



UNITED NATIONS ENVIRONMENT PROGRAMME

*Industrial sources of
marine and coastal pollution
in the East African region*

UNEP Regional Seas Reports and Studies No. 7

Prepared in co-operation with



UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION

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PREFACE

The Regional Seas Programme was initiated by UNEP in 1974. Since then the Governing Council of UNEP has repeatedly endorsed a regional approach to the control of marine pollution and the management of marine and coastal resources and has requested the development of regional action plans.

The Regional Seas Programme at present includes ten 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 combating 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.

Decision 8/13(C) of the eighth session of the Governing Council of UNEP called for the development of an action plan for the protection and development of the marine and coastal environment of the East African region. As a first activity in the region, UNEP organized in October and November 1981 a joint UNEP/UN/UNIDO/FAO/UNESCO/WHO/IMCO/IUCN exploratory mission which visited the eight States of the region 2/ in order to:

- assess each State's interest in participating in a future regional programme;
- consult with Governments with a view to identifying activities that may usefully be included as part of a comprehensive action plan;
- make a preliminary assessment of the environmental problems in the region, including the problems related to the environmentally sound management of marine and coastal natural resources and activities influencing the quality of the marine and coastal environment;
- collect available scientific data and information pertaining to the development and implementation of the action plan planned for the region; and
- identify national institutions that may participate in implementing an action plan once it is adopted.

1/ Mediterranean, Kuwait Action Plan Region, West and Central Africa, Wider Caribbean, East Asian Seas, South-East Pacific, South-West Pacific, Red

(ii)

The findings of the mission were used to prepare the following six sectorial reports:

- UN/UNESCO/UNEP: Marine and Coastal Area Development in the East African Region. UNEP Regional Seas Reports and Studies No. 6. UNEP 1982;
- UNIDO/UNEP: Industrial Sources of Marine and Coastal Pollution in the East African Region. UNEP Regional Seas Reports and Studies No. 7. UNEP 1982;
- FAO/UNEP: Marine Pollution in the East African Region. UNEP Regional Seas Reports and Studies No. 8. UNEP 1982;
- WHO/UNEP: Public Health Problems in the Coastal Zone of the East African Region. UNEP Regional Seas Reports and Studies No. 9. UNEP 1982;
- IMO/UNEP: Oil Pollution Control in the East African Region. UNEP Regional Seas Reports and Studies No. 10. UNEP 1982; and
- IUCN/UNEP: Conservation of Coastal and Marine Ecosystems and Living Resources of the East African Region. UNEP Regional Seas Reports and Studies No. 11. UNEP 1982.

The six sectorial reports prepared on the basis of the mission's findings were used by the UNEP secretariat in preparing a summary overview entitled:

- UNEP: Environmental Problems of the East African Region. UNEP Regional Seas Reports and Studies Series No. 12. UNEP, 1982.

The overview and the six sectorial reports were used as the main working document and information documents for the UNEP Workshop on the Protection and Development of the East African Region (Mahé, Seychelles, 27 - 30 September 1982) attended by experts designated by the Governments of the East African region.

The Workshop:

- reviewed the environmental problems of the region;
- endorsed a draft action plan for the protection and development of the marine and coastal environment of the East African region;
- defined a priority programme of activities to be developed within the framework of the draft action plan; and
- recommended that the draft action plan, together with a draft regional convention for the protection and development of the marine and coastal environment of the East African region and protocols concerning (a) co-operation in combating pollution in cases of emergency, and (b) specially protected areas and endangered species, be submitted to a conference of plenipotentiaries of the Governments of the region with a view to their adoption (UNEP/WG.77/4). The conference is to be convened by UNEP in early 1984.

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INTRODUCTION

Geography of the region

1. The geographical region covered by the East African Action Plan (EAF) consists of the coastal regions of Eastern Africa and the Indian Ocean islands in the area extending from about 13°N to 30°S and from 32°E to 67°E. It covers a vast area which contains the equator and lies mostly in the southern hemisphere. As a result of its location, the area experiences a wide variety of climatic and oceanographic conditions which vary from tropical to temperate.

2. More precisely, the area consists of the coastal regions of Comoros, Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia, and the United Republic of Tanzania, including the wide stretch of the Indian Ocean connecting these coastal regions. On the African continent, that is from Somalia to Mozambique and on Madagascar, the term "coastal regions" refers to the land mass extending continuously from the shoreline to about 20 km inland and includes river estuaries and the body of water lying directly in front of the shoreline. All areas can be considered coastal for Comoros, Mauritius and Seychelles.

3. Agriculture, including subsistence farming, is the main occupation of the region. The principal export crops include coffee, tea, sugar-cane, cotton, cashew, coconut, vanilla, sisal and cloves and the main consumer crops include maize, rice, cassava and bananas. Livestock breeding and artisanal fishing are widely practiced. Agriculture is the principal source of raw materials for industry. Thus industrial activities in the region are highly oriented toward processing raw agricultural produce into semi-finished or finished goods.

