastal or land-locked. This point must be borne in mind in the next section which focusses on the rights of other states to the resources of the zone.

RIGHTS AND OBLIGATIONS OF THIRD STATES WITHIN THE ZONE

There are four categories of third-party interests that may be considered in the question of access to the resources of the economic zone. First are the adjacent coastal states which may, by virtue of proximity, claim some of the resources which spread across territorial boundaries. This point is particularly relevant to the consideration of fishery resources, which may require joint management and control for purposes of exploitation. Kenya, Somalia and Tanzania, for instance, could adopt regional arrangement for fishing of coastal species and thus avoid the conflicts which resulted in the arrest of Kenya fishermen in the Pemba Channel in 1970 (E.A. Standard, 19, 23 and 24 September and 5 and 6 October 1970). To a lesser extent, there

15. U.N. General Assembly Resolution 3016 (XXVII), 'Permanent Sovereignty Over Natural Resources of Developing Countries' adopted on December 1972 (by votes 102 in favour, 0 against and 22 abstaining). Reproduced in International Legal Material, January 1973, pp. 226-7.

may be cases of mineral resources such as hydrocarbons contained in vains which cross national boundaries in the sea-bed or continental shelf. Without agreements for joint management in such areas the potential for conflict is real. In the Red Sea for instance, the Kingdom of Saudi Arabia issued a decree to the effect that she 'owns all the hyrocarbon materials and minerals existing in the strata of the sea-bed adjacent' to her continental shelf.[16] But the Red Sea mineral resources also now include the recently discovered and valuable hot brines in the Central Rift.[17]

Strictly speaking, the issue would not be one of rights per se, if such coastal states can agree on a plan for the joint management and sharing of the resources so that each state exercises sovereign rights over shared resources rather than alienating the sovereignty of any its neighbours. As a matter of fact, the idea of regional arrangements as mentioned in Articles VI and VII could be used to facilitate the establishment of standards for conservation and utilisation of such resources.

The second category of third party interests concern foreign enterprises which wish to participate in the exploitation and exploration of the resources of the zone. Example,are the Deep Sea Ventures a private firm from the United States, the state-owned fishing enterprises of the Soviet Union and the Japanese long-distance fishermen. Article V provides that they 'may obtain permission from the coastal state to exploit the resources of the zone' and only on such 'terms as may be laid down and in conformity with laws and regulations of the coastal state'. Ultimately, this scheme confers no more rights on a foreign state or individual to use the resources of the zone than current provisions of international law confers on a private entrepreneur investing in land-based operations in a foreign country.[18]

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16. Royal Decree Number M-27, dated 7 September 1388 Hegria, reprinted in International Legal Materials, May 1969, p. 606. Section 3 provides for sharing with neighbouring governments which have rights recognized by the government of Saudi Arabia. Almost the whole of the Read Sea is underlain with continental shelf.

17. For a recent report on the deposits see Ross, 1972, pp. 1455-57. Dr. Ross carried out a study of the sediments at the request of Saudi Arabia. Sudan and Eritrea on the opposite shore would have to convince Saudi Arabia of the legitimacy of their claims.

18. In the introductory summary to the 'Report of the Secretary General on Permanent Sovereignty Over Natural Resources' it is stated that the exercise encompasses 'not only the formal rights' of possession of those resources and freedom to decide on the manner in which they shall be exploited and marketed, but also the capability to exploit and market them so that the people of the state concerned may benefit effectively from them'. See the Exercise of Permanent Sovereignty Over Natural Resources and the Use of Foreign Capital and Technology for Their Exploitation, A/18058 of 14 September 1970, p. 7.

It is perhaps no coincidence that the United Nations General Assembly adopted resolution 3016(XXVII) referred to above at the same time that the proposals on extended preferential zones for coastal were being developed.[19] Both efforts point to a compact assimilation of the resources of the economic zone, with full powers in international law of a coastal state to dispose of these natural resources for the primary benefit of its own citizens just as in its national territory, as provided by the General Assembly resolution, 1803 (XVII). Accordingly, we find that third parties have no special rights, either directly or indirectly, to the resources of the zone.

The third category of third-party interests concerns land-locked countries within the African continent. What rights would they have over resources in a zone over which coastal states exercise sovereign rights and exclusive jurisdiction for purposes of exploitation and exploration? Underlying this question is the assumption, based on the principles declared by the majority of states, all that resources beyond the limits of national jurisdiction should be utilised with particular consideration for the interests of developing countries, whether coastal or land-locked.[20] Accordingly, it was felt that in cases where coastal states were negotiating for the extension of their jurisdiction, a special formula was needed to compensate the land-locked states for the disadvantage imposed on them by geography.

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19. See also paragraph (3) of Resolution 3016 (XXVII) which 'declares that actions, measures or legislative regulations by States aimed at coercing, directly or indirectly, other States engaged in the change of their internal structure or in the exercise of sovereign rights over their natural resources, both on land and in their coastal waters, are in violation of the Charter and of the Declaration' of Principles of International Law Concerning Friendly Relations among States contained in Resolution 2625 (XXV) (emphasis added).

20. See U.N. General Assembly Resolution 2467 (XXIII) of 21 December 1968, 2750 (XXV) of 17 December 1970, and 2749 (XXV) of 17 December 1970. The assumptions at the time these resolutions were adopted did not include the extended preferential zones such as the 200 miles proposed by Kenya. Accordingly, by the so-called 'Moratorium Resolution', United Nations General Assembly Resolution 2574 (D) of 15 December 1969, the General Assembly resolved that:-

(a) States and persons, physical or juridical, are bound to refrain from all activities of exploitation of the resources of the area of the sea-bed and ocean floor and the sub-soil thereof beyond the limits of national jurisdiction.

(b) No claim to any part of the area or its resources shall be recognized.

That is, until an international regime is established by international agreement to regulate and administer the use of the area for the benefit of all mankind . This resolution is reprinted in International Legal Materials, 9 January 1970, p.422. The general inclination was still in favour of a limited Territorial Sea and Contiguous Zone as contained in the 1958 Conventions where 12 nautical miles was the limit. The rest of the area was to be res communis ominum. On these discussions see Kunz, 1955, p.829; Kamat, 1972,pp.9-19; and Friedmann, 1971, pp. 757-770.

The Kenya delegate who introduced the concept of the economic zone explained to the United Nations Committee on the Sea-Bed that:-

> The solution of the land-locked countries' problem must be found within a regional framework, and his delegation was prepared to negotiate with other African delegations, to work out an acceptable formula (recorded intervention by Njenga of Kenya in U.N. Document A/AC.138/SC.I/SR.8 of 27 July 1971, p.38).

The question of sharing off-shore resources may be answered by resort to regional arrangements. Indeed, as Article VI of the Draft Articles provides, rights for land-locked, near land-locked or shelf-locked countries 'shall be embodied in multilateral or regional or bilateral agreements'. But the question remains what are the rights of third states to resources over which the coastal state exercises sovereign rigts? The bilateral or regional agreements are to be concluded under terms provided by these Draft Articles. And the Articles, as we have seen, confer on the coastal state exclusive jurisdiction for purposes of control and exploitation of the resources of the economic zone. If this is so, the land-locked countries may have are privileges, but not rights.

Article VI specifies the conditions under which a coastal state can permit a land-locked state to exploit resources of the economic zone. For instance, the coastal state must be satisfied that the resources to be used by the land-locked state are 'effectively controlled by their (the coastal state's) national capital and personnel'. First of all, this could not be ascertained, even if that were possible, without acceptance of a subordinate status of the applying state. Secondly, the idea of 'effective control' may be difficult to ascertain, particularly in a field as technologically complex as the exploitation of marine resources.[21] In the final analysis, the industrialised countries may have better access to the resources of the economic zone than land-locked states in Africa. The industrial countries would pay fees to the coastal states for their participation in the exploitation of economic-zone resources. The arrangements controlling the use of the economic zone do not require that any part of the proceeds from the zone be transferred to an international fund which would benefit the land-locked developing states.

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21. See Permanent Sovereignty Over Natural Resources, note 1, page 8, where it is correctly recognised that the technical capacity to exploit petroleum and mineral resources has been developed primarily in the industrialised countries. On technological limitations in the fishing industry, see Gulkian and van den Hazel, 1971, pp. 7-8.

There is nothing in these discussions which supports the statement alleged to have been made by Njenga on behalf of the Kenya delegation to the U.N. Committee on the Sea-Bed that 'His country was prepared to give nationals of the 14 land-locked countries of Africa, within regional or bilateral agreements, the same treatment that it gave to its own nationals within the limits of its national jurisdiction, (U.N. A/AC.138/SC.1/SR.8 of 27 July 1971, p.38). This would not be consistent with the notion of national severeignty over natural resources and exclusive jurisdiction of the coastal state.

Perhaps in an attempt to modify this alleged position of the Kenya delegation in 1971, Article VI of the Draft Statute refers only 'to the neighbouring developing land-locked, near land-locked[22] and countries with small shelf which would be permitted to invest in the enterprises within the zone. But just what constitutes a neighbouring state? Whose neighbour is Zaire, a near land-locked state whose area occupies the greater part of central Africa? What about the victims of political warfare in southern Africa such as Lesotho, Botswana and Swaziland, all cut off from the sea by South Africa: whose neighbour are they? The Draft Articles give no clue as to what the limitations of 'neighbourhood' shall be and this leaves moot the question of whether Botswana, Lesotho and Swaziland would be left at the mercy of South Africa or if the more fortunate states to their north should consider them neighbours for purposes of resource sharing in the economic zone.

Further, Article XI merely provided that '(n)o territory under foreign domination and control shall be entitled to establish an Economic Zone' but it does not mention whether the neighbouring land-locked, near land-locked or shelf-locked states should have access to the economic zone adjacent to the dominated territories. For instance, how could Zaire exploit the resources off the coast of Portuguese-dominated Angola?[23]

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22. Nearly land-locked states are countries with only a very small coastline, such as Zaire, a large country with only 22 nautical miles of coastline. Land-locked states are defined as 'non-coastal', 'continental' or 'inland' as opposed to coastal and 'shelf-locked' states are coastal but their legal continental shelf is cut off from the sea bed beyond the limits of national jurisdiction by the continental shelf of one or more other states. For a detailed discussion on these disinctions, see Ibler, 1971, p.389.

23. Before their recent independence, countries such as Angola, Mozambique and the Seychelles were easily distinguishable as foreign dominated. In cases, such as Christmass Island, just south of Indonesia's Java but 'possessed' by Australia, the distinction becomes more difficult. In Africa the definition becomes difficult if South Africa is recognised as not being foreign dominated, because this would imply legitimacy to the authority of the Smith Regime in Rhodesia. The South African case of internalised colonialism deserves an attack as a colonial regime in its own right.

The fourth, and final, category of parties which might be interested in the resources of the economic zone are states where were parties to conventions on the off-shore resources before the extension of the proposed jurisdiction. In the Indian Ocean, for example, the Indo-Pacific fisheries Council is still in force, though none of the eastern African states is a party. The Draft Articles make no mention of this sticky issue, nor of the issue of states which claim 'historic' or 'traditional' rights over the resources of the areas to be covered by the economic zone. Generally, it is understood that the new states reject the notion of historic or traditional rights because the implications are [illegible] of colonial domination.

If a new convention is to replace an agreement still in force, this should be stated clearly and unequivocally. Otherwise the members of the Indo-Pacific Fishery Council, for example, such as Japan and China (Taiwan), may simply choose to ignore the new proposal and jeopardise the efficacy of the new regime by continuing their fishing operations within the economic zone.

One approach in a situation where there are long-distance fishing operations in what is the become the economic zone would be to phase the fishing out gradually, say, over a period of two years. This approach could be accompanied by special fees paid by the fishermen to the coastal state as agreed upon.

A second approach, instead of expelling the foreign fishermen, would be to make special fishing agreements for joint enterprises such as Kenya and Tanzania have made with Japan. By now, the Kenya Fishing Industries, Ltd., made up of two Japanese firms, Ataka and Company and Taiyo Fishing Company, with the Kenya Maritime Company, and the parastatal I.C.D.C. has proven profitable (E.A. Standard, 27 June 1970, p.5). The foreign fishermen remain in operation, but as investors under ordinary controls and with security of tenure in accordance with the municipal law of the coastal state and international law (for a discussion of this, see Adede, 1977, pp. 175-193).

In certain cases foreign enterprises may be directed to stop operations and withdraw their vessels as soon as the zone is decided upon, either unilaterally or by international agreement. Such an action was taken by South Africa in 1963 when the government proclaimed its authority to control fishing within twelve miles of its coast and the coast of South West Africa (see Windley 1969, p.502). South Africa did not recognise any traditional fishing privileges on the grounds that all foreign participation was of recent origin, i.e., since 1960-1961, and as such insufficient to constitute a claim to established tradition.

Regarding the Indian Ocean, Hayasi (1971, p.2) has reported that Japanese longline fleets started operations around 1952, while the Koreans and Taiwanese fleets started fishing for tuna in 1964 (Hayasi, 1971, p.7). In such cases the determination of what constitutes an adequate historical claim may be a difficult subject for policy decisions or negotiation. Records would have to be sought to prove exactly when foreign fishing activities began off the coast of a state which decides to terminate them. For example, the Soviet Union, a leading Indian Ocean fishing country, is not a member of the IPFC and so her participation may not be calculated from 1948, the base year when the Agreement first came into force.

The Draft Articles intend that soveregin rights over natural resources and the exercise of jurisdiction accorded to coastal states mean absolute protection of national interests within the economic zone. Other states have no rights, but only privileges as they may be allowed by the coastal state.

Where third States or their nationals are permitted to carry out activities within the zone they are under certain obligations. The second paragraph of Article II provides that 'third states or their nationals shall bear responsibility for damage resulting from activities within the zone'. They must not cause any damage such as pollution of the ocean environment, and if they do, reparations shall be required accordingly. The coastal state is empowered by Article V to 'establish special regulations' by which liability for damages can be determined.[24]

INTERNATIONAL SUPPORT FOR THE CONCEPT OF THE ECONOMIC ZONE

Since its introduction into the lexicon of international negotiations, the concept of the exclusive economic zone has continued to gain wider international support. The first major boost was the Declaration of Santo Domingo. The concept of patimonial sea, which was enunciated by the ten Caribbean States and Mexico at Santo Domingo, supported principles

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24. The article refers only to damages resulting from activities within the zone. Serious damages can be caused by activities outside the zone, for example, in cases of oil pollution. Several international agreements deal with this subject, notably the 'International Convention on Civil Liability for Oil Pollution Damage', agreed upon at Brussels on 29 November 1969 and reprinted in International Legal Materials, 9 (1) January 1970, pp. 45-67.

similar to those of the economic zone.[25] In fact, since that meeting the term 'patimonial sea' has fallen out of use, and its supporters have rallied behind the 'economic zone' concept.

The concept had so much appeal for some of the delegates to UNCLOS III that by 1973 Christopher Pinto, a senior delegate from Sri Lanka, advocated its adoption by the 'Group of 77'.[26] The representatives of the People's Republic of China gave the 200-mile economic zone unequivocal support as soon as they joined the United Nations (speech reprinted in International Legal Materials, 11 1972, pp. 656-659), and later their delegation to the U.N. Committee on the Sea Bed submitted a proposal for an exclusive economic zone similar to the Kenya version (U.N. Doc. A/AC. 138/SC. II/L. 34, reprinted in Official Records, United Nations General Assembly: Twenty-Eighth Session, Supp. 21 (A/902), volume 3, pp. 71-72). The United States delegation submitted a proposal for an economic zone, but without specifying its width (U.N. Doc. A/AC. 138/SC.II/L.35, reprinted in Official Records, United Nations General Assembly: Twenty-Eighth Session, Supp. 21 (A/902), volume 3, p. 75). Argentina proposed a 200 mile economic zone measured from the baseline from which a territorial sea of 12 miles is measured (U.N./Doc. A/AC. 138/SC.I/L.37 reprinted Official Records, United Nations General Assembly: Twenty-Eighth Session, Supp. 21 (A/902), p. 78). Australia and Norway submitted a joint proposal supporting a 200-mile economic zone, but specifically reserving freedom of navigation within the zone (U.N. Doc. A/AC. 138/SC. II/L.36 reprinted in Official Records, United Nations General Assembly: Twenty-Eighth Session, Supp. 21 (A/902), p. 77).

Within Africa, the concept gained clear support. This was indicated in the 'Conclusions of the General Report of the African States Regional Seminar on the Law of the Sea 'held at Yaounde in June 1972.[27] Later on, fourteen

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25. The concept of patimonial sea had originally been introduced to the U.N. Committee on the Sea Bed by the delegate of Venezuela in the summer of 1971. See U.N. Doc. A/AC. 138/SR. 164, p. 3. It was adopted as part of the Declaration by the Specialized Conference of Caribbean Countries and Mexico at Santo Domingo de Guzman on 7 June 1972 and appeared in the Official Records, United Nations General Assembly: Twenty-Seventh Session Suppl. 21 (A/8721), p.70, and International Legal Materials, 11 1972, p. 892. Countries signing the Declaration were Colombia, Costa Rica, Guatemala, Haiti, Honduras, Miexico, Nicoragua, Dominican Republic, Trinidad and Tobago and Venezuela. Five countries, Barbados, El Salvador, Guyana, Jamaica and Panama participated in the Conference but did not sign the Declaration.

26. See Pinto, 1973, pp. 5, 10-11. In August 1971, Pinto had told the U.N. Committee on the Sea Bed that his delegation '... considered that the figure of 200 miles suggested by the representative of Kenya might in the circumstances prove equitable and fair'. See U.N. Doc.A/AC. 138/SC.I/SR.II, of 2 August 1971.

27. Submitted to the U.N. Committee on the Sea Bed as A/AC. 138/79, reprinted in Official Records, United Nations General Assembly: Twenty-Seventh Session, Suppl. 21 (A/9021), Vol. 3, p. 87.

African states, including Kenya, submitted joint draft articles on the economic zone identical to Kenya's original proposal.[28]

By the end of the first substantive session of UNCLOS III in August 1974, it was apparent that the majority of the delegations supported the concept of a 200-mile exclusive economic zone. It was at this point that the leader of the United States delegation wrote that 'with a few exceptions, economic zone proposals have been preferred by all conference groups including the United States'. (Stevenson and Oxman, 1975, p.16). At the end of the second substantive session of the Conference, the Second Committee, whose task it was to draft the articles relating to areas of national jurisdiction, adopted in their Single Negotiating Text an Article 46 providing that 'The exclusive economic zone shall not extend beyond 200 nautical miles from the baseline from which the breadth of the territorial sea is measured' (U.N.Doc.A/CONF. 62/WP.8/Part II, 7 May 1975, reprinted in International Legal Materials 14,1975, pp. 710-721). Precisely the same wording was adopted in the subsequent negotiating sessions which ended in May 1976 and July 1977 (U.N.Doc.A/CONF. 62/WP.8/Rev. I/Part II, 6 May 1976, Article 45; and U.N.Doc.A/CONF. 62/WP.10 of 15 July 1977, Article 57).

It seems definite now that the principle of the economic zone has been agreed upon, whatever its shortcomings and whatever various reasons different states may have had for supporting it. What remains to be ironed out are the details regarding the rights and obligations of the coastal states vis-a-vis third parties (see discussions by Okidi, 1976a, pp. 8-14). Whatever the outcome of UNCLOS III, that is, whether or not a treaty is finally agreed upon and signed, there is no doubt that the exclusive economic zone will be adopted by coastal states through national legislation which will prescribe principles to guide the management of access, exploration, exploitation and conservation of resources.

It is not clear whether Kenya's role in the development of the 200 concept was motivated by well-defined national policy intentions. At least to date Kenya has only claimed a twelve-mile territorial sea (discussed in Okidi, 1976b). What would seem to be the motivating for Kenya is found in the country's 1970-1974 Development Plan (Kenya, 1969, p.294). According to an outline in the Plan, Kenya obtained assistance from FAO in 1962 to study

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28. The other states were Algeria, Cameroon, Ghana, Ivory Coast, Liberia, Madagascar, Mauritius, Senegal, Sierra Leone, Somalia, Sudan, Tunisia and Tanzania. See U.N. Doc. A/AC.138/SC.II/L.40, reprinted in Official Records, United Nations General Assembly: Twenty-Eighth Session, Suppl. 21(A/9021), Vol. 3, p. 87.

the fishing potential of the Indian Ocean along the coast. This was followed in 1966 by a special fishery commission, appointed by the government to carry out a feasibility study on the establishment of a Mombasa-based fishing fleet The commission's recommendation indicated the viability of such an industry and suggested that the fisrt phase would comprise the 'introduction of 12 long liners operating 20 to 200 miles from Mombasa, where there would be a fishing base with a 1,000 tons capacity of cold storage' (Kenya, 1969; for comments on the background to this policy, see Makau, infra. The plan for the development of these fisheries also includes arrangements for sources of equipment and gear. Estimates have been outlined for investments in the harbour and landing and cold storage facilities.

All these investments would form a reasonable basis for a country pressing for a 200-mile exclusive economic zone. This may indeed be the case but the Plan has not been implemented. In recent investigations it was found that Kenya fishermen rarely travel beyond ten miles from the coast. Thus, Kenya still has a long way to go before it can realise the benefit of a 200-mile exclusive economic zone, which the Kenya delegation popularised at international negotiations on the new law of the sea.

APPENDIX, PROFILE OF THE CONTINENTAL SHELF ON THE EASTERN AFRICAN COAST: CAPE GUARDAFUI TO RIVER RUVUMA (ESTIMATES IN KILOMETRES)

Distance from Cape Guardafui	Width of the Shelf	Distance from Cape Guardafui	Width of the Shelf
At 0 distance	52	1800	10
100	25	1900	7
200	48	2000	37
300	16	2100	12
400	12	40° E is at 2130	
500	20	2200	2
600	25	2300	18
700	16	2400 (Pemba	4 either side
800	20	2500	10
5°N is at 840		2600 (Zanzibar)	65 incl. island
900	19	2700	40
1000	20	2750 (Mafia)	70
1100	10	2800	100
1200	10	2900	33
1300	8	3000	12
45°E is at 1350		3100	3
1400	4	3200	2
1500	4	3300	20

Source: Estimates by Dr. K.O. Emery of Woods Hole Oceanographic Institution measured from a bathmetric map. The profile is measured for every 100 km interval from Cape Guardafui to the mouth of River Ruvuma. Measurement were taken for the continental shelf up to 200 metres isobath. The figures are illustrative rather than absolute.

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THE EXCLUSIVE ECONOMIC ZONE AND TANZANIA's FISHERIES POLICY

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INTRODUCTION

The development of International legal thinking on the regime of the economic zone owes a great deal to the developing countries (Osieke, 1975, pp. 313-332). It is not intended in this paper to trace the geneology of the concept, which is well documented elsewhere and in which Kenya played a notable role.[1] The paper begins with the premise that wide consensus now exists on the establishment of an economic zone, which is a maritime area beyond and adjacent to the territorial sea of a coastal state and which does not exceed 200 nautical miles from the appropriate baseline from which the breadth of the territorial sea is measured (see RSNT (II), Draft Arts. 44 (1) and 45). This is not intended to be a comprehensive definition of the economic zone, but it does indicate some of the important coordinates of consensus already achieved. A meaningful discussion of the relevant issues in the emerging law of the sea can only be built around the Revised Single Negotiating text (RSNT) of the Third United Nations Conference on the Law of the Sea (UNCLOS lll).[2]

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1. The concept of the economic zone was contained in the Kenyan proposal, which was submitted to the Annual Meeting of the Asian-African Legal Consultative Committee in Lagos, Nigeria in 1972. It was confirmed at the African States Regional Seminar on the Law of the Sea, held at Yaounde, Cameroon, 20-30 June 1972, (UN Doc. A/AC. 139/79), and by the Council of Ministers of the Organisation of African Unity at Addis Ababa, Ethiopia, 17-24 May 1973 (CM/Res. 289 (XIX).

2. At its fifty-fifth plenary meeting on 18 April 1975, UNCLOS III requested each Chairman of its three Main Committees to prepare an (Informal) Single Negotiating Text (ISNT) covering the subjects entrusted to that particular Committee. In preparing the Texts, the Chairmen took into account all the formal and informal discussions that had been held. The ISNT was released on 8 May 1975 before the adjournment of the third session of UNCLOS III (Geneva, 17 March to 9 May 1975) as UN documents A/Conf. 62/WP. 8/Parts 1 to lll. They have been subject to informal negotiations during both the inter-sessional period and almost the entire fourth session (New York, 15 March to 7 May 1976). At the fifty-seventh meeting on 15 March 1976, UNCLOS lll requested the Chairmen of its three main Committees to revise the ISNT to reflect, as far as possible, the results of the informal negotiations that had taken place. On 6 May 1976, a Revised Single Negotiating Text was released as UN documents A/Conf. 62/WP.8/Rev.1/Parts 1 to lll. Like the ICNT, the RSNT is to serve purely as a procedural device, as a basis for negotiation and no more. It is planned that an Informal Composite Negotiating Text (ICNT) will be prepared during the Sixth Session in New York. It is clear, however, that a great many articles in the RSNT will be retained in the global law of the sea convention which may emerge hopefully, in 1978.

New concepts and new strategies are being developed to reorder the traditional legal thinking for a more just, equitable and comprehensive international legal system for the seas and the RSNT, and in particular the concept of the economic zone amply reflect or reflect these concerns.

We regard the concept of the economic zone itself, and the regime (see Singh 1976, p.20) it will inevitably give rise to, as among the most promising achievements of UNCLOS 111. We shall explore in depth the nature of the emerging regime of the economic zone including the package of rights and obligations that are a part of it. And, we shall endeavour to relate our discussion to the management aspects of the economic zone which, basically, involves rational utilisation of the living natural resources on a sustained yield basis as well as the exploitation of non-living resources compatible with the preservation of the living ones. Tanzania will be the focus of our inquiry.

If law evolves in response to, and tends to conform to, felt necessities and values, then the economic zone as an emerging legal concept, may be regarded as an end-product of that evolutionary. As a dynamic, multi-functional concept, the economic zone reflects the resolve of the developing coastal states to manage and regulate for themselves the natural resources off their coasts. For too long, under the garb of the so-called freedom of the high seas, the long-range fishing fleets of the developed seafaring states have plundered the living resources of the developing coastal states in what is now to become the economic zone. Between the strong and the weak, it has been aptly said (quoted by Raharijaona (Malagasy) in the UNCLOS 111 Official Records, Vol.1,106), it is freedom that oppresses and the law that protects. Freedom of the high seas was exploited by the technologically developed states so ruthlessly and so much in disregard of the interests of developing countries as to become oppressive and repugnant to the notions of justice and fairplay in the emerging new international economic order. The concept of the economic zone, by cutting into the traditional freedom of the high seas, legitimises the aspirations of a large number of coastal states, particularly the developing ones. It should perhaps be pointed out here that the claim for a maximum of 200 nautical miles for the economic zone has been put forth as a minimum, irreducible demand by the Group of 77, particularly the coastal states, and negotiation is now only possible regarding the regime, that is the specific rights and obligations that the coastal states will have in the zone.

The new Law of the Sea Convention, which we hope will come into existence by 1978, will be a crowning achievement of several years of negotiation and bargaining[3] and, more importantly, it should restore our faith in the United Nations and its institutions. If the international community, through;dogged persistence, can develop viable international laws and institutions for the oceans, this may lead to a greater reliance on such laws and institutions generally. Much more is at stake than meets the eye.

Before we plunge into the discussion of the regime of the economic zone, it may be worthwhile to identify the groups of interests that need to be balanced in any comprehensive law of the sea treaty. This will also give us some idea of the monumental complexity of the negotiations involved and perhaps also help us in understanding the available policy choice as we proceed to work out the specifics of the regime of the economic zone. A perceptive jurist, Uwe Jenisch (1976,pp.421-439) has identified the following categories of interests that are involved in UNCLOS III:

1. Interests of the Group of 77, which now has a membership of about 110;
2. Interests of the Nine Members of the European Economic Community;
3. Interests of 17 seafaring states;
4. Interests of some 60 coastal states;
5. Interests of 51 geographically disadvantaged and land-locked states;
6. Interests of the so-called 'territorialists' consisting mainly of Latin American states and some African states such as Somalia; and
7. Interests of 20 Arab states.[4]

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3. They have been going on for nearly four years. UNCLOS 111 has had, so far, six sessions: the First Session in New York 3-15 December 1973; the Second Session in Caracas, 20 June to 29 August 1974; the Third Session in Geneva, 17 March to 9 May 1975; the Fourth Session in New York, 15 March to 7 May 1976; the Fifth Session in New York, 2 August to 17 September 1976; the Sixth Session in New York, 23 May to 15 July 1977; the seventh session in Geneva, beginning 28 March, 1978.

4. Jenisch also identified the 'Interests of the Group of Five, i.e. the United States, England, the Societ Union, Japan and France'Kaniaru (once a Kenyan delegate to UNCLOS III and now with UNEP in Nairobi) objects to the 'Group of Five' as an identifiable separate interest group. He thinks at best, such a groups would only include the Union, Japan and England. This point was made during the deliberation of this workshop, and the writer shares this opinion and would submit that at present no purpose is served by keeping the'Group of Five' as a separate group.

It should be made clear that these groups are not mutually exclusive and, in fact, cannot be, given the complex realities of the era we live in. Just to give an example, some members of the Group of 77 (such as Uganda and Zambia) are also 'geographically disadvantaged and land-locked ... states', and such dual membership has sometimes resulted in strains affecting the cohesive unity of the groups.Nevertheless, these groups represent important realities and help us understand the negotiating tasks ahead. These negotiations have been and will be facilitated by the painstakingly prepared four parts of the Revised Single Negotiating Text (UN DOC.A/Conf.62/WP.8/ Rev.1/Parts 1 to 111 and UN Doc.A/Conf.62/WP 9/Rev.2).[5]

THE REGIME OF THE ECONOMIC ZONE.

What is the nature of the regime of the economic zone which is envisaged by the RSNT (11)?

Draft Articles 44 to 63 deal with the economic zone, which is described at the 'exclusive economic zone'. We regard the word 'exclusive' as unnecessary, however, in view of the regime envisaged in the RSNT (11), and it is likely that the final text of the Convention will use the expression Economic Zone simpliciter.[6]

Draft Article 45 defines the economic zone as an area of the sea beyond and adjacent to the territorial sea and extending outward to 200 nautical miles from the baseline from which the breadth of the territorial sea is measured.[7] Under Draft Articles 44, the coastal states has the following

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5. To avoid confusion, we shall refer to parts of the RSNT by numbers in brackets. Thus RSNT (11) refers to Part II of the Revised Single Negotiating Text, which has been prepared by the Chairman of the Second Committee.

6. During the early stages of negotiations at UNCLOS III, the participating states would, as a matter of strategy, put forth their 'maximum claims' which would allow room for give-and-take. An 'exdusive economic zone', perhaps, represented such a 'maxium claim' of the coastal states, and even though much of the exclusiveness has been negotiated away, the use of the expression has persisted.

7. Draft Arts. 4 to 6 of RSNT (II) stipulate the rules for determining the baseline.

rights in its economic zone:-

(a) Sovereign rights for the purpose of exploring and exploiting, conserving and managing the natural resources, whether living or non-living, of the sea-bed and subsoil and the superjacent waters;

(b) Exclusive rights and jurisdiction with regard to the establishment and use of artificial islands, Installations and structures;

(c) Exclusive jurisdiction with regard to:

(i) other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds; and

(ii) scientific research;

(d) Jurisdiction with regard to the preservation of the marine environment, including pollution control and abatement;

(e) Other rights and duties provided for in the present Convention.

It will be noted that the rights in the economic zone range from the 'sovereign' to 'exclusive' to 'jurisdiction' (power) and simply 'rights'. These terms reflect the intensity of competing claims. They also indicate the complex nature of the legal regime of the economic zone. Their denotation, in the context of the UNCLOS III, can only be hesitant and tentative. But this should not deter us from taking on the problems systematically and we shall negotiate the difficult points as and when they come up.

Our basic difficulty lies in inadequate tools for the conceptual analysis of a terms such as 'rights'. The Hohfeldian model is one attractive alternative though there is little doubt that when Hohfeld made his celebrated analysis (1964), he was thinking of legal relations in private law. Julius Stone has also warned us that duties of public law generally do not obey Hohfeld's specifications as to correlatives (1964, p. 160). Amerasinghe (1975, p. 213), however, has used Hohfeld's terms to advantage in connection with some of the problems concerning the law of the sea. And, while we shall not unduly labour for an exact analysis in rigorous - 'jural opposites' and 'jural correlatives' terms, the Hohfeldian terminology will be used in order to facilitate comparisons of the international legal relations-that Draft Article 44 (1) envisages, by reducing the various categories of rights to Hohfeldian common terms such as rights (stricto sensu), privilege, power, and immunity.

At this stage, something may also be said about the residual rights' in the economic zone. Residual rights, that is rights not specifically appropriated to the coastal states, belong to the international community.[8] Thus, the economic zone can neither be compared to the territorial sea nor to the high seas; it is a category sui generis, a unique package of rights and obligations.

SOVEREIGN RIGHTS IN THE ECONOMIC ZONE OVER NON-LIVING RESOURCES.

Draft Article 44(1) (a) grants the coastal state limited 'sovereign rights' over the sea-bed and the subsoil and the superjacent waters of the economic zone. These 'sovereign rights' do not extend to the air space above the zone, and Draft Article 46 (1) specifically stipulates that all states shall enjoy freedom of overflight in the economic zone.

Even as regards the 'sea-bed, subsoil and the superjacent waters', the sovereign rights are limited to exploring and exploiting, conserving and managing the natural resources therein, whether living or non-living.

Let us first analyse the content of sovereign rights as regards the non-living natural resources, such as mineral and oil, of the economic zone. The context would lead us to describe these rights as a right to explore, exploit and manage these resources. There was little problem with negotiations here, due to the absence of any long-term vested rights as the technology to exploit the minerals and oil from under the sea is of recent origin. No other state has any rights over the non-living resources of the economic zone. In fact, it may be deduced from a careful reading of the RSNT that other states are obliged to carryout any activities in the economic zone in such a manner that the coastal state's sovereign rights over the non-living resources remain inviolate. There is, therefore, some justification in labeling such rights as 'sovereign rights', which, in the hierarchy of legal rights occupy the top run.

Let us now anatomise these sovereign rights in Hohfeldian terminology to find out what they are composed of. We already know there are rights to explore, exploit, conserve and manage the non-living natural resources

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8. To achieve this, Draft Art. 46(2) of RSNT (11) refers to the Chapter on the High Seas, Draft Arts, 77 to 103.

of the economic zone. Rather than discuss each of these individually, we shall focus on the sovereign right to exploit the non-living resources as a prototype for our analysis. Such an analysis, which entails the dissection of the specific sovereign rights in simple Hohfeldian terms, would reveal that there are really a complex aggregate of privileges, rights and powers. The coastal state has a privilege to exploit the non-living resources of the economic zone. It does not have the duty to exploit such resources. It has a right to exploit them if it so wishes. The coastal state also has the power to grant its legal interest in the zone to another through a licence, lease or other contractual arrangements and it is not bound by any duty to choose the beneficiaries in accordance with any prescribed order or scheme of preference. There is only one duty specifically enjoined by the RSNT (II) on the right of exploitation, which is that the right shall be exercised in accordance with the coastal state's general duty to protect and preserve the marine envionment.

But to secure a legal right through an international treaty or through national legislation is one thing; to explore, exploit and appropriate the non-living resources of the economic zone, such as minerals and oil, is quite another. Tanzania extended its territorial waters from 12 miles to a distance of 50 nautical miles, measured from the appropriate baseline, by a presidential proclamation on 24 August 1973. [9] The continental shelf of Tanzania varies from a minimum of 3.5 miles in breadth to amaximum of 36 miles at two points, which include Mafia and Zanzibar islands. Thus, the 1973 presidential proclamation included the entire continental shelf and beyond. But due to lack of technological infra-structure and adequate capital, no attempt has been made so far to tap the non-living resources even of the continental shelf, There has not even been a systematic study of the resources within the bounds of the 50 nautical miles of territorial waters. The oil and Natural Gas Commission of India is prospecting for gas and, possibly, oil deposits on Songo Songo Island very close to the shoreline, on behalf of the Tanzanian Government. The drilling of one test well has indicated gas deposits, and their commercial viability has been established. The socialist ideology of the Government would not seem to allow for prospecting for oil on the continental shelf under production or profit-sharing arrangements, and financial constraints would limit agreements

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9. Government Notification dated 24 August 1973. This notification remains valid under the new permanent Constitution.

of the Songo Songo to a few at a time.[10] The problems involved in the exploration and exploitation of the non-living resources of the 200 - mile economic zone will be immense. In such a zone Tanzania is likely to have mere potential rights. The possibility of finding manganese nodules in commercial quantities is rather dim, and as the bulk of Tanzania's economic zone is deep sea, it would seem that fishing would be a more economically attractive proposition than exploiting the non-living resources.

SOVEREIGN RIGHTS OVER LIVING RESOURCES IN THE SUPERJACENT WATERS

Draft Article 44(1) (a) reads, in effect, that the coastal state has 'sovereign rights' to explore and exploit, to conserve and manage the living resources found over the sea-bed and subsoil and in the superjacent waters of the economic zone. We will endeavour to demonstrate that the choice of the expression 'sovereign rights' in this context is not very apt.[11]

We shall first discuss the living resources of the superjacent waters and later those found on the sea-bed and subsoil.

The most important living resources in the superjacent waters are fish as indicate, the coastal state has the'sovereign rights' to explore and exploit, and to conserve and manage the fish resources. The sovereign rights of the coastal state here are basically rights to a preferential jurisdiction to harvest the living resources in the superjacent waters of the economic zone.

The traditionall international law divided the superjacent waters of the seas into the territorial sea and the high seas, and, as mentioned earlier,this had worked to the disadvantage of the developing states, and most of this is appropriated by a few of the developed maritime states under the garb of the freedom of the high seas! An equitable international regime for the seas has to redress this problem. The situation has been complicated by the position of the seafaring states whose selfish vested interestsare protected by the freedom of the high seas and by the land-locked states who also want a chance to exploit the resources of the seas.

10. Much will depend on the outcome of the drilling. If it is successful, then such arrangements may be repeated. If not, then there may be a rethinking and other alternatives may be tried.

11. Draft Art. 50(2) and 50(3) term 'fisheries' has been substititued for 'living resources'. See also the statement made by Mr. Jeannel of france, UNCLOS - III, Official Records, Vol.II.

Thus, in general, three group of states are involved: the coastal states, the land-locked states adjoining the coastal states and the sea-faring states. If we grant sovereign rights to the coastal state, claims of the other two are naturally negated. The RSNT grants the coastal state sovereign rights, but it also attempts to recognise the claims of the other two and even makes detailed provisions concerning the rights of land-locked states. The two sets of rights can only co-exist by denying the former the chacter of sovereign rights, as traditionally understood, and, in our opinion, it would be better to use a more exact terminology here in the RSNT.

