



UNITED NATIONS ENVIRONMENT PROGRAMME



*Management and conservation  
of renewable marine resources in  
the Indian Ocean region: Overview*

*UNEP Regional Seas Reports and Studies No. 60*

*Prepared in co-operation with*



IUCN

Note: This report was prepared jointly by the International Union for Conservation of Nature and Natural Resources (IUCN) and the United Nations Environment Programme (UNEP) under projects IP/5102-84-09 and GP/5102-77-03 as a contribution to the development of interregional co-operation in the protection and management of the marine and coastal environment in the Indian Ocean region.

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## 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 <sup>1/</sup> 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-orientated programme activities <sup>2/</sup>.

The Regional Seas Programme has always been recognized as a global programme implemented through regional components. Inter-regional 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 five Action Plans 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 (IUCN), in co-operation with UNEP has prepared this document.

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<sup>1/</sup> Mediterranean, Kuwait Action Plan region, West and Central Africa, Wider Caribbean, East Asian Seas, South-East Pacific, South-West Pacific, Red Sea and Gulf of Aden, Eastern Africa and South-West Atlantic.

<sup>2/</sup> UNEP: Achievements and planned development of UNEP's Regional Seas Programme and comparable programmes sponsored by other bodies. UNEP Regional Seas Reports

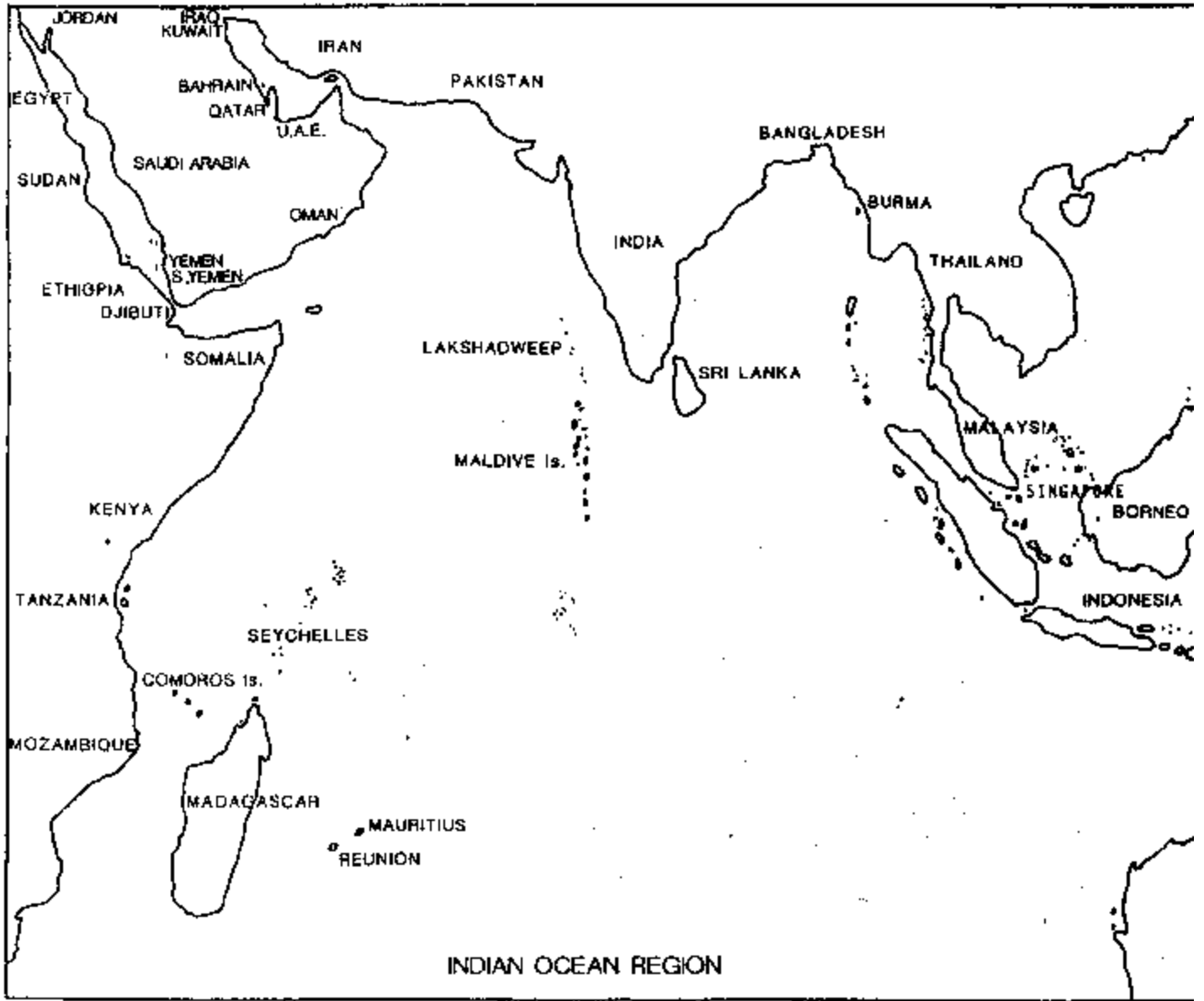
This document is based on more detailed reviews prepared for each of the five regions 2/4/5/6/7/ in the wider Indian Ocean area. They review the past and ongoing conservation activities relevant to the Indian Ocean on the global, regional and national levels; identify priority concerns of the Governments bordering the region; and contain recommendations for inter-regional and regional projects to be undertaken to address those concerns.

