



UNITED NATIONS ENVIRONMENT PROGRAMME

*Management and conservation
of renewable marine resources
in the Eastern African region*

UNEP Regional Seas Reports and Studies No. 66

Prepared in co-operation with



IUCN

PREFACE

Thirteen years ago the United Nations Conference on the Human Environment (Stockholm, 5-16 June 1972) adopted the Action Plan for the Human Environment, including the General Principles for Assessment and Control of Marine Pollution. In the light of the results of the Stockholm Conference, the United Nations General Assembly decided to establish the United Nations Environment Programme (UNEP) to "serve as a focal point for environmental action and co-ordination within the United Nations system" (General Assembly resolution 2997(XXVII) of 15 December 1972). The organizations of the United Nations system were invited "to adopt the measures that may be required to undertake concerted and co-ordinated programmes with regard to international environmental problems", and the "intergovernmental and non-governmental organizations that have an interest in the field of the environment" were also invited "to lend their full support and collaboration to the United Nations with a view to achieving the largest possible degree of co-operation and co-ordination". Subsequently, the Governing Council of UNEP chose "Oceans" as one of the priority areas in which it would focus efforts to fulfil its catalytic and co-ordinating role.

The Regional Seas Programme was initiated by UNEP in 1974. At present it includes eleven regions ^{1/} and has over 120 coastal States participating in it. It is conceived as an action-oriented programme having concern not only for the consequences but also for the causes of environmental degradation and encompassing a comprehensive approach to controlling environmental problems through the management of marine and coastal areas. Each regional action plan is formulated according to the needs of the region as perceived by the Governments concerned. It is designed to link assessment of the quality of the marine environment and the causes of its deterioration with activities for the management and development of the marine and coastal environment. The action plans promote the parallel development of regional legal agreements and of action-oriented programme activities ^{2/}.

The Regional Seas Programme has always been recognized as a global programme implemented through regional components. Interregional co-operation among the various sea areas on common problems is an important element in assuring the compatibility of the different regional components.

As a contribution to the development of the Action Plan for the South Asian Seas region supported by UNEP in the framework of the Regional Seas Programme in the Indian Ocean region, the International Union for Conservation of Nature and Natural Resources, in co-operation with UNEP, has prepared this document.

^{1/} Mediterranean Region, Kuwait Action Plan Region, West and Central African Region, Wider Caribbean Region, East Asian Seas Region, South-East Pacific Region, South-West Pacific Region, Red Sea and Gulf of Aden Region, Eastern African Region, South-West Atlantic Region and South Asian Region.

^{2/} UNEP: Achievements and planned development of UNEP's Regional Seas Programme and comparable programmes sponsored by other bodies. UNEP Regional Seas Reports and Studies No. 1. UNEP, 1982.

The document reviews the past and on-going conservation activities relevant to the Eastern African region at the regional and national levels; identifies priority concerns of the Governments bordering the region; and contains recommendations for interregional and regional projects to be undertaken to address these concerns^{3/}. The assistance of the consultants, J. Kundaeli and L. Barratt, in the preparation of this document is gratefully acknowledged. In addition, the sections dealing with fishery aspects of conservation have been prepared by J. Beddington and J.A. Gulland. The report has been compiled and edited by the Tropical Marine Research Unit, University of York, UK.

^{3/} IUCN/UNEP: Marine and coastal conservation in the East African region. UNEP Regional Seas Reports and Studies No. 39. UNEP, 1984.

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INTRODUCTION

AREA COVERED

The Eastern African region has been provisionally defined as the marine and coastal area of the Indian Ocean within the jurisdiction of Comoros, La Reunion (France), Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia and the United Republic of Tanzania.

The total land area is about 3,540,169 km² (Table 1). The major rivers flowing into the Indian Ocean are shown in Figure 1. In Madagascar the rivers rise from the eastern mountain range (generally over 2,500 m above sea level) cutting across the heavily settled highland plateaux and the western livestock raising belts, both of which are experiencing extensive soil erosion. Thus, whatever land use practices and other developments in the catchment basins of rivers exist, even arising from outside the region, these will have an impact on the marine environment.

The coastal plain is negligible to almost absent on the granitic islands of the Seychelles, the volcanic-origin islands of Comoros and the Mascarenes, and almost the entire eastern coast of Madagascar. Mauritius, which is volcanically older, is less rugged with fairly flat areas along the northern coasts. Western Madagascar's extensive plains are especially associated with the major rivers and are probably the result of deposition of soil from the upland plateaux.