Of these competing claims, those made by the group of land-locked states are important. There are, in all, 51 land-locked and geographically disadvantaged states, many of them in Africa and several of them also in the Group of 77. The land-locked states had actual or potential (mostly potential rights over that portion of the superjacent waters of the high seas that will now be taken away by the coastal states' economic zone, which, in the aggregate, is likely to be around 36 per cent of the entire ocean space. Land-locked states have argued, often along with the seafaring states, for the 'high sea status' or as many rights associated with the high sea status as possible,. It has been reported that in the Geneva Session of 1975 a rift built up between the coastal states and the land-locked states in the Group of 77 over this issue (Jenisch, 1976, p.431). To resolve the crisis, a Group of 21 was formed, of which 10 members were coastal states 10 were land-locked and geographically disadvantaged states, and the Ambassador of Fiji was chairman. The situation was diffused when the land-locked states agreed to abandon their claim for high sea status and the coastal states agreed to negotiate fishing rights for the land-locked states in the economic zone. It seems there is little doubt now that the land-locked states will have some rights to participate in the exploitation of living resources in the adjoining coastal states economic zone. What remains to be settled is the conditions under which such rights will be exercised.

The provisions of RSNT (11) do not truly reflect the intensity of concern of the land-locked states. In fact, they favour the coastal state to a very large extent. They let the coastal state determine what privilege to grant to the land-locked states, if any, according to a very vaguely drawn list of criteia. To put this scheme into operation involves coping

with logistical problems of such magnitude and complexity that many developing coastal states, and Tanzania in particular, may find it frustratingly difficult. The first stage requires the coastal state to determine the maximum allowable catch on a sustainable yield basis (Draft Arts. 50 (1) of RSNT (11). This is a complicated exercise which presupposes a certain base of knowledge, among others things, of fishing patterns as well as of the interdependence of fishery stocks. Draft Article 50 enjoins a coastal state to take into account the best scientific evidence available to it and ensure through proper conservation and management measures' that the maintenance of the stocks of fisheries are not endagered by over-exploitation and populations of harvested species remain at levels which can produce maximum sustainable yield.'.

Maintenance of MSY-exploitation levels also involves a degree of collaboration and cooperation, including the regular exchange of relevant information, at the regional and subregional level. Fish may move in and out of the zones of contiguous coastal states, and this fact alone makes a certain degree of cooperation imperative. Draft Article 50 (5) provides that:

> Available scientific information, catch and fishing effort statistics, and other data relevant to the conservation of fish stocks shall be contributed and exchanged on a regular basis through subregional, regional and global organizations, where appropriate, and with participation by all States concerned, including States whose nationals are allowed to fish /in the economic zone/.

In East Africa, such regional, subregional or global organisations do not yet exist. There is a need to set up such and organisation and this subject will be taken up later in this paper in connection with the discussion of the highly migratory fish species. There does exist, however, an Indian Ocean Fisheries Commission which is under FAO, but its role and functions are quite different.

The difficulties inherent in operationalising the concept of maximum sustainable yield become clear when seen in the Tanzanian context. Part of the problem lies in the geophysical features of the country. The Tanzanian mainland has approximately 500 miles of coastline together with the island of Mafia and other smaller off-shore islands.[12] Part of its

12. Extending from 4.6°S latitude in the north on the border with Kenya to about 10.7°S latitude in the south on the border with Mozambique.

50 nautical miles of territorial waters and all the waters beyond are deep seas. A 200 -nautical-mile economic zone will give Tanzania some 10,000 square miles of ocean space (See Department of Zoology, 1977). The very size of this is a problem in itself. Then a significant feature of Tanzania's coastal architecture is the presence of an elevated fringing reef.

> In many areas, there is a continuous chain of small off-shore islands, presumably formed by fragments of the elevated crest of a previous reef. Between these small islands and the coast, extensive coral beds (Acropora spp.) are to be found. This pattern is repeated, on a larger scale, in the main island channels of Zanzibar and the Mafia islands. (Moris, 1974, p.38).

The coral reef areas on the narrow continental shelf, most of which lie within the twelve nautical miles of territorial waters, are the main centres of marine life, and the bulk of demersal fish stocks are to be found there. The reef is said to be partly responsible for an extreme diversity of species which makes the task of stock assessment very difficult. In addition, the reef terrain is unsuitable for 'calibrated' commercial fishing methods and this adds to the difficulty.

There has never been a scientific stock assessment of the fish population in Tanzania's territorial waters. According to Wijkstrom (1976) due to the nature of the East African coastal currents, relatively unproductive waters stretch for a considerable distance from 50 to 200 nautical miles off-shore.[13] This partly explains why Tanzania opted for a 50-nautical miles belt of territorial waters. However, it may be added in passim that if a new law of the sea convention emerges out of the deliberations of UNCLOS III, Tanzania is very likely to revert to its pre-1973 12 nautical miles of territorial waters, augmented of course by another 188 nautical miles of economic zone (see comments by Warioba of Tanzania, UNCLOS III, Official Records. Vol.2, p.182). The conservation and management of fish resources to maintain a biologically optimum yield will necessitate scientific studies of the abundance, biometric and ecology of fishery stocks in the entire 200 nautical miles of ocean space and the reef areas. Dynamiting reefs, for example, may affect the exploitation potential in the zone as a whole.

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13. Commission Workshop Report No.7, 1976, (hereinafter cited as IOC Workshop. He also points out (p.6) that the region of greatest biological interest is up to about 50 miles offshore.

Without the benefit of stock assessment data, it may not be possible for Tanzania to determine allowable catch in the superjacent waters of its economic zone. With the best of intentions, skill and resources, such assessment will take a great deal of effort several years. There is some awareness of this problem, and it is hoped that present efforts will be increased in years to come. Yet and when the convention into force, decision will have to be made on the basin of whatever information is already available.

This information would largely have to be derived from comparisons from analogous areas. Scientists claim (Matthes, 1974, p.28) that the Indian Ocean, insofar as it has been explored, is less productive than either the Atlantic or Pacific Oceans.[14] Moreover, that portion of the Indian Ocean which touches East Africa, including Tanzania, would appear to have the ocean's lowest primary and plankton productivity and thus its lowest potential for fish (of International Indian Ocean Expedition Report, quoted in Matthes, 1974, p.28). comparison seems to be with the figures of Wheeler and Ommaney (1953), which indicated that certain areas in the Mauritius/ Seychells area are capable of a sustained production of 4.7 metric tonnes/ sq.km. This can be compared with present annual figures from the East African shelf areas of 1.2 tonnes/sq.km. However, Wheeler and Ommaney's figures are for what they termed the 'fishable' area, which is broadly speaking, the raised outer edges of the oceanic banks. According to the East African Marine Fisheries Research Organization (EAMFRO), this area corresponds closely to the offshore banks found off the Zanzibar and Mafia channels. Like the Mauritious/Seychelles are, such 'fishable' areas comprise only a small fraction of the Tanzanian shelf (Moris, 1974,p.40). Some marine biologists of the University of Dar es Salaam estimate the potential yield of demersal fisheries from Tanzanian waters at around 1.5 to 2.0 metric tonnes/sq.km. (Marine Resources Conference, 1974,p.42). The offshore banks of Zanzibar and Mafia channels, which are not yet exploited, are likely to have a potential in excess of 3.5 metric tonnes/sq.km.

No scientific assessment has been carried out of pelagic stocks, including highly migratory species such as tuna. Tanzania, at present, does not have the resources to perform this task; both capital and expertise are lacking. In fact, none of the East African coastal states could carry

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14. Estimates of catch from the Indian Ocean and adjacent seas are around two million tonnes/year. According to an FAO report (Shomura et al.,1967), on the basis of yields per surface area, this is only about 20 per cent of the Atlantic or Pacific Ocean level. Even the potential yields from the Indian Ocean, at about 14.15 million tonnes, compares poorly with potential yields of about 56 million tonnes from the Atlantic and 42 million tonnes from the Pacific Ocean.

out such an assessment independently. It is better done on a regional basis with a regional organisation covering regional waters. At this stage of development, only the pooled resources of the regional states can undertake the task of stock assessment, which at least intially, would not yield anything other than a better scientific understanding of the area. Projects that lead to tangible social and economic benefits will understandably attract most of the scarce resources of an individual state, leaving too little for a project of stock asseement with a more scientific and long-term value. EAMFRO could have provided the organisation for such a study, but it has been inactive for some time and at present does not promise to be revived.

In short, Tanzania for some time to come will not be in position to determine the level of maxmum sustainable yield in its zone. Scientific management would require that such a level be determined for each of the fishable species and that information should be accompanied by effective enforcement machinery to prevent overfishing. This is a hopelessly impracticable task and one may be pardoned for harbouring doubts about the wisdom of some of the provisions of the RSNT (II).

Under the RSNT (11), after determining the limits of permissible catch on a maximum sustained yield basis, Tanzania will be required to determine how much of this she will be able to harvest. Presumably, this will be a periodic exercise as Tanzania increases her fishing capacity from year to year.[15] Tanzania's present fishing capacity is not known. In the absence of scientifically reliable figures of present annual catch, we have to rely on what can be called 'guestimates'. Tanzania's Department of Fisheries' annual catch statistics place total marine fish catches at around 28,000 to 30,000 tonnes, almost all of which are obtained from coastal waters but this does not represent Tanzania's actual fishing capacity. In fact, the figure or 28,000 to 30,000 tonnes is most likely an underestimate of present lelvels.[16] Fish are landed at a thousand small villages and islands

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15. The Tanzania Fisheries Corporation (TAFICO), established in 1974 vide G.N. 58 of 1974, now has six trawlers and plans to augment its fishing potential substantially in the near future.

16. The available increase in Bonito and Sarda along may be as high as 20,000 tonnes/year, according to Saila and Norton (1974).

along Tanzania's coastline, and it is not possible to monitor each station 24 hours a day. In fact, when statisticians began asking fishermen about their catch, the fishermen tended to avoid them and refused to believe that their questions were not part of some taxation scheme. How can we then go about fixing the parameters of Tanzania's fishing capacity we do not really know the total catch at present, nor the total potential exploitation of the waters of the economic zone? Perhaps, a rough estimate could be obtained on the basis of average vessel productivity per day.

It has been estimated that Tanzania has some 10,000 fishermen with about 3,000 traditional and semi-mechanised fishing vessels. It has been further estimated that the (Kambona, 1974,p.15 and Wijkstrom, 1974, p.55). average vessel productivity per day in 1970 was around 30 kgs. for demersal and pelagic fish combined. Productivity for hand-line and dema fishing operations is usually less than one-third of this. Almost all the catch, at present, would seem to come from the first twelve nautical miles of Tanzania's territorial waters, and many biologists believe that the reef areas which are the most productive are already being exploited to the full. Article 1 and 2 of the RSNT (11) lay down that the sovereignty of a coastal state extends over the twelve nautical miles of the territorial sea, which grants Tanzania an exclusive right to the exploitation of fish in that area. Yet this right cannot be exercised in such a way as to jeopardise the exploitation potential of the economic zone. This will place an obligation on Tanzania to manage its fish resources, wherever found, carefully and scientifically, which reguires an integrated approach to all fisheries operations.

The legislative regulation of fisheries and fishing in Tanzania, however, is in a somewhat different pattern. Tanzania passed the Fisheries Act in 1970,[17] which came into force on 1 March 1973 (6.M.No.25 of 1973).

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17. Act No. 6 of 1970 only applies to what is described as the 'Controlled Area'. However, by the Fisheries (Controlled Areas) Order, 1973, (G.N. No.156 of 1973), the entire coastline of Tanganyika, from Tanga on the Kenyan border to Mwambo by Mozambique, and all territorial waters of the Indian Ocean have been declared a controlled area for the purpose of S.5 of the Fisheries Act, 1970. ALso, the Fisheries Act, 1970 by S. 17(1) repealed the Fisheries Ord. (Cap 295) and by S. 18 repealed The Trout Protection Ord. (Cap 368).

The Act uses the mechanism of licensing to regulate fishing.[18] It designates a licensing authority [19] for the registration of vessels and the licensing of fishing vessels and fishermen.[20] Regulation 3(3) prohibits the use of any vessel [21] for fishing purposes unless it has been duly registered.[22] Regulation 11(2) prohibits the use of any vessel for fishing purposes unless it has a valid 'fishing vessel licence' duly issued.[23] There is no registration or licence fee for Tanzanian citizens for non-powered vessels up to ten metres in length, and this covers most traditional fishermen. Regulation 13(1) prohibits fishing without a valid licence. Licence for fishing vessels or for fishing remain in force until 31 December following the date of issue (Reg.17(1), G.N. 57 of 1973). Regulations also provide for a 'sport fishing licence' and 'special licence.' A sport fishing licence, which could be on a fortnightly, monthly or yearly basis caters to the needs of tourists and others who fish for sport (Reg. 17(2)). A special licence permits fishing for scientific research, museums, educational purposes, complimentary purposes or to supply food in cases of emergency when no other adequate food supply is available. It is valid for the period specified therein (Reg.20(1)).

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18. Even the RSNT sanctions the use of licensing under Art. 51(4), which is discussed elsewhere in this paper. The details of licensing in Tanzania are to be found in the Fisheries (General) Regulations, 1973 (G.N.57 of 1973), which came into force on 1 July 1973. The Regulations have so far been amended twice, once in 1973 (G.N. 153 of 1973) and again in 1975 (G.N. 269 of 1975).

19. For the time being, the Director of Fisheries or any Officer authorised by him is the licensing authority (SS.2 and3 of the Fisheries Act, 1970, read with Regulation 2 of the Fisheries (General) Regulations, 1973).

20. The Regulations also apply to fish dealers, but this area does not fall within the scope of this paper.

21. Originally, dug-out canoes were exempted from registration under Regulation 3(2) of G.N. 57 of 1973, but this exemption has been cancelled by the Fisheries (General) (Amendment) Regulations, 1973, (G.N. 153 of 1973).

22. An application in the prescribed form is to be made and the appropriate registration fee paid. Then a certification of registration is issued. The vessel is also required to carry 'permanently and conspicuously' an identification mark which is assigned by the licensing authority.

23. An application in the prescribed form is to be made and the appropriate license fee paid which may be waived in whole or in part for a bona fide Ujamaa village. Before a licence is issued, the vessel may be inspected for seaworthiness. It may be inspected again before proceeding on a fishing voyage to to make sure that it is fit to go to sea and has adequate food, water and a serviceable horn or trumpet.

To protect traditional fishermen, certain fishing methods are exempted from licence requirements (Reg.41 (1)). No licence, permit or permission is required for fishing (a) with rod and line or hand line from the beach without using a fishing vessel, whether for sport fishing, domestic consumption or sale, except in a declared trout stream, (b) with small cast nets or seine nets for amusement, sport, domestic consumption or commercial purpose, (c) with cast nets, baskets, traps or gill nets when used without a fishing vessel for domestic consumption or sale (Fourth Schedule).

To conserve and manage the fish resources, the Regulations empower the Director of Fisheries to attach to any licence any conditions, consistent with the Fisheries Act, 1970, or the Regulations (Reg.18 (1) read with the Preamble to the Fisheries Act, 1970). Such conditions could relate to (a) the methods used in fishing and the use of any equipment, appliance, instrument, net, fishing weir,[24] dams, or any other means whatsoever, (b) closed periods for fishing, which means any period during which, in relation to any species or kind of fish may not be captured, killed, injured, gathered or collected by any means whatsoever, (c) the number of persons to be engaged, the number of boats, nets, fishing weirs, dams or any pieces of equipment, appliances or intruments to be employed for any purpose in relation to fishing, and (d) the minimum length or size of any species of fish which may be captured or kilded (Reg. 18 (2), G.N. 57 of 1973). In addition, every licensee is obliged to furnish such records pertaining to fish or species of fish captured, killed or otherwise acquired or disposed of as he may be directed by the Director of Fisheries (Reg.19 (1)).

Under Regulation 25, no person shall use or be in possession of any explosive, electrical device or any poisonous or noxious substance, with intent thereby to capture, kill or injure fish in any waters or to render any such fish easier to capture.[25] Under Regulation 40(b), no person shall

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24. 'Fishing weir' means any erection, structure, construction or obstruction whatsoever placed across or in any waters and temporarily or permanently fixed to or resting on the bed or a bank, which is designed for the purpose of collection, gathering, capturing, killing or injuring fish. This term includes stake nets and basket traps (S.2, Fisheries Act, 1970).

25. The use of explosives may cause enormous damage to the reefs. However, the Fisheries Division of the Ministry of Natural Resources and Tourism, as well as the Marine Police wing of the Tanzanian Police Force, have been largely ineffective in preventing this practice. Propaganda campaigns to teach the fishermen about the damaging effects on long-term productivity have so far been fruitless .

use for fishing rockets, explosive materials or explosive projectiles of shell except for fishing whales. Regulation 40 (c) prohibits generally the use of harpoon guns or spear guns for fishing.[26] However, Harpoon Fishing (Mafia Island) Regulation, 1973 (G.N. 154 of 1973) authorised fishing by harpoon or spear guns without air bottle for bona fide tourists in Mafia Island waters between 14 July 1973 and 31 December 1974. Cutting through, breaking down or destroying any dam in any water with intent to capture, kill or injure fish is also forbidden (Reg.25 (b), G.N. 57 of 1973). To protect spawning areas, Regulation 26 prohibits the willful disturbance of any spawn or spawning fish or any bed, bank or shallow in which there in any spawn or spawning fish. At any place where fishing in general or fishing for any type of fish is prohibited, no person shall have in his possession any fishing gear, or fish for, buy ,sell or have in his possission any fish, or such type of fish the fishing of which is prohibited, without lawful excuse, the proof of which shall lie upon him (Reg.34).

Other limitations upon fishing relate to the need to protect navigation. Regulation 35 lays down a general rule that no person shall set or use seine nets, gill nets or other fishing gear in such place or manner as to obstruct navigation. Regulation 38 is more specific and provides that except in those cases where the Director of Fisheries permits in writing, all fishing gear shall be so set or used as to leave clear, navigational and unobstructed at least one-third of the whode breadth of the main channel at low tide.

The enforcement mechanism for these Regulations are set out in the Fisheries Act, 1970. The Director of Fisheries, an authorised officer or a police officer above the rank of inspector has, without warrant, the power to (a) board and search any vessel or vehicle, (b) enter any premises or other place whatsoever, (c) seize, remove and retain any fish, fishing gear or any other article or thing whatsoever, whether found on board any vessel or vehicle or in any premises, and in respect of which, it appears to him that any offence under the Fisheries Act, 1970, or Regulations there under has been committed, or which appears to him to constitute evidence of any such offence having been committed, and (d) arrest any person, whom be reasonably suspects of having committed any offence under the Fisheries Act, 1970, or Regulations thereunder or of being about to commit any such offence. (Fisheries Act, 1970, S. 9 (1)). The vessel or vehicle, in which any fish or other article or thing is seized, can be directed to proceed to a convenient port or place for unloading such fish, article or thing and can

26. Harpoon or spear-gun fishing substantially changes fish behaviours making the fish more retiring and harder to oberve.

be detained for such time as is reasonably necessary (S.10 (b)).

As regards the fish or other article or thing so seized, if the Magistrate is satisfied that an offence under the Fisheries Act, 1970, or the Regulations thereunder, has been committed, then, whether or not any person has been convicted in respect of such offence, the Magistrate may order such fish, other article or thing, to be forfeited to the Government of Tanzania (S.11(1)). As fish are perishable and the proceedings before a Magistrate may take time, the Director of Fisheries or any authorised officer is empowered to sell or disposed of the fish first, and then make an application to the Magistrate for forfeiture of the sale proceeds to the Government. If no offence is disclosed in such proceedings, the proceeds can be returned to the claimant-owners (S.11(2) and (3).

As regards the vessel or vehicle, the power to forfeit them rests with the court. Such forfeiture takes place only when a conviction has been secured for an offence under the Fisheries Act or the Regulations thereunder and the court is satisfied that the said vessel or vehicle was used in the commission of the offence (S.12). However, an order for forfeiture is not passed if the owner of the vessel or vehicle satisfies the court that it was used without his knowledge or consent (S.12 provision). Stringent fines and prison terms are also stipulated for any general violations of the Fisheries Act.

In short , Tanzania regulates access to its 50 nautical miles of territorial waters for fishing through a system of licensing. However, given the way this system operates, one may be pardoned for suspecting it to be primarily a revenue-gathering mechanism. Perhaps the absence of reliable scientific data and weak enforcement of legislative provisions due to a shortage of staff and equipment are to blame. The basic structure of the Act and the Regulations made thereunder cannot be greatly faulted. If an economic zone is established, licensing is likely to be retained as a preferred method of regulating the exploitation of living resources in the zone. The list of exemptions from licensing may have to be reviewed, but traditional fishermen using simple methods may continue to be exempted. The licences could be restrictive as regards the species fished and the area of their operation. But in order to use a licensing system to achieve the objectives of RSNT (11), the licensing authorities would have to be guided by competent marine biologists and other technical personnel. In turn, such guidance presupposes the availability or reliable data and regular monitoring of the marine

environment, and it is precisely the lack of these that the operation of the Tanzanian legislative scheme so difficult. Fortunately, some institutions do exist and, given time, resources and proper direction, they should be able to provide adequate information. The Marine Biological Station of the University of Dar es Salaam, which was established in 1967 in Kunduchi, Dar es Salaam, has a fairly well-equipped laboratory for marine ecology and small research vessel. There is also the Fisheries Research and Training Institute of the Ministry of Natural Resources and Tourism, whose primary function is the training of fishery extension officers and applied research to improve the marine fisheries industry. An EAMFRO field station was established in 1976, also at Kunduchi. This belongs to the East African Community, which is now considered defunt for all practical purposes. The station, however, is likely to receive a sophisticated research vessel from West Germany in the near future. In addition, based on the recommendations of the International Conference on Marine Resources Development In Eastern Africa, held in Dar es Salaam in April 1974, an Institute or Marine Resources Studies has been proposed to carry out relevant research on the diverse aspects of marine resources.

ACCESS TO FISHERIES RESOURCES BY OTHER STATES

Under Art. 51(2) of the RSNT (11), if the coastal state does not have the capacity to harvest the entire allowable catch, 'it shall give other states access to the surplus of the allowable catch'. The raison d'etre of this provision is that under-utilisation of the fishery resources of the zone would result in avoidable wastage, which can and should be prevented. Read together, Arts. 44(1) (a) and 51(2) of the RSNT (11) would grant the coastal state a preferential right' to harvest the entire allowable catch of the economic zone, if it is within its capacity to do so. It has been already pointed out that the adjoining land-locked states view this as unfair. We will revert to this question again a little later.

Assuming a surplus of allowable catch, the difficult question remains of how and in what order the access of other states to be determined. While there is no doubt that the coastal state shall make the decision and that it will be able to exercise some discretion, the limits of this decision have not been pulled out. There is considerable pressure here for an adjustment of the interests of various competing groups, and the way this problem has been worked out in the RSNT (11) has been rightly criticised as impractical and unworkable (Jenisch, 1976,pp.431-32). Art. 51 (3) of the

RSNT (11) states that in giving other states access to its economic zone the coastal state shall take into account 'all relevant factors', including inter alia:-

1. The significance of the living resources [27] of the area to the economy of the coastal state concerned and its other national interests;

2. The provisions of Articles 58 and 59, which deal with the rights of the land-locked states and of certain developing coastal states in the region, respectively;

3. The requirements of developing countries in the subregion or region in harvesting part of the surplus; and

4. The need to minimise economic dislocation in state whose nationals have habitually fished in the zone or who have made substantial efforts in research and identification of stocks.

What other factors not specifically spelled out can be regarded as 'relevant', and relevant to whom? Should the four factors explicitly stated be given relative weight in the order in which they appear? Or, should all of them carry equal weight, and any surplus catch be apportioned so as to satisfy all the states involved? It is difficult to believe that Art. 51(3) will survive in the present form. If the object is to limit the discretion of the coastal state in accordance with expressed guidelines, then the article will have to be more specific.

After deciding which other states should be granted access to the surplus of the allowable catch, the question arises under what terms and conditions will such access be granted. Art. 51(2) of the RSNT (11) envisages that they will be determined 'through agreements or other arrangements and pursuant to the terms, conditions and regulations referred to in (Art. 51(4)'.

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27. Art. 51(3) of RSNT (11) uses the expression 'renewable resources' due, perhaps, to an oversight during the revision of the Informal Single Negotiating Text.

Art. 51(4) stipulates that the nationals of other states fishing in the economic zone will comply with the conservation measures and with other terms and conditions contained in the national regulations of the coastal state. Such national regulations, however, will have to be consistent with the Convention and may relate, inter alia, to the following:

1. Licensing of fishermen, fishing vessels and equipment, including payment of fees and other forms of remuneration;[28]

2. Determining the species which may be caught and fixing quotas of catch either for particular stocks, or groups of stocks, or catch per vessel over a period of time or to the catch by nationals of any state during a specified period;

3. Regulating seasons and areas of fishing, the types, sizes and amount of gear, and the numbers, sizes and types of fishing vessels that may be used ·

4. Fixing the age and size of fish and other species that may be caught;

5. Specifying information required of fishing vessels, including catch and effort statistics and vessel position reports;

6. Requiring under the authorisation and control of the coastal state, the conduct of specified fisheries research programmes and regulating the conduct of such research, including the sampling of catches, disposition of samples and reporting of associated scientific data;

7. The placing of observers or trainees on board such vessels by the coastal state;

8. The landing of all or any part of the catch by such vessels in the ports of the coastal state;

9. Terms and conditions relating to joint ventures or other co-operative arrangements; and

10. Requirements for training personnel and transfer of fisheries technology, including enhancement of the coastal state's capability to undertake fisheries research.

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28. which in the case of developing coastal States, may consist of adequate compensation in the field of financing, equipment.

Tanzania's Fisheries Act, 1970, and the Regulations made thereunder cover most of these points, and the wording of Regulation 18, which has been discussed earlier, is wide enough to include the rest. Art. 61 of the RSNT (11) deals specifically with the enforcement of laws and regulations of the coastal state. To ensure compliance with its laws, the coastal state may take necessary measures, including boarding, inspection, arrest and judicial proceedings, but arrested vessels and their crews are to be promptly released upon the posting of reasonable bond or other security. This is not so the case at present under Tanzania's Regulations: vessels may even be forfeited. Under Art, 61(3), penalties imposed by the coastal state for violations of fisheries regulations in the economic zone may not include imprisonment, in the absence of an agreement to the contrary by the states concerned, or any other form of corporal punishment. However, Tanzania's exising Regulations provide for imprisonment.

The Rights of the Land-Locked States.

The basic question is when do the rights of the land-locked states come into play? If their rights only apply to the sharing of the 'surplus' allowable catch, then all the land-locked states actually enjoy is a certain priority among several possible aspirants. Their rights will depend on the capacity of the coastal state to harvest the allowable catch; if the coastal-state can and wishes to harvest the entire catch, then the land-locked states will get no share.

A land-locked state's right is to participate in the exploitation of living resources of the zone on an equitable basis. The term 'equitable' refers to an element of fairness, that take 'into account the relevant economic and geographical circumstances of all the States concerned', as provided in Art. 58(1) of RSNT (11). It is for this reason that bilateral, subregional or regional agreements are envisaged as apt vehicles for working out the terms and conditions of participation (Arts. 51(2) and 58 (1) of RSNT (11).

It is no secret that the land-locked states have not taken kindly to these propositions. They would want to have access to the living resources of economic zone of the adjoining coastal states as a matter of some preferential right, not only to the surplus but to the whole of the allowable catch. In fact, many of them have used the expression 'on equal basis' with the coastal states. This, undoubtly, represents their maximum claim and it is unlikely to be conceded. A preferential right to the surplus

has a better chance of acceptance by the coastal states. No one has yet mentioned one possible compromise, which would be to reserve a designated percentage of allowable catch for the adjoining land-locked states.

There is even greater opposition to the notion of letting the terms and conditions of participation rest on bilateral or regional agreements. Such agreements rest largely upon the fragile assumption of goodwill and good faith, and the history of the East African Community will not inspire many. Land-locked states strongly feel that the terms and conditions of their participation should be made secure by incorporating them into the Convention itself. Then the details could be left to bilateral or regional arrangements. We might add that a provision for compulsory arbitration or some other acceptable mechanism for settling disputes may make the scheme more effective.

Many of the arguments of the land-locked states are based on the assumption that they already have the ability to harvest the living resources of the zone. Art. 60(1) of the RSNT (II) categorically prohibits the transfer of their rights 'to third States or their nationals by lease or licence, by establishing joint collaboration ventures of by any other arrangements'. However, technical or financial assistance from third states or international organisations to facilitate the exercise of their rights can be utilised (Art. 60 (2)). Tanzania's adjoining land-locked states are Burundi, Malawi, Rwanda, Ugand and Zambia. All of them are developing states and, given their presnet state of economic development and the fact that none of them have ever engaged in marine fishing, it is likely that, at least for some time to come, they will not be able to exercise their right to exploit the living resources of Tanzania's economic zone. Whether the surplus of the allowable catch will be enough to meet the minimum expectations of these potential claimants is hard to say at present, in light of limited resources available in Tanzania's economic zone,as described earlier.

Other Developing Coastal States and Access to the Surplus. Like adjoining land-locked states, some developing coastal states have been given a right, under Art. 59 of the RSNT (11), to participate, on an equitable basis, in the exploitation of living resources in the economic zones of other coastal states in the subregion or region. Such states are: (1) those whose geographical peculiarities make them particularly dependent for the satisfaction of the nutritional needs of their populations upon the exploitation of the living resources in the economic zones of their neighbouring states, and (2)

those which can claim no economic zones of their own. As pointed out earlier, under Art. 51 of the RSNT (11), such developing coastal states enjoy a right to participate in the surplus of the allowable catch.

Apparently, no coastal states would qualify under Art. 59 to participate in the exploitation of Tanzania's economic zone. Art. 51(3) of the RSNT (11) also alliudes to 'the requirements of developing countries in the subregion or region in harvesting part of the surplus'. This is apart from Art. 59, and perhaps would cover subsistence fishing in small crafts by fishermen of the adjoining coastal states, such as Kenya and Mozambique.

Maritime States and Access to the Surpluss. It has been pointed out that one of the relevant factors which a coastal state must consider, when deciding how to allocate access to the surplus of allowable catch, it 'the need to minimise economic dislocation in States whose nationals have habitually fished in the Zone or which have made substantial efforts in research and identification of stocks'. These words aim at protecting the interests of maritime states with long-distance fishing fleets. The economic zones include a very large area of the oceans with proven fishing grounds, where the traditional freedom of the high seas permitted the maritime states to harvest the living resources often limited only by their greed or technological capability. Unilateral declarations extending the outer limits of territorial waters or creating maritime zones to prevent the plunder of the living resources have been the only response of the coastal states to this menance. This situation prompted the convening of UNCLOS-111, and one goal of the negotiations is to legitimise these unilateral claims in an internationally acceptable manner. Claims are also considered as set forth by those maritime states who have traditionally fished in the economic zones of other states or have invested substantially in scientific efforts to locate the fishing grounds and identify the stocks. These claims must be considered in order to assure the international acceptability of the solutions reached.

However, as presently worded, Art. 51 of the RSNT (11) does no more than oblige the coastal states to regard the claims of the maritimes states as a 'relevant factor' when deciding on the allocation of the surplus of allowable catch. South Korean, Taiwanese Russian and Japanese fishing fleets have 'habitually' fished in what is now to become the economic zone of Tanzania though exact details of the quantity and composition of their catch from the zone are not known. On the basis of presently available scientific information, a substantial catch would seem unlikely and one does not foresee

that they would have astrong long-term interest in the area. Better and more promising grounds lie off the east coast of the Indian Ocean, within the economic zones of such coastal States as Indian, Pakistan and Sri Lanka. So, as far as Tanzania is concerned, the interests of the maritime states should not prove to be an important factor.

Still in terms of the general problem, we may have a brief look at the United States' Fishery Conservation and Management Act, 1976, which came into force on 1 March 1977. The United States in the leading spokesman for the developed maritime states and the position of this country has considerable influence on the position taken by others. S. 103(d) of the U.S. Act gives us some idea of the possible claims the maritime states could make on a share of the surplus of allowable catch. It reads:-

> It is the sense of the Congress that the United States Government shall not recognise the claim of any foreign nation. (to the economic zone)[29] beyond 12 nautical miles from the baseline from which the territorial sea is measured, if such nation:
>
> (1) fails to recognise traditional fishing activity of vessels of the United States, if any, within such zone;
>
> (2) fails to recognise traditional fishing activity of vessels of the United States with respect to anadromous species or Continental Shelf fishery resources as to which such nation asserts management authority; or
>
> (3) fails to recognise and accept that highly migratory species are to be managed by applicable international fishery agreements, whether or not such national is a party to any such agreement.

Under S. 103(e), sanctions are spelled out. It provides that if, after a reasonable period of time, the United States is unable to achieve an agreement[30] affording vessels of the United States an appropriate portion of fish stocks found in the economic zone of any foreign nation (coastal state) in accordance with traditional fishing practices of such vessels and

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29. The actual words are 'fishery conservation zone, or its equivalent'. which, in the context of our discussion, could validly be described as the economic zone as defined in the RSNT.

30. [illegible] or, has refused to commence negotiations, or has failed to negotiate in good faith or is not complying with its obligations under any existing agreement concerning fishing by United States vessels for fish stocks subject to such nation's fishery management jurisdiction'.

under conditions equal to those established under S.102 of the Act,[31] or if any United States vessel, while fishing in the economic zone of a foreign nation not recognised by the United States, is seized by such nation, then the United States shall prohibit the importation into the United States of any fish or fish products from the fishery involved. Such prohibition is to continue until an agreement is achieved or until the seized vessel and its catch are released, as the case may be. Fish products are widely defined to include any article which is the product of or composed in whole or part of such fish, caught by vessels other than those of the United States.

One can dismiss some of the threat contained in the legislation as a bargaining tactic aimed at striking better terms during negotiations in UNCLOS 111. S. 104 hopefully states:

> The provisions of this title shall expire and cease to be of any effect on such date as a law of the sea treaty (or other comprehensive treaty, convention, or agreement with respect to fishery jurisdiction, which the United States has signed or is a party to) shall come into force or be provisionally applied by the United States.

Anadromous Stocks, Stocks occurring Two Economic Zones and Highly Migratory Species.[32] Anadromous stocks are those species of fish (e.g.,salmon) which spawn in fresh-water rivers and then migrate to ocean waters. Art.55 of the RSNT(11) provides that the states in whose rivers anadromous stocks originate shall have the primary interest in and responsibility

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31. Under S. 102, the United States may authorise foreign fishing in its fishery conservation zone of 200 nautical miles, for anadromous species or for continental shelf fishery resources, depending on (a) whether, and to what extent, the vessels of such foreign nation have traditionally fished in such fishery or for such stock, and (b) if it is a foreign coastal nation, then whether it extends substantially the same fishing privileges to vessels of the United States.

32. Catadromous stocks such as eels, which are covered in Art. 56 of the RSNT (11), are not discussed as they are not available in East African waters in commercial quantities.

for such stocks. This will include:-

1. Establishing regulatory measures for fishing such stocks in all waters landwards of the outer limits of its economic zone; and

2. Establishing total allowable catches, in consultation with other states fishing these stocks, for stocks originating in its rivers.

In order to minimise economic disclocation for states fishing such stocks, the state of origin, when fixing quotas, should consider such factors as the normal catch of these states, their mode of operation, the areas in which they fish and their contribution, financial and otherwise, to measures for renewing anadromous stocks.

Enforcement of regulations regarding anadromous stocks outside the zone shall be by agreement between the state of origin and other concerned states. The fish do not observe artificial boundaries, and the anadromous stocks may migrate into or through the waters of economic zones of states other than the state of origin. It may not be possible to ever determine the inflow and outflow with any degree of scientific precision. However, proper conservation and management measures of such stocks must be based on a degree of cooperation between the states involved. Regional arrangements or an appropriate regional organisation are the proper vehicles to implement such cooperative endeavours.

Anadromous stocks are not the only ones reguiring such an approach. Some stocks of associated species of fish may occur within the economic zones of two or more coastal states, and their movements from one zone to another and beyond into the high seas will also call for a measure of cooperation for effective conservation and management, either on a bilateral level or through an appropriate regional organisation. This is essentially what Art. 52 of the RSNT (11) provides: "Where stocks of associated species occur within the economic zones of two or more states, conservation and development measures shall be undertaken on the basis of a bilateral an agreement or through appropriate subregional or regional organisations. And, where such stocks occur both within an economic zone and in an area beyond and adjacent to the zone, the coastal state and the states fishing for such stocks in the adjacent area should similarly seek agreement on conservation measures on a bilateral or a regional basis.

A regional approach would seem necessary for the highly migratory species, such as tuna, marlin and others, that abound in the Indian Ocean and migrate from one end of the coast to the other. Art 53 of the RSNT (11) proposes exactly this. It states that in order to ensure the conservation and the optimum utilisation of highly migratory species[33] in a region both within and beyond the economic zone, the coastal state and other states shall cooperate directly or through appropriate international organisations. And where such an appropriate international organisation does not exist, they will cooperate to establish one and participate in its work. In fact, the conservation and management of such highly migratory species make regional and international cooperation imperative. Such fish move from one coast to another, from one economic zone to another and from economic zones to the high seas and back again. A coastal state and other states whose nationals fish for them in the region must reach an agreement bilaterally or through an appropriate international organisation to ensure optimum exploitation consistent with scientific conservation measures. A recent position paper assessing the world tuna stock listed the Indian Ocean as having unrealised potential for major tune-type fish (Saila and Nortion, 1974).

For scientific conservation, management and exploitation of highly migratory species, valuable lessons could be drawn from the two tuna conservation conventions. The 1949 Convention for the Establishment of an Inter-American Tropical Tuna Commission applies to the waters of the eastern Pacific Ocean.[34] This Convention established the Inter-American Tropical Tuna Commission, which makes investigations concerning the abundance, biology, biometry and ecology of yellowfin and skipjack tuna and recommends, from time to time, proposals designed to keep the populations of these fish levels of abundance, which will permit the maximum sustainable catch (Art. 11 (1) and (5) of the 1949 Convention). The parties to the Convention enact

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33. Listed in the annex to RSNT (11) as albacore tuna, bluefin tuna, bigeye tuna, skipjack tuna, yellowfin tuna, blackfin tuna, little tuna, prigate mackerel, comfrets, marlins, sailfish, swordfish, sauries, dolphin, oceanic sharks and cetaceans.

34. As of 31 December 1973, the parties to the 1949 Convention were Canada, Costa Rica, France Japan, Mexico, Nicaragua, Panama and the United States.

national legislations under which such recommendations can be enforced.

