

# People and Reefs

**Successes and Challenges in the Management of Coral Reef Marine Protected Areas**

*UNEP Regional Seas Report and Studies No. 176*



This publication was prepared by UNEP in cooperation with the International Coral Reef Action Network (ICRAN). Financial support for the work of ICRAN which forms the content of this publication has been generously provided the UN Foundation, the Goldman Fund and UNEP.

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**UNEP**

PO Box 30552

Nairobi, Kenya

Tel: +254 20 621234

Fax: +254 20 623927

Email: [cpinfo@unep.org](mailto:cpinfo@unep.org)

Web: [www.unep.org](http://www.unep.org)

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## ***People and Reefs***

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Regional Seas Reports and Studies No. 176



## FOREWORD

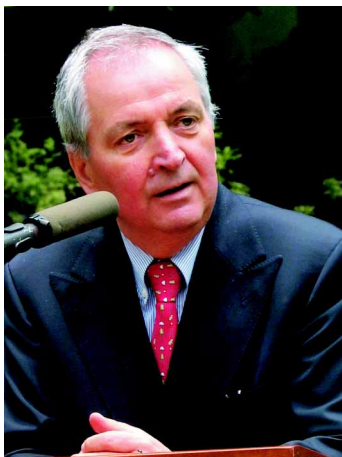
Coral Reefs are among the world's richest and most spectacular ecosystems. Their contribution to marine biodiversity is enormous. While covering less than 1 per cent of the ocean floor, they support an estimated 25 per cent of all marine life. More than one billion people in the tropics benefit directly from coral reef resources for food and as a source of income through activities related to fishing and tourism.

As productive as coral reefs are, they are also among the most fragile ecosystems. The world's reefs have been suffering a dramatic decline in recent decades as tropical ecosystems begin to suffer the effects of human activities and global environmental change. Some 10 per cent of the world's reefs may already be degraded beyond recovery, and another 30 per cent are in decline.

Coral reefs were accorded a high priority for protection under Agenda 21 by the 1992 United Nations Conference on Environment and Development. The international community responded with several initiatives, among which was the International Coral Reef Initiative (ICRI), launched in 1994. Under ICRI's guidance, the International Coral Reef Action Network (ICRAN) was established in 2000. ICRAN is a global partnership dedicated to halting the trend of degradation of coral reefs and related ecosystems worldwide and maintaining their biodiversity, health and productivity .

ICRAN activities are implemented at the site and community level through four of the UNEP Regional Seas programmes. A number of these important coastal coral reef management initiatives were presented at the International Tropical Marine Ecosystem Management Symposium II (ITMEMS II), held in Manila, Philippines, in March 2003, featuring case studies from the Wider Caribbean, Eastern African, East Asian Seas and South Pacific regions. Although they encompass a variety of regional, social and economic contexts, the case studies highlight several important common issues: the importance of stakeholder involvement, empowerment and community support, capacity building and public awareness and education. These case studies also illustrate that, though geographic locations may differ, the challenges and threats which reefs and people face are the same.

"People and Reefs: successes and challenges in the management of coral reef marine protected areas" offers an opportunity to share the experiences and learn the lessons of the many communities and individuals who share responsibility for the sustainable management of these endlessly fascinating and bountiful ecosystems. Only by working together and sharing our knowledge can we hope to preserve coral reefs for the benefit of future generations.



A handwritten signature in black ink, which appears to read "Klaus Töpfer". The signature is written in a cursive style with a long horizontal stroke at the end.

– Klaus Töpfer, Executive Director,  
United Nations Environment Programme

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## EXECUTIVE SUMMARY

This report documents 13 coastal coral reef management initiatives, operated under the ICRAN framework. Although, all case studies were formally accepted, due to unforeseen circumstances/political tensions only eight of these initiatives were presented at the International Tropical Marine Ecosystem Management Symposium 2 (ITMEMS 2), held in Manila, Philippines, 24–27 March 2003, as part of the ICRAN-sponsored session, “The Role of Protected Areas in Management”. In this workshop, in addition to presentations, UNEP Regional Seas, partners, managers and practitioners from a number of ICRAN sites shared their experiences in management of, lessons learned from, and challenges faced by their particular park. They also discussed how ICRAN can contribute towards addressing site priorities and needs as well as future learning opportunities.

Before describing these case studies, this report introduces some of the key issues in coral reef conservation and the role of ICRAN and the UNEP Regional Seas Programme. First, it gives a brief introduction to the natural resources and economic opportunities that coral reef ecosystems provide. The report then highlights marine protected areas (MPAs) as one of the most applicable, useful and comprehensive management strategies available to local communities and local, national and international institutions (e.g., government, academic, scientific, non-governmental and donor organizations) to mitigate the threats faced by reef ecosystems and foster sustainable use of marine and coastal resources worldwide. A description of ICRAN and UNEP’s Regional Seas programmes follows, noting their geographic coverage, how these two institutions came about and developed, their *modus operandi*, and some of the priority issues being addressed by both.

