

**The Application of Integrated Resource Management to
Coastal and Marine Environments with Case Studies from
Australia and Tasmania**

by

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Statement

This thesis contains no material that has been accepted for the award of any other degree or diploma in any University, and to the best of the author's knowledge and belief it contains no copy or paraphrase of material previously published or written by other persons except where due reference is made in the text.

A handwritten signature in black ink, appearing to read 'Anh', written in a cursive style.

Nguyen Thi Kim Anh

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Abstract

The issue of coastal and marine degradation is beset by lack of consensus over the seriousness of the problem and serious practical difficulties associated with designing and implementing effective policy frameworks and strategies for dealing with the problem. The study reviews the literature on the state of these resources. This is used to show that degradation is a serious problem and that the processes behind degradation are both complex and multiple and therefore require co-ordination between many actors and between jurisdictions. The study also sets out to appraise the degree to which the development and implementation of policies tend to conform to a top-down model of policy making and implementation and are characterised by many of the types of strengths and weaknesses associated with that approach.

The thesis analyses the importance of coastal and marine resources and the evidence that these are being managed in an unsustainable manner. It critically assesses the policies and programmes designed to manage coastal and marine environments at the international, national, state and local levels. The study focuses in particular on integrated coastal zone management (ICZM) and sets out to analyse the way in which this tool has been adopted and implemented at these various levels by using Australia as a case study of a national approach and Tasmania as a case study of state and local approach to coastal and marine management strategies. The study concludes by commenting on the types of changes that are required in order for management of coastal and marine resources and environments to be more effective.

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In the memory of my father and for my mother.
(De tuong nho Ba va kinh tang Ma).

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Abbreviations and Acronyms

ABS	Australian Bureau of Statistics (Australia)
ACC	Administrative Committee on Co-ordination
AMISC	Australian Marine Industries and Sciences Council (Australia)
ANZECC	Australian and New Zealand Environment and Conservation Council
ASFIS	Aquatic Science and Fisheries Information System
AUSLIG	Australian Surveying and Land Information Group (Australia)
CAP	Coastal Action Plan (Australia)
CCSI	Coasts and Clean Seas Initiatives (Australia)
COAG	Council of Australian Governments (Australia)
CSD	Commission on Sustainable Development
CSIRO	Commonwealth Scientific and Industrial Research Organisation (Australia)
DELM	Department of Environment and Land Management (Tasmania)
DEST	Department of Environment, Sport and Territories (Australia)
DFIF	Department of Primary Industries and Fisheries (Tasmania)
EEZ	Exclusive Economic Zone
ERIN	Environmental Resources Information Network (Australia)
FAO	Food and Agriculture Organisation
GEF	Global Environmental Facility
GESAMP	Group of Experts on the Scientific Aspects of Marine Pollution
GIPME	Global Investigation of Pollution in the Marine Environment
HORSCEC	House of Representatives Standing Committee on Environment and Conservation (Australia)
HORSCERA	House of Representatives Standing Committee on Environment, Recreation and the Arts (Australia)
ICRI	International Coral Reef Initiative Programme
ICZM	Integrated Coastal Zone Management
IGAE	Intergovernmental Agreement on the Environment (Australia)
IGOOS	Integrated Global Ocean Observation System
IGOSS	Integrated Global Ocean Station System
ILAP	Integrated Local Area Program (Australia)
IMCO	Intergovernmental Maritime Consultative Organisation
IMCRA	Interim Marine and Coastal Regionalisation of Australia (Australia)
IMO	Intergovernmental Maritime Organisation
IOC	Intergovernmental Oceanographic Commission
IPCC	Intergovernmental Panel on Climate Change
IUCN	International Union for Conservation of Nature and Natural Resources (renamed the World Conservation Union)
IWC	International Whaling Commission
LDC	London Dumping Convention
LOSC	Law of the Sea Convention
LUPAA	Land Use Planning Approval Act 1993 (Tasmania)
LUPRP	Land Use Planning Review Panel
MARPOL	International Convention for the Prevention of Pollution from Ships
MCCN	Marine and Coastal Community Network (Australia)
MFPRP	Marine Farm Planning Review Panel