The 1966 International Convention for Conservation of Atlantic Tuna applies to all waters of the Atlantic Ocean, including the adjacent seas.[35] This Convention established the International Commission for the Conservation of Atlantic Tunas. The Commission makes scientific studies of the populations of tuna and tuna-type fish focussing on their abundance, biometry and ecology and including studies of measures to keep of populations of such fish at levels which permit the maximum sustainable catch (Art. IV(1) and 2(b) of the 1966 Convention). The recommendations of the Commission concerning appropriate exploitation levels are made to the parties to the Convention (Art,VIII), who take necessary actions to implement them (Art.IX). The 1966 Convention is far more detailed and complex than the 1949 one. The crux of these agreements is the establishment of a regional mechanism for stock assessment, for determining suitable exploitation levels, and for enforcement. A similar regional mechanism would be appropriate to maintain anadromous and other fishstocks which may occur in more than one economic zone or in the zone and beyond. The RSNT, it has been pointed out, favours regional arrangements in such cases as the best strategy for managingliving marine resources.[36]

A more difficult task is to spell out the details of a viable regional mechanism. For a start, the identification of a region or subregion, in the limited context of our discussion, is far from easy. As a geographical concept, a region is an identifiable area of the earth's surface set apart from others by the existence of some distinctive characterstics, which may range from physical to functional. Thus, Tanzania, Kenya and Uganda as a subregion of Eastern Africa share distinctive common characteristics such as physical topography, geographical proximity, language and culture, but politically, ideologically and economically, the three states cannot be said to have that cohesiveness which is, perhaps, equally basic to their entity as an identifiable and functionally viable subregion. This is what the history of the East African Community has shown. In the same way, one runs into difficult conceptual and practical problems when called upon to identify and isolate individual states for

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35. As of 31 December the parties to the 1966 Convention were Brazil, Canada, France, Ghana, Ivory Coast, Japan, Republic of Korea, Morocco, Portugal, Senegal, South Africa, Spain and the United States.

36. Alexander, 1977,p.84. Some of the ideas in the ensuring discussion are inspired by this article.

a viable regional subregional arrangement to ensure the conservation and management of living resources that are not confined to one coastal state's economic zone. For the scientific management of anadromous stocks migrating into or through the economic zones of other states, bilateral agreements between these states and the state of origin, and between the state origin, and other states fishing for such stocks, are an obvious strategy. The various states actually involved are united by their interest in harvesting the anadromous stocks at the maximum sustainable yield exploitation level on a long-term basis. When stocks of marine fish occur within the economic zones of two or more coastal states and beyond, a similar sharing of interests occurs among the states involved which could be the basis of a working arrangement or agreement for the optimum utilisation of the stocks.

Such arrangements, agreements or coordination might be facilitated through a regional or subregional organisation, but no such organisation in East Africa at present and it may be naive to assume one would work well here just because such organisations have worked elsewhere. Regional arrangements for the management of living marine resources have to be carefully based on a host of relevant factors if their viability is to be assured. An ideal solution in one context may be a hopeless failure in another. The host of factors that might be relevant in one context could never be listed completely, but we shall identify some of them. Of course the initial issue is which states to include in a viable regional arrangement. This can only be resolved by considering the basis of the agreement sought, the integrative (or divisive) factors existing among the states in question, their history of working together, and the presence of common goals for the development of marine resources. Next, a number of decisions must be made concerning the institutional framework: how will it be structured? what functions will it perform? what will be the leadership? the sources of funds? the conflict-solving mechanisms? the relationship with the executive and legislative bodies of the individual states the nature of enforcement, through national legislation or the regional organisation?

It is, perhaps, better at this stage merely to raise relevant questions rather than attempt to answer them. Such questions are functional as they indicate the general nature of such an organisation and the problems likely to be involved. Skolnikoff (quoted in Alexander, 1977) divides the 'functions' of an international organisation into four types: service, norm-creation and allocation, rule observance and settlement of disputes,

and operations. A regional organisation or even an international organisation of the type we are discussing need fulfill only the first three functions as an irreducible minimum. It is beyond the scope of this paper to discuss what role the FAO-sponsored and UNDP-funded Indian Ocean Fisheries Commission, or the internationally recognised National Institute of Oceanography of India, can play in this context. This will largely depend on the type of subregional mechanisms which can be established.

In summary, though the coastal state has been granted sovereign rights to explore and exploit, conserve and manage the living resources in the superjacent waters of the economic zone, the exercise of these rights is limited by the complex range of interests that have to be accomodated. In Hohfeldian terminology, the coastal state has a duty to grant access to certain categories of states for the exploitation of such living resources as it is unable to harvest, and to that extent its power to grant access to other states of its own choice is restricted. The duty to conserve and manage is reflected in the need for bilateral and regional arrangements. The effectiveness of these provisions can only be gauged when they have been implemented, particularly in the absence of adequate technical data.

SOVEREIGN RIGHTS OVER LIVING RESOURCES OF THE SEA-BED AND SUB-SOIL.

Under Art.44(1) (a) of the RSNT (11), the coastal state has sovereign rights to explore and exploit, conserve and manage the living resources found in the sea-bed and subsoil of the economic zone. Art. 44(3) of the RSNT (11), however, adds that rights with respect to the sea-bed and subsoil are to be exercised in accordance with Chapter IV of the RSNT (11). Living organisms on the sea-bed and in the subsoil belong to sedentary species, that is, 'organisms which, at the harvestably stage, either are immobile on or under the sea-bed or are unable to move except in constant physical contact with the sea-bed or the subsoil (Art.65(4), RSNT (11)). They include crabs, lobsters, corals and sponges and present little or no difficulty. Read together Art. 44(3) and Art. 65 of the RSNT (11), grant the coastal state exlusive rights over these species in the sense that if the coastal state does not undertake exploration and/or exploitation no other state may do so without the coastal state's (Art.65 (2)). These rights do not depend upon the coastal state's effective or notional occupation, nor on any express proclamation (Art.65 (3)).

Tanzania, it has been pointed out, has a rather narrow continental shelf and the existing and potential sedentary resources are rather small. In recent years, attempts have been made to start an aquaculture operation to increase the earnings and yield from such sedentary species, but this is still at a very early stage.

EXCLUSIVE RIGHTS IN THE ECONOMIC ZONE

Draft Article 44(1) (b) of the RSNT (11) grants the coastal state exclusive rights and jurisdiction with regard to the establishment and use of artificial islands, installations and structures (Art.68). Draft Article 48(1) explains that the coastal state has the exclusive right to construct and to authorise the construction, operation and use of such installations for the purposes provided in Draft Art.44 of the RSNT (11) and other economic purposes. These purposes could be exploration, exploitation, preservation and management of the living and non-living resources of the economic zone; production of energy from the water, currents and winds; scientific research; and preservation of the marine environment including pollution control and abatement. The list does not include military and strategic uses, which in fact have often been the purpose of such artificial structures, but to what extent is it possible to enforce restrictions on the use of these structures will depend in the long run on the good faith of the coastal states themselves, as well as the efficacy of the enforcement machinery which is set up.

The artificial islands, installations and structures may interfere with the freedom of navigation in the economic zone, so it has been provided that (a) due notice shall be given of their construction and presence (Art 48(3)), (b), where necessary, reasonable safety zones not exceeding 500 metres shall be established around them in order that appropriate measures for ensuring their safety and that of navigation may be taken (Art,48(4) and (5)); and (c) neither the structures nor the safety zones may established where they will interfere with the use of recognised sea lanes essential to international navigation (Art.48 (8)).

Neither Tanzania, nor for that matter any country in East Africa, has any artificial island, installation or structures in its economic zone.

EXCLUSIVE JURISDICTION IN THE ECONOMIC ZONE

Under Draft Article 44(1) (c) (i) of the RSNT (11), the coastal

state has been granted exclusive jurisdiction with regard to other activities related to the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds. Technology is still being developed, but water, currents and winds may well be used as sources of energy in the future. Exclusive jurisdiction will ensure that even if the coastal state is not using the resources of its economic zone in these ways, no one else will be able to undertake these activities in the zone without the express consent of the coastal state.

Under Draft Art. 44(1)(c)(ii) of the RSNT (11), the coastal states has exclusive jurisdiction with regard to scientific research in the economic zone. Let us consider this issue in some detail.

Scientific research is an activity of great importance. Marine scientific research has been defined in Draft Art. 48 of the RSNT (111) as 'any study or related experimental work designed to increase mankind's knowledge of the marine environment' (See Art.73). All states and competent international organisations have the right to conduct marine scientific research in the economic zone of a coastal state, subject to the 'rights and duties of other States' including the coastal state, as provided for in the RSNT (see Art.73 of RSNT (111)). Freedom of scientific research was and continues to be one of the freedom of the high seas. (See Art.76(1) (f) of RSNT (11)). On the other hand, coastal states have legitimate grounds to suspect the motives and purposes of research conducted in waters near their coast. The Mayaguez incident has clearly demonstrated that so-called research operations can serve as a cover for espionage. Furthermore, most of the developing coastal states lack the technical expertise to evaluate a specific research project in terms of their own development goals. Generally speaking, the existing provisions in the RSNT fail to take these problems into account. It is sometimes argued that research related to resource exploitation or to strategic uses is only a small part of all scientific research carried out, and that agreat deal of marine scientific research is really of general social importance, such as global pollution studies or weather forecasting, or at least is'socially neutral (See Knauss, 1973,p.93). So the argument runs, by limiting research efforts to only those approved by the coastal states we run a risk that we may be denying the benefits of research to mankind as a whole. No one denies the strength of such arguments, but neither can anyone possibly deny that almost all marine scientific research is likely for quite some time to be under the control of the developed

states, and their attitudes towards the developing states have not always inspired confidence. Given these facts, it is perfectly understandable that the developing coastal states should insist on a right of consent for research that will take place in their economic zones. The exclusive jurisdiction granted to the coastal states by the RSNT in regard to marine scientific research amounts only to a right to withhold permission for research under certain circumstances. In this respect, the coastal states have been granted four rights:-

1. A right to ensure that scientific research in their economic zones will only be undertaken with their consent in accordance with the proposed Convention (see Art. 60, RSNT (111) and Art. 73, RSNT (11). One aspect of the right is the right to information about the proposed research, because only with the relevant information will the coastal state be in a position to give or withhold its consent intelligently. Art. 58 of the RSNT (111) provides that other states or international organisations shall, at least four months in advance of the expected starting date of the research project, provide the coastal state with a full description of:-

(a) The nature and objectives of the research project;
(b) The methods to be used, including name, tonnage type and class of vessels and a description of scientific equipment;
(c) The precise geographical areas in which the activities are to be conducted;
(d) The expected date of first appearance and final departure of the research vessels, or deployment of the equipment and its removal, as may be the case;
(e) The name of the sponsoring institution, its director and the person in charge of the research project; and
(f) The extent to which the coastal state will be able to participate or be represented in the research project.

The coastal state may, within two months of the receipt of the above information, communicate to the concerned state or international organisation that:-

(a) The information provided regarding the nature or objectives of the research project is inaccurate and does not conform to the manifestly evident facts; or

(b) It needs relevant supplementary information to determine more precisely the nature and objectives of the research project and the extent of compliance with the conditions of Art. 59 of the RSNT (111). Art. 59, which we shall discuss below, obliges the state or organisation undertaking research to grant the coastal state full access to the research endeavour.

If no additional information is requested, then after the four months from the date the initial information was provided, as set out under Art. 58 of the RSNT (111), the concerned state or international organisation may proceed with the research project, unless the consent of the coastal state is withheld.

2. Another right of the coastal state is to withhold its conset for proposed research in its economic zone on any of the following grounds:-

(a) The research bears substantially upon the exploration and exploitation of the living and non-living resources of the zone for which the 'sovereign rights' are wested in the coastal state;

(b) The research involves drilling or the use of explosives for which exclusive rights rest with the coastal state;

(c) The research involves the construction, operation or use of artificial islands, installations and structures for which the coastal State has an exclusive right and jurisdiction; or

(d) The research unduly interferes with the economic activities of the coastal state consistent within its jurisdiction as specified in the RSNT. It is not very clear what this really means, and a coastal state might eithhold its consent unreasonably based on this vague clause.

Consent cannot be withheld on any other ground. In other words, the assumption appears to be that normally consent will not be withheld for marine scientific research for exclusively peaceful purposes (See Art. 51, RSNT (111)). in accordance with the provisions of the RSNT.

3. The coastal state also has a right to participate or be represented in the research project. Art. 59 of the RSNT (111) gives this right substance by imposing a set of duties on the states or international organisations undertaking research in the economic zone. The purpose is not only to ensure the bona fides of the research project, but also to

develop the capability of the coastal state, if need be, to conduct such research. The article ensures the rights of the coastal state, if it so desires, to participate in the research project, especially on board the research vessels, other craft or installations, without payment of any kind. The coastal is also entitled to receive preliminary and final reports and the conclusions of completed research projects. The coastal state may also request access to all data and samples collected by the research project and may have the data copied and samples divided, if practicable, and may receive assistance in assessing such data and samples, as well as the results of the analysis. The coastal state may ask for assurance that the research results are made available internationally as soon as possible through appropriate national or international channels. Finally, the coastal state must be notified of any major change in the research programme and, unless otherwise agreed, the scientific installations and other equipment have to be removed once the research is completed.

4. The coastal state has a right to require that further research in its economic zone be suspended if the state or international organisation carrying out the research fails to comply substantially with Art 58 (discussed above) within a reasonable time or if the information provided regarding the nature and objectives of the research project is shown to be inaccurate (Art. 65). However, non-compliance with Art. 59 in itself does not give the coastal state a right stop an on-going research project, a lacuna which should be looked into when the final Convention is drawn up. All that the default of Art. 59 allows is that the coastal state may require the fulfilment of out-standing obligations arising out of a previous research project before allowing another project to begin.

As pointed out above, these provisions do attempt to provide safeguards against the abuse of the right to conduct marine scientific research but as the developing coastal states lack the technical competence to judge the merits of a research project, these safeguards are not very firm. The most satisfactory article in this context is 52 of RSNT (111), which states that 'marine scientific research shall not form the legal besis for any claim whatsoever to any part of the marine environment ot its resources'.

OTHER RIGHTS AND DUTIES IN THE ECONOMIC ZONE.

Residual rights in the economic zone rest in the international community. Most of these are mentioned in the RSNT. We shall give a few examples of such residual rights.

Art. 46(1) of RSNT (11) grants all states, whether coastal or land-locked, the freedom of navigation in the economic zones. This freedom is subject to the relevant provisions of the RSNT and other pertinent rules of international law not inconsistent with it. In exercising the freedom of navigation, states must have due regard to the rights and duties of the coastal state and must conform to its laws and regulations as long as they are consistent with the RSNT.

However, the coastal state has the exclusive right to construct or to authorise and regulate the construction, operation and use of artificial islands, installations and structures in its economic zone to effectuate the purposes stated in Art. 44 of the RSNT (11). The exercise of this right may conflict with the freedom of navigation to which all states are entitled in the waters of the economic zone, but this is resolved by providing that:-

(a) The coastal state must give due notice of the construction of such artificial islands, installations and structures in its economic zone. Any installations or structures which are abandoned or disused must be entirely removed;

(b) The coastal state must maintain permanent means for giving warning of the presence of these structures;

(c) Where necessary, and taking into account applicable international standards, the coastal state may establish reasonable safety zones not exceeding a distance of 500 metres around the artificial islands,installations or structures and give due notice thereof. In such safety zones, coastly state may take appropriate measures to ensure the safety of the navigation; and

(d) Such artificial islands, installations and structures and the safety zones around them may not be established where they would interfere with the use of recognised sea lanes essential to international navigation (Art.48,RSNT (11)).

Ships that sail in the economic zone, save in exceptional cases expressly provided for in international treaties or by the RSNT, shall be subject to the jurisdiction of the state under whose flag they sail (Art 46 (2), RSNT (11) read with Arts. 78 and 80 (1), RSNT (111)). Safe navigation is the responsibility of the state under whose flag the ship sails, and the coastal state does not seem to have the power to impose restrictions

on the construction, equipment or seaworthiness of such ships. It is the duty of the flag state to ensure safety at sea (ART.82, RSNT (111)).

In the event of a collision or any other incident in the economic zone, no penal or disciplinary proceedings may be instituted against any person in the service of the ship except before judicial or administrative authorities of the flag state or the state of which such person is a national (Art.85(1), RSNT (11). No arrest or detention of a ship, even for investigation, may be ordered by any authorities other than those of the flag state (Art.85(3)). A problem arises in the case of ships that fly a flag as a convenience. Art. 79 of RSNT (11) permits each state to fix the conditions for the right to fly its flag. It only adds that there must exist a 'genuine link' between the state and the ship. It has not been explained anywhere how to determine if there is a 'genuine link' or what happens when it is established that the link is not genuine.

There is a limited right of pursuit in the economic zone granted to the coastal state for violations of such of its laws and regulations that are consistent with the RSNT (Art.99).

All states are entitled to lay submarine cables and pipelines on the bed of the economic zone. (Art. 67 and 100). When laying submarine cables and pipelines, states must pay due regard to cables and pipelines already in position. In particular, possibilities of repairing existing cables or pipelines must not be prejudiced.

The coastal state may impede the laying or maintenance of such cables or pipelines only in the exercise of its right to take reasonable measures for the exploration of the continental shelf, the exploitation of its natural resources and the prevention of pollution from pipelines (Art. 67(2)). The coastal state may also insist on a certain delineation of the course of pipelines on its continental shelf (Art.67(3)).

Every state is to take the necessary legislative measures to make a punishable offence the breaking or injury, by a ship flying its flag or by a person subject to its jurisdiction, of a cable beneath the economic zone, wilfully or through culpable negligence, in such a manner as is liable to interrupt or obstruct telegraphic or telephonic communication. Similarly, the breaking or injury of a submarine pipeline or high-voltage power cable should be made a punishable offence. (Art. 101).

EPILOGUE

While this paper was being written, UNCLOS III was in its sixth session in New York, which was concluded on 15 July 1977. Complete reports of what transpired there are not yet available. However, it would appear that the Informal Composite Negotiating Text (ICNT), which is a further positive step towards realisation of the goal of a global Convention on the subject, does not reflect many changes as regards the legal regime of the economic zone. The definition of the economic zone remains the same; it is still described as an exclusive economic zone. The ICNT,however, uses for the first time the words 'specific legal regime' of the economic zone. The rights in the economic zone, which ranged from sovereign rights, to exclusive rights, to exclusive jurisdiction and jurisdiction, have now been rationalised. In the category of sovereign rights have been added the words, 'and with regard to other activities for the economic exploitation and exploration of the zone, such as the production of energy from the water, currents and winds'. It will be recalled these activities were covered earlier under the rubric 'exclusive jurisdiction' in Art. 44(1)(c)(i). All other rights in Art. 44 are now grouped under 'jurisdiction' alone. The words 'sovereign rights' remain, however. Article 51, 58 and 58 remain the same, with all the uncertainties we have indicated in this paper. A new article has been introduced specifying that articles 58 and 59 (referring to land-locked and certain developing coastal states of the region) will not apply in the case of a coastal state whose economy is overwhelmingly dependent on the exploitation of the living resources of its economic zone.

Few changes have been brought in concerning marine scientific research. Art. 60(c) of the RSNT (111) which we described as vague has been deleted. The issues have been made clear by specifying that, though the coastal states shall have the right to withhold consent, yet this will not normally be done and the grounds on which the consent can be withheld have been clarified. We pointed out that the developing coastal states do not possess the technical expertise to judge the merits of proposed research projects. To meet this objection, two more months have been added to the period during which permission to conduct research is sought in the hope that this extra time be enough to allow a proper examination of the research proposal.

In short, the basic scheme remains intact, and some consensus has been achieved. The next session in Geneva may see further consensus on the details. And, we still hope a global Convention will emerge in 1978.

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IDS/OP 28

SOME ASPECTS OF CURRENT SEDIMENTATION, DEPOSITIONAL ENVIRONMENTS AND SUBMARINE GEOMORPHOLOGY OF KENYA'S SUBMERGED CONTINENTAL MARGINS[1]

by

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INTRODUCTION

In spite of their submarine location and a fairly thick cover of recent sediments, submerged continental margins (continental shelves) are geologically and topographically very similar to the continents they border, and can therefore be regarded as integral parts of those continents. They are generally defined as shallow-water platforms extending from the mean low water line to the 'shelf break' where they are marked by a more or less abrupt increase in slope angle, and thus merge into their much more steeply sloping ocean-ward margins (continental slopes).

Of the many attempts to define the maximum depth of continental shelves, the most notable one is probably that made at a UNESCO conference where the depth decided upon was 600 m (Shepard, 1959). There is, however, a rather wide divergence of opinion, as some authorities prefer a maximum depth of about 100 m.

It has been claimed by many geologists, oceanographers and geomorphologists that during the Riss (Middle Pleistocene) and Würm (Upper Pleistocene) glaciations, a world-wide maximum marine regression occurred; sea-levels were consequently lowered to such an extent that areas now constituting continental shelves were exposed and subaerial conditions prevailed. In east Africa the so-called Kanjeran and Gamblian Pluvials correspond to the Riss and Würm respectively. Wave erosion and shallow-water sedimentation were therefore taking place at much lower levels of the shelves than now. As the ice sheets melted at the end of the Würm, gradual transgression occurred until about 5,000 years B.P., by which time the formerly exposed

1. The author is grateful to the University of Nairobi providing funds which have so far enabled him to carry out work on the shelf off the Malindi area. He would also like to record his appreciation to Dr. J.H. Schroeder and Dr. K.H. Jacob, both of the Technische Universität, Berlin, with whom some of the initial work was carried out on near-shore areas.

continental margins were submerged and subjected to submarine conditions (Fisk, 1959).

As important to the development of continental shelves as glaciation is their tectonic history. The East African coast is an Afro-trailing-edge type (Inman and Nordstrom, 1971 and Shepard, 1973) which has experienced a relatively long period of shelf development. This is a region of vertical movements since Permo-Triassic (Karroo) times and one where open-marine shelf conditions conditions have been established since Jurassic times (Kent, 1974). In contrast, the Gulf of Aden Red Sea coast further north is a neo-trailing-edge type which, because of the much more recent split between the Arabian Peninsula and the African continental block, has had comparatively little chance for shelf development. Presumably, therefore, the Gulf of Aden and the Red Sea represent juvenile Atlantic-type margins at their earliest stage of development.

There has been a tremendous a accumulation of sediments on the East African coast since late Palaeozoic times, but the oldest of these (the Permo-Tiassic Karroo Series) have been preserved only in tectonic troughs. In Kenya, these rocks are represented by the Duruma Sandstone Series (Caswell, 1953, 1956 and Thompson, 1956). Middle Jurassic-Tertiary sequences overlie the Permo-Trias with a fairly pronounced unconformity, and partially cemented or uncemented Quaternary sediments of the present continental shelf overlie these Mesozoic-Tertiary strata.

The present shallow-water sedimentation rates of the East African coast can be generally regarded as fairly high, but they do not attain the magnitude of those of the northeast Indian Ocean (Ewing et al., 1969 and King, 1975) as the estimates in Table 1 show. There is a major drawback, however, in that very little is yet known of both bottom and suspended sediments off the western shores of the Indian Ocean.

Table 1. Relative volumes of two sedimentary zones of the Indian Ocean.

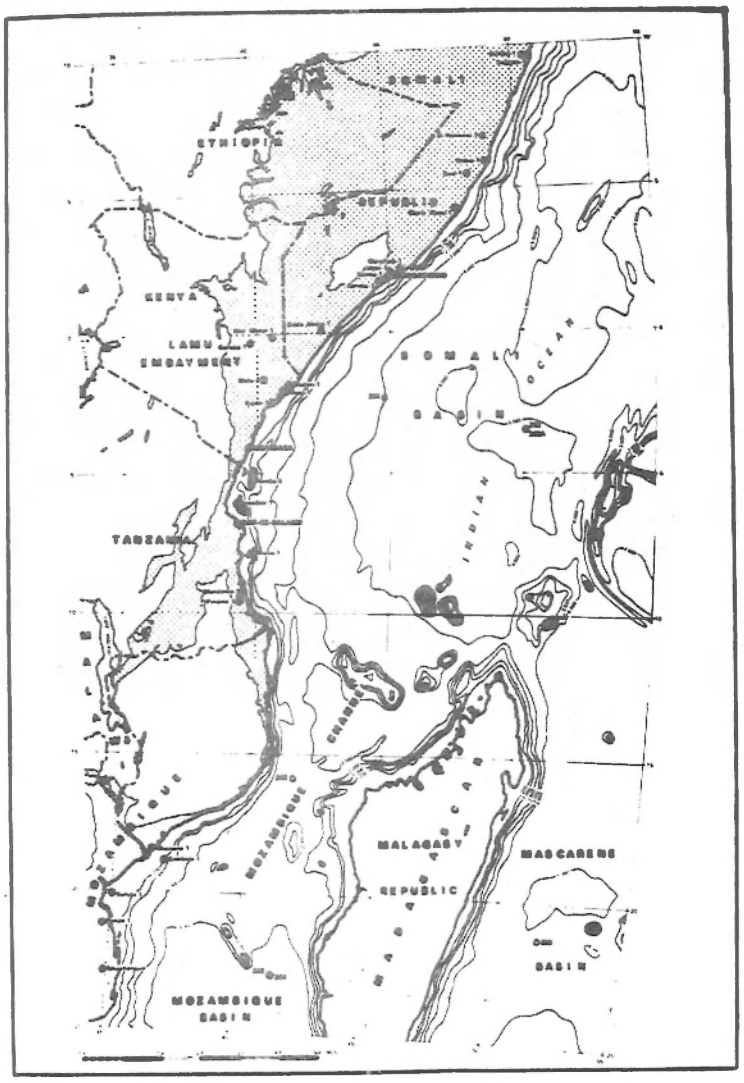
		Volumes 10^{14} m^3	% of total
Submarine delta cones:	Indus	2.12	9.9
	Ganges	7.28	34.2
	TOTAL	9.40	44.2
Afro-Australian bordering basins:	Africa	4.81	22.6
	Australia	0.44	2.1
	TOTAL	5.25	24.7

Source: Based on King, 1975.

Figure 1. Physiographic map of Eastern Africa, its submerged continental margins and the west Indian Ocean.

Source: Heezen and Tharp, 1964.

Figure 2. Map showing part of Eastern Africa and the west Indian Ocean.



Source: Shepard, 1973.

MORPHOLOGY OF THE KENYA SHELF

Topography.

Topographically, the submerged continental margins of Eastern Africa are generally described as Atlantic-type because of the relatively dissected nature of their continental slopes (Heezen, 1974). The principal erosional features are submarine canyons which are also characteristic of continental slopes off eastern North America. However, unlike other Atlantic-type margins which typically have wide shelves, the shelf off Eastern Africa is narrow (Figures 1 and 2). In the Malindi-Mombasa area of Kenya, for example, it is only 3 to 25 km wide, while that off the eastern United States is about 30 to 130 km wide. A fault origin has been suggested for certain straight parts of the Eastern African coast where there is hardly any shelf at all. Considerable widening occurs only in Mozambique south of the Zambezi River mouth, where the shelf bulges ocean-ward to about 130 km between 20^{o} and 26^{o}S latitude (Shepard, 1973), but even this is intervened by a narrow stretch from about 21^{o} to 25^{o}S.

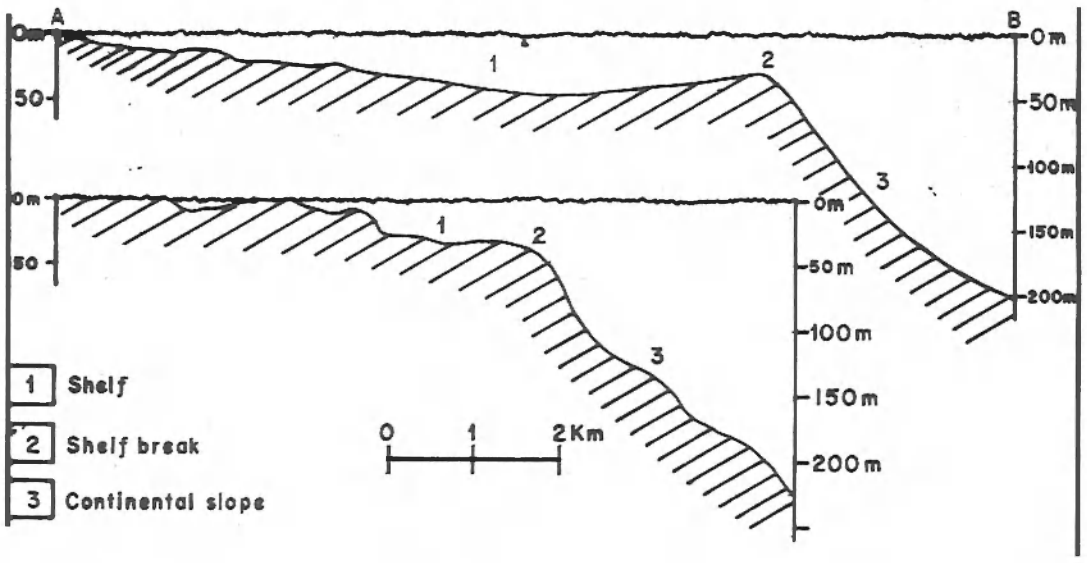
The continental slope of the Eastern African shelf plunges to varying depths with maximum slope base levels about 3,000 m. The shelf itself can generally be described as shallow. Shepard (1973) presents an average depth of about 55 m for outer portions other than those off central and southern Mozambique, where the shelf is widest and has marginal depths of about 380 to 550 m. It widens again to about 240 km off South Africa south of Natal where its outer portions exceed 130 m in depth (Dingle, 1970). In the Malindi area the shelf break generally occurs at about 50 m (Figure 3).

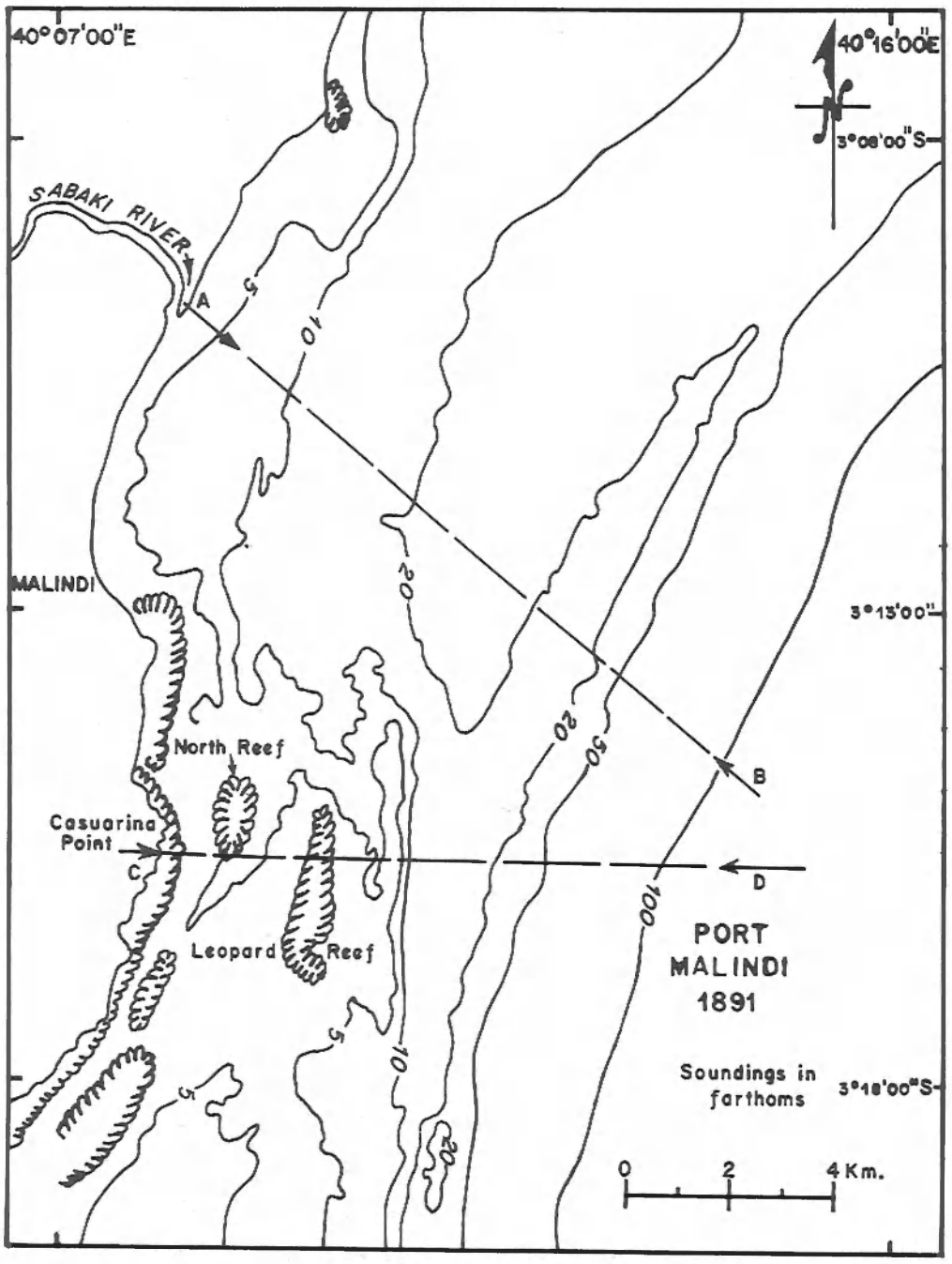
As typical of Atlantic-type shelves elsewhere, the shelf off East Africa is generally characterised by gentle gradients and comparatively little macro-morphological variety, except where the continental slope is terraced and where coral reefs are present. The continental slope off Malindi town is terraced, with two to three shelf breaks at various depths. With the possible exception of those off Somalia and South Africa south of Durban, continental slopes off Eastern Africa are believed to be relatively gentle, especially in the Kenya-Tanzania region.

Coral Reef Morphology

Along the Kenya, Tanzania and Malagasy coasts, as well as in the Red Sea, reef development is nearly continuous except in the vicinities of creeks and estuaries. A fairly extensive coral reefcovered shelf surrounds Malagasy and the Mafia, Zanzibar and Pemba islands off the Tanzania coast.

Figure 3. The shelf off Malindi. The map below shows position of section lines.





In Kenya few live reefs are found north of Malindi because of the sediment-laden nature of shallow-water environments there.

East African reefs can be divided into two types on the basis of location with respect to the shoreline - the fringing reef of the innermost shelf environment, most of which is composed of dead coral in the intertidal zone, and the outer reef which is composed of live coral. There are also the more isolated patch reefs with steep flanks which may attain slope angle values up to 50°.

As a whole, the coral platform in the Malindi-Watamu area exhibits a gentle gradient from shore to ocean-ward outer reef edge, but its surface is extremely uneven with great micro-morphological variety and unsurpassed scenic beauty. The distance from shore to the outer reef edge here varies from one half to three km. The outer reef in this area does not attain nearly the magnitude of the Great Barrier Reef off Australia, and can thus be described as quasibarrier type.

Other Submarine Topographic Features

Other prominent topographic features which break the otherwise gentle relief of the Kenya shelf, as observed off Malindi, are elongate sand banks. These occur at variable distances in near-shore waters and may be partially exposed during low tide. Others are the long-shore troughs which are elongate depressions in near-shore or inter-reef areas (Figure 4). These troughs become swift-flowing channels (tidal channels) during the rise or ebb of the tide.

CURRENT SHELF SEDIMENTATION

Depositional Environments

Sedimentation rates off the coast of Eastern Africa are notably high in the vicinity of large river mouths, such as those of the Tana and Sabaki Rivers which are the largest sources of terrigenous sediments for the Kenya shelf. Huge amounts of clastic sediment are poured into the Indian Ocean by these rivers, which are known to have formed large submarine deltas (Figure 5). In Mozambique the Zambezi River, however, terminates in a submarine canyon along which turbidity currents sweep sediments from the continental slope to the deep-sea floor where a large submarine fan of clastic sediments has been formed. The other major sources of sediment on the Kenya-Tanzania shelf are the coral reefs which provide the bioclastic component.

Figure 4. Submerged topographical features in near-shore waters off Casuarina Point.

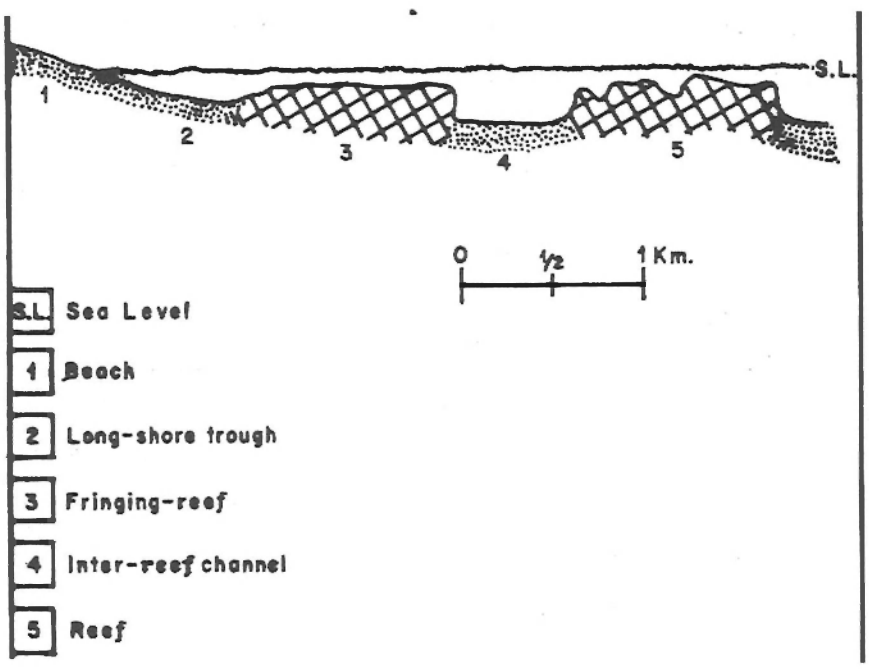
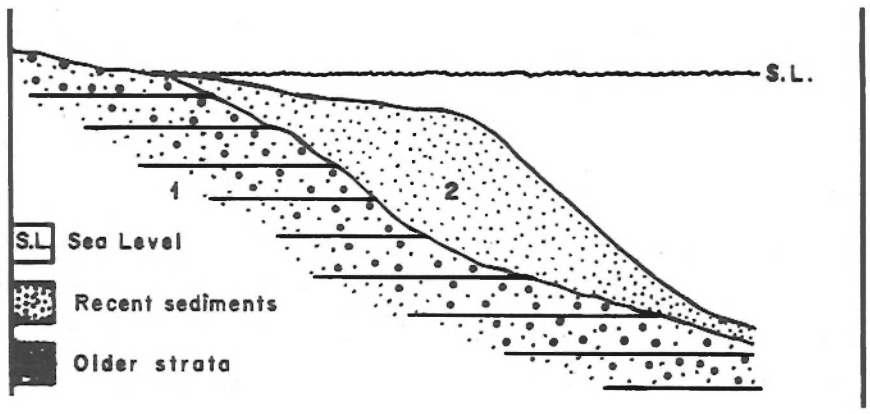


Figure 5. A diagramatic sketch section of the submerged Sabaki River delta (not drawn to scale).



The shelf off Kenya includes a range of typical shallow-water depositional environments in both the inter-tidal and sub-tidal zones. These include, for example, tidal flat, beach, off-shore bar and coral reef environments.

Depositional Processes and Sediment Distribution Patterns

Terrigenous sediment particles conveyed to the sea by rivers are not carried away off-shore as easily as is commonly presumed, but tend to be trapped or retained in near-shore waters or estuaries by shore-ward or upstream movements of saline bottom water (Postma, 1969); this is caused by the differences in density between fresh and salt waters, and culminates in the so-called 'salt wedge' which is characteristic of many river mouths (Postma and Kalle, 1954). This may have been a crucial factor in the formation of the large terminal bar and submarine delta at the mouth of the Sabaki River near Malindi.