This report includes seven case studies from the **Wider Caribbean Region**. The first one focuses on the capacity building opportunity provided by the UNEP-CEP training of trainers programme, while the second study looks at the community-based coastal resource management and marine biodiversity conservation experience in Sian Ka’an Biosphere Reserve, Mexico. The third project analyses rules and zoning issues in the management plan of Chinchorro Banc Biosphere Reserve, Mexico. The opportunities and challenges of using admission fees as a funding source at a small scale, tourism dependant MPA, Bonaire, are presented in the fourth study. The fifth example of reserve management, describes how – from MPA implementation to today – relationships have been strengthened to ensure effective management in the Soufriere Marine Management Area (SMMA). The sixth case study details the role of the honorary game wardens and fisheries inspectors of the Portland Bight Protected Area, Jamaica, in the context of community policing and the country’s “culture of system-beating”. The seventh study depicts the process of conflict resolution between inter-sectoral stakeholders in the Buccoo Reef Marine Park coastal zone, Tobago, using Pigeon Point as an example.

Two case studies are included for the **Eastern African Region**. The first case outlines the implementation of ICRAN activities at the Malindi/Watamu MPA. The second study examines the challenges and opportunities of managing marine reserves, focusing on the Dar es Salaam Marine Reserves System, Tanzania, a MPA surrounded by poor populations and close to a vast urban setting.

Two case studies are described in the context of the **East Asian Seas Region**. The first one focuses on the development of a conservation strategy for Gili Matra Marine Natural Recreation Park, West Nusa Tenggara Province, Indonesia, taking into account sources of conflicts and the park’s potential value, as well as environmental socio-economic conditions of surrounding communities. The second case describes the co-management initiative in coastal resource management and marine biodiversity conservation experience in Bunaken National Marine Park, Indonesia.

Two case studies are presented from the **South Pacific Region**. The first project discusses the development of a multiple-use management plan by the island communities of Jaluit Atoll that would ensure marine and coastal conservation while allowing for sustainable use of biological resources. The second study describes hands-on coral transplantation and restocking experiments, chiefly in Fiji, and analyses the feasibility of such management techniques as a means to accelerate the recovery of coral reef habitats and fisheries resources in MPAs.

Although the case studies present a variety of issues, contexts and responses, and were implemented in four regions characterized by very diverse socio-economic and political situations, all sites highlighted common features:

- Threats to coral reefs – overfishing and associated declines in fish catches; use of destructive fishing practices; pollution (marine and land-based); increasing population pressure; as well as poor development and land use practices.

- Management challenges – resource use conflicts; unsustainable development; and lack of education and public awareness, adequate management of resources, enforcement, monitoring, financial stability and human capacity.
- Lessons learned – the need for: greater community empowerment and involvement; sustained and extensive consultation between stakeholders; proactive and innovative education and public awareness campaigns; improved communication and transparency between all involved members; strong management partnerships to secure long term financial stability; development of management plans based on ecological as well as socio-economic data and linked to regular monitoring programmes; implementation of clearly defined zoning regulations to reduce conflicts between stakeholders; and enhanced enforcement efforts.

## PART I INTRODUCTION

Coral reefs, often referred to as the rainforests of the sea, cover less than 1% of the marine environment, but are among the most diverse, complex, productive and beautiful ecosystems on Earth [1-3]. Beyond their remarkable biodiversity, reefs' benefits include the safeguarding of lives, cultures, and entire economies. They encourage the development of tourism; act as vital protection against storms and thus erosion [4]; provide 10% of tropical countries' fishing harvests as well as 25% of the fish catch of developing countries [1]; and are a source of employment and leisure [2]. Increasing pressure on these ecosystems has led to reef degradation and declines in associated biodiversity; is linked to the loss of economic opportunities; and is presenting growing challenges to the livelihoods of local communities. It is also associated with increasing poverty levels in most coral reef areas around the world, highlighting the crucial economic and social roles of coral reefs in the function and stability of many of the world's poorest coastal and island human communities. Humans need coral reefs; consequently, effective management that promotes sustainable use of marine resources is critical. One of the most widespread and advocated mechanisms for protecting coral reefs is the designation of Marine Protected Areas (MPAs) that implement (preferably large-scale) ecosystem-based management. No-take marine reserves provide particularly effective means of addressing coastal and marine biodiversity conservation [5] as well as fisheries issues, whilst also creating opportunities for sustainable use, alternative livelihoods, and stewardship.

In order to achieve success in Integrated Coastal Management (ICM), participatory planning and decision-making have been highlighted as critical elements of effective management and sustainable use of marine and coastal resources. A key element for successful community participation, information dissemination and education is to understand the local context, including the premise that community participation in management may work best in small, localized MPAs. Co-management – often the framework advocated for the effective management of reserves and the relationships upon which the system is built – need to be flexible. Thus, although the structure can and should involve a variety of stakeholders (i.e. private sector, academic, government, non-government, community-based organizations, and others), the interests of local subsistence resource users must be at the forefront. Furthermore, to ensure MPA objectives, effective enforcement of legal controls is essential, as without it, reserves and ICM programmes will not provide their intended benefits to the marine ecosystems and communities that depend upon them. Moreover, awareness of management activity, the responsibilities and rights of resource and MPA users, and the issues that management must address are essential.

There is also an urgent need for greater recognition by government, funding agencies, and Non-Governmental Organizations (NGOs), that effective enforcement of marine resource use regulations requires much greater financial and political support. Active engagement with the private sector is critical for long-term success in sustaining and conserving coral reefs and related ecosystems, whilst providing food and sustainable economic opportunities to local communities. Well-designed and targeted research, and scientific as well as socio-economic monitoring programmes, are essential components of tropical marine ecosystem management. Unfortunately, even given this knowledge, MPAs average a 10% success rate worldwide, indicating that the challenge of fulfilling both environmental conservation and human needs remains. Failure in effective management and enforcement of legislation in a number of marine parks to date have mainly been attributed to lack of: capacity, political will, buy-in by local stakeholders, consultation, lack of awareness about coral reef values and threats, as well as sustainable funds and the effective targeting of these.