MMAP	Global Plan of Action for the Conservation, Management and Utilisation of Marine Mammals
MPAs	marine protected areas (Australia)
NatMIS	National Marine Information System (Australia)
NGOs	non-governmental organisations
NRIC	National Resource Information Centre (Department of Primary Industries and Energy, Australia)
NSESD	National Strategy for Ecologically Sustainable Development (Australia)
OCS	Offshore Constitutional Settlement (Australia)
OECD	Organisation for Economic Cooperation and Development
OR 2000	Ocean Rescue 2000 (Australia)
RAC	Resource Assessment Commission (Australia)
RMPS	Resource Management and Planning System (Tasmania)
SDAC	Sustainable Development Advisory Council (Tasmania)
SOMER	State of the Marine Environment Report (Australia)
TCT	Tasmanian Conservation Trust
UN	United Nations
UNCED	United Nations Conference on Environment and Development
UNCHE	United Nations Conference on Human Environment
UNCLOS	United Nations Conference on the Law of the Sea
UNDOALOS	United Nations Division of Ocean Affairs and Law of the Sea
UNDP	United Nations Development Program
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organization
WB	World Bank
WCC '93	World Coast Conference, Netherlands (1993)
WCED	World Commission on Environment and Development
WMO	World Meteorological Organisation
WWF	World Wide Fund for Nature

CHAPTER 1

Introduction

1.1 Background

Degradation of coastal and marine environments has been the cause of much concern and the subject of considerable debate during the latter half of the twentieth century. It is a classic 'tragedy of the commons' phenomenon (Hardin 1968), but a tragedy that has been played out at multiple levels as it involves the international, national and local communities. It is also complicated by the fact that coastal and marine degradation is caused not by one or two, but by a myriad of processes. Each of these processes, furthermore, involves a large number of actors with competing interests. The resulting debate has been characterised by differences in opinion over how urgently remedial actions are required, who has the responsibility for addressing the problem, and how both economic and ecological values can be simultaneously protected. The attempt to resolve this set of complex and difficult questions has drawn marine scientists, policy makers and others into protracted debate.

Devising and implementing strategies to address these problems has therefore represented a very challenging task for governments. The critical question is, given these complexities and problems, how have communities and governments gone about attempting to manage the coastal and marine environments under their ownership or jurisdiction and how effective these attempts have been, or are likely to be, in practice. This is an important question as the environmental consequences for failing to implement effective measures to address coastal and marine problems are potentially serious.

To answer the above question, however, it is necessary to examine it from a number of perspectives. This is because coastal and marine degradation is simultaneously a global and a local problem. It is therefore not possible to sensibly discuss the way in which coastal and marine policies have been developed at the national level without an

appreciation of the way in which these policies have evolved in response to international pressures. Similarly, it is not possible to discuss the way in which such policies have been developed and implemented at the local level without reference to the development of policies and programmes at the national level.

It is therefore necessary to approach a discussion of coastal and marine management by considering the development of strategies at the international level and examining the way in which these strategies have been adopted and implemented at the national and more regional levels. At the international level, central concepts such as integrated management for coastal and marine environments have been well advanced and clearly articulated at international forums, such as the third United Nations Conference on the Law of the Sea 1982 (UNCLOS III) and the United Nations Conference on Environment and Development 1992 (UNCED), and have been incorporated into international agreements and policy. These concepts have been developed as a means of facilitating a co-ordinated decision-making framework and the concept of Integrated Coastal Zone Management (ICZM) has been of particular relevance in this regard as it has been central to the development of a co-ordinated decision-making framework in coastal zone management (Cicin-Sain and Knecht 1995). ICZM has been advanced as a vehicle by which the principle of ecologically sustainable development can be implemented (Kenchington and Crawford 1993; Knecht and Archer 1993). Numerous conventions have been adopted and put into effect and there is now considered to be an effective 'Law of the Sea' (Pickering and Owen 1994) that provides the international community with a global directive for the marine environment (Schachte 1992).

The marine environment has been central among the environmental issues addressed at international conferences on the environment. The concepts of sustainable development and integrated management have recently been adopted by international community as the most practical means of installing the environment into economic policy and decision-making and these concepts have been perhaps most rapidly applied to the area of coastal and marine environmental management.

It is not clear how effectively these efforts at the international level have been translated into action, and to what degree these ideas and principles that have been developed at the international level have been adopted and applied at the national and more local

levels. Some have argued that such initiatives at the international level have actively encouraged national action in managing the coastal and marine environments (Davis 1996a). Others, however, have argued that the practical difficulties of co-ordinating policies both between and within nations have often resulted in the adoption of approaches that typically involve multiple agencies with conflicting agendas rendering implementation problematical and the overall result inefficient (Brenton 1994). It is clearly important to ascertain which view is the more correct because a failure to effectively implement these policies has major ramifications for the global as well as the local and national communities.