A different from of sediment entrapment is caused by asymmetries of tidal currents in near-shore waters and on inter-tidal flats (van Straaten and Kuenen, 1957). Consequently, more of the fine sediments are carried shore-ward with the flood than ocean-ward with the ebb. This may have been an important factor in the formation of the finegrained deposits on inter-tidal flats of the Sabaki River mouth.

Long-shore currents constitute an additional decisive factor in sediment distribution in the shallow near-shore waters of this area, and the siltation problem of Malindi Bay may perhaps be largely attributable to them. Northeast current- and wave-generating winds coincide with the main Sabaki floods and hence the sediment-bearing currents and increased turbidities of waters in the bay.

These facts are not meant to imply that all the terrigenous sediment distribution in the Malindi area is absolutely restricted to the shallow waters of the shelf. Turbidity currents operating by way of submarine canyons may also convey considerable amounts of muddy sediments to areas well beyond the continental slopes.

An interesting point about the distributional patterns of bottom sediments in near-shore areas of the shelf off Malindi concerns the relative proportions between the clastic (largely quartz) and bioclastic (carbonate) sand components in samples collected along the low water line (Table 2). About 100g of each sample was sieved in order to separate the sand fraction for analysis.

Figure 6. Map showing source areas of samples referred to in Table.

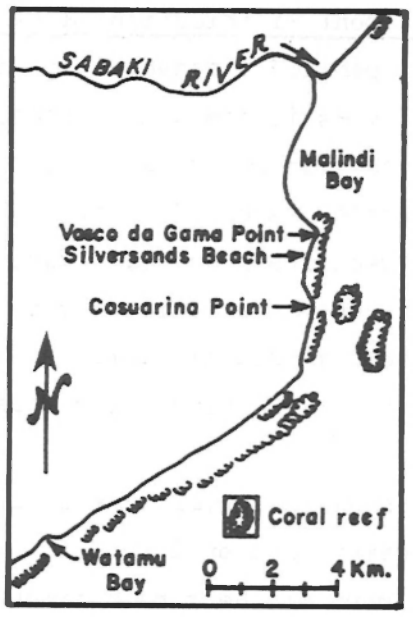


Table 2. Relative amounts of quartz and carbonate sand components in bottom sediment samples from the Malindi area.

Source of sample	No. of samples collected	Approx. distance (km) from Sabaki River mouth	Relative amounts (%) of quartz and carbonate components (range in which component values fell)
Sabaki River mouth	9	-	Quartz > 95 Carbonates < 0.005
Malindi	9	7	Quartz 70 or more Carbonates < 0.5
Vasco da Gama Pillar	9	9	Quartz 50-60 Carbonates 30-40
Silversands	9	9.6	Quartz 10-25 Carbonates 60-75
Casuarina Point	7	14.5	Quartz > 5 Carbonates > 90
Watamu Bay	7	32	Quartz < 0.5 Crabonates > 95

In the Malindi Bay area the clastic component is predominant and progressively increases northwards towards the Sabaki River mouth which is the main entry point of the terrigenous sediments. On the other hand, the predominant component at Silversands is the bioclastic one which progressively increases southwards and consists mainly of calcareous coral and shell sands. In between these two contrasting situations is the intermediate Vasco-da-Gama Pillar area where samples were found to contain the two sediment types in nearly equal proportions. This serves to illustrate the significance of the source (provenance) of young bottom sediments found on the Kenya shelf.

Another source of interest in the current shelf sedimentation off Malindi is associated with coral reefs which excellently illustrate biogenic construction and sediment production. The dispersal of coarse-textured carbonate sediment here is much influenced by the micro-morphological nature of the reef surface. Both bioturbation and physical processes of sediment production operate here, and the intra-reef variety of sediment source largely depends upon intra-reef ecology.

The East African reefs generally contain a wide variety of floral and faunal associations that occur with the various coral genera. A few examples will suffice. As observed in the Malindi area, encrusting calcareous algae can be locally abundant in the ocean-ward parts of the reefs in this region. There are two major types of non-encrusting algae, namely the green algae which are especially abundant on the inter-tidal coral reef flats and the brown algae which dominate the floral portion of the outer reefs. There is also a great abundance of marine fauna such as porifera, hydrozoans, crustaceans, echinoderms and molluscans. Some of these, for example echinoderms such as sea-urchins are borers or burrowers which in this way help in the destruction of the reef and in the production of sediment. All the floral and faunal types associated with the coral reefs contribute to sediment production, and hence to sedimentation, in this particular environment.

Grain-size Distribution

Recent sediments of the Kenya shelf include clays, silts, marls and sands. As already indicated, sands constitute the commonest terrigenous deposit in near-shore areas north of Malindi and are of predominantly quartz (silica) composition. South of this town, carbonates are predominant except where rivers enter the sea. Grainsize distribution patterns of both the clastic and bioclastic materials are dependent upon the energy of sediment-distributing waves and currents, and on the micro-morphological nature of the local depositional environment.

Figure 7a - b. Grain-size distribution in some sediment samples from the shelf off Malindi.

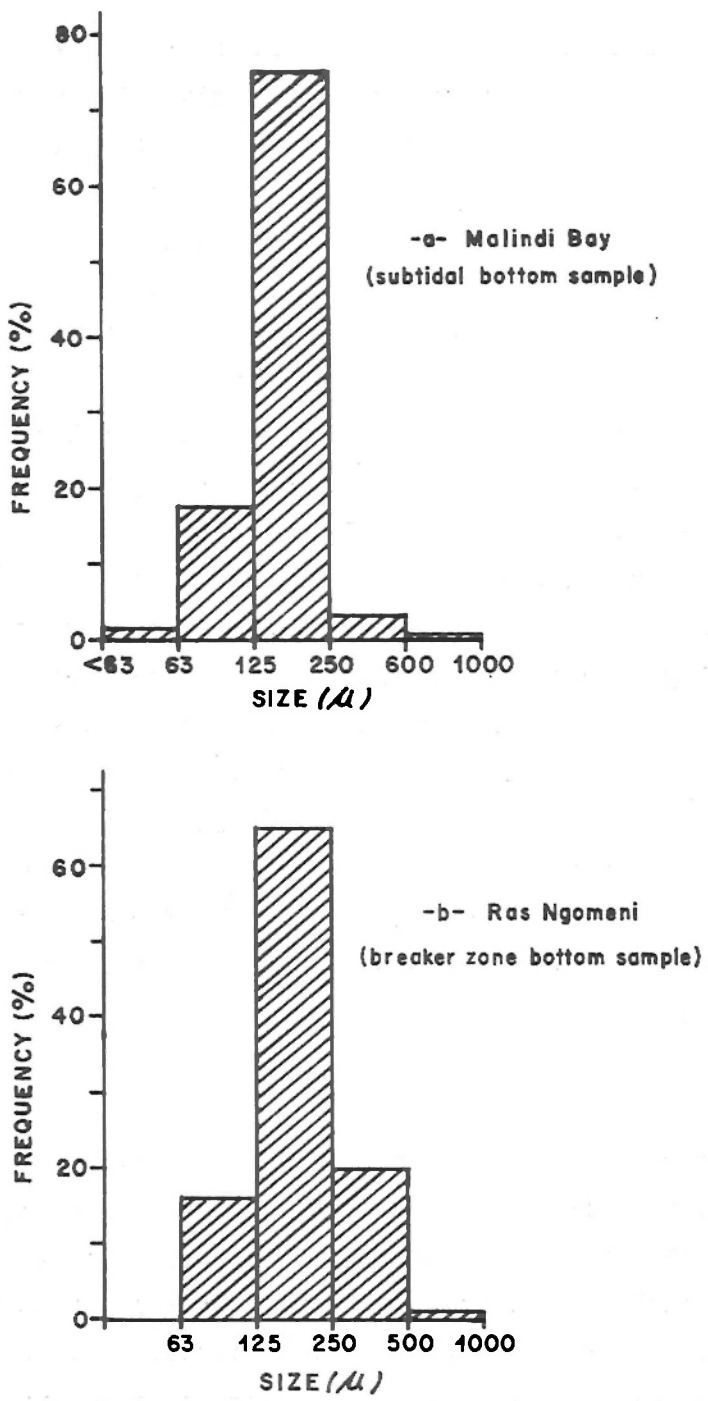
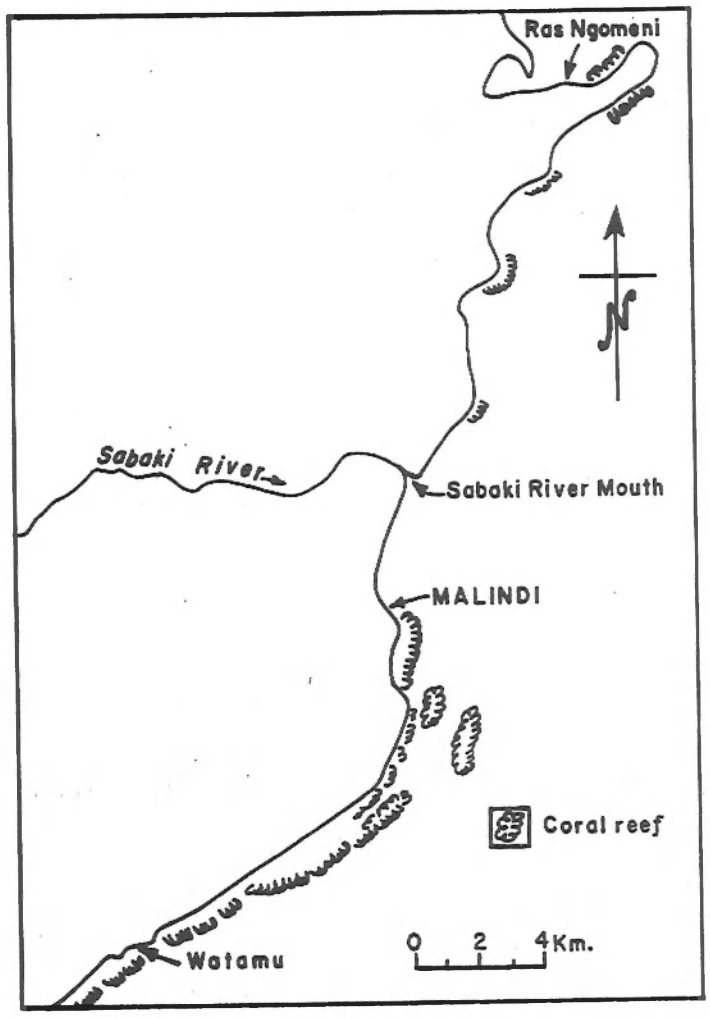
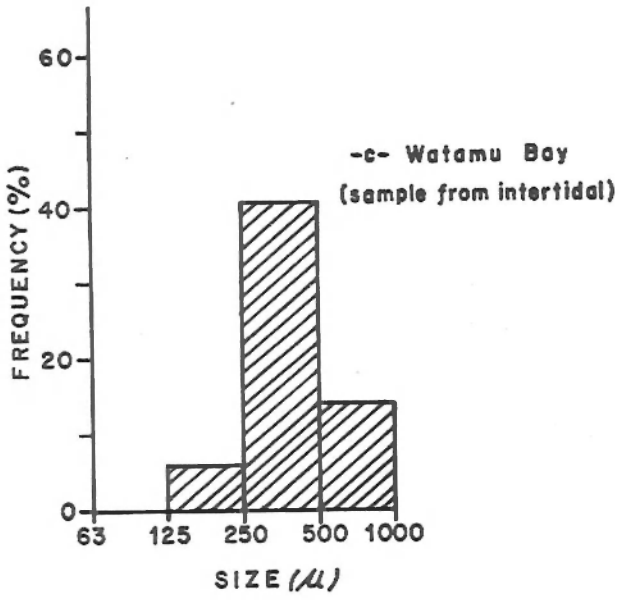
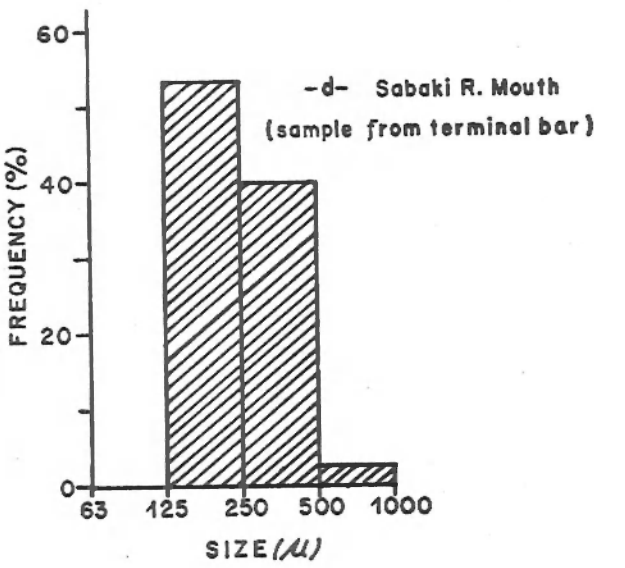


Figure 7c - d. Grain-size distribution in some sediment samples from the shelf off Malindi.







In the Malindi area, modal grain-size values in most wave-and current-distributed terrigenous clastics deposited on low-energy, gently sloping inter-tidal environments fall within the fine to medium sand range (Figure 7a-d), but the coarse sand fraction dominates upper beach sands in high-energy environments. Fine sands and muds invariably occur in the low-energy 'quiet' environments such as parts of Mida Lagoon near Watamu. A 'fining' oceanward of sediments in Malindi Bay was recognised from the progressively decreasing grain size ranges in samples collected in a traverse from the upper beach to the sub-tidal zone. Muds are preponderant in the relict bottom sediments of the outer portions of the shelf.

Pockets of very coarse locally-derived sediments of gravel size occur in the inter-tidal littoral zone below wave-eroded cliffs and in depressions and cavities of coral reefs. In both environments a great variety of large shell fragments are intermingled with the other sediments.

Mineralogy

Mineralogically, the samples of terrigenous clastics from the shelf off Malindi consisted largely of silicate minerals among which quartz and mica were predominant. The bioclastics consisted largely of one carbonate form, calcite, but in freshly weathered coral occasional aragonite needles could also be detected under the microscope.

Organic matter of terrigenous origin is common, and this is spectacularly recognised in the floating masses of vegetable matter conveyed to the sea during flush floods. Organic matter of marine origin, for example the calcareous algae and sea-weed, are very commonly mixed on beaches with other wave-deposited debris.

RESOURCES

It is obvious that without the recent boom in oil and gas, most continental shelves might have remained largely unknown. The shelves of the North Sea and off Australia provide good examples of submarine continental margins now well investigated and well known through the services of petroleum geologists and geophysicists.

Even though petroleum geologists are usually particularly interested in Atlantic-type shelves, it would be rather premature to make conclusive generalisations concerning the oil potentialities of the East African shelf. This could be said for other important economic minerals as well, because the western part of the Indian Ocean is still poorly surveyed, hence a largely

unknown shelf. A lot more data from detailed investigations, preferably from ocean-going vessels, of bottom sediments and underlying strata are essential before any credible assessment of economic potentialities (with respect to economic minerals) can be made for this shelf.

Among the economic minerals minerals retrieved from ocean bottoms are manganese nodules (MnO_2), submarine phosphorite (phosphorite nodules), glauconite, and barium sulphate concretions ($BaSO_4$). MnO2 nodules and high-grade $BaSO_4$ concretions have been found elsewhere in the Indian Ocean (Goldberg, 1954 and Jones, 1387) .

The principal economic minerals currently associated with the shelf in Kenya (Pulfrey, 1942 and Hove, 1976) and Tanzania (Gilek, 1971) are the heavy minerals from placers in beach sands and off-shore sand bars. The possible economic importance of these placers is attributed to the presence of magnetite, ilmenite, rutile, zircon, monazite and cassiterite. These, however, have not yet been found in commercial quantities. Even ilmenite, which is now considered a strategic mineral and one of the most abundant of these minerals in this region, hardly ever exceeds 10 per cent in the placers studied at Ras Ngomeni and the Sabaki River mount in Kenya (Hove, 1976) and thus falls far short of the 50 per cent required for exploitation. The economic potentialities of known placers are, however, still to be fully investigated, and the field exploration for new placers needs to be continued.

Another near-shore geological commodity of possible economic importance to East African countries is the sand of in-shore and littoral zones. If retrievable at reasonable costs, non-carbonate sand could be an important source of material for the construction industry as aggregates in concrete, as filler material, etc. In the U.S.A., for example, this has been one of the most important mineral commodities (in terms of tonnage) obtained from the shelf and contiguous littoral zones.

Sea water itself could be utilised more extensively for the extraction of certain minerals. North of Malindi, for example, common salt (NaCl) has for many years been extracted from sea-water. This is done by elaborate process whereby natural evaporation processes are utilised for the final precipitation of NaCI crystals.

Summary

Topographically, the submerged continental margin of Eastern Africa

is generally regarded as Atlantic-type. However, it is a relatively narrow shelf with continental slopes or 'shelf breaks' of varying depths. Gradients are typically gentle with comparatively little morphological variety except where the shelf is terraced or where coral reefs are present.

Current shallow-water sedimentation rates are fairly high, especially in the vicinity of large river mouths where long-shore currents assume the principal role in sediment distribution, and where large accumulations of these terrigenous sediments have formed submarine deltas. The Sabaki River is a case in point, as it is known to have built a huge submarine delta where it enters the Indian Ocean and is associated with the siltation problem of Malindi Bay. The shelf off the Kenya Coast includes a range of typical shallow-water depositional environments, for example those of the inter-tidal zone, the coral reefs, etc.

North of Malindi, bottom sediments consist largely of terrigenous clastics whereas to the south of this coastal town they consist predominantly of bioclastic (carbonate) types. The sediments include clays, silts, marls, sands and, in restricted beach and coral reef localities, some gravels. The clastic sediments consist largely of silicate minerals dominated by silica, micas and certain clays. These surface sediments range up to several metres in thickness, and overlie the older Mesozoic strata. Modal grain-size ranges of both clastic and bioclastic sediments vary locally, partly according to the energy of sediment-distributing waves and currents and, as in the coral reefs off the Malindi-Watamu area, partly according to the micromorphological nature of the shelf.

It would be premature to make conclusive generalisations concerning economic potentialities (with respect to economic minerals) of the Kenya shelf. This part of the Indian Ocean is still poorly surveyed and a lot more data from detailed investigations (preferably from ocean-going vessels) of bottom sediments and older submarine strata are essential. Heavy mineral placers in beach sands and near-shore sand banks are fairly well-known in Kenya and Tanzania but the economic potentialities of these have still to be fully assessed.

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MARINE NATIONAL PARKS IN COASTAL AND OFFSHORE RESOURCES MANAGEMENT

by

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INTRODUCTION

This paper deals with the establishment and management of Marine National Parks in Kenya since 1962 when the First World Conference on National Parks was held in Seattle. Kenya was anxious to implement recommendations of the conference and in 1968 the first two Marine National Parks were established at Malindi and Watamu on the North Coast. At the First World Conference on National Parks, Dr. Carlton Ray, of the New York Zoological Society presented a paper entitled 'Inshore Marine Conservation'. In this paper, Dr. Ray said, 'my theme will be the extension of the ideas of land and freshwater conservation to the marine environment which means: parks, sanctuaries, management and regulations to control man's behaviour in relation to the marine resources'. Dr. Ray emphasised that the world is made up of islands in the sea, and man should take care of the sea to save the land. Water and earth should be thought of as constituents of one planet. At the end of that conference, the following recommendations, was adopted:-

> Recommendation No. 15. Whereas it is recognized that the oceans and their teeming life are subject to the same dangers of human interference and destruction as the land, that the sea and the land are ecologically interdependent and indivisible, that population pressures will cause man to turn increasingly to the sea, and especially to the underwater scene, for recreation and spiritual refreshment, and that the preservation of unspoiled marine habitat is urgently needed for ethical and esthetic reasons, for the protection of rate species, for the replenishment of stocks of valuable food species and for the provision of undisturbed areas for scientific research.
>
> The First World Conference on National Parks invites the governments of all those countries having marine frontiers and other appropriate agencies to examine as a matter of urgency the possibility of creating marine parks or reserves to defend underwater areas of special significance from all forms of human interference, and further recommends the extension of existing national parks and equivalent reserves with shorelines into the water to the 10 fathom depth or the territorial limit or some other appropriate off-shore boundaries.

The Republic of Kenya responded positively to these recommendations, and the Government of Kenya still actively favours the establishment of national Parks in a variety of representative ecosystems.

THE CONCEPT OF MARINE PARKS

The concept of preservation of underwater areas is probably not new. Some native peoples of oceanic islands, who were almost solely dependent on products of the sea for survival, established taboos that prohibited or restricted the use of certain inshore areas and specific forms of marine life ages ago. These taboos served the same purposes as the regulations and laws we use today (Regulation in Appendix 1).

The concept of the preservation of both land (terrestrial) and underwater (marine) areas was known in Kenya before foreigners arrived. Fishermen at the Coast from Kiunga area to Vanga were aware of preserving their fishing areas. They did this by not fishing in certain areas, thus leaving them for breeding more fish. The Maasai in Kenya were aware of their relationship with wild animals. They had taboos against touching or eating certain species of animals. In other words, animals that were not needed for food were never killed or destroyed. These taboos have contributed to the abundance of wildlife in their areas. The arrival of foreigners with their new ideas concerning the use of natural resources has led to the destruction of our natural heritage as can now be seen.

REASONS FOR ESTABLISHING MARINE PARKS

Underwater parks or reserves are established for many purposes. The following list is illustrative of these aims, rather than exhaustive:-

1. Perpetuation of unspoiled natural submerged areas and the significant features they posses without the impact of damaging uses. This is when an area has been set aside for no other pupose except viewing. This type of area is supposed to remain entirely virginal. Use of the area should be regulated so that nothing is disturbed.

2. Restoration and rejuvenation of an area that is submerged and has been degraded. Degradation has a very severe impact on such an area. Ways and means are sought to restore the area to as near to its natural state as possible.

3. Protection, restoration and perpetuation of individual species of marine life. An area where the habitat is good for a certain species which has been fished out can be restocked with the same species from other areas. This was carried out in Malindi where all the shells had been removed; now

the area is full of live animals with shells. It is almost impossible for a marine species to be fished out completely, but this should not be used as an excuse for over fishing. Actually, extinction is not so much the danger as that a species in a certain area will be reduced to the point that fishing is no longer possible on commercial or sustained yield basis. Aquatic and terrestrial animals produce a certain yield each year, depending ultimately upon the carrying capacity of their environment. It is this yield only, like interest from a bank account, which can be taken on a continuing basis. For most marine species, the level of sustained yield possible is still not known.

4. Marine parks are also used for research and education. Some areas within parks can be used as research grounds, and the knowledge gained can be used in establishing other areas. For example, Dr. A.J. Bruce, of the East African Marine Research Organization carried out a research study for three days and identified 67 species, one of which was previously unknown. Education gained from areas earmarked for research will also be helpful in marine biology courses.

5. Marine parks can serve as buffer zones for the protection of marine species. Most of the marine parks border fishing areas, and since the parks are protected and relatively undisturbed they serve as good grounds for breeding. This has been observed in Malindi and Watamu. Appendix 2 shows the number of fish caught and other marine resources utilised for three years. After about two years, figures for the area surrounding Shimoni (the most recently established marine park) will be computed to see what effect the park will have on the availability of marine resources. Some of the fluctuations in these figures are caused by bad weather or by fishermen not going out at all. Fish and other marine resources for Malindi are harvested within the National Researve or just few miles from the Reserve.

6. Recreation is allowed free of charge within the two marine parks which have already been established (see Appendix 1). The only thing that visitors must pay for is seeing what is under the water (Appendix 3).

These purposes will not be achieved unless all forms of marine life, as well as historical and geological objects, are completely protected in underwater parks. In some areas, the limited removal of animals or other objects should be allowed on a controlled basis for research purposes.

DEVELOPMENT OF MARINE PARKS

Progressive stages in the establishment of underwater parks vary between countries according to the prevailing laws, procedures, jurisdictions and public opinion. In general, the following steps may provide an orderly

sequence for the development, acquisition, operation, management and use of marine areas:-

1. Establish the concept of marine resources conservation and the public understanding and appreciation of the needs to preserve the marine environment. It is often difficult to convince the local inhabitants of the importance of marine resource conservation. This was because the areas that are supposed to be preserved have usually been fishing grounds used by the inhabitants for a long time. In Kenya, the Fisheries Department first earmarked the two areas designated to become national parks as fish reserves, and this first step was very important.

2. Make an inventory of the coastal environment to determine the types of environments present, their state of preservation, the uses being made of them, the impact of these uses and the significant species, features and areas. National parks cannot be designated without first making an inventory of the environment. For example, Mombasa Port could not be made into a national park or reserve because the reef does not provide any kind of protection. The water is too deep for any reef organisms, the area is polluted by oil and it is in constant use by ocean-going vessels. Areas are ideal for designation as national parks if they contain significant species of wildlife and if they can be protected without encroaching on other resource uses. Also areas with unique features should be protected.

3. Based upon the inventory described above, classify the environment into groups such as the tide pools, coral reef and kelp beds. These classes are used to determine what areas should be designated as reserves, parks or as fishing grounds. Different species of fish are found in different types of environment.

4. After the environment has been classified, a detailed study should be conducted to determine the significance of various areas and the boundaries required for the desired degree of protection. The feasibility of establishing certain sites as underwater protected areas should be determined then the appropriate procedures should be followed. Selection should be made from among the areas studied of the most representative areas and those that most urgently need protection.

5. A master plan should be made of specific areas, to indicate the primary purposes of preserving them, the proposed boundaries, the types of facilities and developments that are needed, the types of uses and activities that are possible and those that should be prohibited, and the management and operational requirements.

6. The areas should be protected securely by legislation (see Appendix 1), auction, declaration, proclamation and other methods.

7. Establish appropriate rules and regulation (Appendix 1).

8. Acquire the land and waters if this has not been done through the establishment procedure.

9. Develop the area in accordance with the master plan.

10. Operate, manage, protect and use the area. This involves adequate enforcement of necessary rules and regulations, provisions for the health and safety of visitors, protection for marine life and other park features, the maintenance of facilities and interpretation of marine features.

REASONS FOR DISASSOCIATING THE MARINE PARKS FROM THE FISHERIES DEPARTMENT

Marine Parks in Kenya now belong to the Department of Wildlife Conservation and Management under the Ministry of Tourism and Wildlife. The Department of Fisheries is a separate branch of the same ministry. The Fisheries Department is credited with initiating the establishment of the marine parks. Both Watamu and Malindi Parks were first gazetted as Fish Reserves under the Fisheries Department. Administration by the Fisheries Department and as Marine Parks differs in several ways, however:-

1. Personnel of the Marine Parks are responsible for law enforcement and guidance, while those of the Fisheries Department advise fishermen of fishing methods and the types of gear to use.

2. Fishermen would assume if the Parks were under the administration of the Fisheries Department that they should be allowed to fish in the Parks. If the Parks were run by Fisheries Department the prosecution of law breakers would be difficult to carry out. This is why these two departments are kept separate.

3. The duties of a Fisheries Officer would be contradictory if he were to better exploit the natural resources and then turn around to arrest the person he had instructed for breaking the law.

4. Though they are separate, the two departments assist each other and work cooperatively whenever necessary.

INTERACTION BETWEEN THE DEPARTMENT OF WILDLIFE CONSERVATION AND THE FISHERIES DEPARTMENT

Before the amalgamation of the Kenya National Parks and the Game Department, the Fisheries Department initiated the establishment of Marine Parks. As mentioned above, these areas were Reserves under the Fisheries Department before they were gazetted as National Parks. The sites were determined by the Fisheries Department and the original proclamations made. The department also agreed that some 95 square kilometres of the sea surrounding the two Parks at Malindi and Watamu should be declared Marine Reserves. The two departments now work together in this area.

THE IMPACT OF THE MARINE PARKS ON THE TRADITIONAL FISHERMEN AT THE COAST

Traditional fishing methods in Kenya may not have ill effects on the reef or the species of fish, and so it is allowed in the Marine Reserves. Some of the fishermen complain that the fish have vacated the Reserves and can only be found in the Park areas. However, as the Parks are not fenced at all, the fish can always move into or out of the demarcated area. Fishermen are also allowed to pass through the Parks free of charge, though this privilege is sometimes abused, especially during rough weather.

There have been complaints that many of the fishermen cannot afford expensive vessels for fishing out beyond the National Parks, and the government through the Fisheries Department is ready to give loans for purchasing larger vessels.

Some traditional fishermen have learned that they can earn more money taking tourists out into the Park than by fishing. This has been observed because most of the tourist boats are owned by former traditional fishermen. In this way, traditional fishing is actually decreasing without the Parks forcing the fishermen to abandon their livelihood.

THE CONTRIBUTION OF THE MARINE PARKS TO THE NATIONAL ECONOMY

Many visitors who go to the Coast have realised the pleasure of visiting the Marine Parks, which are quite different from the land-based Parks. Visitors who had no idea of the life in the sea have realised that a whole new world of wildlife exists. Consequently, the number of visitors to the Marine Parks has steadily increased (see Appendix 4). The Department collects revenues from gate fees which supplements the budgets for administering the Parks.

Many of the tourists spend a week or two on the Coast, and a large number of new hotels and lodges have been built to accommodate them, which provides employment for both up-country and coastal people. Questions have been raised regarding the effects of tourism on Kenyan coastal people. Some of these effects are probably good, and others not. The people at Coast have traditionally filled the lower level job assocated with the tourist industry, but increasingly they are qualifying for managerial jobs in the hotel industry.

FUTURE DEVELOPMENT

At present there are three Marine National Parks in Kenya: Malindi, Watamu, and Kisite/Mpunguti. There are also plans to establish another Reserve in the Lamu/Kiunga area on the North Coast.

When planning future Marine Parks, some of the mistakes of the past will be corrected. According to a paper presented by Dr. Carlton Ray at a conference promoting the 'Establishment of Marine Parks and Reserves in the Northern Indian Ocean, Including the Red Sea and the Persian Gulf' held in Tehran in March 1975, governments have been advised to set up parks in stages. Dr. Ray stressed the need for surveys and research, the need for proper planning and managerial procedures as an integral part of national and regional land-use planning, the need to involve marine research institutes in research and monitoring and in promoting greater regional coordination of scientific programmes, the importance of taking full advantage of technical assistance available from international organisations, the need to stimulate public awareness and to promote educational programmes, and the importance of providing training of personnel for the management of marine reserves.

APPENDIX 1: REGULATIONS AND DIRECTIVES TO VISITORS

There are two gazetted National Marine Parks, one near Malindi and the other near Watamu. Please check on maps obtainable from all our offices and be sure of the boundaries.

Essentially in these Marine Parks, the Wildlife Conservation Department has given the following concessions free of charge, but the authorities reserve the right of admission:

(a) Passage and anchorage of boats ... but a free PERMIT must be obtained first for the period required.

(b) Free swimming, water skiing just off the beach. You do not have to pay for this.

(c) Free walking, basking and picknicking anywhere along the beach.

NOTE: THE ONLY THING YOU PAY FOR IS SEEING WHAT THERE IS UNDERWATER. YOU ARE DEEMED TO BE SEEING WHEN YOU USE ANY TYPE OF GOGLES, SNORKELS, MASKS AND GLASS BOTTOMED BOATS.

Within these gazetted National Marine Parks it will be an offence to:-

(a) Go goggling or use 'glass bottomed boats' without an appropriate permit. This applies to boat captains as well.

(b) Reside in the Marine Park.

(c) Possess any weapon, explosives, trap or poison inside the Park.

(d) Possess, kill, injure, capture or disturb any animal or take away or destroy any egg or nest.

(e) Cut or set fire to any vegetation or damage any object.

(f) Introduce any animal or vegetation into the Park without a permit.

(g) Remove any vegetation or animal alive or dead (or remove any object of geological, prehistorical, archaelogical, historical or other scientific interest).

(h) Destroy or deface any object, whether animate or inanimate in the Marine Park.

NOTE: Marine rangers are there to assist and generally to help as well as to enforce the law:-

(a) In both Marine Parks please produce a ticket or give information when required.

(b) Ensure that you get a stamped ticket for your money.

(c) These regulations and directives supercede any previous ones.

(d) These regulations are a guide to help visitors to avoid committing offences unnecessarily. On the whole, the Wildlife Conservation Act, 1976 and any subsequent amendments will supercede the regulations and directives.

Enjoy the Marine Parks and come back again.

WITHIN THE GAZETTED NATIONAL RESERVE

This stretches from Vasco da Gama Pillar to three miles out to the sea and south parallel to the sea shore to just south of Mida Creek (marked by a single buoy at the southern limit).

The whole of the Mida Creek is also a National Reserve (please refer to map obtainable from our offices).

Subject to ultimate Parks' laws and regulations activities in the gazetted National Reserve are permitted free of charge and free of permit.

But, it will be an offence to:-

(a) Spearfish

(b) Collect Shells or Corals.

APPENDIX 2: QUANTITY AND VALUE OF MARINE FISH LANDED

STATION

	METRIC TONS	'000 SHS	METRIC TONS	'000 SHS	METRIC TONS	'000 SHS
LAMU	1,125	1,298	858	1,486	874	1,533
MALINDI	372	854	391	1,263	371	1,167
KILIFI	113	264	142	420	240	681
MTWAPA	-	-	-	-	-	-
MOMBASA	1,083	3,411	936	2,386	1,054	3,285
SHIMONI	211	362	191	465	176	436
VANGA	321	546	307	730	319	820
PORT FISHING	86	212	88	300	67	273
OTHER COASTAL VILLAGES						
VILLAGES	235	360	203	375	236	464
AREAS NOT ACCOUNTED FOR	-	-	-	-	883	2,099
TOTAL	3,546	7,307	3,116	7,425	4,220	10,758
CRUSTACEANS						
LAMU	69	438	60	385	48	392
MALINDI	4	25	12	82	16	143
KILIFI	4	23	5	44	10	94
MTWAPA	-	-	-	-	-	-
MOMBASA	89	553	14	106	24	203
SHIMONI	5	30	3	27	2	16
VANGA	14	55	12	69	12	72
OTHER FISHING VILLAGES	24	84	15	79	12	63
TOTAL	209	1,208	121	792	124	983
OTHER MARINE PRODUCTS						
LAMU	50	49	24	25	-	-
MALINDI	49	153	18	106	1	19
KILIFI	10	38	3	18	-	-
MTWAPA	-	-	-	-	-	-
MOMBASA	150	126	128	160	75	75
SHIMONI	8	19	5	8	-	-
VANGA	-	-	-	-	-	-
AREAS NOT ACCOUNTED	2				111	1,516
TOTAL	269	385	179	317	187	1,610

APPENDIX 3: WILDLIFE (CONSERVATION & MANAGEMENT) ACT 1976

NO 1 OF 1976

IN EXERCISE of the powers conferred by section 16 to the Wildlife (Conservation and Management) Act 1976, the Minister for Tourism and Wildlife makes the following Regulations:-

PART III

1. The fees for each person to enter a Marine National Park of Marine National Reserve shall be as follows:-

(a) Non-resident adults.....Shs 10/- per person per day
(b) Resident adults..... " 2/50 per person per day
(c) Children under 12 years..... " 1/- per child per day
(d) Organized school parties.....Cts. -/50 per student per day

2. Seasonal passes for entry into Marine National Parks and Marine National Reserves are issued as follows:

(a) Quarterly - adults.....Shs 40/-, children Shs.10/-
(b) Half yearly - adults..... " 50/-, children " 15/-
(c) Yearly - adults..... " 70/-, children " 25/-
(d) Half-yearly - Boats..... " 60/-
(e) Yearly - Boats..... " 100/-

PART IV

(a) The admission fees for every vehicle, bus, aircraft or any other category of vessel shall be Shs. 20/-

(b) The fees in paragraph (a) shall also apply to boats used to convey visitors and crew into and out of the Marine National Park or National Reserve per visit.

Made this 12th day of October 1976.

M.J. OGUTU
MINISTER FOR TOURISM & WILDLIFE

APPENDIX 4a: MARINE NATIONAL PARKS VISITORS, 1970

MARINE NATIONAL PARKS VISITORS - 1969

Month	Adult Residents	Adult Non-Residents	Children 1/-	Children -/50	Free Entrants & VIPs	Duty/Other Pass Holders	Season Ticket Holders	Total	Total Vessels
January	859	1,217	8	317	3	-	-	2,404	204
February	645	1,173	-	97	1	-	-	1,916	225
March	455	1,159	1	90	32	-	-	1,737	196
April	859	448	338	59	40	-	1	1,745	188
May	129	47	27	-	-	-	-	205	27
June	82	80	8	-	2	-	-	172	25
July	274	480	124	-	4	-	-	882	108
August	1,174	719	661	19	35	-	-	2,608	176
September	728	511	181	1	43	-	-	1,464	135
October	566	456	156	6	8	-	-	1,192	122
November	385	739	86	-	30	-	-	1,240	126
December	1,293	981	573	-	68	-	-	2,915	252
	7,449	8,010	2,163	589	266	-	1	18,480	1,784

REVENUE

Adults Residents		18,622.50
Adults Non-Residents		80,100.00
Children		2,163.00
School Parties		294.50
	KSHS.	101,180.00

APPENDIX 4b. MARINE NATIONAL PARKS VISITORS, 1970

Month	Adult Residents	Adult Non-Residents	Children 1/-	Children -/50	Free Entrants and VIPs	Duty/Other Pass Holders	Season Ticket Holders	Total	Total Vessels
January	945	1,540	6	311	8	-	-	2,830	244
February	571	1,482	-	103	8	-	-	2,164	157
March	618	1,317	-	126	92	-	-	2,153	168
April	516	491	24	296	78	-	-	1,405	109
May	64	75	-	15	20	-	-	174	13
June	98	118	-	15	30	-	-	261	26
July	359	479	51	163	57	-	-	1,106	90
August	1,480	1,001	-	712	118	-	-	3,311	228
September	731	651	13	203	76	-	-	1,674	144
October	522	666	16	91	132	-	-	1,427	105
November	423	819	-	64	74	-	-	1,380	156
December	1,396	1,403	-	607	150	-	-	3,556	225
	7,723	10,042	110	2,726	843	-	-	21,441	1,665

REVENUE

Adult Residents	19,307.50
Adult Non-Residents	100,420.00
Children	110.00
School Parties	1,363.00
K.SHS.	121,200.50

APPENDIX 4c. MARINE NATIONAL PARKS VISITORS, 1971.

Month	Adult Residents	Adult Non-Residents	Children 1/-	Children -/50	Free Entrants & VIPs	Duty/Other Pass Holders	Season Ticket Holders	Total	Total Vessels
January	975	1,904	321	-	146	-	-	3,346	213
February	689	1,747	83	-	175	-	-	2,694	180
March	482	1,424	86	14	118	-	-	2,124	154
April	1,186	839	516	-	95	-	-	2,636	188
May	169	118	56	1	28	-	-	372	36
June	103	146	23	-	25	-	-	297	33
July	446	1,047	248	-	97	-	-	1,838	134
August	1,452	1,335	838	12	229	-	-	3,866	292
September	625	818	211	-	118	-	-	1,772	138
October	585	905	129	-	131	-	-	1,750	135
November	531	1,007	131	-	37	2	81	1,789	144
December	1,812	1,270	926	4	67	8	106	4,193	290
	9,055	12,560	3,568	30	1,266	10	187	26,677	1,937

REVENUE

Adult Residents	22,537.50
Adult Non-Residents	125,600.00
Children	3,568.00
School Parties	15.00
K.SHS.	151,720.50

APPENDIX 4d. MARINE NATIONAL PARKS VISITORS, 1972.