The International Coral Reef Action Network (ICRAN) co-organized a session at the Second International Tropical Marine Ecosystems Management Symposium (ITMEMS 2) focusing on 'The Role of Protected Areas in Management.' At the session, the United Nations Environment Programme (UNEP) Regional Seas partners and site managers of ICRAN presented a number of papers and case studies on the sustainable management and conservation of coral reefs at ICRAN sites in the Caribbean Sea, Indian, and Pacific Oceans.

To date, these papers have not been published, nor finalized, but they contain a wealth of information, experiences, and lessons learned. As such, they constitute an opportunity to showcase one of the most successful aspects of the ICRAN partnership and the progress made by its UNEP Regional Seas partners.

To maximize the global benefit and reach of the papers, they have been edited into a UNEP Regional Seas Reports and Studies series. The studies are presented within a general framework, introducing ICRAN and the Regional Seas mandate and action arena, as well as placed within the environmental and socio-economic context and activities of the partners within each region.

## PART II INTRODUCTION TO ICRAN

*'ICRAN is an innovative and dynamic global partnership of many of the world's leading coral reef science and conservation organizations. Its main objective is to halt and reverse the decline in health of the world's coral reefs. The partnership draws on its partners' investments in reef monitoring and management to create strategically linked actions across local, national, and global scales. ICRAN is thus the first partnership to respond to conservation needs at the global scale by recognizing both traditional and scientific perspectives of coral reef dynamics and respective social dependency. It seeks to put financial mechanisms in place that support the translation of findings into direct on-the-ground action throughout the world's major coral reef regions.'*[6]

The International Coral Reef Action Network (ICRAN) [www.icran.org] is an active strategic alliance, which recognises that of the planet's 284,300 km<sup>2</sup> of coral reefs [1, 2], 70-80% are located in developing countries, with communities that derive their livelihoods from reef resources. With over 10% of the world's reefs already seriously degraded and a larger percentage being threatened [7], ICRAN focuses on strengthening the capacity of local communities to manage their marine and coastal resources sustainably through monitoring and communications [8], in order to mitigate and reverse coral reef decline.

In 1994, at the first conference of parties to the Convention on Biological Diversity (CBD), the International Coral Reef Initiative (ICRI) was first announced. Its mission is to address the plethora of threats leading to the rapid demise of reefs worldwide, help reverse current trends, and raise awareness about the ecosystem's decline in health [9]. The Initiative was to achieve this through its informal global partnership of world leaders (e.g. governments) and experts (e.g. NGOs, academic institutions and the private sector) on coral reefs.

At the first ICRI Workshop, held in the Philippines in June 1995, governments, donors, funding agencies, development organisations, NGOs, the scientific community, and private sector developed a 'Framework for Action,' a strategy document aimed at achieving sustainable management of coral reefs and related ecosystems [9]. They also endorsed the ICRI's 'Call to Action,' a policy statement by the international community intended to draw attention to 'the threats to coral reefs and their significance to humankind' [9]. ICRAN was established in 2000 in recognition of the need for research and management efforts to be coordinated across all relevant institutions in order to carry out ICRI's urgent recommendations to save the world's reefs.

The Network was set up by its founding partners (UNEP, WorldFish Centre (previously the International Centre for Living Aquatic Resources Management, (ICLARM)), World Resources Institute (WRI), UNEP-World Conservation Monitoring Centre (UNEP-WCMC), Global Coral Reef Monitoring Network (GCRMN), ICRI Secretariat, Coral Reef Alliance (CORAL)) as an innovative and dynamic global partnership of coral reef experts from both scientific and conservation organisations [6, 10]. The action phase of ICRAN was launched in 2001, with all activities made possible by an historic grant from then United Nations Foundation (UNF).

ICRAN's action plan recognises the importance of scientific, traditional, cultural, and economic aspects of conservation needs [6]. Findings are translated into direct on-the-ground action throughout the world's major coral reef regions, as well as at the regional and international levels [6], by means of a strategy that includes alternative livelihoods, training, capacity-building and the exchange of scientific, economic, traditional and social information [4]. In so doing, it puts into practice the notion that the overall success of Agenda 21 (a global programme of action and strategy document for sustainable development) depends significantly on dialogue and the development of a consensus between all local and national stakeholders [9].

### **Mission**

ICRAN's current mission is based on three key interlinked components: (1) reef management, (2) global coral reef monitoring and assessment, and (3) communications and knowledge dissemination. UNEP, through its Regional Seas programmes, coordinates the reef management component of ICRAN in the Wider Caribbean, Eastern Africa, the South Pacific, and East Asian Seas region [11] (Table 1).

*Reef management* – Through local outreach, ICRAN assists local communities and coral reef managers by providing support and resources to enhance their management capacity and build on successfully implemented techniques. In addition to support provided at a local level, ICRAN offers a forum that allows for community experiences and knowledge to be extended to other interested coral reef managers and policy makers worldwide.