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- 3/ IUCN/UNEP: Management and conservation of renewable marine resources in the South Asian Seas region. UNEP Regional Seas Reports and Studies No. 62. UNEP, 1985.
  - 4/ IUCN/UNEP: Management and conservation of renewable marine resources in the Kuwait Action Plan region. UNEP Regional Seas Reports and Studies No. 63. UNEP, 1985.
  - 5/ IUCN/UNEP: Management and conservation of renewable marine resources in the Red Sea and Gulf of Aden region. UNEP Regional Seas Reports and Studies No. 64. UNEP, 1985.
  - 6/ IUCN/UNEP: Management and conservation of renewable marine resources in the East Asian Seas region. UNEP Regional Seas Reports and Studies No. 65. UNEP, 1985.

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## INTRODUCTION

### Introductory Comments

This paper provides a summary of the status of different biological marine resources, habitats, species groups and species of economic value and/or scientific interest within the Indian Ocean Region (IOR). It also gives an overview of the degradation of these resources that is becoming apparent through much of this region. The extent of national and international activities directed towards managing and conserving these resources is also indicated.

Further details concerning the topics covered by this overview may be found within the five supporting reports, each of which deals with one of the five 'regional seas' areas lying within the wider Indian Ocean region.

Joint consideration of the status of the marine environment within these five areas makes sense, both from scientific and practical points of view. The areas together constitute the greater portion of a single major marine biogeographic province (the Tropical Indo-West Pacific). Within this province all areas have most habitats and species in common. Thus within any one smaller area up to 80% of the species of marine animal and plant are likely to be ones occurring through much or all of the Indian Ocean. Likewise, the conditions and problems affecting the marine environment are for the most part similar throughout this region. And, in addition, the social and economic conditions are comparable in many of the countries concerned so that they face similar problems in developing the effective conservation and management of their marine resources.

### Area Covered

The five Regional Seas areas covered by this report are (from north-west to south-east): the Red Sea and Gulf of Aden region; the Kuwait Action Plan region; the Eastern African region; the South Asian Seas region and the East Asian Seas region.

The area covered by this report therefore has its northernmost limits at 30°25'N in the Red Sea, and at 30°30'N at the head of the Kuwait Action Plan (KAP) region, while the southerly limit is marked by latitude 25°S, at the Mozambique border. The western boundary runs along almost the entire East African coast, thus encompassing the continental island of Madagascar, and the smaller oceanic island groups of the Seychelles, Mauritius, Reunion, Comoros, Lakshadweep and Maldives. And the eastern boundary lies at approximately 40°E on a line which virtually divides the Island of Irian (New Guinea) in two.

It is worth noting that within this region the islands of Indonesia and the Philippines have much the longest coastlines: Indonesia comprises approximately 13,677 islands, with a coastline length of 81,000 km. (Soegiarto & Polunin, 1982); the Philippines encompasses 7,107 islands and has a coastline length of approximately 17,500 km (de Celis, 1981). This fact is of regional significance since, if the total coastline of some of the mainland areas is computed, it is much smaller than that of either of these two island groups (see Table 1). Hence the potential for coastal and shallow-water marine habitats (mangrove, seagrasses, coral reefs, etc.) is somewhat greater in the East Asian Seas region than in other parts of the IOR. It, and the KAP and Red Sea and Gulf of Aden

regions, must also be considered more vulnerable to pollution because of their semi-enclosed nature.

Table 1

Region	Length of Coastline (km)
Eastern Africa region	11,950
Red Sea and Gulf of Aden	9,571
Indonesia	81,000
Philippines	17,500

### Climate

The climate within the Indian Ocean region varies both seasonally and according to location. In general it is dominated by the monsoonal cycle. Annual rainfall, for example, increases moving southwards and, outside the incidental precipitation frequently associated with the coast and the islands, its seasonal occurrence is closely tied to that of the monsoon winds. The seasonality of the monsoons is, in turn, linked to the position and movement of the Intertropical Convergence Zone (ITCZ).

At the beginning of the year the ITCZ lies south of the equator. In the south, the south-east trades blow, while in the north the north-east monsoon is fully developed, but is dry over much of the Indian Ocean. In the second quarter, the ITCZ moves north, reaching southern India in late April. The south-east trades occupy the whole of the southern ocean, while in the north rain systems become frequent in the Bay of Bengal and in the south-east Arabian Sea, a few developing into cyclones. In the third quarter the south-west monsoon holds sway over the Arabian Sea, India, the Bay of Bengal, the western part of the East Asian Seas region, and the Eastern Africa region, where mean

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