Month	Adult Residents	Adult Non-Residents	Children 1/-	Children -/50	Free Entrants and VIPs	Duty/Other Pass Holders	Season Ticket Holders	Total	Total Vessels
January	1,234	2,071	433	-	89	-	115	3,942	303
February	694	2,095	205	-	24	-	88	3,106	250
March	608	1,999	256	-	152	-	96	3,311	266
April	1,284	814	666	2	99	6	71	2,942	229
May	173	214	55	-	16	-	27	485	44
June	371	460	101	2	93	-	400	1,067	88
July	528	1,188	393	105	19	-	63	2,296	180
August	1,761	1,754	1,066	44	70	-	98	4,793	347
September	835	1,209	252	73	55	-	72	2,496	205
October	731	1,197	165	-	126	9	74	2,302	180
November	612	1,223	154	51	32	-	59	2,131	176
December	2,213	1,293	927	17	167	7	74	4,698	323
	11,044	15,517	4,673	294	942	22	877	33,369	2,591

REVENUE

Adult Residents		27,610.00
Adult Non-Residents		155,170.00
Children		4,673.00
School Parties		147.00
	K.SHS	187,600.00

APPENDIX 4e: MARINE NATIONAL PARKS VISITORS, 1973.

Month	Adult Residents	Adult Non-Residents	Children 1/-	Children -/50	Free Entrants and VIPs	Duty/Other Pass Holders	Season Ticket Holders	Total	Total Vessels
January	920	1,901	443	-	54	-	14	3,332	204
February	696	2,000	162	-	87	-	78	3,023	256
March	687	1,434	187	-	28	-	74	2,410	200
April	1,162	953	520	111	14	-	7	2,667	215
May	229	136	130	-	4	1	6	506	55
June	299	298	94	-	13	-	35	739	76
July	541	1,200	249	-	-	-	67	2,057	175
August	1,407	1,464	943	87	5	-	42	3,948	318
September	809	945	331	66	2	-	39	2,192	180
October	599	1,162	197	71	15	-	49	2,093	180
November	617	1,297	90	71	6	-	128	2,209	180
December	2,222	1,406	973	14	143	6	220	4,984	487
	10,188	14,096	4,319	420	371	7	759	30,160	2,526

REVENUE

Adult Residents		24,470.00
Adult Non-residents		140,960.00
Children		4,319.00
School Parties		210.00
	K.SHS.	170,959.00

APPENDIX 4f: MARINE NATIONAL PARKS VISITORS, 1974

Month	Adult Residents	Adult Non-Residents	Children 1/-	Children -/50	Free Entrants and VIPs	Duty/Other Pass Holders	Season Ticket Holders	Total	Total Vessels
January	1,222	2,445	624	18	20	-	217	4,546	333
February	652	2,340	182	-	3	-	148	3,325	275
March	813	1,579	200	70	75	-	133	2,870	248
April	1,331	868	717	293	37	-	132	3,378	239
May	476	364	166	15	36	2	28	1,087	95
June	400	365	141	-	11	-	33	960	85
July	548	1,187	274	9	28	-	79	2,125	172
August	1,803	1,625	931	115	17	41	176	4,708	374
September	926	1,066	300	71	50	-	113	2,526	211
October	960	1,235	301	53	37	10	146	2,711	186
November	675	1,412	158	19	72	-	111	2,447	207
December	2,163	1,627	370	103	71	16	127	5,077	372
	11,969	29,235	4,864	766	457	69	1,446	35,750	2,797

REVENUE

Adult Residents		29,922.50
Adult Non-Residents		292,350.00
Children		4,864.00
School Parties		383.00
	K.SHS.	327,519.50

APPENDIX 4g: MARINE NATIONAL PARKS VISITORS, 1975

Month	Adult Residents	Adult Non-Residents	Children 1/-	Children -/50
January	1,446	2,283	539	16
February	753	1,880	149	-
March	1,168	1,721	430	228
April	890	852	419	13
May	309	255	72	-
June	302	457	78	89
July	604	1,271	255	61
August	1,981	2,093	922	107
September	654	1,111	222	39
October	612	1,399	195	57
November	735	1,465	155	22
December	2,074	1,833	897	82
	11,528	16,620	4,333	714

Free Entrants and VIPs	Duty/Other Pass Holders	Season Ticket Holders	Total	Total Vessels
31	-	105	4,420	342
11	-	107	2,900	245
95	1	186	3,829	294
89	3	95	2,361	205
15	5	5	661	71
9	-	27	962	90
1	-	80	2,272	199
53	68	71	5,295	426
56	-	42	2,124	199
32	10	72	2,377	226
32	14	53	2,476	244
37	12	53	4,988	473
461	113	896	34,665	3,014

REVENUE

Adult Residents	28,820.00
Adult Non-residents	166,200.00
Children	4,333.00
School Parties	357.00
K.Shs.	199,710.00

APPENDIX 4h: MARINE NATIONAL PARK VISITORS, MALINDI, 1976

Month	Adult Residents	Adult Non-Residents	Children 1/-	Children -/50	Free Entrants and VIPs	Duty/Other Pass Holders	Season Ticket Holders	Total	Total Vessels
January	1,336	2,443	427	-	39	22	59	4,331	461
February	871	2,525	236	-	-	-	35	3,667	242
March	584	2,153	122	-	24	-	21	2,904	361
April	1,375	1,264	665	117	16	-	13	3,450	370
May	362	448	75	-	8	3	-	896	96
June	229	406	89	-	-	-	22	746	72
July	640	1,564	268	34	9	56	6	2,577	247
August	1,289	2,566	681	162	166	5	40	4,909	434
September	980	1,776	303	9	8	-	31	3,107	31
October	621	1,620	121	-	37	2	6	2,407	291
November	629	1,949	95	-	-	-	17	2,690	333
December	2,394	2,623	992	-	-	-	61	6,070	661
	11,310	21,337	4,074	322	307	88	311	37,754	3,599

REVENUE

Persons		245,880.00
Vessels		71,980.00
	K.Shs.	317,860.00

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AN ASSESSMENT OF KENYA'S COASTAL TOURISM

by

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THE COAST TOURISM INDUSTRY AND ITS CONTRIBUTION TO THE NATIONAL ECONOMY

Kenya's fundamental policy is to maximise net economic benefits from tourism, subject to social, cultural, environmental and political constraints. In practice this means maximising wealth generated by tourism (with raising net foreign exchange receipts as one component), increasing employment opportunities, increasing Kenyan ownership and management of a growing industry, and reducing any undesirable social or environmental consequences of tourist expansion. In this particular respect, tourism at the Coast plays a particularly important role in the overall development of tourism as vital sector of the national economy.

The development of tourism at the coast began in the 1940s, and for twenty years or so coast hotels catered primarily for European settlers from East and Central Africa. During the late 1960s there was a dramatic change in orientation towards foreign tourism. The growth of international tourism of the Kenya Coast has been largely due to the efforts of international tourist investors, especially European-based tour operators in the last five year or so. At present, less than six foreign tour operators account for 90 per cent of all European visitors, representing around 65 per cent of hotel occupancy at the Coast every year. The increasing flow of European visitors to the Kenya Coast is reflected in the changing pattern of hotel ownership, from family or individual proprietors to investors with direct links to the international industry. The increasingly important role which the tour operator is playing in selling beach holidays overseas has had a significant impact on the character and pricing of the beach holiday. However, it has also affected the viability of some hotels which do not have the resources for effective direct participation in the European market.

Accommodation

Out of the total number of hotel establishments (219) in the country in 1976, the Coast accounted for about 34 per cent. For Kenya as a whole, bed occupancy rates declined from 52 per cent in 1971, but showed an upward trend in 1976 when the rate went back upto 50.8 per cent. In the same period at the Coast, bed occupancy was 43.3 per cent in 1974 and increased

to 55 per cent in 1976. Coast hotels accounted for 35 per cent of total bed-nights spent by foreign visitors in 1974, excluding residents of Uganda and Tanzania.

Several features of the development of tourism at the Coast can be identified. There has been an absolute increase in bed-nights sold each 'tourist' year (October to September) in the recent post. The rate of increase for the peak season (December to March) has been fairly constant, but the pattern in the low season (April to September) has not been so regular. The problem of off-season months (May and June) still remains, and finally, the dependence of beach hotels on foreign visitors is still increasing.

Employment

One of the advantages of an expanded tourist industry is the creation of job opportunities. However, the creation of employment opportunities in the tourist sector is an expensive venture in terms of scarce resources. Coasts are certainly involved in training subsistence farmers to be semi-skilled workers in the tourist industry. One does not easily transform farmers into waiters, cooks, managers and administrators. The training of these people can be fairly expensive, and reduces the profitability of investment in the tourist industry at the initial stage. Declining profit expectations might necessitate foreign investment or local government involvement.

It is not easy to be specific about the actual nature and magnitude of the contribution of tourism to the national economy. There are many implicit assumptions relating to tourism in a developing country such as Kenya. Often,the maximisation of economic benefits appears to be pursued with almost total disregard for social, cultural and environmental factors. Tourism sprawls over a number of industrial classifications, such as hotels, transport, hunting (though already banned) and fishing, among others. According to the 1973 Statistical Abstract, roughly 19,092 persons were employed in the tourism industry. It should be noted that very few of these employees were women. At the Coast which is predominantly Muslim, there are cultural reasons for this lack of female employment, whilst elsewhere, although women often apply for jobs, employers tend to think that male employees cause fewer management problems. Apart from office work, women are only employed as chamber maids. According to a survey carried out by Walter Elkan for the Institute for Development Studies, in 1973, the ratio of employee per hotel bed in Kenya is 0.84. He claims this ratio is high by comparison to Europe: Switzerland, for instance, has a ratio of 0.30. Although this difference is in part a reflection of lower labour efficiency, there are other explanations. A higher proportion of hotels in Kenya provide full dining facilities than in Europe where there is often a range of restaurants to choose from. Consequently

the Kenyan hotels employ greater numbers in kitchen and dining room staff. Nor do hotels in Europe ordinarily provide their own swimming pools, discotheques or laundries. Secondly, a higher employment ratio is a rational response to differences in the relative costs of labour and machines. In hotel kitchens in Kenya less use is made of labour-saving devices, and there is a more generous provision of personal services at all levels.

This ratio can be expected to decline as efficiency improves. In the Caribbean, where basically the same considerations apply, the ratio is generally between 0.50 and 0.70 employees per bed in existing hotels, with 0.50 the more common ratio in newly opened hotels (see Elkan and Morley, 1971).

Infrastructure

Infrastructural facilities have greatly contributed to tourism growth at the Coast. The Kenya Coast is 490 kilometres from the capital city of Nairobi, and the journey is made easy by an all-asphalt highway. The improvement and expansion of the Port Reitz Airport in Mombasa, with a 3,500 metre runway has enabled the airport to take large, wide-bodied jets, and this has had an important impact on the demand for beach holidays. Direct flights to Mombasa from Europe and other parts of the world will contribute to the increase of the number of tourists to the Coast.

According to a study carried out for the Diani resort complex, it is anticipated that Europe will remain the most important tourist market, accounting for 80 per cent of visitors to the Coast. Domestic tourism, it is assumed, will account for between 6 and 9 per cent and the North American market around 6.5 per cent. Despite the obvious difficulties in forecasting the future developments of the international tourist industry, the demand projections for Kenya beach holidays are considered realistic, and the build-up of accommodations at Diani is well within the average estimates of that demand.

FOREIGN EXCHANGE PROCEEDS AND LEAKAGES

As has been stated before, the fundamental policy on tourism in Kenya is to maximise net economic benefits from the industry. However, it has been discovered that there are a lot of loopholes and leakages in foreign exchange earnings from the industry. Estimated tourist expenditure rose by 23 per cent from K£33.4 million in 1975 to K£41.1 million in 1976, including an element of pre-payment but excluding the cost of air fares. Although few studies have been made of the problem, it is estimated that 20 to 40 per cent of tourist expenditure for Kenyan holidays goes to countries

other than Kenya, and some estimates are as high as 60 to 80 per cent.

Methodological approaches to this problem vary. From the evidence it seems that the Caribbean islands such as the Bahamas and Antigua lose between 40 and 50 per cent of their tourist income. A more pessimistic analysis has been provided by Bryden (1973). Figures for Kenya vary from 22 to 40 per cent, and the World Bank has accepted a general figure of around 55 per cent (1972, p. 385).

In the absence of definitive studies of this problem, one can only point to mechanisms through which tourist expenditures are siphoned out of the host country. For one thing, the construction of hotels and other infrastructure to support the tourist industry requires equipment and materials which a third world economy may well not be able to supply itself; the foreign exchange component of the construction of a tourist hotel to international standards is fairly high. Lifts, air-conditioning systems, vehicles, and surprisingly high proportion of food and drink is often imported.

Beyond the physical flows of imported goods destined for the tourist industry the question of financial flows, stemming from foreign control which is the normal pattern of this industry. In its purest form, the industry's hotels are owned by international hotel chains which siphon off a percentage of the profits in the form of overseas remissions. In addition, the highest-paying jobs are usually held by expatriates, who are most likely to spend money on imported goods or to bank their savings abroad. Even if the host government is trying to gain control of the industry, the employment structure will only change slowly. The international hotel chains may well be retained through services contracts which, as experience has shown in other industries such as copper, may give them a better return than if they actually owned the hotels.

Finally, the host governments may offer generous tax benefits to foreign farmers, which bring into question whether the host country is receiving any return at all. A prime example is the Ivory Coast, which is trying to build a coastal tourist industry by offering tour and hotel companies a variety to tax exemptions lasting from five to ten years. In the case of the Club Mediterranee, the government actually financed and built the necessary premises on the understanding that the company would not have to pay anything back until the occupancy rate had reached a certain pre-determined and profitable level (Trade Travel Gazette, 16th March 1973, p. 28).

If anything, the power of airlines and tourist operators is increasing, since they have been using their pivotal position in the market to diversify vertically, thus increasing their hold on the entire industry. Thus, the airlines have developed international hotel chains to accommodate the passangers they carry (Pan Am owns Inter-Continental Hotels, TWA owns Hilton International, a group of European Airlines own the Penta chain, etc.), while tour operators have built up their own airlines to carry the tourists they attract and have invested directly in many hotels. The development of computerised reservation systems has increased the hold of such companies, since it means that they can ensure a higher occupancy rates for any of the hotels they bring into their system. This is, for instance, one of the strengths of Holiday Inns, which has expanded widely through franchising. Foreign investors put up the money to build hotels which, by taking the 'Holiday Inn' name and being linked to the company's computer terminals, will attract more people than similarly designed and located hotels without these advantages.

The problem for the host country is how to short-circuit the whole process by selling directly to the tourist or by ensuring that the business generated by the airlines and tour operators is at least partially diverted to airlines and hotels from which the host country will receive a better economic return. Direct selling is probably economically unjustified, since national tourist offices in tourist-generating countries will only attract potential tourists who have already decided on their holiday destination. Thus the business generated by any single national office is likely to be less than that of international tour operators. An extention of the direct approach is to increase advertising which emphasises the attra-actions of the host country, thus influencing the tourist before he goes into the travel agent's shop or studies the tour operator's brochures. However, an expensive advertising campaign can use up a portion of the foreign exchanged expected to be generated by the tourist industry. For instance, the British spend US$ 0.26 for every American they bring over the Atlantic, Jamaica and the Bahamas are spending 4.17$ per head and Bermuda $ 5.15. One suspects that the competition in such promotional expenditure by national tourist organisations is only beginning, and that the next decade will see such budgets increase significantly (see Ogilvie, 1975).

A more promising approach might be to try to develop an aviation policy which maximises the returns to the host economy. For some countries, a national airline may be essential if tourism is to survive at all. Thus the

Caribean governments have not let the Caribbean Airline die, in spite of its problems, since the established airlines such as Pan Am have been cutting back their services to this area. It is a hopeless situation to have more hotel space than there is passenger capacity on the international airlines.

As even the established airlines have been discovering, it is extremely easy to lose money in this business, but it should be noted that this sector of the industry is relatively easy to control. In particular, air traffic rights are under extremely tight national control, and it is universally accepted that no airline can fly into a country without that country's permission. Generally, for regularly scheduled flight, an airline is only permitted to fly in within the framework of an overall bilateral agreement between the two flag governments.

Thus a tough-minded host government could insist that only its flag carrier and that of a specific tourist-generating country should fly between their two countries: Very tough-minded governments would insist that the total revenues of the two airlines are shared, as happens widely within Europe (thus making it relatively unimportant if the developing country's airline is relatively inefficient in attracting passengers).

One suspects that tourism is an industry in which it is very easy to go wrong. The over-optimism of the 1950s and 1960s must be curbed, particularly by the awareness that the industry is becoming more and more capital-intensive every year. It is tempting for governments to persuade themselves that their economies are benefiting more from the tourism industry than they actually are by failing to carry our the necessary calculations.

SOCIAL CONSTRAINTS

The economic benefits of tourism can readily be illustrated by statistics, but the costs of tourism in terms of political and social implications cannot so easily be quantified. Detailed surveys carried out in the Diani and Watamu/Malindi areas have reinforced the concern expressed in Kenya over the past years. It is important to consider these implications rather than simply seeking the maximum number of tourists.

Tourism began in Kenya as a luxury for the rich and privileged settlers and foreign travellers. An image of exclusiveness still exists to some extent, in that local people are excluded from tourist hotels at the coast and elsewhere by the level of prices. This, together with the fairly

obvious differential of wealth between residents and visitors, tends to perpetuate, if only symbolically, the colonialist 'master-servant' relationship between the tourist and the local population.

In the long-run, the economic exclusion of local people from tourism is likely to cause resentment towards the industry, not only in the coast region but throughout Kenyan society. The signs are that a connotation of 'parasitism' could become attached to the servicing of the industry and a resentful 'dependancy complex' could develop among people employed at the tourist centres. Hence the need to Kenyanise the tourist industry, to ensure that a sizeable proportion of the proceeds accrue to local people.

The disregard for the social and cultural 'costs' of tourism may be explained in part by the fact that the tools of economic analysis are ill-adapted, if not incapable, of handling such variables. Social changes are often not easy to quantify. In this respect, it is sufficient to quote Mr. Ley, then Manager of the T.T.C:

> In my opinion, a developing country is one that is still making needed progress in such matters as science and technology, but culturally / emphasis added / may just be as advanced and may be even more so than those countries that have industrial wealth. In Africa, for example, there are several countries that are certainly developing industrially and economically. But from the cultural standpoint such countries as, say, Egypt have very little to learn from the already developed countries. In fact they have a great deal to give, and here I think is where tourism can play an important role.

In this brief assessment, we have tried to show how the problems of tourism at the coast reflect the general problems of the entire industry in developing coutries. Hopefully, a better understanding of these problems will lead to greater efforts to solve them.

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IDS/OP 28

LAND AND ACCESS RIGHTS IN KENYA'S WATER-FRONT AT THE COAST

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A: The Problem

This paper is concerned with two issues only. Firstly, it sets out to examine the structure of land ownership along Kenya's coastal water-front; and in particular to identify as precisely as possible what social classes or groups own what interest in what land in this area. Secondly it attempts an assessment of the nature and extent of public access rights along the water-front in the light of the existing ownership structure.

The interrelationship between these two issues and their relevance to the theme of this Workshop is not difficult to see. In political economies anchored on the primacy of private property: a category to which Kenya's system rightly belongs, the fact of ownership by individuals par se confers a wide measure of control over the utilisation of land and that of the resources above, subjacent and contiguous to it. This means that public access to any of these resources, if it exists at all, must be founded on some overriding principles such as public policy or necessity. In the context of coastal and off-shore resources this often turns on a careful balance between state interest in riparian land and other resources, and the property rights of individual or corporate owners. It is these and analogous problems which we shall attempt to grapple with.

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1. 'Public' here refers to both the state and individuals other than those that have ownership rights within the study area.

B. The Nature of Land Rights

1: The Relevance of Physical and Human Factors

The Kenya coastline measures approximately 350 kilometres from Vanga on the Tanzania border to Kiamboni on the Somalia boundary. From an ethno-linguistic point of view this and areas adjacent to it harbour a rich and complex cultural heritage. Although the area is still dominated by the bantu of the Mijikenda group, historically there has been always a strong Arabic and Swahili influence. More recently the area has been and continues to be the destination of may up-country migrants in search of land and to a lesser extent employment opportunities. The combined effect of physical-geographic and eco-climatic factors along the water-front makes its immediate surroundings to a distance of a couple of miles inland suitable mainly for the development of recreational facilities rather than intensive agriculture. Both of these factors as we explain below have had tremendous impact on the structure of land ownership in this area and in particular the pattern of distribution of land rights, and the social composition of the land owners there.

2: The History of Land Ownership

Although scholars of Arab and Swahili history[2] sometimes argue that these ethnic groups were the earliest to arrive in the coast and therefore established tenure rights by first settlement, the better view is that the Mijikenda, Taita and Pokomo presence precedes that of any ethnic group in this area. Like most other African societies, the Mijikenda had no conception of title to land, and much less of jurisdiction as a political fact being founded on original title to land. The land - the physical solum - belonged to the cultural deity and was available to every member born or adopted into any one of the numerous lineages that made up any particular ethnic or sub-ethnic unit.

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2. See the Report of the Parliamentary Select Committee on the Issue of Land Ownership Along the Ten-Mile Coastal Strip of Kenya, June 1978.

This at least was the position before middle-east Arabs migrated into this area to set up permanent slave posts and to strengthen trade. Slavery had one important effect on land tenure and settlement patterns in the area. It led directly to the displacement of the Mijikenda people and the expropriation of their land by the Arabs; a situation which was later consolidated by the extension of jurisdiction by the Sultan of Zanzibar over a small strip of land along the coast extending to a distance of ten nautical miles inland.

Occupation by British colonial agents after 1886 did not alter this pattern of settlement. Indeed colonialism cemented Arab control over land within the strip thus preventing any possibility that the Mijikenda might reassert their rights in the area. This was done inter alia through a 1908 Land Title Ordinance whose sole purpose was to require all persons being or claiming to be proprietors of immovable property within the strip to lodge their claims within six months with a recorder of titles, so that documents of title could be issued to them. Land which was not claimed within that period was declared vacant and taken over by the colonial government. As a result of the 1908 Ordinance the Mijikenda were rendered landless both in fact and law; a position which was affirmed and guaranteed by the independence constitution in 1963. Many of them, however, continued to live on the land as 'squatters'.[3]

Several important developments after independence have led to further changes in the structure of land ownership within this area. The first of these has been the growth of tourism as a lucrative economic enterprise. The immediate effect of this has been a rapid and speculative increase in land prices at the coast and in particular in that of first and second beach plots. The areas most affected by this have been Kilifi and Kwale Districts. Because most of the land in this area is technically agricultural land,[4] seldom is there a rational

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3. The term 'squatter' is technically inappropriate here since most of these people have lived with the knowledge and express consent of the registered landowners themselves.

4. According to the Land Control Act (Cap. 302) any land which is not within a gazetted township or municipal area is 'agricultural'.

system of market control either in terms of who may participate or the price at which property should change hands. A recent parliamentary committee report[5] suggests that between 1972 and 1978 land prices at the coast have risen by more than 5,000%. The second has been the opening up of large areas of under-utilized land in Lamu and Tana River Districts for ranching, irrigation development and re-settlement programmes. The combined result of these two developments has been that the Kenya Coast has become one of the most popular destinations for people of all classes and inclinations.

3: The Structure of Ownership and Distribution

The implications of this historical background for the structure of land ownership and contemporary pattern of distribution and use are several. Firstly the social composition of land owners at the coast has been fundamentally altered. In Kilifi, Mombasa and to a lesser extent Kwale District for example there has been a rapid substitution of Arab, Euro-Asian and the poor among the Mijikenda land owners within the strip with local and up-country politicians, civil servants, managerial staff in private industry and multinational corporations. This is particularly critical in respect of land within half a mile of the water-front, and in the ranching and resettlement areas north of Mombasa.

Secondly because of the nature of this 'invasion', landlessness has not only increased; it has become a crucial variable in coast and national politics. The rather sudden upsurge in landlessness has been the result primarily of the fact that most of the new land owners invariably insist on vacant possession before completion of the transfer or take such measures as would ensure this soon after entry.

The third and of equal significance is the fact that land use patterns along the water-fron have changed in response to the demands of the tourist industry which has now superceded all other economic ventures as the leading money spinner in the area. Thus instead of an active

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5. op cit p.13.

fishing industry for example, much of the coastal off-shore area is rapidly being converted into marine reserves. As an industry concerned only with the development and provision of facilities for leisure, tourism has turned the coastal water-front into a series of exclusive resorts which raise important questions in the area of public policy. For although we have argued elsewhere[7] that the fact of individual ownership through adjudication and registration of title has not quite wiped out the cultural conception of the place of land in the family economy, this is far from being true of the coastal water-front.

C: The Problem of Access Rights

The position described above raises important questions in connection with state and public access rights to facilities and resources along the water-front. Two separate issues may be considered here: namely how conflict between state interest in and individual user of riparian land is to be resolved, and the nature and extent of access rights to beaches and aquatic life within the territorial sea of members of the public who hold no ownership rights along the water-front.

1: State Interest in Riparian Land

It is an accepted principle of law that individual rights to the physical solum and to all that is on, below or above it are subject to such rights and interests as the state may arrogate to itself. State rights and interest may take one or two forms. They may be expressed in terms of direct ownership of the res or the imposition of obligations on the manner in which individuals may exercise their ownership rights. In other words, the fact of ownership alone cannot be used to totally exclude the state and its agents from individual property. This derives from the very nature of political sovereignty and the fact that an important jural postulate in common law property jurisprudence is the radical (i.e. original) ownership of all land comprised in the national territory by the state.

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7. H.W.O. Okoth-Ogendo, 'African Land Tenure Reform, Chapter V in Heyer et al Agricultural Development in Kenya (OUP 1976).

This principle has been incorporated in Kenyan law to the following extent. Firstly individual ownership of land confers no rights to precious minerals found in or above the physical solum, nor does it confer a power to deal with them without licence from the state. State ownership of these resources necessarily implies a right of access to them; a right which can always be enforced by resort to eminent domain in cases of persistent interference by individual land owners. Secondly in the case of land adjacent to tidal waters, the individual does not as a general rule have any riparian rights beyond the high water mark. Land and marine resources beyond this point vest in the state by virtue of sovereignty.

The nature of tourist development at the coast, however, is such that privately owned land along the water-front cannot be fully utilised without access to the area beyond the high water mark. Such recreational activities as swimming, angling, goggling and surfing would not be possible without this. Therefore a licence to develop and operate recreational facilities along the water-front ordinarily includes a permission to utilise land beyond individual ownership limits. Such licence, however, must be enjoyed with due deference to superior interests retained by the state.

2. Access Rights of Members of the Public

The fact that most of the land adjacent to the water-front is privately owned and beyond that is state property means that except on the basis of a contractual licence members of the public have no general access rights to recreational facilities and marine resources within this area. But access by way of an easement can always be acquired for a wide variety of purposes. This can be done by grant, indulgence or long and continuous user for the statutory period of twenty years.[8] There will be cases, however, in which the state prescribes that certain recreational facilities be open to members of the public.[9] This is a mechanism which, has, however, been used rather sparingly.

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8. See the Limitation of Actions Act, 1968.
9. For example Kenya Beach on the North Coast in Mombasa.

Access to recreational facilities per se however acquired do not confer an automatic right to abstract or utilise marine resources beyond the high water mark. The latter, e.g. fishing in tidal waters and the collection and disposal of shells, are in the nature of profits a prendre and must be acquired in the same way as easements. In the case of rivers emptying in tidal waters the right to fish is restricted to that part of the river reached by the tide. The right to fish upstream belongs to the riparian owner who alone may licence others to fish therein. This remains the position even if there is a public right to navigation throughout the course of the river.

D: Some Public Policy Implications

The position outlined above suggests that not only is land ownership along the water-front already highly privatised, the intensive nature of the use to which beach land is put may pose a big threat to the rational management of marine resources. Attempts have been made to combat this by declaring most areas marine national parks. But even this has run into difficulties inter alia because it runs counter to well-established fishing and shell gathering activities of the coastal people. What the correct balance should be, however, is beyond the scope of this essay.

DEVELOPMENT OF THE SHIPPING INDUSTRY: THE EAST AFRICAN CASE[1]

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INTRODUCTION

A number of conferences have been held on the law of the sea, in an effort to keep up with new problems caused by rapidly changing technology. The rate of technological advance has outstriped the ability of the sluggish international legal superstructure to respond to new problems and issues.

These conferences are convened under the umbrella of international law, which is made up of all the rules determining the rights and obligations of the ruling classes. The basic aim of these conferences is to harmonize class interests when a clash occurs among the members of the international community. For example, the topics covered in conferences on the law of the sea vary over time, indicating a new level reached by the productive forces of one group, in opposition to another. Harmonisation is sought in conferences or conventions such as those which took place in Geneva - the 1958, Geneva Convention on the 1958 continental Shelf, the 1958 Convention on the High Seas, and the 1958 Convention on the Territorial Sea and the Contiguous Zone.[2]

International law, as it is continuously reformulated, manages to harmonise conflicting interests and uphold the interests of the most powerful classes, i.e., the imperialist powers. The interests of the weaker and economically dominated states are overwhelmed. In these conferences, however, controversial issues arise, indicating the extent of the contradictions existing

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1. This paper is a shortened version of Mr. Mahalu's original presented at the Workshop. It was prepared by Sidney B. Westley, Publications Editor at I.D.S.

2. Tanzania is not a signatory to any of these conventions. Kenya is a party to all of them.

between the rich and the poor states. The decisions reached on these issues lead some of the poorer states to doubt the actual role played by international law in protecting their interest.

Today these deliberations take place among three camps: the imperialist countries, the socialist countries and the developing countries. The imperialist West, apart from being the seat of the financial oligarchies, is generally held to be the architect of contemporary international law. International law was developed in Europe by the bourgeois class during the period of the bourgeois revolution against feudalism. At that time, productive forces reached a new level and the feudalist mode of production became a hindrance to the full development of capitalism. From this time onwards, national states emerged, reflecting the interests of the bourgeois class which were national, rather than local. International law in its general form today was derived from a system of rules based on the formal equality of independent and sovereign nation states. The ruling classes were served by this international legal superstructure, and it reflected the extent of their interest in the new economic system.

By the 1880s, capitalist society had turned international law into some kind of club for 'civilised' nations, thus paving the way for the invasion of the 'non-civilised' nations by imperialism. Imperialist activities were justified by international law which favoured the 'spheres of influence' concept and all forms of aggression aimed at furthering or protecting monopolistic interests. In its economic context, therefore, international law upholds the most basic interests of the bourgeois class and the domination of the economically weak.

The socialist countries, having revolted against the capitalist system, are strongly opposed to any form of imperialist economic aggrandisement. In most instances, they are firm supporters of the less developed countries in questions of international law.

The less developed countries (LDCs), once the victims of bourgeois international law's crude colonialism, are today victims of neo-colonialism. They are supposed to observe an international legal superstructure which, in most cases, runs contrary to their economic independence and political freedom.

Their traditional modes of production were crushed at the outset of colonialism, giving way to a colonial economic system which was extractive

and anti-developmental. The capitalist modes of production introduced into the LDCs were basically aimed at satisfying the needs of the metropolitan countries, so that today the LDCs are oppressed, dependent economies. International law assures them of some equality as sovereign states (see Article 2(1) of the U.N. Charter), although the success of their efforts in the international forum depends very much on whether their interests coincide with those of the major powers. This situation has often provoked the LDCs to act unilaterally to protect their economic or strategic interests. When such unilateral acts are carried out, for example the extension of the territorial waters beyond the twelve-mile limit, the imperialist powers claim that the LDCs are breaking international law and that their claims are illegal. For the imperialist powers, as long as the seas remain open to their exploitation, then international law has been observed. In this situation, however, only the strongest nations, equipped with sufficient capital, technological expertise and military force, can use international law to further their own interests and this is what the imperialist powers do in the area of navigation and other uses of the sea.

The current structure of the law of the sea is basically in the interests of the rich nations who have the capital and technological expertise to exploit the sea resources. The less developed coastal states lack capital and technology which makes their adjacent seas vulnerable to exploitation by alien powers to the detriment of their own interests. The less developed states need protection from this exploitation, but they do not achieve this in the international legal forums.

In this paper, we shall not deal with the law of the sea as such, but with an activity which is governed by international maritime law --the shipping industry. Historically, international maritime law originated before the general international law known today. Maritime interested led to shipping activities and hence to laws of the sea which were compiled in the Mediterranean region as early as 900 B.C. International maritime law today still reflects many traditional interests and practises which are now irrelevant, particular to the LDCs who wish to participate in the shipping industry. Yet the LDCs are compelled to observe these rules.

As the shipping industry has developed through the centuries, new laws have been made to reflect changing circumstances. According to Marx, 'Whenever, through the development of industry and commerce, new forms of intercourse have been evolved... the law has always been compelled to admit

them among the modes of acquiring property' (Marx and Engels, 1973p. 79). Today the shipping industry plays a major role in world trade and reveals the dominant role played by the imperialist forces.

The LDCs are dependent on the shipping industry to transport their raw materials (exports) to markets in the metropolitan centres. During the colonial era, cash crops were produced in the colonies to provide raw materials for industrial production in the metropolitan countries, and that pattern exists today, even though the former colonies are nominally independent. The LDCs rely on metropolitan markets for their cash crops because the domestic markets for these primary commodities are very limited. The LDCs must pay to ship their commodities to the metropolitan centres on vessels owned by the capitalists, thus reducing their foreign exchange earnings. These earnings are further reduced by the profits taken by metropolitan finance capital which finances the production of the commodities. In this way, the imperialist countries deny the LDCs any form of ownership because such ownership would challenge the very existence of imperialism.

The LDCs have taken several steps to reduce the cost of shipping their commodities, and one of these has been the founding of their own shipping lines. In these efforts, they have encountered many problems. For one thing, the new national shipping lines face a complicated system of regulations, to the extent that national lines are sometimes not free to carry the exports of their own countries. They also face strong competition from the long- established conference lines. Given this situation, the economic gains the LDCs hoped to achieve by founding their own national shipping lines have often been illusory.

This study of the shipping industry in East Africa follows a historical materialist approach, which is the most scientific way to analyse the actual causes of the problems underlying this industry. /Ed. note: At this point the original paper contains a long discussion of the history of the shipping industry in Europe. Because of space limitations, this has not been indluded./

THE POLITICAL ECONOMY OF SHIPPING

In the second half of the nineteenth century competition in the European shipping industry was acute and this led to a fall in the profit margins of the shipping companies. For this reason, in the 1870s the capitalist shipping companies formed combinations among themselves, known as conference lines, to regulate the traffic and fix the carrying rates, and to combat competition from shipowners who were not conference members. These shipping companies entered into agreements to standardise their tarrifs for an agreed period and to offer

deferred rebates to regular shippers on condition that they did not use vessels belonging to companies outside the conference system.

Today, membership in a conference varies from two shipping lines to forty or more. The members of the conference act in combination to admit or exclude applicants for membership, to share cargo among themselves, and to make common policy on such matters as the levels of shippers' discounts or rebates, methods to combat competition from non-members, pooling and sharing earnings, and problems of enforcement. There are two types of conferences -- the 'closed' type and the 'open' type. In the 'closed' type, which is typical of the system in Britain, new members can only join with the consent of the existing members. In the 'open' type of conference, as it exists in the U.S., new members may join so long as they meet the criteria laid down by the Federal Matitime Commission.

In the Indian Ocean, the conference system was first dominated by British shipowners. Because of the inherent contradictions in the capitalist system, competition increased among shipowners as the level of productive forces advanced, efficiency increased and many new ships were built. The first conference system in the area was formed in 1875 for the U.K. - Calcutta tea trade. This was followed by separate conferences for the Madras - U.K. and the Bombay/Karachi - U.K. routes, and the conference system expanded further as shipowners from other European countries began to participate. By 1948, there were over 100 different conferences operating in the Indian Ocean (Deakin, 1973, p. 23). Today, there are a total of about 360 conferences in operation.

In general, the inherent contradictions in the capitalist system have led over the years to increasing competition and a reduction in profits, and for this reason monopolistic organisations such as the conference systems were formed. The conferences blocked the 'loyalty contract' systems.

Freight rates are st by the conferences freely, without considering the effects on trade in general or on the interests of the less developed countries. Rates are high, to assure a substantial level of profits to the conference members, and they are often discriminatory. For example, commodities shipped from the LDCs to the metropolitan centres are often charged higher rates than similar commodities shipped in the opposite direction. Rates can be raised unilaterally, without consulting the shippers. Finally, the conferences are often highly restrictive in terms of admitting new members, since one of their primary aims is to avoid sharing the market too broadly.

During the colonial period, the conferences of the metropolitan countries were protected from competitiion on routes between their metropolitan centres and their colonies, both from shipping firms of the other colonial powers and from any shipping enterprise which might have started up in the colonies. At the time that many former colonies were gaining independence, the conference systems were firmly entrenched and competition among the established conferences was increasing.

On achieving independence, the LDCs gained a sovereign status which entitled them to become subjects of international maritime law. However, although the shipping industry is very important to these new countries, their participation has remained almost negligible (see Institute of Shipping Research Research, 1970, p. 6). As of 1969, the LDCs accounted for 64.7 per cent by weight of ocean-borne trade, but owned only 7 per cent of the world's merchant fleet (Review of Maritime Transport, UNCTAD 1971 TD/B/C.4/82). These figures are broken down in Table.

Table 1. Ownership of commercial shipping lines.

LDCs in Asia	4.4%
LDCs in Latin America	2.6%
LDCs in Africa	0.6%
Total	7.6%
Socialist Countries of Eastern Europe and Asia	8.9%
Developed Countries	83.5%
Overall Total	100.0%

Source: Review of Maritime Transport, UNCTAD 1971 TD/B/C.4/82.

In terms of registration, 17.9 per cent of the world fleet is registered in a small number of developing countries, such as Panama and Liberia, but these ships are largely under control of the traditional capitalist maritime powers.

The economic viability of the LDCs rests to a considerable extent on exporting commodities to the metropolitan centres in order to earn the foreign exchange needed to purchase the capital goods crucial for their industrial development. Their dependence on imperialist shipping lines means that their vital trade links may be cut off in time of war or international disturbance and that a certain percentage of their export earnings is lost in payments for shipping. This situation is exacerbated by the fact that the imperialist shipping lines are able to set their freight rates arbitrarily,

and in case of international disturbance there is nothing to prevent these prices from increasing exorbitantly. Thus the present pattern of ship ownership leads to a large net flow of foreign exchange from the LDCs to the imperialist countries year after year. As Iqbal describes the situation, 'Buying a commodity with transport increases the total foreign exchange outflow; selling a commodity and buying transport at the same time reduces the foreign exchange inflow' (p.59)

When the less developed countries trade with the developed countries, or even with each other, they have no alternative but to buy transport from the developed countries. Most of the conferences originate in the developed countries, and by now they have covered nearly all the world shipping routes. Some of the LDCs have tried to join these conferences, but most of the conference systems are 'closed' ones, as described above, and membership is very restrictive.