*Global coral reef monitoring and assessment* – By building on new and existing scientific data, learning from traditional local knowledge and the lessons of practical experiences, ICRAN partners are:

- continuing to develop ReefBase (www.reefbase.org) – a global database supporting management of coral reefs;

- producing coral reef maps and gathering field data to update reports on the condition of coral reefs worldwide;
- developing risk assessments of coral reef resources;
- conducting socio-economic valuations of coral reefs, including fisheries and mariculture analyses; and
- expanding the global Reefs at Risk programme, a project which has developed a series of globally-consistent indicators of human pressure on coral reefs. These indicators evaluate pressure from coastal development, marine-based pollution, sedimentation from inland sources, and overexploitation of coral resources [12], focusing on specific threats and regions.

*Communications and knowledge dissemination* – The International Coral Reef Information Network (ICRIN) [www.icrin.org/](http://www.icrin.org/) – serves as the communications and public awareness arm of ICRI. The network serves to provide general coral reef information, as well as tools and resources, based on data and reports from monitoring and assessment projects carried under ICRAN, to ICRAN partners, other key stakeholders, scientists, and policy makers at an international, regional, and local level. The ICRAN assessment and information dissemination activities are designed to produce and make available the knowledge needed to empower decision-makers to develop and implement policies for the sustainable management of coral reefs [10].

**Table 1 – Demonstration sites (sites with proven ability to manage their coral reefs) and target sites (sites where best practices implemented at demonstration sites can be adopted) in the Caribbean, Eastern Africa, East Asia and South Pacific.**

Region	Demonstration sites	Target sites
Caribbean	Hol Chan Marine Reserve (Belize)	Providencia (Colombia)
	Bonaire Marine Park (Bonaire)	Punta Frances (Cuba)
	Sian Ka'an Biosphere Reserve (Mexico)	Parque del Este (Dominican Republic)
	Soufriere Marine Management Area (St Lucia)	Portland Bight and Negril (Jamaica)
		Bucoo Marine Park (Tobago)
		Los Roques (Venezuela)
Eastern Africa	Malindi and Watamu Marine National Park and Reserve (Kenya)	
	Nosy Atafana Marine Park (Madagascar)	
	The Cousin Island Marine Protected Area (Seychelles)	
	St <sup>e</sup> Anne Marine Park (Seychelles)	
	Dar es Salaam Marine Reserve (DMRS) (Tanzania)	
East Asia	Bunaken Island (Indonesia)	Ninh Thuan (Vietnam)
	Mo Koh Surin (Thailand)	Sanya (China)
	Apo Island Marine Reserve (Philippines)	Koh Rong (Cambodia)
	Komodo Island (Indonesia)	Gili Islands (Indonesia)
South Pacific	Samoa MPA Project – Savai' and Upolu Islands (Samoa)	
	Jaluit Atoll Marine Conservation Area (Marshall Islands)	
	Sustainable Management of Aquarium Harvesting Operations – Vitu Levu and Vanu Levu (Fiji)	Coral Gardens Project – Langa Langa Lagoon, Malafe Island (Solomon Islands)
	Coral Gardens Project – Cuvu Tikina (Coral Coast) (Fiji)	Tokelau Marine Conservation Area (Tokelau)

## PART III INTRODUCTION TO REGIONAL SEAS

The UNEP Regional Seas Programme, initiated in 1974, is a global programme that engages governments to focus on specific regional actions needed to control causes of environmental degradation as well as the mitigation or elimination of its consequences through the sustainable management of shared marine and coastal resources [13]. It has been identified by governments as the key regional mechanism for the implementation of ICRI [9].

At present the programme includes 13 Regional Seas programmes, the Mediterranean, Red Sea and Gulf of Aden, the Regional Organization for the Protection of the Marine Environment (ROPME) Sea Area (Kuwait region), Wider Caribbean, East Asian Seas, Southeast Pacific, Western and Central Africa, Eastern Africa, South Pacific, Black Sea, Northwest Pacific Action Plan, South Asian Seas, Northeast Pacific, and with the upper Southwest Atlantic in development [14]. There are also five partner seas programmes: Antarctic, Arctic, Caspian Sea, Oslo and Paris Commission (OSPAR) for the Northeast Atlantic and Helsinki Commission (HELCOM) for the Baltic [14, 15]. Overall, the programme links more than 140 coastal states and territories [14].

The Governing Council of UNEP has called for the development of regional action plans (prescriptions for sound environmental management [15]), formulated according to the needs and environmental challenges of a given region, as perceived by the governments concerned [16, 17]. Action plans should also recognise the human and financial capacity of partaking national institutions and be based on a region's socio-economic and political situation [13]. Regional action plans (Table 2) for those involving countries with coral reefs) further promote the parallel development of regional legal agreements and of programme activities, by linking assessments of the quality of the marine environment and causes for its deterioration with actions towards the sustainable management of marine and coastal resources [13].