1.2 The Purpose and Argument of the Study

The purpose of this study is therefore to analyse international efforts aimed at addressing problems relating to the coastal and marine environments and to examine the way in which these have been adopted and applied at the national and local levels. In doing so, the thesis is based on two simple propositions. The first of these propositions relates to how big the task confronting us is. Simply put, the proposition advanced here is that the need for action to address coastal and marine degradation is relatively pressing and in many cases urgent.

The second proposition deals with the question of how effective our present efforts at addressing these problems are. It is that both the development and implementation of policies and programmes designed to do so will be difficult for two reasons: (i) the processes behind degradation are both complex and multiple and will therefore require co-ordination between many actors; and (ii) coastal and marine degradation is transboundary in nature and their resolution therefore requires co-ordination between nations and between the various tiers of government within nations. In the latter case, development and implementation of policies will tend to conform to a top-down model of policy making and implementation will therefore tend to be characterised by many of the types of weaknesses associated with that approach. In this model, policies are developed at the top-most tiers of government while implemented by the bottom or more local tiers of government (Ham and Hill 1993). Although this model of policy development and implementation has been criticised (Ham and Hill 1993), it nonetheless provides a portrayal of the policy process in some areas. In particular, those

involving global issues are more likely to conform to such a model of policy development and implementation. The current development of Greenhouse gas abatement policies in Australia, for example, has been largely a top-down process. Coastal and marine management policies have also tended to be developed and driven from the top while implemented from below.

The problems with such a top-down approach to policy making and implementation are many and well-known (Ham and Hill 1993). The more links in the process, the greater the likelihood of policy failure. How well the process works in practice may depend on the nature of the relationship between the various levels of government, on the number of government agencies with conflicting agendas involved and the stability of governments. The top tiers of government, furthermore, may develop policies but provide few resources for their implementation. Or the policies handed down to the bottom tiers of government for implementation may not be well-developed and require further evolution in development during the implementation process. This means there are likely to be many difficulties in developing policies which aim to address what are basically global problems when responsibility for implementing these policies rests with local tiers of government (Ham and Hill 1993).

When applied to coastal and marine issues the top-down model could be complicated by a further problem. The relative focus on the split between coastal and marine shifts by necessity towards the coastal and away from the marine as the jurisdiction of governance becomes more localised. This means that policy developed at the top is likely to have a greater emphasis on the marine environment while implementation at the bottom will have a more coastal flavour. This difference in emphasis has the potential to create added tension between policy development and policy implementation.

1.3 Aims and Objectives

The aim of this thesis is to critically assess policies and programmes designed to manage coastal and marine environments at the international, national, state and local levels. The thesis focuses in particular on ICZM and sets out to analyse the way in

which it has been adopted and implemented at these various levels. The specific objectives of the thesis are:

- to assess the issues and problems that have given rise to the perception that management of coastal and marine resources is required and that ICZM is the most suitable means by which sustainable development of the coastal zone can be promoted;
- to analyse the efforts at the international level aimed at developing a conceptual framework for coastal and marine management and its implementation;
- to examine how coastal and marine management policy has adopted and implemented at the national level with Australia as a case study; and
- to examine how coastal and marine management policy has been adopted and implemented at the state and local levels with Tasmania as a case study.

1.4 Research Approach

1.4.1 Selection of Case Studies

In order to examine the development and implementation of coastal and marine policy at the national, state and local levels, and to describe the possibilities and constraints facing policy makers, a series of case studies were employed. As no two countries are exactly alike with regard to either coastal and marine problems or policy development and implementation, yet they may have many problems in common, the case studies have both general and specific implications in coastal and marine management in the post-UNCED era.

At the national level, Australia was used as a case study. There were a number of reasons for selecting Australia for this purpose. It is a nation that has been described as extremely conscious of its responsibilities and obligations for ocean governance emerging from the UNCED 1992 and the entry into force of the LOSC (VanderZwagg *et al.* 1996a). It has one of the world's largest maritime jurisdictions and a coastline which is a focus for a range of human economic activities¹. In order to manage the coastal and

¹Australia has the longest ice-free coastline (36,735 km) and the third largest maritime area of any country in the world (8.94 million km²) 200 nautical mile Exclusive Economic Zone (EEZ), excluding the Australian Antarctic Territory) (VanderZwagg *et al.* 1996a).

marine environments, Australia has undertaken a number of initiatives aimed at improving maritime governance and the conservation and management of coastal and marine resources. It has been argued by Haward (1996) that the development of programmes and policies to promote and implement ecologically sustainable development and ICZM in Australia is emerging as an imperative for both the Commonwealth, the federal government in Australia, and state (including territories) governments. The three spheres of government face serious challenges in establishing an integrated framework to manage the coastal and marine environments (Haward and Hildebrand 1996). VanderZwagg *et al.* (1996a: 4) have stated that 'the experiences of Australia and Canada in the post-UNCED era may provide some lessons for other states grappling with the need to develop integrated approaches to managing their ocean and coastal resources'.