For some time there was no institution or organisation to check the activities of the conferences in any way. The Maritime Transport Committee of the Organisation for Economic Cooperation and Development (OECD) solved problems for the shipping companies as they occurred and served as a mouthpiece for the shipping policies of the developed countries. The Committee of European Shipowners and the Consultative Shipping Group represented the interest interests of shipowners and governments in Europe and Japan respectively. Although the LDCs accounted for 64.7 per cent of ocean-borne trade by weight as mentioned above, there was no institution to defend their interests.

After the General Agreement on Tariffs and Trade (GATT) proved to be little concerned with the interests of the LDCs, the United Nations Conference on Trade and Development (UNCTAD) was founded in 1964 to serve as a mouthpiece for the LDCs. These countries pressed for an international examination of trade activities, and especially of the shipping industry, so a Committee on Shipping was set up within UNCTAD. This committee has about 45 members. All the major maritime powers are represented, as well as the socialist countries, but most of the members are from the less developed c countries. Deliberations and negotiations are carried out according to the UNCTAD group system.

In this Committee, the developed countries opposed the formation of national shipping lines by the LDCs, claiming that with the establishment of national lines there would follow a preferential system for carrying cargoes from these countries which would impinge on the freedom of the high seas. The developed countries view the freedom of the seas as both the freedom of navigation and the freedom to load cargoes at any port.

freedom of the seas to them means the minimisation of governmental and international intervention in their monopolistic practises. The LDCS responded that, given their dependence on the shipping industry in which they had no say, their balance of payments position would be improved by the establishment of their own commercial fleets. Given the conferences' history of charging high, discriminatory and anomalous freight rates, the LDCs had a right to establish a protective system in order to establish their national shipping industries. The socialist countries have supported the LDCs in this Committee.

The Committee produced a document known as the Common Measure of Understanding (Proceedings of UNCTAD 1964, Vol. 1, p. 64). It was stated that the liner conferences were necessary for a regular and stable shipping services, which of course represented a victory for the developed countries. However, some measure of cooperation was demanded between shippers and shipowners for the smooth functioning of the system. The most important point was the establishment of consultative machinery whereby the shippers and shipowners would meet to discuss tariffs, freight rates and tying devices. The conferences would be represented in the ports they served, and the imperialist demand for the improvement of the ports was also included in the document. The new merchant marines of the LDCs would be included in the conferences, but their participation should be based on 'sound economic criteria'.

At the Second UNCTAD in New Delhi in 1968, the LDCs presented their views in a document called the 'Charter of Algiers'. They expressed their dissatisfaction with the arrangements of the international shipping industry, and demanded that the Committee on Shipping should discuss international shipping legislation and that studies should be carried out on freight rates, the activities of the conferences and the adequacy of shipping services. The governments of the developed countries should press shipowners to stop charging high rates for non-traditional exports from LDCs and to lower the rates on traditional exports. The LDCs demanded equal participation in any conference dealing with matters affecting their foreign trade ('Charter of Algiers', UNCTAD, U.N. Pub. E.68.11/D.15 1968, p.431). The Committee on Shipping discussed the establishment of national and regional consultative machinery, the establishment or expansion of the LDCs' merchant fleets, current and long-term aspects of maritime transport, and international shipping legislation.

UNCTAD has provided a platform from which the LDCs can express their views, but it has not effectively stimulated the development of the their new shipping industries. The only remedies which have been suggested are that the LDCs should charter full-load vessels and increase their bargaining power vis-a-vis the developed countries, which is difficult since the LDCs themselves are not united on all issues. Another issue is the discriminatory freight rates charged on LDC exports. Products, such as manufactured and semi-manufactured goods, which have not been shipped traditionally on certain routes, are generally charged particularly high rates, known as 'general cargo rates'. The LDCs have been asking for low 'promotional freight rates' for such goods, but no agreement has been reached.

All the groups participating in UNCTAD's Committee on Shipping have favoured the establishment of consultative machinery. The shippers and the conferences were to form councils which would consult with each other on such issues as freight rates, the adequacy of service, representtation in the conferences, and the rules and regulations covering shipping. In general, these councils have not proved successful. There has been a lack of unity among shippers, and the councils have tended to be dominated by the relatively large and well established shippers who have colluded with the conferences and received special favours. Even today, shippers are only consulted, but the real decision-making power rests with the conferences. In light of these problems, it still seems that the best solution for the LDCs would be to form their own shipping lines.

THE SHIPPING INDUSTRY IN THE LESS DEVELOPED COUNTRIES

It will not be an easy matter for a less developed country to start a shipping industry. A large amount of capital is needed which is generally not available in an LDC without the participation of international finance capital. In addition, the LDCs do not have a well established ship-building industry. Even in countries where ships are being built, the foreign exchange component can be as high as 70 per cent ('Charter of Algiers' 1968, p. 431). In this situation, it is debatable whether one can say that the ship has actually been built by the LDC or not.

In addition, the LDCs generally lack the skilled manpower necessary for the smooth running of a national shipping line, and some 'national' lines are in fact run by expatriates. Training of personnel for the LDCs' shipping industry is being carried out in some LDCs themselves and in the socialist countries, and UNDP and UNCTAD have also made available training facilities for seagoing personnel and managers, though these facilities do not meet all the demands of the LDCs.

Recognising that government support will be necessary to stabilise and expand the new shipping **industries,** the LDCs have favoured government financial assistance in order to establish large enough fleets to provide regular service and attract regular clients, and preferential treatment in cargo reservations. The developed countries have been reluctant to accept these demands, but they have not been united in this position.

Any discussion of national shipping lines in less developed countries should distinguish between true national lines, carrying national commodities and under the control of citizens of the country in question or the state, and fictitious national lines that are in fact foreign owned and foreign controlled. As mentioned earlier, 17.9 per cent of the world fleet falls under this fictitious category. This phenomenon will be treated in some detail.

Flags of Convenience

International customary law imposes a duty upon every state owning ships to register all ocean-going cessels and provide its protection to those vessels which are registered and fly its flag. Such ships carry the nationality of the state where they are registered, which is called the 'flag state'. However, there is no international convention governing the procedure for registering ships. This is left to the municipal enactments of the national states. The 1958 Geneva Convention on the High Seas provides a law governing the registration, flag and nationality of ships, but it does not set down registration procedures. It only refers to customary law as follows:-

> Art.5 (1) Each State shall fix the conditions for the grant of its nationality to ships, for the registration of ships in its territory, and for the right to fly its flag. Ships have the nationality of the state whose flag they are entitled to fly. There must exist a genuine link between the state and the ship; in particular the state must effectively exercise its jurisdiction and control in administrative, technical and social matters over ships flying its flag (emphasis added).
>
> (2) Each state shall issue to ships to which it has granted the right to fly its flag documents to that effect (Art.5)

The Convention, however, goes on to indicate that every state must take such measures for ships under its flag as are necessary to ensure safety at sea with regard, inter alia, to the manning of ships and labour conditions of crews in accordance with international labour regulations. These obligations are to be met through municipal enactments of the national states.

Registration carries an international legal significance in that any registered ship cannot, prima facie, be confiscated (Naim Movan v. Attorney General for Palestine, 1948 (AC) 351). Registration also determines state jurisdiction: vessels in the high seas are subject to no authority except that of the state whose flag they fly, as stated in the SS Lotus case (PCIJ, Series A, No. 10, p. 25). In most cases, the number registered is also a good indication of the number of ships owned by a particular country.

Although there are no uniform conditions governing domestic rules for registration, the practises of different states can be categorised as rigid, moderate and relaxed. Where the national legislation governing the registration of ships is rigid, the vessel must be owned within the country and a number of crew members and the captain must be nationals. Moderate legislation calls for ownership by nationals on a majority basis, but sets no other conditions relating the nationality of the crew or the captain. Under relaxed legislation, foreign owners may register ships almost on the same basis as nationals.

Today, the states with relaxed registration laws are causing a lot of international concern. Shipowners from states with rigid laws often prefer to register their vessels under these states. In Liberia, examples, according to the Maritime Code of 18 December 1948, as amended on 22 December 1949:-

> The following vessels are eligible to be documented:
>
> (1) A sea-going vessel whenever built, owned by a citizen or national of Liberia, or of any foreign country. The terms 'citizen' and 'national' shall include corporations, partnerships and associations of individuals.
>
> (2) Any vessel of twenty net tons or over engaged in trading on the inland waters of Liberia.

Such relaxed legislation leads to a grant of nationality to a ship with which the registering state has no genuine connection, apart from the formal certificate of registry. This system is known by the expression, 'flags of convenience'.

This practise is not new. As early as the sixteenth century, shipowners from states whose national regulations limited their commercial activities attached their vessels to a foreign fleet. They might also do

this to avoid the monopolistic regulations of the foreign nation: for example English nationals sailed under the Spanish flag in order to gain access to the lucrative West Indian trade then under a Spanish monopoly (Williams, 1941, p. 43). Again in Newfoundland, English fishermen risked deportation because of the competition they offered to the established fishing industry, so they sailed under the French flag (Williams, 1941, p. 144). In the nineteenth century, British trawlers registered their vessels under the Norwegian flag in order to avoid British legislation limiting trawling in the Moray Firth.

This practise has continued into modern times when, for example, during time of war shipowners from belligerent states have registered their ships under the flags of neutral states in order to avoid capture. Sometimes shipowners have avoided taxation in this way as well as legislation covering minimum wages health standard ' treatment of crews. With the internationalisation of capital, the nationality of a ship is now no longer necessarily the nationality of its owner. Countries which have relaxed registration procedures also tend to have relaxed legislation governing taxes, labour conditions, health requirements, etc. The most popular of these countries for registration are Panama, Liberia, Honduras and Costa Recently, Somalia has also relaxed its legislation in an attempt to encourage foreign shipowners to seek its flag protection. In 1969, 17 per cent of the world fleet was registered in these countries, and by 1976 they accounted for more than 30 per cent (see Daily News (Dar es Salaam) 14 April 1977, p. 2).

The term 'flags of convenience' came into use in 1954 in a report of the Organisation for European Economic Cooperation on the practises of Panama, Honduras and Liberia, among others (Boczek, 1962, p.5). According to this report, these countries permitted ships to operate under their flags at a nominal level of taxation and with lower standards of social security for their crews than those of most other countries (see OEEC, 1954, pp. 19 and 65). Boczek defined a flag of convenience as the flag of a country allowing the registration of foreign-owned and foreign-controlled vessels under conditions which are convenient and opportune for the persons who are registering the vessels (1962, p.2). In 1958, the Maritime Transport Committee of OEEC defined them as:-

> The flags of such countries as Panama, Liberia, Honduras and Costa Rica whose laws allow, and indeed make it easy for ships owned by foreign nationals or companies to fly these flags... in contrast to the practice in the maritime countries where the right to fly the national flag is subject to stringent conditions and involves far reaching obligations.

These definitions indicate the degree of corruption at the international level pursued by imperialist shipowners in order to reap higher profits. The flag of convenience enables a shipowner to increase his profits by ignoring the labour regulations for the welfare of his crew and the health regulations designed to protect his crew and passengers.

Naturally, the nations granting 'flags of convenience' resent this term. The Central American countries involved prefer the expression 'flags of necessity' while the Liberians prefer 'flags of attraction'. The U.S. maritime unions tend to call them 'runaway flags', and others 'tax-free flags', 'pirate flags', etc.

The practise of registering under these 'flags began in the inter-war years to avoid the complicated and stringent regulations of the ship-owners' home countries. The small registering states offered all the protection the owners needed and could not exercise any genuine control over their operations. The owners registering in this way have tended to be U.S. and Greek citizens. Panama and Liberia offer exeption from taxation to all ships registered under their flags, so that none of the profits made under this system are transmitted to these countries for economic develop-ment. All the profits go to the metropolitan centres.

Governments of the developed countries have been the strongest opponents of this system, since it intensifies competition for their own shipping industries. The system is so lucrative from the owners' point of view, however, that some countries, such as Greece, have had to offer concessions to their shipowners to keep them from registering under the 'flags of convenience'. The less developed countries, even those with more stringent registration requirements themselves, have not been strongly opposed to the system because any increase in competition serves to lower freight rates and because the countries offering relaxed terms for regi-stration of vessels are among the less developed. This whole situation will be discussed at the next meeting of UNCTAD's Committee on Shipping (Daily News (Dar es Salaam), 14 April 1977).

The LDC Shipping Industry within the Political Economy

The development of a shipping industry in the less developed countries is hindered by political economic factors at the world level. Although the LDCs may oppose the activities of the conferences, they must come to terms with them if they want to expand their own industry. They must also use capital and skilled manpower from the developed countries and in this way their state of dependency is perpetuated. Exploitation

by international monopolies is at the core of imperialism; for the LDCs to demand equality with the developed countries would mean the extinction of the imperialist system. Obviously, the imperialists will not negotiate their own extinction.

In opening a session of the UNCTAD Committee on Shipping, Garmani Corea, the Secretary General of UNCTAD, expressed his disappointment that the LDCs have not increased their participation in the shipping industry in the past few years. This situation is not surprising, though, when one considers fully the mechanisms of the imperialist system. The imperialist forces have no intention of allowing the LDCs to participate as equals in international economic activities. Thus, laws that indicate the rights and obligations of the LDCs are looked on with disfavour, and an international convention which actually seeks to rememdy the unfavourable position of the LDCs will not be ratified. For example, a 'Code of Conduct for Liner Conferences' has been formulated which sets out guidelines under which 40 per cent of merchant shipping would be under the control of exporting countries, 40 per cent controlled by importing countries and 20 per cent by so-called 'third flag' countries. Opponents of the code include Britain, the U.S. and the Scandinavian countries who argue that the code could cause ships to sail without full cargoes which would raise costs and reduce efficiency (Daily News (Dar es Salaam), 16 April 1977). So the shipowning countries have not ratified the code.

In an imperialist system, nothing really belongs to the poorer countries, as stressed above. This will be seen in the case of the East African shipping industry which will be discussed in the next section.

THE SHIPPING INDUSTRY IN EAST AFRICA.

The history of shipping in East Africa goes back to very early times. It started with the dhow traffic which linked the East African coast with the countries of the Persian Gulf, the Red Sea, India and even China. The dhows were owned and operated by foreigners mostly Arabs from countries with more highly developed forces of production than those of the East African coastal inhabitants, and in this situation East Africans were eventually shipped overseas to these countries as slaves.

In the fifteenth and sixteenth centuries, Europeans appeared on the East African Coast as one stop on their trade routes to the Orient. Apart from the Portuguese in Mozambique, they did not build permanent settlements.

However, with the tremendous rise in capitalist productive forces and relationships in Europe in the nineteenth century, the European traders came to overshadow the Arabs whose productive forces had remained static. Trade activities were stimulated to serve the interests of the Europeans.

The present boundaries of Kenya, Tanzania and Uganda were set in those days, under British and German colonial rule, and the inhabitants were forced to grow primary commodities, such as cotton, sisal and coffee, which were taken to the coast and shipped to the metropolitan centres. Railways and ports were built to bring commodities from the interior to the coast and thence overseas and finance capital was invested in agricultural production. A colonial economic pattern was established, aimed at turning the colonies into producers of raw materials and markets for European manufactured goods, a system which was not designed to assist the inhabitants of the colonies, but rather to exploit their state of relative underdevelopment. The money economy was introduced, and farmers were forced to cultivate cash crops or to work on European-owned plantations in order to raise the money they needed to pay taxes to the colonial governments. From this time onwards, East Africa was forced to look to Europe as the principle market for her exports.

The first World War marked the contradictions inherent in the capitalist system: it was the first imperialist war. A series of peace treaties followed designed to regulate the level of armaments and formalise the new division of territories. As one of the victors, Britain took control of Tanzania, as well as Kenya and Uganda, and the system of capitalist exploitation was formalised through the Kellogg-Briand Pact. As before, capitalist interests prevailed in East Africa. Africans were not encouraged to enter the commercial sector, and the British dominated every field of production. This was the situation when the East African states were granted formal independence.

With independence, the era of neo-colonialism was inaugurated; economic relationships remained the same as under the colonial system. The same commodities, coffee, cotton and sisal, were grown for export to the metropolitan centres, and if anything, dependence on foreign markets and foreign capital increased. The establishment of merchant marines, for example, relied wholly on the support of foreign capital and British and American shipping conferences continued to dominate the East African shipping

trade. In June 1967 the East African Community was founded through the signing of the Arusha Agreement, as an attempt by the three former colonies to improve their economic position through joint action.

As fully sovereign littoral states, Kenya and Tanzania became perfect or proper subjects of international maritime law. As a landlocked independent state, Uganda is a conventional subject of international maritime law, under the Barcelona Convention of 1921 and the New York Convention of 1965. Though lacking a maritime boundary, landlocked states may register their own vessels which fly their flags. Lacking national legislation to regulate merchant shipping, the three East African states relied on the U.K. legislation which was adopted as part of their domestic law. In 1966, the Central Legislative Assembly of the East African Common Services Organisation (predecessor to the East African Community) had enacted a Merchant Shipping Act, but shortly afterwards it was decided that maritime shipping should be governed by national legislation and the 1966 Act went out of effect. The national legislation **enacted** in Kenya (Cap. 389) and in Tanzania (Act No.43 of 1967) is similar, aimed generally regulating the orderly development of merchant shipping in the two countries. There are a few crucial differences, however.

Legislation in Tanzania and Kenya Covering the Registration of Ships

Both Tanzania's and Kenya's national maritime legislations closely follow the text of the East African Merchant Shipping Act of 1966, but with some important differences based on the two country's different national policies and philosophies. While Tanzania pursues a more socialist policy, Kenya is more openly capitalist and thus more open to private foreign investment. This important difference is reflected in the maritime legislation of the two countries covering the ownership and registration of ships. The registration clauses are contained in Tanzania's Sec. 3(1) of Act No. 43 of 1967 and in Sec. 3 of Kenya's Cap. 389.

In Tanzania, a ship is considered Tanzanian only if it is owned wholly by qualified persons, who are defined is Sec. 3(1) as 'a person who is resident in the United Republic', 'a body corporate, incorporated under and subject to the laws of the United Republic, or 'the Government of the United Republic'. The term 'resident' makes the intention of the legislation ambiguous. From a strict interpretation of this section, there is no indication of an intention to restrict the ownership of ships to Tanzanian citizens, as opposed to non-citizens who are resident in Tanzania. There is no definition of the

term 'resident' anywhere in the Act, neither is there a definition in the Interpretstion and General Clauses Ordinance, Cap. 1, nor in the Citizenship Act of 1961, Cap. 512. The term is found in the Income Tax Act, No.33 of 1973, but its meaning there is restricted to application to that particular Act. If the term is taken to mean both citizens and non-citizens residing in Tanzania, then there is no restriction on non-citizens carrying on shipping activities in Tanzania while receiving financial support and direction from outside the United Republic. The possible significance of the phrase 'wholly owned by qualified persons' is lost.

A body corporate, incorporated under and subject to the laws of Tanzania, and having its principal place of business in Tanzania, qualifies to be registered as the owner of a Tanzania ship. Again, we must ask whether the underlying interests in such a corporation would be national or foreign private investments in Tanzania must be approved by the relevant minister, according to the Foreign Investments (Protection) Act No. 40 of 1963 (Cap. 533). According to the Act, the minister may issue a certificate to an applicant at his discretion, considering whether the enterprise in question would further the economic development of Tanzania. This provides mechanism for approving of foreign interests before they can be incorporated under the Companies Ordinance (Cap. 212).

The use of the word 'wholly' would seem to exclude the registration of a ship in Tanzania owned by foreign interests under the cover of partial Tanzanian participation. The legislation seems to be aimed at establishing a close link between the ownership of the ship and the state of registration, but the use of the word 'resident' in the clauses which follow opens up some ambiguity.

The Kenyan legislation on the registration of ships reads as follows:-

3 (1) A ship shall be registered as a Kenya ship if it -

(a) is of twenty-five net register tonnage or more; and

(b) is owned by persons qualified to be an owner of a Kenya ship; and

(c) is not exempted from registration.

(2) The following persons are qualified to be an owner of a Kenya ship -

(a) a person who is resident in Kenya; or

(b) a body corporate, incorporated under the Laws of Kenya, which has its principal place of business in Kenya; or

(c) the Government

As with the Tanzanian legislation, the word 'resident' is used but not precisely defined. However, the world 'wholly' is missing, which would indicate a more receptive attitude towards foreign interests which can qualify to own a Kenya ship is they are incorporated under the laws of Kenya. Neither legislation openly invites foreign shipownership, and neither is so rigid as to prohibit foreign ownership expressly. Both legislations are of the moderate type, where foreign registration might be permitted in specific cases in pursuance of economic and political goals. Neither specificies that the masters or crews of registered vessels should be citizens of the flag state.

Legislations Covering Pollution from Ships.

Both national legislations have ten parts. Part IX in each country refers very briefly to the question of pollution. Neither legislation explores solutions to this problem or provides for any supervisory or controlling machinery. In the Tanzanian Act, which is no different from the **Kenya Act**, Sec. 309(1) provides that "discharge" in relation to oil or oily mixture means any discharge, escape or leak, however caused'. Section 309(2) prohibits:-

> the discharge of any oil or oily mixtures from any ship into a harbour or into the sea within 100 miles from the coast of the United Republic; or any Tanzanian ship into the sea within 100 miles of any land. If this provision is not observed, then the owner or master of the ship shall be guilty of an offence and shall, on conviction, be liable to a fine not exceeding ten thousand shillings.

This section reflects the jurisdiction of a coastal state over all ships within 100 miles of its coastline and over its flag ships anywhere they may happen to be. However, without adequate patrolling of the coastal, areas, this legislation on its own will not provide an effective safeguard against pollution, since ships can discharge their oil or oily mixture without being detected, particularly and night. According to the 1954 International Convention on the Prevention of Pollution of the Sea by Oil*, facilities should be provided in ports for the discharge of oily wastes. Either the governments themselves should provide these facilities or the shipping lines should be required to do so in order to secure landing rights. Failure to provide these facilities and inadequate patrolling of the coastal areas would seem to invite ships to discharge their oily wastes illegally.

* The provision exists in the 1962 and 1971 amendments to the Convention.

The Tanzanian Shipping Industry.

Since the Arusha Declaration in 1967, the state in Tanzania has taken over most economic activities which were previously under private foreign control. Since it is a basic aim of the government to control the economy closely along socialist lines, foreign private investment has been held constant, although the participation of international finance capital has been increasing. At the time of the Arusha Declaration, international shipping of Tanzanian goods was almost entirely in the hands of foreign shipping companies. The Merchant Shipping Act, passed in the same year, was intended to provide generally for the control, the regulation and the orderly development of a national shipping industry. However, the developmemt of such an industry has been limited. Small-scale fishermen and traders have been active along the coast, but the government is increasing its participation in these activities with the aim of centralising them.

Before the collapse of the East African Community, the East African Railway Corporation operated a shipping line on inland waters, particularly on Lake Victoria. This provided facilities for communication and transport-ation of passangers and goods along the lakeshore of each member country and be between countries. Now the Tanzanian government has provided three ships to continue this service on the Tanzanian lakeshore.

For international maritime trade, the governments of Tanzania, Kenya, Uganda and Zambia have founded a joint shipping line, the Eastern African National Shipping Line in 1966. This line was originally intended to handle all imports and exports to and from Eastern Africa but it has fallen short of this goal, due to the activities of the conference lines which it has joined.

The Eastern African National Shipping Line. The Eastern African National Shipping Line was founded and started operations in 1966, under the ownership the governments of Tanzania, Kenya Uganda and Zambia and of the Southern line, a private company incorporated in Kenya and owned by a number of European conference lines. The EANSL is a limited liability company registered in Tanzania with offices in Dar es Salaam and Mombasa. Mombasa serves as the headquarters and the centre of operations.

According to its articles of association, the line is supposed to Establish and maintain regular services by steamships or other vessels, to act as shipowners and ship managers and to enter into contracts to carry mail, passengers, goods or cattle by any means, either on its own or by other

vessels (see UNDP/UNCTAD, 'East African Shipping Study Report', p.380.) The management of the company was originally contracted to the Southern Line, but as of 1 December 1973, the company has been run by its own designated staff. All the managerial staff of the company are nationals of the four Eastern African countries, but assisted by expatriate technical personnel who have been hired on a contract basis since December 1974.

The company owns four ships and also operates one chartered ship, as follows:-

1. Harambee - owned and registered by Kenya. Built in 1953. Dead weight is 10,181 tons; bale capacity 533'; speed 13.5 knots; passanger capacity 12.
2. Uganda - owned and registered by Uganda. Built in 1953. Dead weights is 9,115 tons; bale capacity 500'; speed 15 knots; passenger capacity 12.
3. Ujamaa - owned and registered by Tanzania. Built in 1959. Dead weight is 9,113 tons; bale capacity 500'; speed 15 knots.
4. Mulungushi - owned and registered by Zambia. Built in 1960. Dead weight is 9,110 tons; bale capacity 500'; speed 15 knots.
5. Eva - chartered. Registered in Liberia. Built in 1957. Dead weight is 10,500; bale capacity 610'; speed 12 knots (see UNDP/UNCTAD, 'East African Shipping Study Report', preliminary report, 1974,p.2115).

The objectives of the participating governments were stated at the founding of the Eastern African National Shipping Line in a policy paper entitled 'Shipping Policy in East and Central Africa' (see the Inter-governmental Standing Committee on Shipping, 1966). They are as follows:-

1. To conserve and earn foreign exchange to help stabilise the balance of payments position of the participating countries,
2. To provide diversified employment opportunities for nationals of the participating countries ,
3. To reduce economic dependence,
4. To influence the decisions of foreign conference lines relating to freight rates,

5. To promote exports from the participating countries,

6. To help ensure national security in times of international hostilities or war, and

7. To own and control the shipping industry of the participating countries.

Unfortunately, these objectives have not been met because from the beginning the company was managed by a traditional foreign shipping firm which favoured the long-standing shipping monopolies and undermined the aspirations of the four participating governments.[3] As of 1973, the company's participation in East Africa's overall ocean traffic was about 2 per cent. This was made up exclusively of general cargo transport in cooperation with the European/East African Conferences and the Far East Conferences. By 1975 in cooperation with the European Conference, the company shipped about 5 per cent of the total exports from East African and 10 per cent of the total imports (UNDP/UNCTAD, 'East African Shipping Study Report', p.384).

The company has had to join the East African Conference, but in spite of this does not have its own berths in the East African ports. (Kamanzi, 1975, p. 109). Through the allocation of berths, the company has been kept in a subordinate role and denied full access to shipping activities to and from East Africa. The company has to rely on foreign agents for consignments, and these agents tend to reserve the best paying cargoes for foreign shipping firms, leaving the Eastern African National Shipping Line with the poorly paying cargoes. This situation was described in the Sunday News (Dar es Salaam) on 27 February 1977 as follows:-

> According to people conversant with liner shipping, the EANSL is an economic mess because it also does not get adequate customers, even from East Africa, due to imperialist manouvres.
>
> Apart from facing tough competition with well-established conference lines, the EANSL is forced by rules of the conference to operate her vessels during the off season only. Regulations are laid down which require vessels of the line to operate on certain routes only in particular periods when there is no substantial cargo to ship.
>
> The national line finds itself in further economic problems due to the fact that it has virtually no berths of its own; hence it has to pay high berthing commissions every time it enters a harbour. Furthermore, the line pays $7\frac{1}{2}\%$ of its net freight as management commission to its agents.

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3. The Board of Directors has three members from rival shipping lines.

Since it was established in 1966, the company has consistently shown a financial loss. Its influence on the overall shipping trade in Eastern Africa and the American continent, handling some 10 per cent of Tanzania's total export trade. As of 1 July 1977, the American and Japanese members of this conference raised their freight rates by 10 per cent unilaterally, without consulting the Eastern African National Shipping Line or individual importers or exporters in Eastern Africa. Such a move indicates the power these monopolies hold over the interests of developing countries.

The Eastern African National Shipping Line was founded in the hope of setting up a national shipping industry in a context of capitalist free competition. However, given the development of imperialist forces today, compatition is only possible between well established monopolies, and not for an infant shipping industry, although, paradoxically, it has been strongly supported by international finance capital.

Tanzania has responded to this situation with plans to purchase an additional ship. Negotiations are underway with a shipbuilding firm in West Germany, with finance provided by the Tanzanian Investment Bank. Tanzania has also started an independent shipping service which competes with the established conferences. Finally, Tanzania has made a number of bilateral arrangements which assure equal participation in the traffic between Tanzania and another country in both directions. The socialist countries of Eastern Europe, the USSR and communist China have been making bilateral shipping agreements for some time, including agreements with a number of less developed countries. As might be expected, the imperialist countries regard any departure from their own multilateral shipping industries as less efficient and leading to higher costs, but Tanzania has found that bilateral shipping arrangements can lead to an efficient organisation of overseas trade (Journal of World Trade Law, 6 (1), p. 87).

The Sino-Tanzanian Joint Shipping Company. The company was founded in January 1967 with an initial share capital of TShs 30 million, based on a bilateral agreement between Tanzania and communist China. Two Tanzanian vessels were acquired with an interest-free loan from China, and half of the cost of a third vessel was met through the company's profits. The company now has four ships - Ushirika, Zun Hua, Asia Africa and Chamwino - operating between the Tanzanian coast and the Far East, the Persian Gulf and ports on the Mediterranean and Western Europe.

There is not a great deal about this company. According to information from one official, the circumstances surrounding its founding were 'very special', hence confidential. In his 1974/75 budget speech, the Minister for Communication and Transport, Ndugu Alfred Tandau, described the activities of the company as encouraging and derserving applause. However, the company faces stiff competition from the conferences in attracting cargoes. The General Manager, Ndugu Buhatwa, has noted that buyers and sellers in Tanzania are still using the conference lines and 'there is no way of persuading them to have their cargo transported by non-conference members'. The line is not given any preferential treatment in the allocation of cargo from Tanzania. Figures on cargo carried from 1967 to 1975 are as follows:-

Year	Tons of General Cargo
1967	31,000
1968	73,998
1969	63,296
1970	82,000
1971	79,998
1972	-
1973	106,478
1974	99,000
1975	118,000

Although these figures seem to indicate a general upward trend, there is a long-standing shortage of cargo. For example, in 1967 one ship carried 31,000 tons of cargo in six months, while in the whole of 1974, three shi's carried only 99,000 tons. The ships are apparently operating at about 50 per cent capacity (see Sunday News (Dar es Salaam) 27 February 1977).

With such an independent, bilaterally controlled shipping line, the freight rates charges should reflect more closely the interests of the shippers than is the case with the conference lines. With interest-free loans made available for the founding of the line, this company should be able to form the basis of a truly East African shipping industry once the problem of cargoes is solved.

The Tanzanian Coastal Shipping Lines, Ltd. This company was founded in 1973 with the aim of organising the Tanzanian coastal trade as a government

monopoly. It is wholly owned by the Tanzanian government. There is only limited information concerning the company's organisation or financial support.

The company owns three ships. Two of them, one at 650 tons dwt. and the other ar 550 tons, were bought with a grant from Norway. The third, at 2,200 tons, was purchased through a loan from the Tanzania Investment Bank, which in turn is supported by the World Bank.

The two smaller ships carry passengers and cargo, and the larger ship only carries cargo. They operate along Tanzania's southern coast, between Mafia, Kilwa, Lindi and Mtwara, but recently their operations have been extended to Mombasa in the north and Comoro in the south. Plans are also underway for the company's vessels to operate in Mozambique.

At first glance, this might appear to be a truly independent national operation. However, on closer inspection of the formation and operation of this firm, Tanzania seems to a sphere of interest for the operation of international finance capital.

CONCLUSION

We have seen that it is basic to the imperalist system that the less developed countries be denied ownership and control of economic activities which would enhance their own development. Imperialism can only function if some nations remain economically backward, and thus the imperialist nations can never be expected to assist the LDCs to attain full economic development.

It follows that the shipping industry in Eastern Africa is dominated by monopolistic conference lines from the imperialist nations. The formation of the Eastern African National Shipping Line represented one attempt to break this domination, but the conferences participated in the new line from the outset and prevented it from ever offering any serious competition. Theconferences control the allocation of cargoes, even of national exports, and reduce the national line to carrying less well-paying cargoes and operating during the off season. Although the national line has worked within the conference system from the outset, it has never had any influence on the operations of the conferences. This leaves the shipping industry in Eastern Africa today still dominated and exploited by the conferences, and a substantial independent national or regional shipping industry has yet to emerge.

As already described, the shipping industry needs a great deal of finance capital which is not available in Eastern Africa. It also needs skilled personnel whose training is often long and expensive. Training institutions established in Eastern Africa must be funded by foreign capital, and loans must also be provided to train nationals overseas. Thus, the development of the local shipping industry can be seen as an investment of foreign capital which perpetuates dependency and ultimately generates more profits for the developed countries.

The laws regulating the shipping industry themselves reflect the neo-colonial economic order. These laws apply to a level of productive forces which the local population has not yet attained. Therefore, the industry established under such laws is not Eastern African: it is only an extension of the economic activities of the metropolitan centres into economically backward countries.

How will an Eastern African shipping industry be established. The countries of the region must become self-reliant because they can never hope for substantial support from the imperialist nations who would not work against their own best interests. UNCTAD remains the only international forum which deals with this issue, as the Law of the Sea Conferences never consider the problems of the shipping industry as whole. And international opinion, as reflected in the deliberations of UNCTAD, remains divided, so that a concention which might reverse the present situation of imbalance and dependency has yet to be agreed upon.

What is needed is to change the international economic pattern which now reflects the domination of metropolitan interests over those of countries in Eastern Africa. National economies need to be diversified, based on production for local consumers, using local natural resources and promoting rural development and local employment. Trade in the region needs to be encouraged, to reduce the reliance on foreign suppliers and markets. Capital and technological assistance should be sought from other less developed countries or from only those developed countries ready to offer interest-free loan. This means a primary target must be a stronger unity among the less developed countries themselves.

In addition, shipping lines must be set up, often on a bilateral basis, which are independent from the monopolistic conferences. When such

lines are established, it is important that the participating countries reserve their cargoes for their vessels, rather than those of the conference lines. We have seen that the Sino-Tanzanian Joint Shipping Company must operate well below capacity because Tanzanian exports, such as coffee, cotton and sisal, are not reserved for this line. Tanzania is now setting up another similar bilateral arrangement with India, and an Indo-Tanzanian Joint Shipping Company will soon be in operation.

Finally, a truly national shipping industry in a less developed country will be possible with the overthrow of the international imperialist system by the world's working class. Although this will take some time, it it important to mobilise the workers and make them aware of their real enemies because in the last analysis it is the workers who will be responsible for a national shipping industry.

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ROLE OF UNITED NATIONS ORGANISATIONS IN DEVELOPMENT AND MANAGEMENT OF MARINE RESOURCES AND ENVIRONMENT

By

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INTRODUCTION

The nations of eastern Africa are facing an unprecedented challenge with respect to their marine resources and environment. Many countries are assuming responsibility for offshore areas out to 200 nautical miles (370 kilometres) width as a result of their participation in the Third United Nations Conference on the Law of the Sea and in recognition of the need to develop and manage their coastal and offshore marine resources and environment. This expansion constitutes a major opportunity for economic development, but it also produces a severe demand on the existing basic and applied marine science manpower and infrastructure, in addition to the relevant governmental, economic and social elements. It also comes on top of the already steadily increasing use of coastal areas.

However, the eastern African nations have foreseen the consequences of these trends and have taken steps, both nationally and internationally, to plan ahead. In doing so, they have called upon the services of the United Nations organisations of which they are members. This paper examines briefly how the system of organisations can serve its members in problems of this type.

Such collaboration has already been fruitful. This workshop is one good example, as well as two other conferences involving Unesco. The International Conference on Marine Resources Development in Eastern Africa was held in Dar es Salaam, 4-9 April 1974, organised chiefly by Tanzania. UNESCO assisted the participants from elsewhere in eastern Africa to attend. The report of this conference (edited by A.S. Msangi and J.J. Griffin) provides an excellent analysis of the entire economic, social and scientific system that is involved in developing and managing marine resources and the marine environment. The other conference in which UNESCO participated was the Scientific Workshop to Initiate Planning for Co-operative Investigation in the North and Central Western Indian Ocean, held in Nairobi, 25 March - 2 April 1975 and sponsored by the East African Community and several UN organizations: the Intergovernmental Oceanographic Commission (of UNESCO), the Food and

Agriculture Organisation (Indian Ocean Fishery Commission) and UNESCO. The report (IOC Workshop Report No. 7) gives recommendations on programmes for basic and applied marine science needed for development and management of the region's marine resources and environments, including recommendations with respect to the necessary manpower and infrastructure.

UN ORGANISATIONS

The United Nations organisations comprise a system set up by the nations of the world so that they can mutually co-operate with one another. Thus, this system is at the disposal of the member states of the separate UN organisations to assist one another co-operatively in developing and managing marine resources on both a national and a global scale. At the moment, the nations of the world are undertaking a major task in this regard through the Third United Nations Conference on the Law of the Sea. The task before the Conference is difficult and delicate, both because of the new ground being broken and also because of the wide variety of national interests which must be accommodated. The nations themselves will determine what the final outcome is to be. Afterwards, the nations of the world will implement this outcome through the existing UN organisations and any new bodies that might be formed.

This will provide new challenges to the UN system, but within a framework which is already dealing with numerous aspects of marine resources management and development. What is new is the recognition of the importance of these matters at high political levels and, furthermore, recognition at these levels of the need for manpower and infrastructure to develop and manage marine resources, both in developing and developed countries.

At the present time, there are many UN organisations that deal with these matters, in a co-ordinated and co-operative way, roughly parallel to analogous ministeries within each member state. These activities reflect the governmental inputs into these organisations. Many different agencies have been charged with specific activities related to marine resources. For example, FAO is charged with the development of fisheries; IMCO with matters relating to ocean transport; WMO with matters relating to marine aspects of weather forecasting; WHO deals with health aspects; IAEA is concerned with matters such as offshore dumping of radioactive waste and the offshore installation of reactors. In addition through UNESCO member states co-operate to ensure that the scientific basis for these activities is well worked out, with the concomitant development of the necessary manpower and infrastructure. The United Nations itself is deeply involved in the legal aspects through

the Conference on the Law of the Sea, and also has a programme on coastal area development. The United Nations Environment Programme (UNEP) is very deeply involved in questions of environmental management of regional seas, with the Mediterranean Sea as its present priority target. The member states, through the United Nations Development Programme (UNDP) provide funds for these activities, on the basis of priorities determined by the individual member states themselves. Both UNEP and UNDP work closely with the rest of the UN organisations in the execution of individual projects. Many other agencies have important functions as well.

It must be pointed out that the internal organisation of every UN agency is unique, reflecting both the demands made by member states and the historical development of the agency. They vary from highly centralised structures to regional structures, to structures decentralised down to the national level.