# Regional Seas



West to East: North-East Pacific South-East Pacific Wider Caribbean Upper South-West Atlantic West & Central Africa  
Mediterranean Black Sea Eastern Africa Red Sea & Gulf of Aden ROPME Sea Area South Asian Seas East Asian Seas  
North-West Pacific South Pacific Partner programmes: Arctic North-East Atlantic Baltic Sea Caspian Sea Antarctic

PART III

Table 2 – Regional action plans involving countries with coral reefs or coral communities

Regional Sea <sup>1,2</sup>	Countries <sup>3</sup>	Action Plan	Convention
Wider Caribbean	Antigua and Barbuda <sup>1</sup> , Bahamas, Barbados, Belize, Colombia, Costa Rica, Cuba, Dominica, Dominican Republic, Grenada, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Panama, St. Christopher and Nevis, St. Lucia, St. Vincent and Grenadines, Suriname, Trinidad and Tobago, United States of America, Venezuela, the Caribbean Territories of France, Netherlands, and the United Kingdom	Action plan adopted in 1981	Cartagena Convention (1983) Entered into force in 1986
East Asian Seas	Australia, Cambodia, China, Indonesia, Malaysia, Philippines, Republic of Korea, Singapore, Thailand, and Vietnam	Action plan adopted in 1981	
Eastern Africa	Comoros, La Reunion (France), Kenya, Madagascar, Mauritius, Mozambique, Seychelles, Somalia, the United Republic of Tanzania, and South Africa [21]	Action plan adopted in 1985	Nairobi Convention (1985) Entered into force in 1996 [22]
ROPME Sea Area (Kuwait region)	Bahrain, Islamic Republic of Iran, Iraq, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates	Action plan adopted in 1978	Kuwait Convention (1978) Entered into force 1979
Northeast Pacific [27]	Colombia, Costa Rica, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama [28]	Action plan adopted in 2002[29]	Antigua Convention (2002) [29]
Northwest Pacific	People's Republic of China, Japan, Republic of Korea, and Russian Federation	Action Plan adopted in 1994 [13].	
Red Sea and Gulf of Aden	Egypt, Jordan, Saudi Arabia, Somalia, Sudan, Palestine, Eritrea, and Yemen <sup>[14, 25]</sup>	Action plan originally adopted in 1976, revised in 1982 the Strategic Action Programme, was formed in 1995 [14, 21]	Jeddah Convention (1982) Entered into force in 1985
South Asian Seas	Bangladesh, India, Maldives, Pakistan, and Sri Lanka	Action plan adopted in 1995 [13]	
Southeast Pacific	Chile, Colombia, Ecuador, Panama, and Peru [14, 25]	Action plan adopted in 1981	Lima Convention (1981) Entered into force in 1986
Upper South Pacific	Australia, Cook islands, federated States of Micronesia, Fiji, France, Kiribati, Republic of the Marshall islands, Nauru, New Zealand, Niue, Palau, Papua new Guinea, Solomon Islands, Tonga, Tuvalu, United Kingdom, United States of America, Vanuatu, and Samoa [25]	Action plan adopted in 1982	Noumea Convention (1986) Entered into force in 1990
Southwest Atlantic	Argentina, Brazil, and Uruguay	Action Plan not developed	
West and Central Africa	Angola, Benin, Cameroon, Cape Verde, Congo, Cote d'Ivoire, DR Congo, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Liberia, Mauritania, Namibia, Nigeria, Sao Tome and Principe, Senegal, Sierra Leone, Togo, and South Africa <sup>[25]</sup>	Action plan adopted in 1981	Abidjan Convention (1981) Entered into force 1984

<sup>1</sup> Only regions with tropical coral reefs or coral communities are included. <sup>2</sup> All data apart from where indicated from [18]. <sup>3</sup> All eligible parties are listed. Parties that have ratified or acceded to the Convention are in italics.