In terms of coastal and marine issues, Australia also has features in common with a number of other countries. In particular, in terms of coastal policy, similarities between Australia and both the United States (US) and Canada have often been pointed out. First, all three are coastal states and based on comparative statistics of coastal population, coastal industry, coastal recreation and tourism, Australia is the most coastal-oriented of the three (Hildreth 1992). Second, all the three countries have federal systems of government and the implementation of coastal and marine management in a country such as Australia is therefore of particular interest. The implementation in coastal countries with federal systems of government is fraught with problems, including a conflict in jurisdiction and management of the coastal and marine resources. The appropriate federal-state relationship then becomes an extremely important component of any coastal management scheme which is instituted (Hildreth 1994). Some of the means used to resolve these conflicts in Australia, such as the Offshore Constitutional Settlement (OCS), have been described as relatively successful (Haward 1989). It therefore represents a useful model of coastal zone management for other countries with a federal system of government.

Australia is also an interesting case study due to the fact that its strong interest in coastal and marine matters has a significant effect in the Asia-Pacific region (Faulkner 1995). In the context of the South Pacific region, the development of a national management policy for Australia's coastal and marine areas may provide a model of a process that

could be considered by states in the South Pacific and other regions such as those in the Indian Ocean. Because it has greater technical, human and financial resources than many of its neighbouring countries, Australia can contribute substantially to the coastal and ocean development and management of the South Pacific region (Morrison 1995; Bergin and Michaelis 1996). According to Woodroffe (1995), climatically and demographically, Australia contrasts with neighbouring South-east Asian and Indian Ocean coastal states, but the challenges of managing its productive but fragile coastal ecosystems are similar to those faced by other countries in the region, and there are many lessons to be learnt in common.

Tasmania, Australia's smallest and only island state, was used as a case study of coastal and marine management at the state and local levels. It is the most coastal Australian state, with the greatest length of coastline per total land area. While coastal and marine resources significantly contribute to the development of the State's economy, environmental problems are evident in many areas in the coastal zone. As a rule, the Tasmanian Government has the primary responsibility for coastal zone management. It has recognised the importance and sensitivity of the coastal and marine environments, and has attempted to develop a new system to address conflict over use and accommodate future use and development of these environments. It is in the process of addressing the weaknesses of the traditional coastal zone management approaches and establishing an appropriate framework for managing the coastal and marine environments. Mechanisms put in place in the attempt to overcome the problems include the Resource Management and Planning System (RMPS) and the State Coastal Policy. The former is of particular relevance to the study as it is an integrated system of planning and policy control which attempts to apply central concepts developed at the international level, such as sustainable development and ICZM, to problem solving at the state and local levels. The State Coastal Policy, on the other hand, represents a new policy mechanism in coastal zone management.

Coastal zone management has also emerged at the local level. The role of local government in environmental management in general, and in coastal zone management in particular, has been evolving and its importance is now recognised globally and nationally. According to Haward and Hildebrand (1996) and Brown (1995), local government has the most important role in achieving the integration in coastal zone

management in Australia. Local government is responsible for many day-to-day decisions on the use and management of coastal zone resources. In Australia in general, and in Tasmania in particular, local governments are restructuring so that they can fulfill their evolving role and responsibilities.

1.4.2 Information Collection

The research methodology involved a number of strategies suited to the multiple objectives of the study. Internet and on-line library searches were used to obtain information on the evolution of issues and the development of coastal and marine policy at the international and national levels. Academic, government and non-governmental literature found in this way provided further reference material.

A major limitation of the study was the lack of available published information on coastal zone management at the state and local levels. Additional information was therefore obtained from interviews with various individuals with expertise in this area, including State Government officials, through personal interviews and electronic mail. A short questionnaire was prepared and sent to all local councils with jurisdiction over coastal areas in Tasmania in order to supplement information on coastal zone management practices at the local level. The questionnaire is described more fully in Chapter Six (section 6.4.3.2).