INTERNATIONAL CO-OPERATION AT THE NATIONAL LEVEL

Marine science is both a discipline and a tool. It is an essential component of any system involving development and management of marine resources and the marine environment. This is firmly recognized within the UN organisations. Thus, there exists a marine scientific body of the member states, the Intergovernmental Oceanographic Commission (IOC), which has responsibilities beyond those of its parent organisation, UNESCO. It serves as a common scientific resource body at the service of other UN organisations, including the UN, FAO, WMO and IMCO. It also works closely with IAEA and UNEP. Other co-ordinating mechanisms also exist between the UN organisations at the secretariat level.

As pointed out, member states work through any given UN organisation co-operatively to help one another. Thus member states set the priorities and the programme of each organisation. The secretariat of each organisation the assists the member states in executing the programme and in preparing future programmes.

What does this mean in terms of the scientist or administrator who is charged by his government with the development and management of coastal and offshore resources? At the simplest level, he can take advantage of the diverse programmes already existing within the many UN organisations that may be relevant to his particular task. The exact way of going about this varies from country to country. It must be realised that the UN agencies are governmental organisations and hence all their activities are governmental

and so tend to be executed through governmental channels.

On the other hand, the scientist or administrator can help shape the programmes of the organisations. This requires that he convince his own government to set a high priority in the marine resources field. It is then necessary for the appropriate delegation of the government to take matters to the governing body of a given UN organisation and convince them, in turn, to give high priority in this field. Probably every government handles its formulation of planning activities in different ways. Nonetheless, the fact remains that a given UN organisation can only execute that programme that its member states have decided upon.

Taking advantage of the UN system involves a knowledge of that system. See, for example, a document of the Third UN Conference on the Law of the Sea (A/CONF.62/L.14) entitled 'Annotated Directory of Intergovernmental Organisations concerned with Ocean Affairs'.) The official channels for communicating with various UN agencies often reside in different ministries of a given government, and national delegations to a given UN organisation often reflect the relevant national ministry. Thus, if a government wishes to participate in a certain programme on marine resources of a particular UN agency, then it must pass through a given line of communication. As governments are composed of individuals, those individuals concerned must know the proper path.

Now what does this mean relative to a workshop such as this, or the plans of a country for the development and management of its marine resources? Ideally, the output of the workshop or the national plan will be an integrated programme looking at the entire system needed for the development and management of these diverse marine resources on a national or regional basis. For the execution of this integrated programme, with respect to the UN organisations, it is then necessary to differentiate the programme into the aspects in which each UN organisation is competent. This may also reflect the mode of execution within the country itself. As indicated above, this obviously requires knowledge of the system. Co-ordination should occur, both at the country level and at the International level. Organisations such as IOC, UNEP and UNDP have been charged with strong co-ordinating functions in matters relevant to this workshop at the international level.

In order to help member states and their responsible officials in this task of integrated planning and differentiation for execution, all of the UN organisations have regional officials or offices. With regard to marine sciences and related aspects of the development and management of marine resources,

the UNESCO Regional Office for Science and Technology in Nairobi will assist - both in providing information on the whole system of UN organisations and in helping member states work with UNESCO.

REGIONAL PERSPECTIVES TO COMBAT MARINE POLLUTION AROUND AFRICA

by

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INTRODUCTION

Marine pollution as used in this paper, was defined in Article 2 of the Barcelona Convention of February 16 1976:-

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

Politically, the continent of Africa, excluding the Republic of South Africa, is a distinct entity whose aspirations have been enshrined in the OAU charter to which the diverse nations all subscribe. The scope of regional action under the auspices of or in conjunction with the OAU is open-ended and fundamental, not only in the economic, political, scientific and technological fields but also in such areas as co-operation in the development of regional seas programmes. Indeed, in the negotiations prior to and during the third UN Law of the Sea Conference, the African states under the auspices of the OAU forged common positions and submitted proposals spelling out their interests in the negotiations which were still on going. It might be considered possible for these 48 states to conclude one regional convention to combat marine pollution around the continent, but such an approach would be contrary to some of the political and geographical realities of the region as a whole.

The vast African continent borders the Atlantic Ocean on the west and the Indian Ocean in the east, with long coast lines extending into the two hemispheres, the Mediterranean in the north, the Red Sea in the north east - all having varied climatic and environmental conditions and resources This very vastness renders one regional approach to marine pollution impracticable. The sub-regional approach for the areas identified below (hereinafter referred to as regions) seems more appropriate for the effective protection of the marine environment from pollution and for the conservation of resources.

The regions around which regional programmes could be developed are as follows:-

1. The Mediterranean region;
2. The Red Sea;
3. The Gulf of Guinea and adjacent coastal areas;
4. The Indian Ocean and adjacent islands; and
5. the Ssouthern African region.

The regional approach is presently being pursued in the first three of these regions, as will be described a bit more fully below, and in due time they are likely to be emulated in region four, but not in region five, as explained below. Were some sort of regional structure to exist in all these areas, no doubt some forms of co-operation among them could be evolved, such as the exchange of information and data or assistance in time of emergencies. What is important for now is to examine each of them and their future potential for participation in regional seas or law of the sea activities. Such regional efforts are likely to continue irrespective of the success or failure of the UN Law of the Sea Conference, in view of the political, economic and scientific factors inherent in each region, the imperatives for co-operation among the neighbouring states and the various decisions of certain governing bodies within the UN, for example the UNEP Governing Council. The regional approach is likely to be successful because states in one region are united by a number of common interests and factors, although individual states might be considered in one or more regions.

PRINCIPAL SOURCES OF POLLUTION AROUND AFRICA

Generally speaking, the immediate sources of pollution, and their influence on the marine environment, may be different in each region. Accordingly, each region should be carefully studied to determine priority areas of concern and possible action. Several sources of pollution should be investigated.

Landbased Pollution

Invariably landbased sources of pollution amount to around 80 per cent of total marine pollution, and hence it is very important to develop means of curbing this type of pollution. This pollution can be water-borne through the action of rivers, floods or seepages, or air-borne through winds and agricultural, industrial or mining wastes can be transported to the seas in great quantities, depending on the nature and intensity of activities.

Industrial/Sewage Wastes

In several of the regions, major towns and concentrations of industries are on the coast or near rivers which empty into the sea. In a number of cases, industries are expanding in port towns.

Oil Pollution

Oil pollution could be the result of off-shore exploitation, as happened in a blowout in Nigeria, or the result of transportation activities, whether accidental or deliberate, as observed by the Gulf of Guinea mission. At present Angola, Zaire, Gabon, Nigeria, Algeria and Libya have discovered oil and are actively exploiting it, while a majority of other African countries are engaged in oil exploration. As regards shipping activities, it is estimated that 24,000 ships pass around the Cape of Good Hope each year, supplying approximately two thirds of the western world's oil needs. (AFP, May 23 1977 page 3.) Others pass through the Suez Canal. With this level of shipping activities, incidents of oil pollution are bound to occur.

Nuclear-based Pollution

The prospect of this form of pollution occuring in most African countries, except for South Africa, is rather remote. However, other countries could transport nuclear wastes to areas that ultimatley affect the African region, and this possibility warrants a close look.

UNEP AND THE REGIONAL SEAS PROGRAMME

At the outset one might ask how UNEP became involved in regional seas activities, and where those activities are based. On the initiative of its members from developing countries, during the first Session of the UNEP Governing Council held in Geneva in 1973 six priority areas for action were established which included the oceans. At that juncture it was expected that UNEP would play a prominent role, which it has since endeavoured to play, in the ongoing negotiations on the Law of the Sea Conference. The Conference, which had a lengthy agenda with many complex issues, left obvious uncertainties as to when and whether agreement would be reached on a comprehensive legal instrument governing the regime of the seas. In this situation, there was need for urgent action in certain marine regions where pollution was reaching alarming proportions, threatening the extinction of living resources or creating hazards to human health. In these areas action could not await the conclusion of the negotiations on the Law of the Seas. Building on some commendable groundwork

by FAO, UNEP ventured initially into the Mediterranean region, and was eventually advised by its Governing Council to concentrate on regional seas in its oceans programme, in addition to continuing to advise the Law of the Sea Conference on environmental issues. Regional activities are carried out, and at the same time close attention is paid to the proposals before Committee III of the Law of the Sea Conference and as appropriate they are incorporated into the regional instruments.

Through its Division of Geophysics, Global Pollution and Health (Division I) and its Division on Economic and Social Programmes (Division III), UNEP is concentrating attention on the following marine regions:-

1. The Mediterranean - implementation of a comprehensive action plan;
2. The Persian Gulf;
3. The Caribbean; and
4. The West African coastal region: initiation of preparatory work for this regions spurred by the success in the Mediterranean.

UNEP is also considering programmes in the East Asian seas, the Red Sea and the Pacific.

In developing regional programmes, UNEP works very closely with the relevant UN agencies and national Governments. In essence therefore, UNEP's coordinating and catalytic roles are seen in action. Thus in June 1976 at Paris, OETO (ESA), UNESCO, IOC, FAO, IMCO, WHO, UNIDO and IAEA were convened by UNEP and agreed on the guidelines and principles for the development of comprehensive action plans for each region. A summary of the guidelines and the steps taken by the relevant agencies and governments are summarised at paragraph 489 of UNEP/GC/90, the report of the Executive Direct on the environment programme submitted to the Fifth Session of the Governing Council in May 1977. A summary of the guidelines including the action plans is as follows:-

1. Environmental assessment component

   - Evaluation, research, monitoring and information exchange, leading to a report on the state of the marine environment and its living resources;
   - Assessment of the impact of the marine environment on development policies for industry, agriculture, urbanization, fishing, maritime transport, exploitation of mineral and energey resources, tourism, etc.

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* Now formally known within UNEP as the Kuwait Regional Convention.

2. Environmental management component

- Arrangements for the elaboration and conclusion of legal instrument to protect the marine environment;
- Preparation of guidelines for environmentally sound development and for the protection of the marine environment, to be included in general guidelines for environmental management of the regional sea and the areas adjoining it;
- Arrangements for the control of pollution by oil and other harmful substances;
- Plans for the management and conservation of living resources (e.g., marine parks, aquaculture);

3. Supporting measures

- Identification of technical assistance, training, education and information exchange needs;
- Provision of information for the general public.

UNEP's role in the development of the action plans is as follows:-

1. To work out a draft action plan for a given region in consultation with governments and concerned agencies;
2. To secure the approval of the action plan by the governments of the region concerned;
3. To implement the action plan with the co-operation of the governments concerned; and
4. encourage the governments concerned to assume full responsibility for further action on the protection of the environment.

Initially UNEP and other UN Agencies, in co-operation with the governments of the region concerned, will be responsible for implementation of the action plan, but in the end the national governments will have to develop capabilities for the continued operation, monitoring and safeguarding of their own environment. The implementation of regional programmes includes the development of capabilities for tackling various social, economic, scientific and other problems of a region. These programmes will be initiated at different times and the role of UNEP will vary from area to area depending on the resourcefulness of the governments concerned and their readiness to assume total responsibility. Ultimate UNEP withdrawal from a given region will be gradual in order not to disrupt the co-operative arrangements it has, in a number of cases, painfully catalysed.

With this brief sketch of how UNEP operates, it is time to turn to the marine situation around Africa.

THE SITUATION AROUND AFRICA

The Mediterranean Region

In many ways the Mediterranean region is the most complex of the regions, but at the same time it is the most advanced in the preparation of a legal regime and the implementation of a comprehensive action plan prepared under the auspices of UNEP, in co-operation with agencies such as UNDP, IMCO, IOC, FAO and WHO. The large fleet of ships that cruise in the area, the exploitation and transportation of oil, the large-scale industrial and other development activities, the sharing of the sea between developed and developing states, socialist and non-socialist states, friendly and antagonistic states, states with technology and scientific know-how and those without - all these factors add to the complexity of the region. Nevertheless, the mutual concern of all the states involved for the restoration of the sea, which had reached a critical environmental stage to the detriment of living resources, tourism and the health of the inhabitants of the region, was strong enough to set aside other points of hostility and made them agree to come to a conference to plan a strategy for restoring the Mediterranean and develop common programmes for the region. The concerned countries are Albania, Algeria, Cyprus, Egypt, France, Greece, Israel, Italy, Lebanon, Libya, Malta, Monaco, Morocco, Spain, Syria, Tunisia, Turkey and Yugoslavia, and with one exception (and based on factors not related to the protection of the marine region) they have all taken part in the efforts to develop a comprehensive action plan and its implementation. The action plan for this area has a legal component and other components, embracing integrated development and scientific aspects.

The legal component entails the development of a convention. In the case of the Mediterranean, the Barcelona Convention of 16 February 1976 has been sigend by 17 states and the EEC, and is expected to receive requisite ratification to bring it into force in 1978. Another legal component is the envisaged publication of a survey of national legislations on the protection of the marine environment and the development of future protocols to the Convention. For example, UNEP in cooperation with WHO, is developing a protocol on landbased sources of pollution. The salient features of the Convention, which are influencing the development of other regional conventions, are highlighted below.

The other component of the comprehensive action plan is a complex programme involving the governments of the region, certain national institutions and UN Agencies, and covering research, monitoring, collection of data, e.g., surveys on landbased sources of pollution, and the development and implementation of the so-called Blue Plan which entails, among other things, the collection and exchange of data on major developments and environmental protection activities in the region. The Blue Plan, administered by a small coordinating unit working closely with national bodies from each country, is intended to function within carefully defined areas of activities. Thus the inter-governmental meeting held on 31 January to 4 February 1977 identified a number of priority areas for immediate action. These include, inter alia, protection of soil, management of water resources and marine living resources, human settlements and tourism. The cost of implementing phase one of the Blue Plan, which could take off at any time now, is estimated at $1.5 million, with 50 per cent to be contributed by the countries concerned, 25 per cent by UNEP and the rest by other agencies (see UNEP/GC/90 paragraphs 496 and 497).

It is clear that a regional examination, followed by the establishment of a framework to coordinate development-oriented activities in the region, will best ensure management of resources by national governments in such away that unwarranted environmental repercussions will be avoided, and an environment will be enhanced which has, over the years, been under severe strain. Doubtlessly the complexities of the Mediterranean region will not be the same in other regions around Africa: the action plans elsewhere must take account of the differing circumstances in each region.

Features of the 1976 Barcelona Convention. The Barcelona Convention is not an isolated legal instrument; it draws heavily from other instruments, such as the Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea of 22 March 1974, the Paris Convention on the Prevention of Marine Pollution from Landbased Sources of 4 June 1974, and the London Convention on the Prevention of Pollution from Ships of 2 November 1973, to cite but a few examples. The Barcelona convention is appropriate in that it has a limited, defined area of application, it is a response to difficulties commonly felt by the governments of the region, and it is in line with the directives of the UNEP Governing Council to promote the development of environmental law. Besides, the convention brings into focus the importance of national governments' ratifying other global instruments that have a bearing on the marine environment, which if attained, will be a substantial contribution by UNEP in its catalytic role. It is no wonder that following what was seen as an important UNEP contribution to the containment of marine pollution in the Mediterranean, a number of

governments in Africa, Latin America and Asia called for similar action in respect of their regional seas.

The Barcelona Convention contains 29 articles: a protocol for the prevention of pollution of the Mediterranean by dumping from ships and aircraft, a protocol concerning co-operation in combating pollution of the Mediterranean by oil and other harmful substances in case of emergency, and an annex on arbitration. Article 4 defines general obligations by the participating states, articles 5 to 8 defines problems emanating from specific pollution sources - namely dumping by ships and aircraft, exploration and exploitation of the seabed, and landbased activities. Articles 13 and 14 refer to the institutional arrangements that are charged with overseeing the implementation of the Convention. In the new instruments that are likely to be devised in other regions, the chances are that the general obligations will remain the same. The particular obligations may differ from region to region, though oil and landbased sources generally will remain central areas of concern. There is likely to be some form of institutional arrangement, and here there is considerable scope for deviation from the Barcelona Convention. Each region will also have different approaches to the number of protocols needed, the subjects which will be covered and whether there is an immediate need to establish regional institutions, either to combat oil pollution or to coordinate the monitoring of pollution and scientific research. Equally, there will be variations of emphasis and different approaches to education, training and technical assistance, which invariably will be of crucial importance in many regions. Some of these differences will be occasioned by such considerations as available resources, personnel, technical and scientific expertise and institutional back-up, and the readiness of governments to assume responsibility for the agreements encouraged by UNEP in each region. From UNEP, there will probably be no preferences as such: a given solution for each area will necessarily be determined by the governments concerned, taking all the surrounding circumstances into account.

The Red Sea Area

UNEP has not been heavily involved in the Red Sea marine region, except for a limited financial contribution towards the training of scientists and technologists to man a marine research and monitoring centre which will be established. A contribution has also been made towards providing equipment for the centre, and towards carrying out a survey of living resources in the sea. In other respects the development of an action plan for the protection of the Red Sea from pollution has been developed under the auspices of the Arab

League Educational, Cultural and Scientific Organisation. A draft convention, adapted as part of the action plan in January 1976, is ready for signature, and the Arab League is expected to convene a conference for that purpose.

This effort by the Arab League demonstrates that determined organisations and states can approach their marine environment problems without necessarily waiting for UNEP to take the initiative.

The Gulf of Guinea and Adjacent Coastal Areas

The Gulf of Guinea and the adjacent coastal areas, along with the Mediterranean, are the marine regions receiving priority attention from UNEP. Action by UNEP for the Gulf of Guinea was requested by Ghana during the Third Session of the Governing Council in 1975, supported by Zaire, Ivory Coast, Nigeria and Senegal. The countries concerned called on UNEP to study the problems of marine and coastal pollution in all their aspects and particularly oil pollution along the West African Atlantic coastline, with a view to initiating a Barcelona-type convention for that area. Accordingly, UNEP sent a two-man exploratory mission to the area from 25 April to 2 July 1976. The mission visited 14 countries and collected information on two others, Sao Tome and Principe and Cape Verde. The countries visited were Cameroon, Equitorial Guinea, Gabon, Nigeria, Benin, Togo, Ghana, Ivory Coast, Guinea, Sierra Leone, Liberia, Senegal and Gambia. In these countries the mission had discussions with a wide ranging group of government and UN officials whose responsibilities had a bearing on the marine environment (see the report of the mission, 'Exploratory Mission on the Marine Pollution Problems of the West African Coastal Countries on the Gulf of Guinea, 25 April - 2 July 1976').

The mission identified the following as the main types of marine pollution in the area:

1. Sewage - Domestic waste in liquid or solid form, whether treated or not, strewn in the sea, coastal lagoons and beaches;
2. Industrial waste: Similar to domestic waste;
3. Logs: A lesser problem in the long-run;
4. Oil pollution: From exploitation and transportation activities, with the latter constituting the gravest manace; and
5. Coastal erosion: Following human activities.

According to the views of the government officials consulted, the mission recommended that action toward the conclusion of a regional convention on the protection of the marine environment be undertaken as soon as possible. A convention, it was felt, should embrace the countries visited, Sao Tome and Principe and Cape Verde and three other countries not visited, Congo, Zaire and

Angola, which the mission considered as conveniently forming a unit.

The mission found existing scientific institutions and indigenous expertise in the region severely inadequate, and hence requiring technical assistance for training, not only in pollution control but also in marine sciences. It also found the means of combating pollution, in the event of its occurring on a significant scale, practically non-existent, and hence deserving immediate redress. The eagerness of the governments of the region to act on these problems without delay augurs well for early results in the development of an action plan, including a legal framework, which UNEP is evidently facilitating in consultation with the governments concerned and the pertinent UN agencies. Thus during the Fifth Session of the Governing Council of UNEP, Senegal, Liberia, Ivory Coast, Ghana, Benin, Nigeria and Gabon initiated a Council decision in which the Executive Director, in cooperation with the governments and the relevant UN agencies, governmental and non-governmental bodies concerned, was authorised to convene before May 1978 such meetings as may be necessary to prepare for a regional conference consider 'a draft action plan and all related questions'. In short, action to protect the marine environment in the Gulf of Guinea is well underway and could be expected to yield results, hopefully in the next two years.

The Indian Ocean and Adjacent Areas

The Indian Ocean coastal and island states are grouped into a region, although it could be argued that the area does not strictly constitute a regional marine area as such since it faces an open sea rather than an enclosed sea or gulf, as is the case with the Mediterranean, the Red Sea, and the Gulf of Guinea areas. It could also be argued that the area, stretching from the horn of Africa in the north to Madagascar in the south, including three other island states, Seychelles, Mauritius and Comoro, does not constitute a geomorphological unit, although it is influenced by similar climatic factors. In addition there is no doubt that the three island states, Seychelles, Mauritius and Comoro, are a considerable distance from the mainland and are likely to strain any agreement on the geographical limits to be covered. All in all, strictly following logic, Mozambique, Comoro, Madagascar and Mauritius southward could be a region, and another could be comprised of the countries to the north with the undesirable consequence of leaving out Seychelles altogether. Nevertheless, it is pragmatism and political reality, rather than logic by itself which will determine the scope of the region.

The states of Somalia, Kenya, Tanzania, Mozambique, Mauritius, Comoro Islands and Seychelles fall within the same geographical and political zone, namely eastern Africa. As mentioned elsewhere, they all border on busy tanker and shipping routes from America and Western Europe to the Middle East and the Far East which time and again are affected by the closing and opening of the Suez Canal. They are thus subject in varying degrees to pollution by oil as a result of the heavy ship traffic. Besides the more routine sources of oil pollution from ships they share the risk of an accident occuring in the area and a tanker on ship causing pollution to their coasts which none of them independently could contain. Had the December 1976 break-up of the Liberian tanker, Argo Merchant, off Nantucket Island, which caused a discharge of 7.5 million gallons of oil, occured off eastern Africa, the impact on the environment would have been grim. As it was, the incident caused consternation in the US and raised important questions regarding the competence of that country to handle such incidents (see the Wall Street Journal, December 22 1976, the Washington Post of the same date, and the New York Times of 30 and 31 December 1976). One way of preparing for such a major disaster would be to pool the resources available in the region.

At the same time, some of the states are engaged in the off-shore exploration for oil which, if it oil is discovered, could present further possibilities of pollution in the region. The Nigerian blow-out, as the recent Bravo blow-out off Norway in the North Sea in April 1977 was contained with American expertise. The Norwegian blow out was only contained after nine days, discharging 7.5 million gallons of oil (Herald Tribune, May 2 1977) at a cost of approximately $10 million (AFP, May 20, 1977). An important political factor is the proximity of the Republic of South Africa which means that the other states, sharing a diametrically opposed political outlook, must stick together to the exclusion of South Africa in their technical, scientific and economic initiatives. It is also significant that all the countries in the region are less developed countries, and the all share common aspirations to understand the living resources in the area, to protect such resources from either extinction or degradation as a result of pollution, and to promote competence in all forms of scientific research, including the effects of warm currents and the winds on the environment. Given these considerations, there is much to be said for grouping the region as one.

A case could be made for initiating cooperation among the governments of the eastern African coastline aimed at the protection of the marine environment of the region. The common factors which influence the resources in the area should be investigated, and coastal developments should be planned in an

integrated fashion in order to avoiding adverse environmental consequences. In comparison with West Africa, eastern Africa has relatively few cities with significant populations, industrial establishments and ports. The envisaged developments of Mombasa, Tanga and Dar es Salaam ports, and such industries as may be established in the area, are unlikely to have a revolutionary impact on the environment in the immediate future, particularly given renewed emphasis on rural development in Kenya, Tanzania, Mozambique and Madagascar. It seems timely to begin preparing for regional cooperation to prevent undesirable consequences for the marine environment of the region, also keeping in mind the tourism industry in some of the concerned states.

This marine region is not at present a priority for UNEP's regional seas programme as priority is now being given to the Mediterranean and the Gulf of Guinea. UNEP and other UN agencies, however, are concerned with a number of activities in the areas for example monitoring and the living resources of the Indian Ocean, as well as the identification of national scientific institutions in coastal countries throughout the world. In this connection, UNEP has sponsored a 'Marine Environmental Monitoring and Marine Living Resources Assessment Programme for the Indian Ocean Region' which was carried out from June 1975 to June 1977 by the National Institute of Oceanography of India. This programme included the preparation of a listing of institutions with oceanographic capabilities, particularly their facilities, personnel and ability to carry out oceanographic monitoring and living resources assessment. In cooperation with IOC and FAO, the Institute is also to prepare a plan for the assessment of the living resources of the Indian Ocean. There is an on-going FAO/UNDP 'Indian Ocean Fisheries Survey', and UNDP/FAO are also initiating a fisheries project for Zanzibar whose first phase will cost US $4.1 million (AFP, 23 May 1977, p.15). There can be little doubt that when completed, these projects will make a useful contribution to the preparation of African regional cooperative arrangements and will broaden our knowledge on this environment.

But how do the governments of the area regard the protection of the marine environment? They do not all consider it equally important as is shown by their participation in the Governing Council of UNEP. As of 1977, four eastern African countries were members of the Council, Kenya, Tanzania, Malagasy and Somalia. Of these, Kenya has brought up the subject of marine pollution as important, and as warranting the sort of action taken in the Mediterranean, in the Third, Fourth and Fifth Sessions. Kenya was also one of the states which played a prominent role in drawing up a list of UNEP priorities in 1973 during the First Session of the Governing Council. Some of the states of the region such as Tanzania, Kenya, Mauritius, Malagasy and Somalia, have played important

roles in the Law of the Sea negotiations.

One aspect of coastal development that implies a concern about pollution is tourism, as it is seriously affected by pollution. Concern for tourism is uneven among the governments of the region; a great deal of concern for coastal tourism is only evident in Kenya, Seychelles and Mauritius. Kenya has protested very loudly against oil pollution as manifested by tar balls on beaches along the coast. The incidence of tar balls may decrease along the eastern African coastline following the reopening of the Suez Canal. Kenya has also prosecuted ships known to pollute coastal waters. There should be a similar concern in Seychelles and Mauritius, both of which, like Kenya, earn significant revenues from coastal tourism. This Workshop in eastern Africa, organised by IDS, should point out gaps to be filled in our knowledge and map out areas of possible co-operation and action.

Further meetings should be organised among all the coastal states of eastern Africa to investigate the various sources of pollution, such as oil, industrial/sewage and agricultural chemicals. These meetings should also bring into focus the various national institutions (or lack of them) dealing with marine affairs, the available equipment and scientific expertise, for only with such information can a sensible action plan eventually emerge.

Southern African Region

The Southern African region is a misnomer at present for, excluding Namibia, it involves only one coastal state, the Republic of South Africa. Consequently only national measures by South Africa, directed towards both the Indian and Atlantic Oceans, can be envisaged for now. However, should the policies of South Africa change to make it acceptable to the OAU and the ECA, South Africa could join in regional cooperative arrangements for both the Indian and the Atlantic Ocean. Till such time, this area is of national rather than regional concern, and as such cannot expect to receive priority by international organisations. This then is a case where political hostility is more important than co-operation, however desirable, in technical and scientific fields.

CONCLUSION

We have attempted to survey the situation around Africa in terms of possible areas of regional cooperation and in the context of ongoing activities, particularly as regards UNEP, We have shown that UNEP, along with other UN agencies, is deeply involved in the Mediterranean, has led the way in preparing for action in the Gulf of Guinea and will play a

lesser role in the Red Sea where the Arab League has provided strong leadership in a region of visible political sensitivity.

The eastern African Indian Ocean coast is not yet a priority in the UNEP regional seas programme, but there is scope for the area to be taken up in due time when the governments of the region show a concerted readiness for action. During the Fifth Session of the Governing Council, Kenya strongly urged action for this area in the Plenary Session and in Sessional Committee I.

Pending a regional co-operation programme, as dictated by desires of the relevant governments and the peculiarities or potentialities of the region, a great deal of action is possible at the national level to preserve the marine environment off the coast and its living resources. Some of the steps which could be taken are as follows:-

1. First each coastal state should deliberately accord marine affairs some priority in the context of its economic development, and an effort should be made to give substance to such policy intentions. The starting point, should be to examine whether there are existing institutions which can carry out a policy of studying and protecting the adjacent seas. If there are institutions such as marine or oceanographic institutes or centres, to train marine specialists and oceanographers and conduct scientific research, they should be examined, the equipment in their custody assessed, and their financial and personnel needs determined.

In East Africa, within the context of the East African Community, there has been an East African Marine Fisheries Research Organisation which was based in Zanzibar and subsequently moved to Mombasa. In fact the contribution of this Organisations seems to have been very limited, but it does exist, and it might serve as a focus for co-operation among the East African states, though in view of present tensions the prospects are not encouraging. An evaluation of other institutions in the region should be carried out.

In Kenya three other institutions could possibly provide a nucleus for development in marine studies either separately or better still in collaboration. Co-operation between government departments and the oil industry is manifested in the recently created Anti-pollution Committee in which the National Environment Secretariat is playing a coordinating role. Besides this effort, other national departments or institutions worth mentioning include:-

a. The Ministry of Tourism and Wildlife, whose Department of Fisheries has laboratories and, apparently, some fairly modest equipment which could be a basis for giving practical training to marine biologists.

b. A National Council for Science and Technology was formed within the Ministry of Finance a few years ago. The Council as presently constituted has a limited staff ; lacks the resources to administer an effective marine research, coordination and training programme, but it surely has the potential to do this with some additional support.

c. The University of Nairobi has reputable science faculties and distinguished Kenyan and non-Kenyan scientists who could probably respond quickly to the need for undergraduate and graduate training in marine sciences, supplemented by the creation of an oceanography department or institute as a constituent part of the University. The idea of such an institute has been discussed not only in the University but in government circles, but it has yet to be implemented. Given that marine affairs are of priority concern, it should take little persuasion to initiate national action without delay.

Elsewhere in the region, training in marine science has been initiated. Thus Tanzania, Mozambique, Malagasy and Mauritius have national universities where present training in fisheries and marine biology is based and could be expanded to meet increased national and regional needs. Tanzania has a Research Council and has done groundwork for the establishment of a Marine Science Development Centre under the University of Dar es Salaam. In Malagasy, there are plans to establish a Regional Oceanographic Training Centre (ECA Report of the Fourth Meeting of the Intergovernmental Committee of Experts for Science and Technology Development, Addis Ababa, 24 - 28 January 1977, E/CN.14/684, pp. 4 and 10).

2. The second aspect of national action is to develop the capacity to detect and punish violators of national legislation, who degrade or pollute coastal and adjacent waters from ships, and to clear away the effects of such pollution and degradation in a reasonable time after occurrence. This is a complex, difficult and expensive undertaking for any country, as past oil-spill incidents have shown, and particularly so for developing countries, given their budgetary constraints and competing national demands and expectations. Nevertheless there is no choice: an effort has to be made to develop these capabilities, at the national level

or in co-operation with other states. For a start, some of the states of the region, for example Kenya, Tanzania and Malagasy, have navies - albeit of limited capability - whose mandate could be broadened to include pollution control activities. Police airwing and civilian aircraft could also be used initially. Some limited capability could also be built around each national port authority. In this connection, the establishment of an anti-pollution committee by Kenya, and its association with the port authority, government and oil industry, is a step in the right direction. In this connection it should be noted that IMCO could, if requested, render technical advice.

3. The third aspect of national action is to study relevant marine environment instruments with a view to accepting and effectively enforcing them. Such instruments include several IMCO and other international conventions, e.g., the London Convention on Dumping of 1972. All too often a number of governments accept international instruments and thus assume international obligations, but without giving national effect to such instruments. Such a lacuna cannot be redressed other than by national authorities, and such action in itself shows that a country is serious in its concern for the protection of the marine environment. Such action is needed by the governments of Eastern Africa.

For example, only Kenya and Malagasy Republic are parties to the IMCO Convention for the Prevention of Pollution of the Sea by Oil of 1954; as amended in 1962, and only Malagasy Republic has accepted the 1969 amendments; Kenya and Mauritius are parties to the Geneva Convention on Fishing and Conservation of the Living Resources of the High Seas of 1958; only Kenya is party to the London Convention on the Prevention of Pollution from Ships of 1973; while Somalia and Tanzania seem not to have accepted either of the foregoing conventions or such other conventions as the Geneva Convention on the High Seas and the Continental Shelf of 1958 to which Kenya, Mauritius and Malagasy are parties. None of the states of the region except Kenya has, as of now, ratified the important 1973 IMCO Convention on the Prevention of Pollution from Ships. It may be useful to mention that Nigeria asked IMCO to send an expert to study its ports and advise on the implications of ratifying the 1973 Convention. The 'Wennink report' of the study, entitled 'Report on the Evaluation and Qualification Related to the International Conference on Marine Pollution' as it Applies to the Federation of Nigeria', is extremely informative. So are paragraphs 63 to 83 of a paper entitled 'Environmental Impact of the Transportation of Oil' prepared by an IMCO staff

member, Mr. Yoshio Sasamura for the UNEP Petroleum Industry Seminar, held in Paris on 29 March to 1 April 1977, which review the development and application of global instruments that relate to oil transportation.

4. Each nation should examine whether or not it has adequate environmental legislation and whether such legislation is effectively enforced. Gaps should be identified which can be redressed at the national level. President Kenyatta reiterated this concern unambiguously for Kenya in his 20 October 1976 address to the nation. Many nations do not lack appropriate legislation, but rather do not enforce such legislation. One important issue that requires constant attention is the decision on the location of industries and the standards to apply to avoid causing undesirable environmental consequences to marine regions and resources.

5. Educating the public not to pollute their coastal environment is essential. Environmental education is of cardinal importance to the health and enjoyment of the people and the health of the environment. The public should be educated not to litter their beaches, dump wastes in coastal waters or use unsanitary methods of waste disposal, all too common among fishing village communities along the coast. Public education should also be extended to weekend tourists who are increasingly becoming a phenomenon at the coast.

There are just a few possibilities for government of the region to consider and discuss in further meetings and seminars organised on an eastern African basis. Such discussions will hopefully lead to some more substantial form of regional co-operation in this important field. This Workshop has made an important beginning.

SCIENTIFIC BASIS FOR THE DEVELOPMENT AND MANAGEMENT OF COASTAL AND OFFSHORE MARINE RESOURCES

by

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NATURAL COASTAL SYSTEMS

The natural environment of coastal areas is the most complex in the world, because the coastal areas consist of naturally intricate terrestrial systems and marine systems, plus the manifold interactions between the systems and the variations of the subsystems from place to place. Although a given environment may appear to be quite stable, this stability is in fact typically a state of dynamic equilibrium, with the environment in a delicate balance involving a myriad of natural processes. Hence, development of coastal resources may not only have profound effects on the environment but also these effects cannot be controlled or predicted without a deep understanding of that environment. The management of human activities in the coastal areas must be based on a thorough knowledge of the environment.

The basic scientific approach should be that any given environment is composed of a spectrum of natural systems. Each environment is different, depending on which systems are in ascendency. As examples, the marine geological systems are almost all associated with mass transfer. The biological systems should be based on ecological systems. The chemical systems involve mass balances and *in situ* reactions. The marine physical systems require analysis of environmental parameters such as tide, sunlight and temperature. Each coastal environment requires specific analysis to determine the relative importance of each system.

Coastal resources are both concrete, such as fish or sand, and abstract, such as the aesthetics of beach use. A coastal resource constitutes an element of the coastal natural environment or a sum of such elements. It is a resource because its special or collective properties are of use to society.

For our purposes, there is no distinction between concrete and abstract coastal resources, because the important factors are:-

1. Identification of the properties useful to society,
2. Finding the means to exploit these properties, and
3. Controlling the impact of exploitation on the environment.

We shall first discuss the scientific systems involved and then how to handle these in the context of coastal development. An emphasis will be placed on marine systems, but this must not obscure the relevance of terrestrial systems.

Physical Processes and Systems

The understanding and modelling of the physical systems or physical processes of the coastal environment should be the starting point of all coastal investigations, as all other natural coastal systems (geological, biological, chemical) are conditioned by these physical systems and factors. Conservative physical properties, such as density, temperature and wave energy, can be considered as systems where quantities are transferred. Examples of physical processes are wind stress, temperature diffusion and mixing, which drive or affect the physical and other systems. Physical factors of importance in coastal aquatic systems include waves, tides, currents, temperature, density (a function of temperature and salinity), pressure, mixing, sound transmission, light and light transmission and wind and other air-sea interaction.

Considerable progress has been made in recent years in the numerical modelling of coastal circulation, especially in bays, lagoons and estuaries (see, for example, Gordan and Spaulding, 1974). The models range from highly theoretical to highly empirical. For instance, models for estuaries of complex geometry are quite empirical, using factors such as basin topography, tidal cycle, wind stress and bottom stress as parameters, and testing the iterative models against known current velocities measured at selected sites in the estuary. Numerical models are very useful when investigating such disparate matters as the distribution of planktonic larvae, the diffusion of thermal plumes from power plants, or the distribution of bottom sediments.

The atmospheric system produces large effects in the coastal area through wind, rain and storms. The wind-driven currents and waves are an ever present factor, modulating the other systems. Hurricanes and typhoons are effective agents of change, especially if there is a large storm surge associated with a high tide at the coast. Progress is being made in modelling and forecasting such storms and conditions.

Chemistry of the Coastal Aquatic System.

The water chemistry of the coastal system is the most complex of all major aquatic systems. It is where that the fresh water of the rivers mixes with the saline water of the sea, yielding a very large range of chemical concentrations and producing various chemical reactions because of differing chemical equilibria between fresh water and sea water. In addition, there exist coastal waters with special characteristics of their own, such as the acidic and organic waters of marshes and mangrove swamps, the highly

saline waters due to high evaporation in desert areas, and of course the polluted water associated with the coastal disposal of organic and chemical waste. Finally, because coastal waters tend to be organically quite productive, the organic and nutrient chemistry of coastal waters is intimately related to the life cycle of marine organisms, especially phyto- and zooplankton and coastal seaweeds.

Several different approaches must be used to differentiate these coastal chemical systems. Three useful approaches involve determining mass balances, biogeochemical pathways and residence times. The establishment of the natural mass balance of a chemical element or species involves determining all sources and all sinks of this element. The biogeochemical pathways are those taken by the element from the sources to the sinks. The residence time of a component in sea water (or any other sub-system) is that time that it takes for half of the component to be removed.

Sources in the coastal aquatic system include rivers, local surface runoff, submarine ground water springs, rain, wind-borne materials, the upper oceanic waters and the coastal upwelling of deep, nutrient-rich oceanic waters. The land sources may provide highly organic material. Sinks include the sediments, the atmosphere, the open ocean and organisms. The chemical pathways may be quite simple, such as the simple mixing of riverine and marine sodiumions, or quite complex such as those for dissolved silica in which both inorganic and organic factors are active.

When dealing with pollution, the concepts of chemical mass balance, biogeochemical pathways and residence times are vital for determining the ultimate fate of these introduced compounds. For instance, if the balance cannot be made, then on one extreme a significant sink exists which must be found and accounted for, or at the other extreme an important source of pollution remains to be identified. The biochemical pathways determine the effect of the pollutant on the organism. The biogeochemical pathways and sinks determine how nature is dealing with the pollutant. The residence time shows whether the effects will be short-term or long-term.