Protocols and agreements	Secretariat
<p>Protocol concerning Cooperation in Combating Oil Spills (adopted 1983; entered into force 1986)</p> <p>Protocol concerning Specially Protected Areas and Wildlife (adopted in 1990; entered into force in 2000)</p> <p>Protocol concerning Land Based Sources of Pollution (adopted in 1999, not yet in force) [19]</p>	<p>Caribbean Regional Co-ordinating Unit (CAR/RCU) UNEP 14-20 Port Royal Street Kingston, Jamaica Tel.: (1 876) 92 29267/8/9; Fax.: (1 876) 92 29292; E-mail: uneprcuja@cwjamaica.com www.cep.unep.org</p>
	<p>Regional Coordinating Unit for the East Asian Seas Action Plan, UNEP, 9th Floor, Block ARajdamnern Avenue Bangkok 10200, Thailand. Tel.: (66 2) 288 1860; Fax.: (66 2) 281 2428; E-mail: Surendra.Shrestha@rrcap.unep.org[20, 21]</p>
<p>Protocol concerning Protected Areas and Wild Fauna and Flora in the Eastern African Region (adopted 1985) [23]</p> <p>Protocol concerning Co-operation in Combating Marine Pollution in Cases of Emergency in the Eastern African Region (adopted 1985) [23]</p>	<p>UNEP, Division of Environmental Conventions P.O. Box 30552, Nairobi, Kenya Tel: (254) 262 2025; Fax: (254) 262 4300 Email: dixon.waruinge@unep.org www.unep.org/eaf/[24]</p>
<p>Protocol concerning Marine Pollution Resulting from Exploration of the Continental Shelf (adopted 1989, entered into force 1990) [23]</p> <p>Protocol for the Protection of the Marine Environment against Pollution from Land-Based Sources (adopted 1990; entered into force 1993) [23]</p> <p>Protocol concerning Regional Cooperation in Combating Pollution by Oil and Other Harmful Substance in Cases of Emergency (adopted 1978; entered into force 1979) [23]</p> <p>Protocol on the Control of Marine Transboundary Movements and Disposal of Hazardous Wastes (adopted 1998) [23]</p> <p>Protocol on Biological Diversity and Establishment of Specially Protected Areas (under development) [25]</p>	<p>Regional Organization for the Protection of the Marine Environment (ROPME); P.O. Box 2638813124 Safat, Kuwait Tel: (965) 531 21 40-3; Fax: (965) 531 2144 E-mail: ropme@kuwait.net or ropme@qualitynet.net[26]</p>
	<p>North East Pacific Programme Central American Commission for Maritime Transport (COCATRAM) Contiguo Hotel Mansion Teodolinda, Aartado Postal 2423, Managua, Nicaragua Tel: 505 2 2222 759 Fax: 505 2 222 759; Email: geinfrae@ibw.com.ni</p>
	<p>UNEP, Regional Seas Coordinating Office P.O. Box 30552 Nairobi, Kenya Tel: (254) 262 4544 Fax: (254) 262 4618[21, 30]</p>
<p>Protocol on Regional Cooperation in Combating Pollution by Hydrocarbons or Other Harmful Substances in Case of Emergency (adopted 1982; entered into force 1985). [23]</p>	<p>PERSGA Regional Organization for the Conservation of the Environment of the Red Sea and Gulf of Aden PO Box 53662, Jeddah 21583, Saudi Arabia Tel: (966 2) 657 3224; Fax: (966 2) 6514472 Email: persga@persga.org[31]</p>
	<p>South Asian Cooperative Environmental Programme (SACEP); No. 10 Anderson Road, Off Dickman's Road Colombo 5, Sri Lanka Tel: (941) 589 787; Fax: (941) 589 369 E-mail: aj_sacep@eureka.lk</p>
<p>Agreement on Regional Cooperation in Combating Pollution by Hydrocarbons or Other Harmful Substances in Case of Emergency (adopted in 1981) [23]</p> <p>Supplementary Protocol to the Agreement on Regional Cooperation in Combating Pollution by Hydrocarbons or Other Harmful Substances (adopted in 1983; entered into force in 1987) [23]</p> <p>Protocol for the Protection Against Pollution from Land-Based Sources (adopted in 1983; entered into force in 1986) [23]</p> <p>Protocol for the Conservation and Management of Protected Marine and Coastal Areas (adopted in 1989; entered into force in 1994) [23]</p> <p>Protocol for the Protection Against Radioactive Contamination [25] (adopted in 1989; entered into force in 1995) [23]</p> <p>Protocol on the Programme for the Regional Study on the El Niño Phenomenon (ERFEN) (adopted in 1992) [23]</p>	<p>Comisión Permanente del Pacifico Sur (CPPS). Regional Coordinating Unit of the Plan of Action of the South East Pacific Av. Carlos Julio Arosemena Km. 3.5 via a Daule Guayaquil, Ecuador Tel.: (593) 2 234 331/5/6; Fax: (593) 2 234 374 E-mail: cpps_pse@cpps-int.org[21, 32]</p>
<p>Protocol concerning Cooperation in Combating Pollution Emergencies (adopted in 1986; entered into force in 1990) [23]</p> <p>Protocol for the Prevention of Pollution by Dumping [25] (adopted in 1986; entered into force in 1990) [23]</p>	<p>South Pacific Regional Environment Programme (SPREP) P.O. Box 240 Apia, Western Samoa. Tel: (685) 21 929; Fax: (685) 20 231; E-mail: sprep@samoa.net URL: http://www.sprep.org.ws/</p>
<p>Currently focusing on the implementation of the GPA for the Protection of the Marine Environment from Land-Based Sources and Activities [25]</p>	<p>UNEP, Division of Environmental Conventions P.O. Box 30552 Nairobi, Kenya Tel: (254) 262 4544 Fax: (254) 262 4618[33]</p>
<p>Protocol concerning Cooperation in Combating Pollution in Cases of Emergency (adopted in 1981; entered into force in 1984) [23]</p>	<p>UNEP Regional Coordinating Unit for West and Central Africa; c/o Ministère de l'Environnement et la Forêt 20 BP 650, Abidjan 20, Côte d'Ivoire Tel.: (225) 20 211 183 Fax.: (225) 20 210 495 Email: biodiv@africaonline.co.ci[34]</p>

Although the specific activities for any region are dependent upon the needs and priorities of that region, all regional action plans, which have to be formally adopted by all governments of a given region, are structured in a similar way. The Earth Summit/UN Conference on Environment and Development (UNCED)/World Summit on Sustainable Development (WSSD) held in Johannesburg (2002), in many ways, helped shape the work agenda and priorities (Water, Energy, Health, Agriculture, and Biodiversity (WEHAB)) of the various programmes [27]. Action plans usually include the following independent components [35, 36]:

1. *Environmental Assessment* – Causes of environmental degradation are monitored and evaluated to estimate the magnitude and impact of ecological problems in the region. These findings are then used to prioritize future action.
2. *Environmental Management* – Activities aimed at curbing existing environmental problems and preventing the development of new ones.
3. *Environmental Legislation* – The legal framework for cooperative regional and national actions is provided by an umbrella regional convention, elaborated through specific technical protocols.
4. *Institutional Arrangements* – Upon adoption of an action plan, governments agree to act as the permanent or interim secretariat of the action plan.
5. *Financial Arrangements* – UNEP, together with selected UN agencies and other organizations, provides catalytic support, or so called 'seed money,' in the early stages of regional programmes. However, as programmes develop, it is expected that the governments of the region will come to assume full financial responsibility for the activities implemented.