1.5 Thesis Outline

The thesis begins by addressing first the proposition that coastal and marine degradation is serious and that the overall need to address these problems is pressing and often urgent. Chapter 2 presents a discussion of the imperatives for coastal and marine management. The economic and ecological roles of the coastal and marine environments, and their importance, are described and the common problems associated with these environments, especially those associated with the coastal zone, are discussed.

The remainder of the thesis is devoted to the second proposition of the thesis, that policy development and implementation in this area is beset by many problems caused by the multiple issues and multiple jurisdictional nature of the issues and the fact that policy

implementation conforms largely to the top-down model. Chapter 3 analyses the history of international efforts aimed at developing mechanisms by which to manage coastal and marine environments and traces the evolution of concepts central to coastal and marine management at the international level. This history and evolution have been a response to changing perceptions concerning the need for coastal and marine management and these changes in perception are also described. The response at the international level has included conferences and associated treaties and agreements which ultimately culminated in the adoption of the concept of ICZM at the UNCED 1992. Chapter 3 concludes with a summary of the mechanisms adopted at the international level to facilitate the adoption and implementation of major programme areas of Chapter 17 of Agenda 21², and especially the concept of ICZM.

The focus of the study shifts in Chapter 4 to the national level by examining the way in which the concepts central to coastal and marine management adopted at international forums and in international treaties have been adopted and applied at the national level. Australia's particular needs for coastal and marine management are examined and the ways in which the national government has responded to these needs are discussed. The legislative and institutional framework for coastal and marine management at the national level is also reviewed, with a summary of national inquiries into the coastal zone and an account of the Ocean Rescue 2000 Program (OR 2000) and Marine Program, the Commonwealth Coastal Policy and the Coastal Action Plan (CAP), the recent Coasts and Clean Seas Initiatives (CCSI), and the Commonwealth Oceans Policy.

In Chapter 5, the focus of the study shifts once again to examine coastal and marine management at the state level, using Tasmania as a case study. Studies on the Tasmanian coastal zone are summarised and the RMPS and the State Coastal Policy are described. The Chapter concludes with a detailed assessment of the State's marine farming planning process in order to ascertain the extent to which ICZM has been incorporated into the State's planning system.

Coastal zone management at the local level is discussed in Chapter 6. Although ignored by the UNCED 1992, coastal zone management at the local level is currently attracting considerable attention from the Commonwealth and Tasmanian Governments. The

² Agenda 21 was a global programme of action adopted at the UNCED 1992. Chapter 17 was the chapter on coastal and marine environments.

Chapter analyses the failure of Chapter 17 of Agenda 21 to take into account the role of local government in coastal management. It examines the role of local government in environmental management in general, and in coastal zone management in particular, and Commonwealth and Tasmanian Government programmes aimed at enhancing this role. It also discusses the progress and problems local government faces in coastal zone management.

In the concluding chapter, the results of the previous chapters are summarised and the changes required for more effective management of coastal and marine environments are discussed. It is argued that most of the problems associated with the implementation of ICZM and their possible solutions are the responsibility of all spheres of government. Changes in the behaviour and attitude of these governments are therefore likely to be a prerequisite for promoting the sustainability of coastal and marine environments.

1.6 Definitions

Before launching into the thesis, it is necessary to define the important terms used in this thesis. This is because various definitions associated with coastal and marine management, such as the marine environment, the coastal zone, coastal zone management and ICZM, have often been advanced at international forums, in national and regional reports and inquiries, and in policy documents on coastal and marine management. It is therefore necessary to begin by clarifying the definitions used in this study.

(i) The definition of the marine environment

The definition of the marine environment used in this study is that agreed at the UNCED 1992 as follows:

The marine environment - including the oceans and all seas and adjacent coastal areas - forms an integrated whole that is an essential component of the global life-support system and a positive asset that presents opportunities for sustainable development (Johnson 1993: 308).

(ii) The definition of the coastal zone

Definitions of the coastal zone have proved to be the most contentious and varied in definition. While many different definitions of the coastal zone have been proposed, these can be grouped, in the main, according to whether they focus on administrative, linear or biophysical characteristics. In practice, a combination of an administrative and a linear definition is often chosen for practical reasons of implementation (Tasmanian Department of Environment and Planning 1991). The definition of the coastal zone employed should be flexible and depend on the issues being confronted (Tasmanian Department of Environment and Planning 1991; RAC 1993a). RAC (1993a) further contends that any policy on coastal zone management should consider the coastal zone in its broadest sense. For example, the approach advocated by the Organisation for Economic Cooperation and Development (OECD) Environment Directorate (1991), and adopted by the Resource Assessment Commission (RAC) Coastal Zone Inquiry 1993 in Australia, was that the definition of the coastal zone should be variable and adjusted according to the nature of the problem being examined and the particular objectives of management (RAC 1993a).