Marine Geological Systems

The geological system here is considered to consist of (1) Source, (2) transport and (3) sink. The system then is concerned with the transfer of matter. This transport may refer to either a mechanism or process. Most research in the past has been devoted to uncovering the process. Thestages are reasonably well known (or inferred) now (see, for example, Shepard, 1973), so that the entire

system can be discussed. A large coastal system may consist of several successive sub-systems, where the sink of one becomes the source of the next (see Table 1).

Table 1. Components of the coastal geological system.

Sources

river and its delta
headlands and eroding beaches
offshore older deposits and transient offshore bars
windblown sediment (usually minor)

Transporting agents

waves
currents
winds

Sinks

aggrading beaches
deeper continental shelf
submarine canyons
transient bars
sand dunes and lagoons behind beaches

The geological systems of the coastal environment must be considered to be in a state of dynamic equilibrium. As such, a change in one element of the system produces feedback through the system requiring that a new state of equilibrium be attained. Such a change need not necessarily be deleterious, but unless the dynamics of the system are understood the effects cannot be predicted.

Rivers and streams constitute the major source of sediment to the coast. Where the river source is large, deltas form, such as the Rhone, Nile and Mississippi deltas (each of which is different). Note that these deltas are in dynamic equilibrium as well - major erosion has occurred on the Nile delta with the blockage of the Nile flow by the Aswan dam. Sinks vary depending on the local sub-system. Landslides are locally important sources of sediment along shore cliffs; submarine landslides are a major means of sediment 'failure' for initiating sediment transport down submarine canyons.

The process of beach erosion is now understood in the context of multiple sources and sinks of sand with the sand moving under the forces of waves, currents and the wind. The beach itself is an equilibrium feature undergoing dynamic change. A change in any factor has immediate repercussions on the beach.

For a beach, there is an onshore-offshore component of sediment movement and a longshore component. Typically during the winter with its larger waves, the beach is eroded and the sand is transiently stored in an offshore bar, leaving a gravelly beach if such material is available. During summer, the sand is transported back to the beach by the gentler waves (because the backwash of the wave is gentler than the beachward thrust), and the beach aggrades. For most beaches (except small pocket beaches), the waves and currents produce a longshore sediment driff component. As long as the sediment source supply is abundant and the ultimate sediment sink is stable, then the year to year character of the beach will not undergo significant change. On the other hand, if the sediment source is cut off (for example, by a newly constructed breakwater), then the beach will erode, because the sand of the beach will continue to be fed into the sink; the results can be disastrous for nearshore construction. Conversely, that same breakwater will act as a trap and the beach will build out on its up-current side.

Modern marine geology cannot be understood without considering the repeated major lowering of sea level due to continental glaciation (the 'ice ages'). The most recent lowering was 130-150 metres about 15,00 years ago. After that time, the sea level rose rapidly to near the present level about 5,000 years ago, as the continental glaciers melted, and this level is still rising very slowly at a few centimetres per year. When the sea level was low, all or most of the continental shelf became land, with the result that rivers debouched at the shelf's edge. Moreover, rivers cut deeply into their former beds producing canyons at the present coastline, and as the sea level rose, these canyons gradually filled. The beachline, of course, also moved across the shelf so that the present topographic features and sediments of the continental shelf are a mixture of relict river and beach features upon which may be superimposed modification due to modern processes. Just as we find that heavy minerals (magnetite, titanite, gold, platinum, diamonds, etc.) are concentrated in modern beaches, so there are older analogs under relict beaches on the deeper continental shelf.

Table 2 gives examples of useful or important geological properties, materials and processes of the coastal area, with examples of impact.

Table 2. Geological properties, materials and processes of the coastal area.

Mineral/fluid sources: sand, gravel, lime, heavy minerals, petroleum, fresh water

Removal of sediment from channels and harbours

Transfer/importation of sediment for beaches and land fill

Construction of breakwater, piers and other structures

a. may change sediment regime

b. may require knowledge of foundation properties

Removal/transfer of sediment may/will change sediment regimes and, if in lagoons or estuaries, change the tidal prism which determines the flushing rate

Oil production may/will require structures and can cause land subsidence (through removal of subsurface oil) with severe results at the coastline

Coastal landsliding can be induced by a number of factors such as cutting away the toe of the slope, introduction of water which lubricates the slide plane, etc.

Certain sea floor and terrestrial soil properties favour certain biological resources

Disasters, particular to coastal geology, include tsunamis associated with Krakatoa-type volcanic eruptions and with large-scale sea-floor movements associated with certain earthquakes.

Ecosystems

Biological systems or ecosystems are very different from geological systems, but they share the property of dynamic equilibrium. Ecosystems are very much more complicated than geological systems and are by no means competely understood. Nevertheless, significant progress is being made in modelling ecosystems (see, for example, Steele, 1974). In order to characterise an ecosystem (terrestrial or marine) a large number of factors must be known. As in geological systems, ecosystems are made up of many subsystems which interact with one another. Ecosystems can be analysed in various ways. A common one is to evaluate the energy flow through the system, taking into consideration all inputs and outputs.

One must know the life cycle of individual organisms and their trophic level (i.e., who they eat and who eats them) in the food web. Symbiotic (mutualism) relations must be known.

If an ecosystem is to be characterised, the following parameters ideally need to be measured: the species present (both plant and animal), the quantity of each specise, the age of each species, type of communities present and niches present.

The geological substrate is important for an ecosystem. In the marine environment, such a substrate can consist of gravel, sand,,mud (silt and clay), clay or limestone (shells, breccia or solid reef). The substrate may be very simple, as in a sand beach, or very complex, as in a marsh (sediment plus organic matter in various states of acidity, oxygen tension and salinity).

Environmental parameters have a significant effect on ecosystems in their absolute value, their range in value with time and even in their rate of change with time. For example, a simple organism's rate of metabolism is determined by the surrounding temperature, organisms differ in the range of temperature that they can tolerate and an organism may undergo 'thermal shock' by too radical a temperature change - a change that might be survived if it had occurred over a longer time interval.

For marine organisms, the important physical parameters (with their changes) include sunlight (length of day and cloud cover), temperature, salinity, turbidity (both as it reflects water clarity and suspended particulate material), water depth (including tidal change) and parameters associated with waves, tides and currents such as periodicity, velocity, trajectories and verticity. Chemical characteristics of water are vital for marine plants and affect marine animals. Important chemical parameters (with their changes) are salinity, oxygen, the major nutrients (nitrate, phosphate, silicate), various trace metals (such as copper) and various organic and non-organic compounds which can stimulate or depress. Pollutants typically fall into the last category. Physical parameters of the substrate also affect marine ecosystems: rock versus sediment , sediment grain size distribution, sediment cohesion, sediment permeability, Eh, pH, and lateral and vertical changes.

All of the above have their analogs in the terrestrial coastal ecosystem. Man can affect the ecosystem in various ways, for example: exploitation of single species which affect the overall equilibrium, exploitation of off-shore sand and gravel which may affect the habitat of benthic living resources, filling of wetlands, introduction of waste industrial chemicals and poisons, introduction of organic matter and nutrients, changes in salinity (e.g., damming rivers) and changes in temperature (e.g., warm effluent from power plants).

MANAGEMENT OF NATURAL COASTAL SYSTEMS

Management has been defined as 'judicious use of means to accomplish an end' (Woolf, 1975). Thus we must specify the end in order to discuss the system of management. On the basis of UNESCO's Constitution and its stated objectives, I summarise (speaking as an individual) UNESCO's overall ends to be the promotion of science through international co-operation for the purpose of ensuring:-

a. The survival of man (both short term and long term),

b. The intellectual, emotional and cultural evolution of man, and

c. An enhanced quality of human life (physical, emotional and intellectual).

These goals are relevant to the issues under consideration, which are not simply economic because an important factor involves the environmental feedback in the development of the resources. Many societies are now requiring that development meet defined environmental standards. Such standards are based on cultural standards which change as society and, indeed, development evolves. Such standards require that disturbance of the environment can proceed only so far and that an environmental cost be reckoned in the cost of exploitation. The environmental knowledge to assess the state and changes of the environment are acquired through scientific investigation. Thus, the seminar here inherently involves economic, scientific and cultural factors, as well as a host of other factors (see for example Msangi and Griffin, 1974).

Coastal resources development and management requires a complex interdisciplinary effort to deal with this use of the coastal environment, involving several fields such as environmental science, law, economics and demography. (Figure 1). Here we are particularly concerned by the environmental aspect, since human use of the coastal area must react with the environment in accordance with natural laws. The intelligent management of that use can only be carried out through knowledge of those natural laws and hence through intimate collaboration with the environmental sciences. Diagrams are very useful in outlining (a) the necessary input into a suitable management use policy (Figure 1), (b) how that use policy is modulated by environmental science (Figure 2) and (c) the role of the environmental scientist in a development scheme (Figure 3).

The role of the environmental scientist has three aspects: Theoretical knowledge, environmental research/monitoring and science policy. The information required from environmental science for coastal development/management policy

includes the following:-

a) Statement of natural laws governing the entire environmental system,
b) Existing state of knowledge of a given environment,
c) Identification of gaps in knowledge regarding a given environment which must be filled through research,
d) Response of a given environment to various inputs,
e) Long-term predictions, and
f) Recommendations.

A clear distinction must be made between science and applied science/engineering, because the term 'science' is being used rather loosely in modern society. Science as used herein is 'a) knowledge covering the operation of general laws as obtained and tested through the scientific method and b) such knowledge concerned with the physical-biological world and its phenomena ...' (Woolf, 1975). The scientific method consists of 'principles and procedures for the **sy**stematic pursuit of knowledge involving the recognition and formulation of a problem, the collection of data through observation and experiment and the formulation and testing of hypotheses' (Woolf, 1975). Applied science is the application of science to 'practical use, especially applying general scientific principles to solve definite problems' (Woolf, 1975). Engineering is closely related but not necessarily synonymous: it is 'the application of science and mathematics by which properties of matter and sources of energy are made useful to man in structures, machines, products, systems and processes' (Woolf, 1975).

In terms of the different aspects of development, science (or better, basic science) has as a short-term goal 'intellectual development', while 'economic development' only appears among its long-term goals. In contrast, economic development is a prominent short-term goal of applied science and engineering, while intellectual development only appears among the long-term goals. Thus, although all these fields of activity require fine skills and intelligence, the short-term outputs are often very different because of different objectives.

It should now be clear that simplistic approaches have no place in dealing with coastal development. The history of coastal development shows that projects which disrupt coastal systems at the minimum have adverse environmental effects, and at the worst not only fail to accomplish their developmental objective but make conditions worse. Nonetheless, the coastal system has considerable resiliency and development can succeed if it is

Figure 1 Role of environmental sciences in developing a rational coastal zone development/management policy. (The diagram suggests how science modulates certain other inputs).

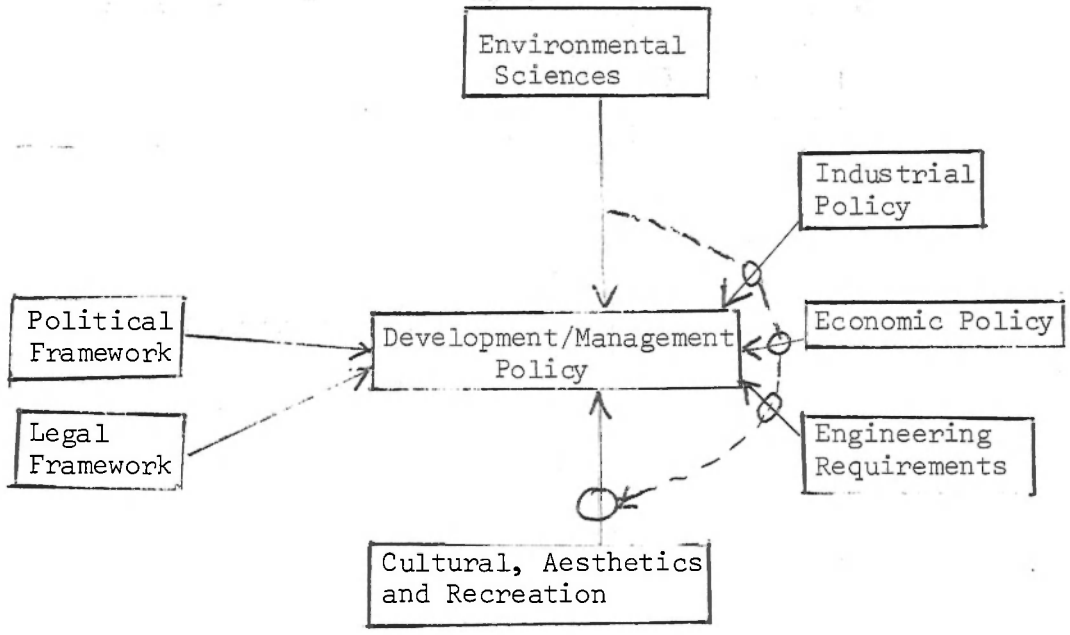


Figure 2. Role of environmental sciences in implementation of coastal development/management showing identified categories of coastal use.

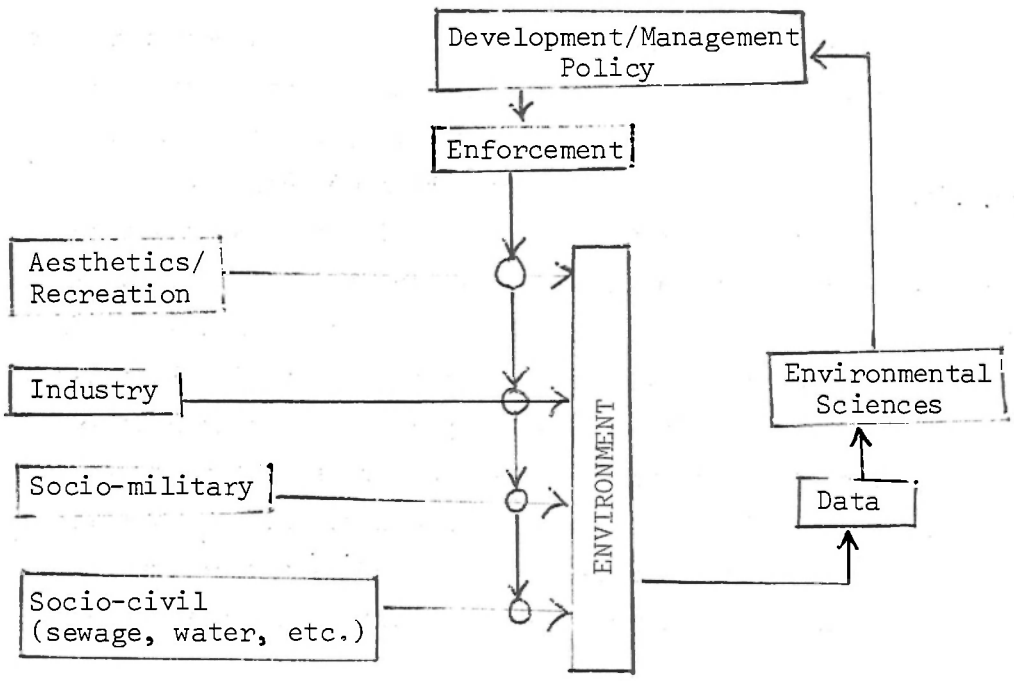
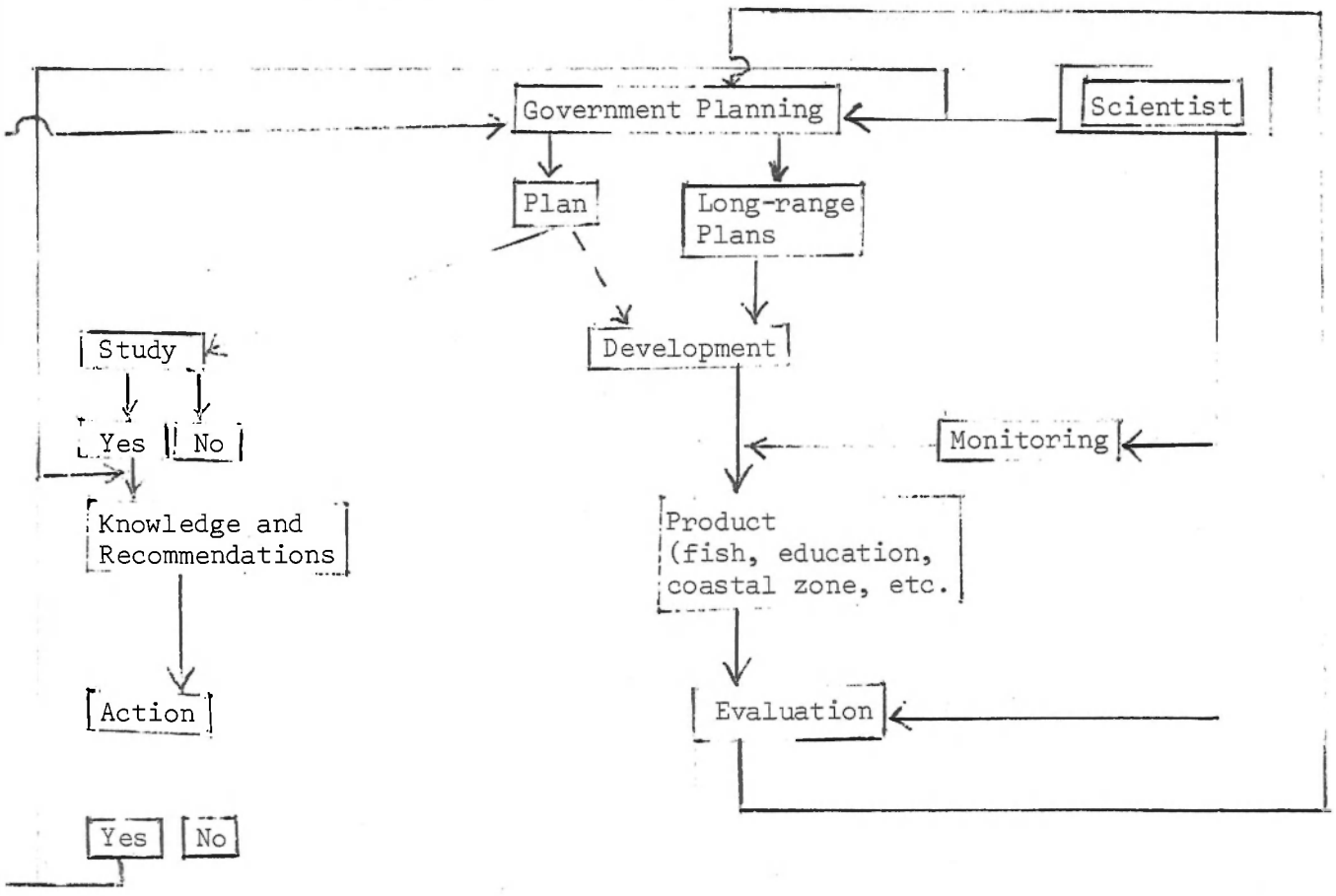


Figure 3. Schematic outline of a scientist's possible participation in a development scheme.



planned and implemented in harmony with the coastal systems. In the following, I assume that is the objective.

At a very early stage in coastal planning, a thorough reveiw must be made of the available knowledge base concerning the marine and terrestrial environment of the concerned coastal area. Concurrently, a survey should be made of the coastal area in order to classify the major operative natural systems and their regional context. An analysis of these two inputs will establish where data gaps exist which require long-term efforts to fill, such as tidal data, prevailing wind direction and speed, etc. Steps should then be taken to establish research and survey projects to acquire information considered to be high priority. Both basic and applied science approaches may be required. Knowledge required for land-use policy is particularly necessary at this stage. A basic identification of coastal resources must be made before exploitation can be considered and the necessary programme for identification of coastal resources should be initiated at this stage.

As coastal planning focusses on specific sites, uses or development projects (see Table 3), a more detailed scientific approach is required. Detailed analysis is required on how the natural systems will affect the use or project, and vice versa. The systems must first be identified and then evaluated as their importance to design or impact. Gaps in knowledge must be identified. This requires a close interaction between the scientist, the engineer and the planner. A research programme must be established to acquire high-priority data needed for design purposes and to estimate the environmental impact of the development project. Resource surveys will be required to evaluate the specific resource in question. The scientific work at this stage will be highly applied but may be usable for basic science as well, if the supporting research projects are carefully designed. This is particularly useful where the local environmental knowledge base is small, because such research will help support later development projects by providing a better understanding of the concerned natural systems. Trained manpower, resources and data processing facilities are limited in most countries, and effort must be directed to gathering and processing only a small portion of the environmental parameters. A careful, thorough analysis of the systems at the start of a project will save time, effort and resources during implementation. The relevant parameters and systems should be identified with as much precision as possible (and reviewed as the project progresses) rather than using a shotgun approach. Priorities should be established as to the parameters needing investigation and monitoring.

If the environmental analysis and the project design allow implementation of the project, then a third stage of environmental research should be implemented to monitor and evaluate feedback between the environment and the development project. The specific type of research will depend upon the parameters to be measured and the frequency of measurement. Long-term follow-up may or may not be required, depending on the type of development project. For example, little follow-up will be required after construction of a bridge, but extensive follow-up may be required to monitor the effects of a power plant's thermal plume in the water or atmosphere.

The scientific analysis at any of the three stages (planning, design or implementation) may reveal major knowledge gaps concerning the fundamental dynamics of a given natural system or sub-system. The time frame of the latter two stages may not allow such knowledge gaps to be filled as the research may be rejected as too lengthy, too complex or too basic. If future development projects deal with the same natural system, then a mechanism must be available to support scientific research into such systems. Whether such

Table 2. Examples of coastal development.

Marine

Resource exploitation

- Surface minerals (sand, heavy minerals, phosphate, limestone, etc.)
- Sub-surface petroleum
- Distillation of salt water for fresh water
- Extraction of chemicals from sea water (salt, bromine, magnesium, etc.)
- Direct energy extraction from waves, currents, thermal differences, etc. (of potential use)
- Fisheries
  - benthic
  - pelagic
  - mariculture
- Seaweed harvesting

Construction

- harbours
- breakwaters
- bridges
- offshore oil wells and terminals
- power plants
  - wearshore
  - offshore, floating (planned)
- buoys, light towers
- underwater pipelines and cables

Other uses

- Aesthetics and recreation
  - beach use
  - sailing
  - conservation areas for coral reefs, marine views, etc.
  - marine scientific research
- Homes on houseboats and yachts
- Transportation of goods and people by sea and air
- Waste disposal (solid and liquid waste, heat).
- Defence zones

Terrestrial (more complex than marine development and classified differently)

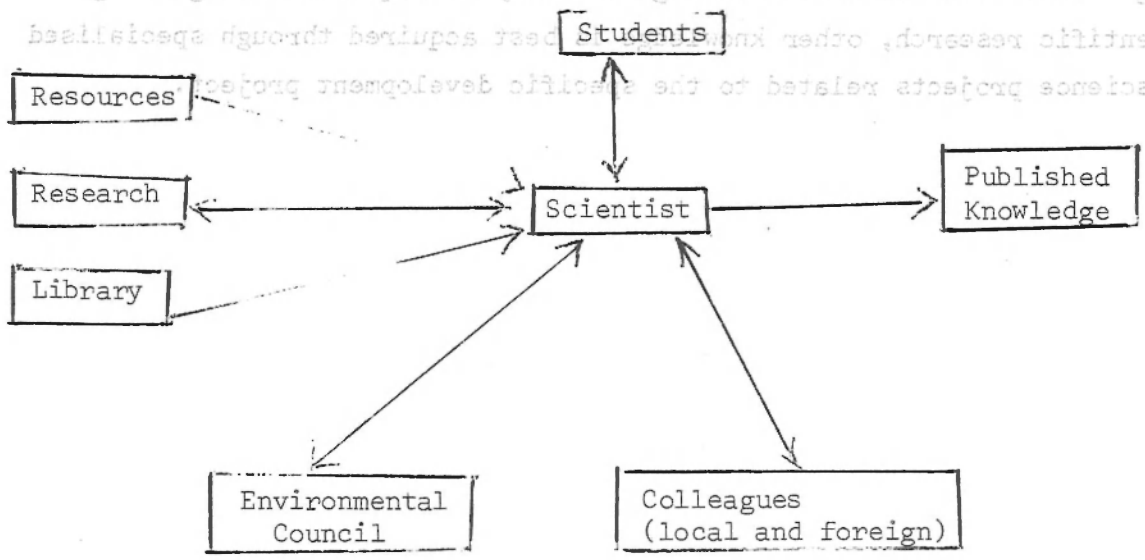
- Human habitat
  - life support system
  - recreation and aesthetics
  - social system infrastructure
  - ecology
- Goods production/transfer/use
- Food production/transfer/use
- Energy production/transfer/use
- Water production/transfer/use
- Mineral production transfer/use
- Waste production/transfer
- Land surface use
- Transportation = transfer (roads, railroads, airports, pipelines, wires, etc.)
- Construction to support above.

research is applied or basic is simply a semantic question if the lead time is long.

The effort required to carry out environmental research should not be underestimated. First, environmental research, particularly marine research, can be quite expensive in time and funds, and second, the development may succeed or fail on the basis of the quality of the data acquired. A compensating factor is that for most individual development projects only certain natural systems will be crucial to the design and impact, and thus the required data may be restricted to only certain parameters. Well trained scientists and engineers are required so that they can draw on the extensive existing knowledge acquired around the world in similar environments and apply it to the specific project. Field equipment and properly equipped scientific vessels and laboratories are required to measure and analyse the data.

If basic and applied environmental research is to be self-sustaining and effective in a country or region, the environmental scientist must be supported by an infrastructure such as the one depicted in Figure 4. Such an infrastructure can be evolved through a development scheme which will produce the necessary human resources needed to develop and manage the coastal resources.

Figure 4. Necessary structure and activities for a productive, effective scientist whose half-life is 10 years.



SUMMARY

The natural environment of the coastal area is made up of interacting natural systems: geological, biological, chemical and physical. The environment is extremely complex because it includes both marine and terrestrial systems, their mutual interactions at the shoreline, as well as meteorological systems. A very common characteristic of these systems is that they are in dynamic equilibrium; that is, any disturbance, either natural or man-made, on a system can cause profound changes on the entire system as it regains a new balance.

The problem facing planners is how to implement coastal area development so that the development will not be threatened by some unforeseen aspect of the complex natural environment and in turn the environment will not be adversely changed in some equally unforeseen way. Successful development planning hence requires a proper knowledge base and understanding of the natural environmental systems involved for each separate development project. For each project, the relevant natural systems must be identified, an assessment must be made of existing environmental data and information, a determination must be made as to what data and studies are lacking a work plan must be developed (and executed) to acquire and interpret the necessary knowledge a determination must be made of who is to do the work with the time and resources required and monitoring of the environment must be carried out as development progresses. Some of this knowledge can only be acquired through long-term scientific research, other knowledge is best acquired through specialised applied science projects related to the specific development project.

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THE ROLE OF THE UNIVERSITY IN THE DEVELOPMENT OF NATIONAL MARINE POLICY

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THE MARINE ENVIRONMENT OF THE KENYA COAST

Kenya has a coastline of approximately 500km which lies entirely to the south of the Equator, from 1°40's. The coast is bordered by a narrow continental shelf which, for the most part is 3 to 10km wide except in the north, off Lamu, where it extends out to 45km. From Malindi in the north to Shimoni in the south an almost continuous fringing reef has developed on the continental shelf, being broken only opposite creeks and estuaries where the outflow of fresh water has killed the corals.

Most of the reef is dead and is in the form of elevated platforms which are emersed at low tides. Living corals occur mainly on the seaward side of the platforms and in shallow inshore regions. There are especially well developed corals around Kiunga, Malindi, Watamu and Kisite.

The littoral habitats of the coast are varied. These include beaches, cliffs, reef platforms which may enclose 'lagoons' and channels, sandy shores and mangove swamps. These habitats support a rich variety of flora and fauna.

The northward flowing East African Coastal Current forms the surface water at the coast and governs the conditions in the upper layer of the sea. However, its northward extent, velocity, vertical thickness and salinity are all affected by the two major alternating monsoonal seasons to which the coast is subject.

RESEARCH ACTIVITIES.

Science studies on the marine environment in Kenya and its living

and non-living resources are limited. A brief review of the published works shows that the hydrography of the East African coastal waters was surveyed by Newell (1957 and 1959). Since then little work has been done to enhance the hydrographical knowledge of the Kenya Coast.

The fisheries potential of the coastal waters has been surveyed by the Fisheries Department and the East African Marine Fisheries Organisation. However, more comprehensive data are needed.

The coral reefs on the Kenya coast have been surveyed recently by Hamilton (1976), who has carried out a mainly taxonomic study, and by Jachowski (1975) who has done an ecological survey of the Malindi Marine Park. Studies on marine turtles have been done by Frazier (1975).

Studies on the littoral have been carried out mainly by staff members of the University of Nairobi. These studies have mainly been biolo gical, but more recently some geological studies have also been carried out. Since 1962 the Department of Botany has conducted pioneering research in the marine botany of the Kenya coast. Prof. W.E. Isaac collected extensively along the coast between 1962 and 1969 and has written several, mainly taxonomic, papers on the algae and marine angiosperms (Isaac 1967, 1968,1969, 1971). Since 1972, this author has continued the work, mainly on the ecological aspects. S.K. Imbamba (1972) and E.M. Lind (1956) have made contributions.

The Department of Zoology has been less active in marine research due to staffing limitations. However, short-term research activities have been carried out by Dr. C.P.M. Khamala on echinoderms (1971) and by Dr. R. Jackhowski (1975) who studied the structure and ecology of coral reefs in Malindi Marine National Park, as mentioned above . The Department of Geology has recently been active in marine studies, with Dr. A.R.T. Hove's work on marine sediments. (see article in this volume)

Other studies on the littoral include those of Lawson (1969), the Bangor-Watamu Expedition of 1969, Yenenik (1976) and a group from the University of Leeds (Evans et al, 1977)

MARINE RESOURCES OF KENYA.

The marine resources of Kenya are perhaps the least exploited

natural resources of the country. Thus, there is need to carry out feasibility studies for economic exploitation of the living and non-living resources and expand present exploitation of the resources.

The inshore fishes of the coast are at the moment exploited on a small scale and largely at subsistence level. The coral reefs are productive, but not easily exploited by conventional methods. There is a need to improve the fishing methods and to raise fishing to an economic level. Also, since the continental shelf is narrow along most of the Kenya coast, offshore fisheries, based on such species as tuna, should be encouraged. Mariculture of fish and crustacea such as prawns and lobsters needs also to be encouraged and commercialised. Beche-de-mer are being exported from Kenya on a small scale at present. However, there are no studies on these creatures to assess their numbers and learn their biology in order to ensure continuous exploitation.

Studies on the algae of the Kenya coast by the author show that there are algae of economic value. The feasibility of exploiting algae for the extration of agar and alginate and their use as fertiliser need to be looked into in detail.

Mangroves have been exploited for a long time for use as timber for building purposes. Mangroves poles are exported from Kenya to the Middle East. However, there is a need for studies to assess the optimal rate of exploitation and conservation measures must be exercised, as mangrove swamps are an important habitat for certain fisheries.

Shells, corals and coral fishes are collected and sold to tourists and also exported. Though there are certain restrictions on the collectors, these natural resources are in many areas been overexploited which has led to the destruction of the reefs. A complete ban on collection has been imposed to conserve the habitats for posterity.

The economically exploitable non-living resources of inshore and offshore regions along the Kenya coast have been poorly surveyed and exploited. At present, common salt is extracted from sea water by evaporation at two sites north of Malindi. The Atlantic-type continental shelf of the Kenya coast might potentially contain oil reserves and surveys are now under way to locate exploitable reserves. Heavy minerals,

such as ilmenite, hematite and zircon, are known to be present on the Kenya coast, as pointed out by Dr. Hove, but exploration needs to be intensified to discover whether commercially exploitable quantities exist. (see Hove's paper in this Volume.)

In addition to possibilities for exploiting the marine resources of the Kenya coastal environment, there is a need to study and conserve the marine flora and fauna; to guard against pollution, for example by siltation, sewage effluent and oil spillage; and to retrieve and preserve items of historical importance along the coast. The contribution of the coast to the Kenyan tourist industry of this country is well known and requires no further elaboration.

THE ROLE OF THE UNIVERSITY.

The University as an institution of higher learning must involve itself in enhancing our knowledge of the marine environment and the animal and plant life of the region, as well as contributing to the development of marine resources, As pointed out in this volume and in the paper by Mr. Makau, there are indications of a wealth of living and, to some extent, non-living marine resources in Kenya's coastal waters which are at the moment not been fully exploited largely due to inadequate knowledge a about them.

What we do to exploit, manage or conserve the marine resources, we need in the first instance an accurate inventory of the environment, the processes operating initial and the factors which influence it. A review of the literature has shown that comprehensive information geological, chemical physical and biological aspects of the Kenya marine environment are lacking and it is imperative to acquire this information assess the potentials for national planning and management. The research programmes in the relevant department of the University should be co-odinated to meet these needs.

One of the reasons for the lack of information of the marine environment, and its resources has been the lack of trained personnel in Kenya and the lack of funds and facilities to carry out research programmes. Specific training in marine sciences has been at a low level in Kenya. Apart from some undergraduate courses in the B.Sc. programme at the University, there have been two regional training courses sponsored by UNESCO's Division of Marine Sciences which were held at the Kenya coast. The first was held in 1973 and was on 'The Inner Shelf and Nearshore Environments', and the

second one in 1974 was on 'Sedimentology of the Coast and Shelf Environment'.

The University's policy as an institution of higher learning is able to design suitable training programmers to fulfil the country's manpower requirements. As far as teaching programmes are concerned, the Department of Botany and Zoology have been offering course in marine botany and zoology as part of their undergraduate programmes. Up to 1976, these were core courses and included a joint field course at the coast. Since the 1976/77 session the number of marine-orientated courses has increased in both the departments and provisions have been made for some degree of specialisation in this field.

The Departments of Geography and Geology also cover coastal and marine material in their programmes and have been conducting a field course at the coast. The University has recognised that there are deficiences in the present course system. Trained graduates are needed to take up research and technical responsibilities in research institutes and other organisations, e.g., the University, the Fisheries Department, EAMFRO and the marine parks. Consequently the Faculty of Science has thought it appropriate to introduce a co-ordinated multi-disciplinary programme in marine sciences.

A committee, comprised of members from the various departments, was set up in 1976 to draw up a viable undergraduate programme in marine sciences. The draft programme has been under discussion by the departments and it is hoped to be launched in the 1978/79 session.

Proposed Programme of Studies for the B.Sc. Degree in Marine Sciences

A one-unit introductory course, covering the basic concepts of both the physical and biological components of marine sciences, will be offered in the first year. The second - and third - year programmes will be equivalent to one subject and will be offered under the physical and biological marine sciences options. This is necessary to allow for individual interests and specialisations. It is contemplated that teaching the various courses will initially be the responsibility of individual departments. However, a fully-fledged department of marine sciences is envisaged at a later stage. Initially the marine science programme (MSP) will be run by the Department of Botany with the advice of an Inter-departmental Committee made up of representatives of all the participating department.

The proposed programme is outlined below:

Units to be Offered under the Marine Science Programme.

Year 1. Introduction to marine sciences (1 Unit)

Chemical, physical and biological aspects of the marine environment will be covered. All departments will participate in the teaching of this unit.

Year 2. A. Physical Marine Sciences Option

CORE COURSES	OFFERING DEPARTMENTS
1. Chemical Properties of Sea Water (1 Unit)	Chemistry
2. Coastal Topography and Coastal Processes (1 Unit)	Geography
3. Mineralogy and Petrology of Marine Sediments (1 Unit)	Geology
4. Air-Sea Interactions (1 Unit)	Meterorology
5. Biology of Marine Plants (1 Unit)	Botany
6. Ecology of Marine Anthropods ($\frac{1}{2}$ Unit)	Entomology
7. Zooplankton ($\frac{1}{2}$ Unit)	Zoology

B. Biological Marine Sciences Option

CORE COURSES	OFFERING DEPARTMENTS
1. Biology of Marine Plants (1 Unit)	Botony
2. Arthropod Systematics ($\frac{1}{2}$ Unit)	Entomology
3. Ecology of Marine Arthropods ($\frac{1}{2}$ Unit)	Entomology
4. Zooplankton ($\frac{1}{2}$ Unit)	Zoology
5. Evalution and Systematics of Marine Invertebrates ($\frac{1}{2}$ Unit)	Zoology
6. Chemical Properties of Sea Water (1 Unit)	Chemistry
7. Coastal Topography and Coastal Processes (1 Unit)	Geography
8. Air-Sea Interactions (1 Unit)	Meteorology

Year 3. A. Physical Sciences Option

CORE COURSES	OFFERING DEPARTMENTS
1. Shore and Offshore Structures (1 Unit)	Chemistry
2. Eustatism, Types of Coasts and Shorelines; Submarine Morphology (1 Unit)	Geography
3. Geology of Oceanographic Areas (1 Unit)	Geology

4. Project: each student will carry out a research project in his Field of specialisation. (1 Unit)

OPTIONAL COURSES

1. Marine Natural Products (1 Unit)	Chemistry
2. General and Local Circulation of the Atmosphere (1 Unit)	Meteorology

B. Biological Sciences Option

CORE COURSES

1. Ecology of Benthic Marine Plats (1 Unit)	Botany
2. Phytoplankton ($\frac{1}{2}$ Unit)	Botany
3. Biology and Behaviour of Marine Arthropods (1 Unit)	Entomology
4. Comparative Physiology of Marine Arthropods ($\frac{1}{2}$ Unit)	Entomology
5. Marine Fisheries (1 Unit)	Zoology
6. Ecology and Behaviour of Marine Animals (1 Unit)	Zoology
7. Project. each student will carry out a research project in his field of specialisation. (1 Unit)	

The courses in the Biological Marine Science option are designed to produce graduates who would be fisheries officers, marine ecologists and biologists. The Physical Marine Science Option will produce scientists who can deal with pollution problems and chemical and physical aspects to the marine environment. Postgraduate programmes will also be offered.

To implement this programme the University's physical facilities at the coast need to be expanded and additional manpower recruited . The present physical facilities at Moana, the Botany Department's marine field station, are limited to a small laboratory, without flowing sea water, and simple living accommodation for five to eight scholars, However, the site offers ample space for additional developments. Future development plans include a new class and research laboratory block with following sea water, additional housing units for staffs, a student hostel and a fibre-glass boat for inshore fishing and plankton collection. Aquisition and development of other sites more suitable for geological and related physical marine studies is also envisaged.

Co-operation with existing laboratories at the coast (e.g. those of the Fisheries Department, the Marine parks and EAMFRO) in research, teaching and vessel facilities is envisaged to make the programme more effective, but this aspect has not yet been investigated fully. Finally, the University cannot afford to set up a marine science complex at the coast on its own. Funds from outside will have to be sought.

Other institutions in Kenya involved in the marine sciences include the Fisheries Department, EAMFRO and the marine parks. A national marine institute has been proposed by the National Council for Science and Technology. It is hoped that such an institute would involve itself in a number of areas:-

a. The formulation of policies for research and development

b. The co-ordination of all marine research activities in the country.

c. c. The development of natural and human resources in the coastal area, and

d. Communication with UNESCO/UN and FAO/UNDP who have shown an interest in the national marine programme, in the hope of obtaining financial aid fro them.

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