Some of the priority issues being addressed by the Regional Seas agreements include [36]:

- *Ecosystems and biodiversity*, with emphasis being placed on coral reefs, considered to be among the most productive of all natural ecosystems, but facing a wide array of serious threats; and coastal wetlands including mangrove forests and salt marshes;
- *Living resources*, with fish, molluscs and crustaceans, representing major food sources for subsistence communities around the world, but many of these populations now being threatened by overexploitation;
- *Land-based sources of pollution*, where municipal, industrial, and agricultural wastes, as well as run-off constitute 80% of all marine pollution;
- *Coastal development*, caused by expanding coastal populations, which are reshaping the coastline and causing the decline of habitats and their associated species.

Although overall coordination of the Regional Seas programmes is guaranteed by the Regional Seas Coordinating Office of UNEP in Nairobi, the success of the programme critically depends on the political commitment of the governments concerned. The regional programmes are implemented at the national and regional level by relevant organizations dealing with particular issues, many of which represent common concerns of other regional programmes.

Today, UNEP is developing a new strategic action programme to foster collaboration among Regional Seas Conventions and Actions Plans and their global counterparts. Key elements of this programme include commitment, participation, sustainability, and partnership. The strategy calls in particular for close coordination with the Global Plan of Action for the Protection of the Marine Environment from Land-based Sources of Pollution (UNEP GPA), Multilateral Environmental Agreements (MEAs), ICRI, ICRAN, the Global International Water Assessment (GIWA) and the Global Plan of Action for Marine Mammals. Cooperation should also be reinforced with international organizations such as the International Maritime Organization (IMO), the Intergovernmental Oceanographic Commission of the United Nations Educational, Scientific, and Cultural Organization (IOC of UNESCO), and the Food and Agriculture Organization of the United Nations (FAO). Moreover, participation in the Global Assessment of the State of the Marine Environment (GMA) and in the Barbados Programme of Action for the Sustainable Development of Small Island Developing States should be fostered [13].

**PART IV  
INTERNATIONAL TROPICAL MARINE ECOSYSTEMS MANAGEMENT  
SYMPOSIUM 2**

**ICRAN SESSION WORKSHOP REPORT: ROLE OF MARINE PROTECTED  
AREAS IN MANAGEMENT**

The Second International Tropical Marine Ecosystems Management Symposium (ITMEMS 2) held in Manila, Philippines, 24–27 March 2003, brought together 200 people from 36 countries. The meeting consisted of 20 workshops, which considered priority issues and problems of management identified through a questionnaire that had been sent to managers from all coral reef regions of the world, early in the conference planning process [37]. Backgrounds varied from managers, scientists, private sector, NGOs, to development and funding agencies, reflecting a broad range of experience. The aim of the symposium was to review the issues facing tropical marine ecosystems as well as progress to date, and share and discuss lessons learned in implementing the ICRI Framework for Action. A specific objective of the symposium was also to provide an opportunity for managers to engage in multidisciplinary discussions to identify gaps and priorities for future management action [37].

ICRAN hosted and chaired the session entitled 'The Role of Protected Areas in Management'. In this session, managers and practitioners from a number of ICRAN sites shared their experiences, described lessons learned, challenges faced from their particular park, and discussed how the ICRAN network can make a contribution towards addressing the site priorities and needs, as well as future learning opportunities. The discussions and recommendations proposed by the participants in this session were promoted by eight presentations from four ICRAN regions (Table 3, in bold). An additional number of studies have

**Table 3 – Case studies discussed in this report. The ones listed in bold were presented at ITMEMS 2, those in normal font had been accepted, but, due to unforeseen circumstances, the authors were unable to attend the conference.**

<b>CARIBBEAN</b>	<p><b>Community-Based Coastal Resource Management and Marine Biodiversity Conservation; Lessons from Punta Allen, Sian Ka'an Biosphere Reserve, Mexico</b></p> <p><b>Capacity Building for Marine Protected Area Management: The Case of the UNEP-CEP Training of Trainers Programme</b></p> <p><b>Management plan of 'Banco Chinchorro' Biosphere Reserve: A case study of Concerted Rules and Zoning with Stakeholders</b></p> <p>Admission Fees: Opportunities and Challenges of Using Admission Fees as a Funding Source at a Small Scale, Tourism Dependant MPA. Case Study of the Bonaire National Marine Park, Bonaire</p> <p>Strengthening Relationships: The Case of the Soufriere Marine Management Area (SMMA), Saint Lucia</p> <p>Community Policing and the 'Culture of System-Beating': The Honorary Game Wardens and Fisheries Inspectors of the Portland Bight Protected Area, Jamaica, West Indies</p> <p>Conflict Resolution Between Inter-Sectoral Stakeholders for the Buccoo Reef Marine Park Coastal Zone in Tobago: The Pigeon Point Case Study</p>
<b>EAST AFRICA</b>	<p><b>Implementing ICRAN Activities at the Malindi/Watamu MPA Complex Demonstration Site, Kenya</b></p> <p><b>Challenges and Opportunities in Managing Marine Reserves Surrounded by Poor Population and Urban Settings. Case study of the Dar es Salaam Marine Reserves System, Tanzania</b></p>
<b>EAST ASIA</b>	<p><b>Solution strategies of the Alternative Income Increase in Gili Matra Marine Natural Recreation Park (GM-MNRP) West Nusa Tenggara Province, Indonesia</b></p> <p><b>Bunaken National Park Co-Management Initiative</b></p>
<b>SOUTH PACIFIC</b>	<p><b>Multiple-Use Management Plan for Whole of Atoll Management: Jaluit Atoll Marine Conservation Area Management Plan</b></p> <p><b>Coral Transplantation and Restocking to Accelerate the Recovery of Coral Reef Habitats and Fisheries Resources within No-Take Marine Protected Areas: Hands-on Approaches to Support Community-Based Coral Reef Management</b></p>

been included in this report as these had been accepted for presentation at the symposium, but, due to unforeseen circumstances/political tensions, the presenters were unable to attend the conference (Table 3, normal font).