There is general agreement that, in physical terms, the coastal zone covers an area extending landward and seaward of the shoreline and that the coastal zone should be defined as the dynamic interface between land and sea, a transition space between two environmental domains (Sorensen and McCreary 1990). There is much disagreement, however, on how the on/offshore part of the coast should be determined. Given this lack of consensus over definition, it was necessary to decide which definitions were appropriate for this study. It was considered that the definitions of the coastal zone stated in the Australian Federal Coastal Policy 1995 and Tasmanian State Coastal Policy 1996 were most suitable as they are particularly well suited to the aims and objectives of the thesis as outlined in section 1.3 above. The Australian Commonwealth Coastal Policy 1995 defined the coastal zone as:

The boundaries of the coastal zone are considered to extend as far as inland and as far seaward as necessary to achieve the Coastal Policy objectives, with a primary focus on the land-sea interface (Australia 1995:3).

The Tasmanian State Coastal Policy 1996 defined the coastal zone as:

The coastal zone extends seaward to the outer limits of the terrestrial sea adjacent to Tasmania, embracing islands and outcrops within the jurisdiction of the State, excluding Macquarie Island, and extends inland to the extent necessary to embrace activities, uses and developments which may have a significant effect upon the amenity and environment of the coast as constituted by the primary elements listed above. The zone extends inland to the extent necessary:

** to embrace proposed activities, uses and developments which in the opinion of the relevant planning authority may, if allowed to proceed, impact on the coast; and*

** to achieve the principles, objectives and outcomes of this Policy (Tasmania 1996:6).*

(iii) The definition of coastal zone management

A small number of definitions of coastal zone management exists. The one used in this thesis is that adopted by the South Australia Coast Protection Board and the US Coastal Zone Management Act 1972:

A process of making decisions on use of the coast, having first studied the environment and its capabilities as well as the issues involved and alternative solutions to them, and having sought and considered the views of the public. It will generally involve guiding development and recreation to less sensitive areas, while restricting access and use in more fragile parts (Australia 1980:3).

(iv) The definition of integrated coastal zone management

The concept of integrated resources management has received international acknowledgment as representing a better approach to resource allocation and decision-making. The plain English version of the term 'integration' provides some understanding of what is meant by that term. According to the Webster Dictionary, 'to integrate' means:

To combine to form a more complete, harmonious or co-ordinated entity (Webster Dictionary, in Kenchington and Crawford (1993)).

In coastal and marine management, the concept of integrated management is concerned with creating a framework which avoids the traditional sectoral approach and brings together management of different parts of the marine environment and ensures that common objectives are pursued and achieved. According to Sainsbury *et al.* (1997), the

core aspects of integrated coastal and marine management are the consideration in the decision-making process of the following factors: the effects of using coastal and marine resources on ecological, economic, cultural and social values of the coastal and marine environments; the integration between governments; and the integration between governments and community and industry in the management of these environments. Kenchington (1993) has argued that in order to achieve integrated management for the coastal and marine environments, it is critical to incorporate in the traditional sectoral approach a multiple-use philosophy of resources and space management, which emphasises sustainable use of the resource base and implies measures and mechanisms for the anticipation, resolution or accommodation of conflicts among competing users of the coastal and marine areas.

The term ICZM has several definitions, each of which possesses key elements that are important. Agenda 21 of the UNCED 1992 defined ICZM in terms of the overall objective which was:

To improve or restructure the decision-making process so that consideration of socio-economic and environmental issues is fully integrated and a broader range of public participation assured (Johnson 1993: 200).

Definition of ICZM from the OECD Environment Directorate (1991), on the other hand, defined ICZM as:

Management of resources as a whole in relation to local, regional, international goals (OECD 1991: 37 in RAC (1993b: 7)).

Finally, a global conference to exchange experience in preparing national guidelines for ICZM and development, the World Coast Conference '93³ (WCC '93) adopted the following definition of ICZM as:

The comprehensive assessment, setting of objectives, planning and management of coastal systems and resources, taking into account traditional, cultural and historical perspectives and conflicting interests and uses; it is a continuous and evolutionary process for achieving sustainable development (IPCC 1993: 49).