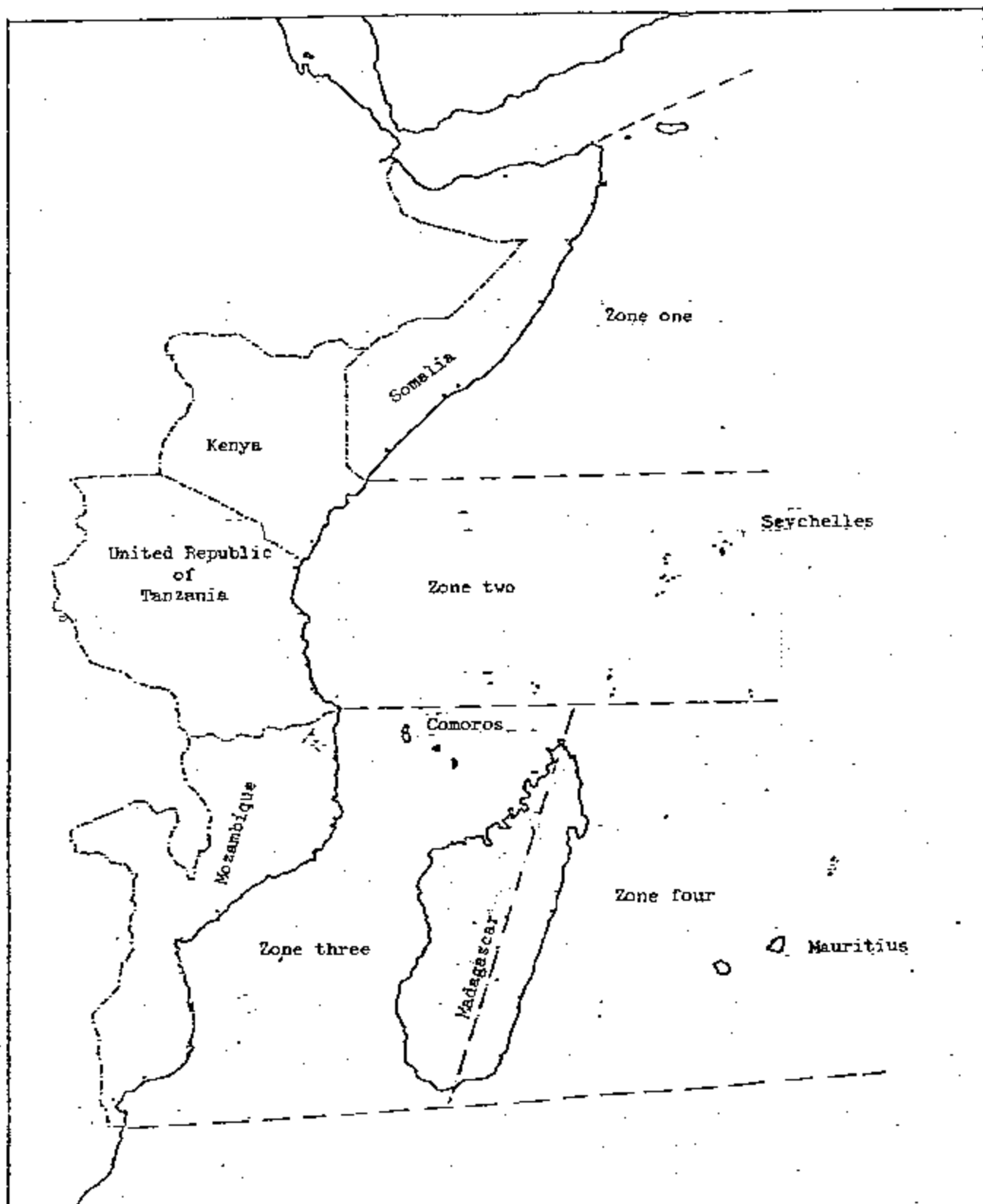
Classification into zones

4. The East African region may be classified into four zones, as shown in the figure, on the basis of the main hydrographical characteristics of the region. To obtain the zone boundaries shown in the map, the actual limits of the major ocean currents in the region have been slightly modified and approximated by nearby borders.

5. The classification provides a convenient and practical means of assessing industrial inputs into the ecological matrix of the region. From the classification, present levels and types of land-based pollution inputs into the different subcompartments of the region can be estimated and appropriate sites located for various types of activities.

6. Zone one extends from the northern limits of the East African region (about 13° N) off the horn of Africa to just south of the equator (about 2°S). This zone is characterized by the Somali current which completely reverses its flow biannually in response to monsoon seasons. The zone is further characterized by a permanent upwelling area off the Somali coast.

The zones of the East African region



7. Zone two, extending from about 2°S to about 10°S and dominated by the eastward-flowing Equatorial Counter Current, is a zone of dynamic offshore mixing. This zone lies between the westward-flowing North-East Monsoon Current and the westward-flowing South Equatorial Current.

8. Zone three extends from about 10°S to the southern limits of the East African region off the coast of Mozambique. The main hydrographical current here is the fast-flowing southward Mozambique Current which feeds from the South Equatorial Current and flows into the Agulhas Current around 26°S. Within the Mozambique Channel, the Mozambique Current moves southwards with a shoreward component along the Mozambique coast and gradually generates a counter current offshore which flows northwards along the Madagascar coast.

9. Zone four lying immediately to the East of Madagascar and extending to just beyond Mauritius, and from about 10°S to about 26°S, is marked by the westward flowing South Equatorial Current. The South Equatorial Current is deflected by the islands of Mauritius and Madagascar into two components which reunite just off the Southern part of Mozambique to form the Agulhas Current. This zone is also characterized by cyclones. The division of the region into the four zones is shown in the following table:

Zones of the East African Region

Zone	Countries	Major Current
I	Somalia	Somali Current
II	Kenya, Tanzania Seychelles	Equatorial Counter Current
III	Mozambique, Comoros Madagascar	Mozambique Current

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