### Results of the ICRAN workshop

The presentations illustrated activities throughout the four coral reef regions, highlighting capacity building, the development of management plans, resource use conflicts, private sector involvement and partnerships, as well as alternative livelihoods. In addition to providing a global forum for ICRAN global partners to present their regional activities, the ICRAN session allowed participants to exchange information about experiences, and get a wider perspective on the project as a whole. It also presented ICRAN with the opportunity to showcase the successes and challenges of a project implemented on a local scale via a global network.

The following set of questions guided the discussion that followed on from the presentations:

1. What additional role can ICRAN play in the short and long-term to strengthen the capacity of communities and MPAs to manage their tropical marine resources?
2. With emphasis on peer-to-peer interactions and ICRAN's innovative approach of focusing its efforts on sustainability of reefs and community livelihoods, are there significant benefits to participating in a global learning framework?
3. What additional learning opportunities should ICRAN be contributing to, and promoting, in an effort to strengthen learning experience and framework through peer-to-peer networks?
4. Do the projects and priorities of ICRAN fulfil the needs at the site level? What should the priorities of ICRAN be?
5. Can a global initiative respond adequately to what a local coastal community would define as sustainability?
6. What lessons have been learned through the formation and implementation of an ICRAN network that is based upon information and experience sharing?

The discussions addressed issues of stakeholder involvement and conflicting use of marine resources, a recurring theme through all ICRAN sites. Other concerns highlighted the still prevalent use of destructive fishing practices, as well as the lack of enforcement and monitoring in all of the four coral reef regions. Participants also drew attention to the need for greater integration of traditional management systems (e.g. traditionally closed areas) with so called 'modern' systems, particularly in the South Pacific region. Lack of awareness of the importance of MPAs, lack of management capacity, lack of alternative income opportunities, and lack of stakeholder involvement in management planning still threaten the success and effectiveness of many marine reserves.

Participants also discussed how material presented could be used to highlight valuable lessons learned through ICRAN, what management initiatives ICRAN can provide elsewhere in the world, and how ICRAN should encourage sustainable practices. A number of 'lessons learned' were brought up by a number of participants. These included amongst others:

- Stakeholders are to be involved at all stages of MPA planning and management and feel empowered.
- Public awareness and education campaigns at all levels are crucial to the success of a MPA.
- The periodic review of training materials is important; follow-up training courses for MPA managers would improve capacity building and communication needs to be carefully targeted to individual user groups.
- When zoning a tropical marine national park, active involvement of primary user groups and a spirit of compromise are crucial to success. Zonation schemes should be kept relatively simple, with clearly demarcated boundaries. In addition to the need for MPAs to be geographically well defined, user rights have to be made clear.
- The most important aspects of successful implementation of a park user fee system are (a) active involvement of the tourism sector in the design of the system, and (b) earmarking of revenues for conservation and related education, as well as outreach and monitoring activities, in order to gain widespread tourist acceptance.

- Involvement of the private sector in co-management of MPAs is highly beneficial. Once potential business competitors focus on the benefits of cooperating to protect the resources in the MPA upon which their income depends, they become one of the strongest proponents of good management and bring considerable financial and human resources to the table.
- While multi-stakeholder co-management is clearly an effective strategy, a firm enforcement system is critical to achieving natural resource management goals. In the Indonesian context, multi-stakeholder patrols involving both trained security officers and local villagers have proven highly effective.
- Alternative income opportunities for local communities should be developed to lessen the pressure on marine resource harvesting. However, 'alternative livelihood programmes,' aimed at stakeholders currently involved in destructive activities in the coastal zone, are ineffective and largely rejected by local communities. Community conservation/improvement programmes should focus on rewarding those that have chosen sustainable livelihoods, while those that persevere with destructive activities should be dealt with by a strong enforcement system.

Finally, workshop participants proposed the following recommendations:

- Donor agencies must recognise the need for, and importance of, long-term projects.
- Global initiatives should be used to leverage funding for capacity building in local communities.
- Small amounts of funding can go a long way, i.e. donors do not need to invest large amounts to achieve good results.
- International programmes need to recognise that local communities have great pride in working with them.
- Mechanisms should be designed to foster self-sufficiency and local counterpart involvement.
- Exit strategies are needed for self-sufficiency, e.g. transfer of leadership and funding to local agencies and communities.
- 'Keep up the good work' – managers should continue their good performance to obtain additional funds, and not become complacent with seed funding.
- Need for continued support of exchange programmes (cross-visits), e.g. community to community, peer to peer.
- Increase networking at all levels (managers, cross communities) and establishment of a managers-dedicated network.
- Need for specific training for managers, e.g. Training of Trainers Programme.
- Networks should facilitate the compilation of lessons learned/best practices, taking into account the context in which they worked, and disseminate the information.
- Evaluation of activities is needed to determine level of success – need for documentation, useful information for donors.

More detailed results and discussion of lessons learned from these case studies, and selected others, can be found under the following regional chapters.