In all of these above definitions, ICZM is understood to be a dynamic process in which a co-ordinated strategy is developed and implemented by all spheres of government for

³ The Conference was held in early November in Noordwijk (the Netherlands) (Haward and Hildebrand 1996).

the purpose of allocating environmental, socio-cultural, and institutional resources so as to bring together multi-disciplinary and cross-sectoral interests into a single framework in order to achieve conservation and sustainable multiple use of the coastal zone (Sorensen and McCreary 1990).

CHAPTER 2

Coastal and Marine Resources and the Need for Integrated Coastal Zone Management

2.1 Introduction

The coastal and marine environments of a country are among its most significant assets and they provide a wide range of resources and opportunities for various activities. These environments contains complex and diverse ecosystems that are subject to continual change caused by both natural processes and the effects of human activities. A relatively large proportion of human activities, including tourism and recreational activities, mariculture, fishing and industrial activities, takes place in the coastal zone. These current uses of coastal resources have significant direct, indirect and cumulative impacts on the environment and coastal and marine degradation has been common. This has led to a strong desire to preserve the coastal zone and to ensure that it is used in a sustainable manner. This chapter provides an account of the ecological and economic significance of coastal and marine resources, as this forms an essential part of the support for ICZM.

2.2 Coastal and Marine Resources and their Economic and Ecological Importance

Oceans cover more than two-thirds of the Earth's surface and are said to be the dominant factor in the operation of the biosphere (Prager 1993). The marine environment, which includes all oceans, seas and adjacent coastal areas, is an extremely complex, highly diverse, and dynamic system which is an essential component of the global life-support system (Clark 1996; Johnson 1993). Its distinctive ecosystems, such as coral reefs and mangroves, provide important sources of both living and non-living resources, the former having no equal on land. There is a greater diversity of species in

the sea than anywhere else on Earth and many food chains begin with marine organisms (Pickering and Owen 1994).

The exploitation of living and non-living marine resources involves many kinds of human activities, a high proportion of which is centred on the coastal zone. Rapid expansion of the human population has increased the demand for food and minerals, and technological development has made more extensive exploitation of marine resources possible. Today, more than half of the world's population of 5.6 billion live within 60 km of the shoreline and these communities are highly dependent on coastal resources for their survival (Johnson 1993). The main economic activities undertaken in the coastal zone are listed in Table 2.1.

Table 2.1 Human Uses of the Coastal Zone

Zone	Type of coast	Uses
Subtidal-offshore zone	Continental shelf	Fishing, oil exploration, mining, sand dredging, dumping of wastes, sewage outfalls
	Coral reefs	Tourism, fishing, quarrying
	Estuaries	Tidal barrages, coastal protection schemes
Intertidal-nearshore zone	Sand and gravel beaches	Recreation, sand and gravel mining, back beach building, coastal protection schemes
	Wetlands	Aquaculture in converted ponds, oyster beds, reclamation, grazing, reed and timber extraction, canals/pipelines, nature conservation
Backshore zone	Shore platforms	Seafood hunting/collecting, quarrying
	Dunes	Recreation, golf courses, nature reserves, building, water extraction, army manoeuvres
Onshore zone	Cliffs	Shore protection works, building on cliff tops, mining, conservation coasts
	Coastal towns and reclaimed land	Ports and harbours, marinas, housing, industry, agriculture, nature reserves, tourism

Source: Viles and Spencer 1995

A wide variety of marine species are used as a source of food, genetic stock for aquaculture, genetic material for biotechnology applications, the production of medicines, and materials used in food processing and other industrial applications (Miller and Catena 1991). Historically, the primary role of the oceans, in the human economy, has been to provide food. Exploitation of fisheries has been one of the most important human activities associated with the marine environment. The biological

resources of the seas have been harvested since prehistoric times and today about 6% of all protein consumed by humans is obtained directly from the sea. If indirect supplies of protein, such as fish meal used as feedstock for other animals are included, this figure increases to almost 25%. Seafood is therefore a critically important resource, and on a worldwide basis provides more protein per capita than beef and mutton combined (Clark 1996). Yields have increased nearly fivefold over the past four decades (Johnson 1993) with a total production in 1991 of 81.7 million metric tons (Mmt), 95% of which is taken from waters under national jurisdiction. The World Resource Institute (1991) estimates that about 9,000 species of fish are commercially exploited, 22 of which are harvested in quantities exceeding 100,000 metric tons per year.