The mainland coastal plain lies less than 100 m above sea level and is very variable in width. It is narrowest (less than 10 km wide) along the Mozambique-Tanzania and Tanzania-Kenya borders and northern Somalia. It is widest (about 20 km) from central Somalia southwards to north of Mombasa (Kenya), central Tanzania, central and southern Mozambique.

Much of the coast, especially north of Kenya, is relatively unindented. This may be partially ascribed to the absence of large rivers and to the coastal currents which flow parallel to this coast. The result is that there are relatively few mangrove stands to be found here; a similar situation is also noted for the east coast of Madagascar where the Madagascar current flows parallel to the coast.

The continental shelf is very narrow, averaging only 15 to 25 km in width. Along the mainland it varies from as narrow as a few hundred meters off Pemba in Mozambique but extends to nearly 145 km in the Bight of Sofala (Figure 1). The shelf area for the different countries is indicated in Table 1. The shelves and banks are areas of intensive biological activity and productivity. Clearly therefore, the narrower the shelf, the less productive the sea area and as will be seen later, the West Indian Ocean is relatively fisheries-poor compared to other regions.

The sea bed drops rather sharply after the continental shelf, plunging to depths of over 2,000 m below sea level. The plunge continues to a general depth of 4,000 m except where interrupted by submerged platforms and islets associated with the island countries.

One important limestone plateau is the Seychelles Ridge which supports four major patches of continental shelf. The first supports the Seychelles islands, which are principally granitic but with limestone highs and coralline islands. The others are capped with limestone only: the Saya de

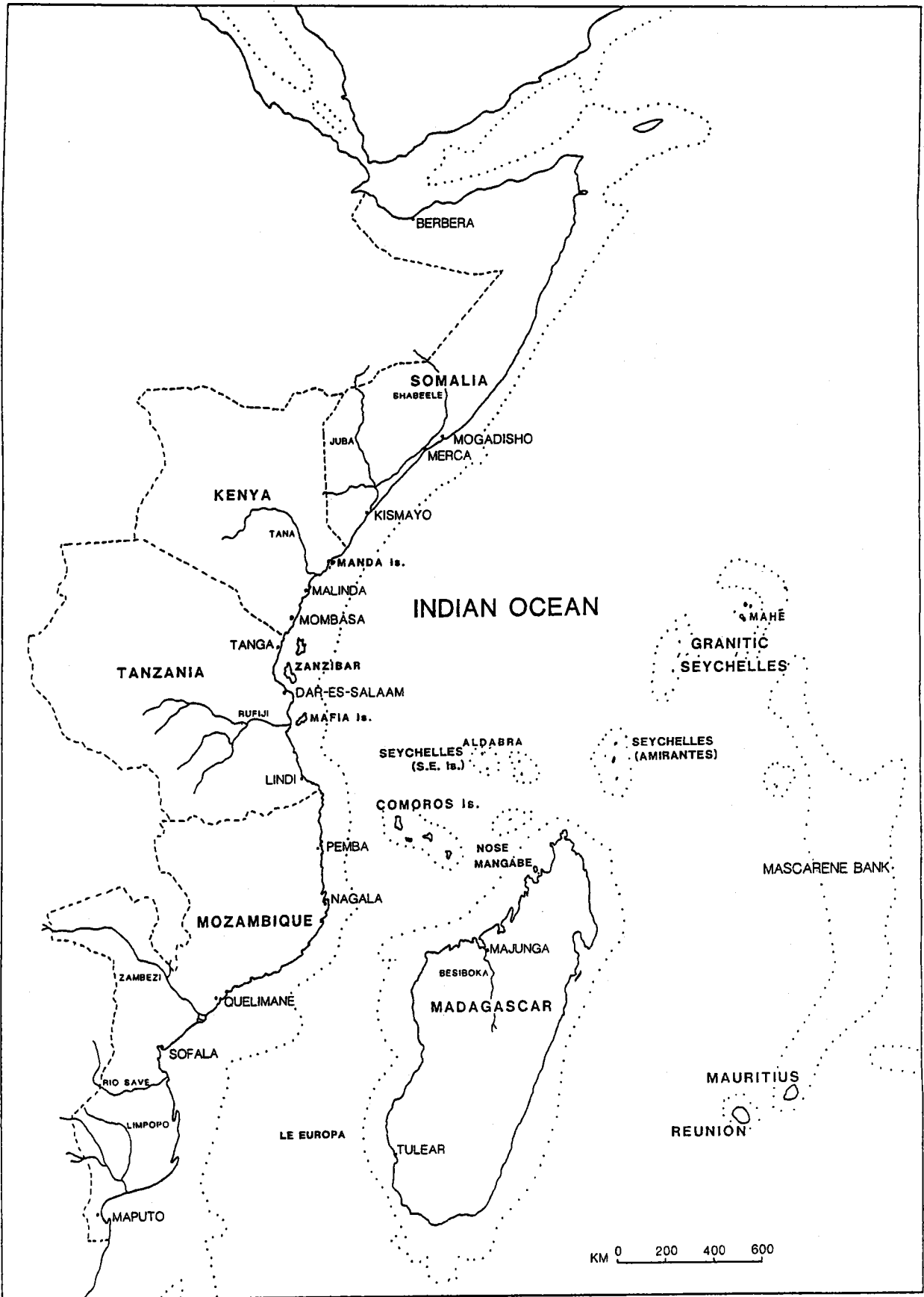


Fig.1 The Eastern African Region, showing major towns, coastal settlements and rivers
.....Represents the limits of the continental shelves and major banks in the Western Indian Ocean
(Information from Ambio 12(6), 1983, IUCN)

Table 1 - General Profile of Countries in the Eastern African
Region after UN/Unesco/UNEP

Countries	Land Area (sq km)	Estimated Shelf Area Depth Range	Length of Coastline (km)	Estimated Population in 1980 (million)	Marine Fish Landing in 1980 (1,000 metric tons)	Per Capita Fish Consumption in 1980 (kg life weight)
	(1)	0-200 sq km (2)		(3)	(3)	(4)
Comoros	2,236	900	350	0.33	4.0	12.4
France (la Réunion)	512	-----	207	0.46	-----	-----
Kenya	582,650	6,500	500	16.40	5.4	3.3 (5)
Madagascar	595,790	135,000	4,000	8.74	12.0	6.0 (5)
Mauritius	1,865	1,600	200	0.99	5.3	17.7
Mozambique	738,000	120,000	2,500	10.47	31.7	3.5
Seychelles	443	48,000	600	0.06	5.0	82.0 (6)
Somalia	637,657	32,500	3,000	3.64	11.0	0.6
Tanzania	939,703	30,000	800	17.00	49.2	10.0 (5)

(1) ANON, 1981

(2) FAO, Fishery Country Profiles and FAO/IOP, 1979

(3) FAO, 1981

(4) FAO, ICS printouts, Fish. Department, unpublished

(5) Note that freshwater fish supply exceeds marine catch

(6) Note that per capital fish consumption is subject to great variation due to comparatively small number of inhabitants and yearly variability in total supply (consumption by tourists is not separately accounted for)

N.B. Data for France (La Réunion) not available from the same sources.

Malha Bank, Nazareth Bank and Cargados Carajos shoals. Of these only the last have islands (St Brandon group) although large areas of all three lie in water of a few meters deep.

In the southwest, the Mascarene islands include La Reunion (the highest point of the Indian Ocean), its dependency Rodriguez, and Mauritius. All are separated by deep water.

The population of the region was about 62.24 million in 1981 with an average annual growth rate of about 3.0%. However, about 75.3% of the population of the region is agricultural being either cultivators, pastoralists or carrying out mixed farming. A small proportion living along the coasts, main rivers and inland lakes practice artisanal fishing. Agricultural production, and even fisheries as practiced by the local populations is essentially subsistence in nature.

It should be mentioned that population distribution on the mainland is very uneven. This uneven distribution is closely determined by soil fertility and the presence of disease vectors such as mosquito and tsetse-fly which has rendered northern Mozambique as well as a good proportion of the coastal belt of the mainland and western Madagascar uninhabitable on a large scale. The prevailing climatic situation, for example the desertic conditions in southwestern Madagascar and in Somalia from Merca northwards also govern population distribution. Another factor is, of course, the existence of economically active coastal towns, particularly those associated with import, export and processing of materials. The populations of some of the major cities and towns is shown in Table 2, which also gives estimates for the discharge of domestic sewage. At present levels - except very locally in towns without sewage treatment plants, this is considered to have a negligible impact on the marine environment.

CLIMATE

The climate of the region may be described as moderately warm tropical but with semi-desert to desert areas in most of Somalia, north and north-eastern Kenya, central Tanzania and south-western Madagascar. In the extreme south, Madagascar has a Mediterranean type climate while southern

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