Biological marine resources are also an important source of genetic stock for the aquaculture industry which has proliferated in many coastal nations, especially in tropical countries. Aquaculture has recently become one of the fastest growing economic activities in the coastal zone (Clark 1996). Many coastal habitats, such as mangroves, are regarded as well suited to this industry. Approximately 13 Mmt of fish are produced by the aquaculture industry annually, representing about 15% of the world's total fishery catch (Ingmanson and Wallace 1995). The production of fish from aquaculture has not only helped alleviate local food shortages but also forms the basis of a strong export market in many countries (Goldberg 1994).

The use of marine organisms in the development of medicinal products has also become increasingly important. Medicinal products derived from marine flora and fauna include antibiotics, tumour inhibitors, coagulants and anticoagulants, and substances used in treating heart or nerve ailments (Miller and Catena 1991). The most important of these products are algin, agar and carrageenan, all of which are algal extracts. Many other derivatives are in various stages of testing and development. However, modern biomedical use of marine organisms is still in an early stage of development (Ingmanson and Wallace 1995).

The marine environment is also rich in non-living resources. Salt is produced at coastal sites in many countries (Pickering and Owen 1994) and salt deposits are mined around the world. Many minerals and natural resources occur in ocean-bottom sediments,

although only a few of these are currently mined commercially. These include oil, natural gas, manganese nodules, phosphate compounds, gold and diamonds. For example, oil and gas are extracted from wells located on the continental shelf in many countries of the world, such as Australia, countries in the Persian Gulf and in the North Sea, gold is mined in many delta regions along the coast of continental US and Alaska, and diamonds are mined in delta sediments on the continental shelf off South Africa (Pickering and Owen 1994; Ingmanson and Wallace 1995). While the number of marine mineral resources positively identified to date has been small, other mineral commodities have been found along the outer continental shelf and on the deep sea bed. As marine mining and extractive technologies are developed, these potential resources are likely to become viable mineral reserves (Prager 1993).

The use of desalination plants to produce fresh water, and the development of ocean and tidal energy conversion systems, are now increasingly receiving attention as the supplies of these resources are depleted and the environmental problems associated with water pollution and pollution from the production and use of energy increase. The technical potential for producing fresh water and energy from the oceans is very substantial (Pickering and Owen 1994; Middleton 1995; Ingmanson and Wallace 1995).

The marine environment also supports a wide range of terrestrial and marine-based tourism and recreational activities. Beaches are the focal point for most coastal tourism and are a major source of revenue in many coastal countries (Middleton 1995). The Pennekamp State Coral Reef Park in Florida (US), for example, attracts 1.5 million visitors per year. Tourism and recreational activities have grown faster in coastal areas than most other activities, and have become significant contributors to the economies of many coastal countries. According to Miller and Catena (1991), coastal zone tourism may now be the world's largest single business sector. In France, for example, 18% of domestic tourism and 19% of international tourism is associated with the Mediterranean coast. The figures for Tunisia and Yugoslavia are 80% and 90% respectively. For small countries, especially those without industrial and agricultural outputs, tourism often constitutes a major component of the national economy. The economy of the Caribbean islands, for example, is based to a very high degree on tourism (Goldberg 1994). The income generated from such tourism is often a major source of foreign exchange in such

countries. More than half of the foreign exchange earnings of the Cayman Islands, for example, are from coral reef based tourism (Middleton 1995).

Shipping is another significant activity undertaken in the marine environment. It is one of the cheaper means of conducting trade between countries and the world economy is highly dependent on marine transportation. Marine transport technology has advanced dramatically over recent years, especially in commercial and military areas (Ingmanson and Wallace 1995; Pickering and Owen 1994).

In addition to these economic values of marine resources, the marine environment serves very important ecological functions. According to Miller and Catena (1991), these include the circulation of mineral nutrients and energy, assimilation of waste products, regulation of the chemical balance of oceans, support for the atmosphere and soils, and maintenance of biological diversity. The oceans also play a very important role in regulating global climate and in moderating global temperatures. It is the high thermal capacity of water that makes much of the earth inhabitable (Prager 1993). In addition, coastal habitats provide protection from severe storm events. Mangroves and coastal wetlands, coral reefs, coastal barrier islands and lagoons are often recognised by natural hazards experts as the best defence against storms and erosion, deflecting and absorbing much of the energy of these events (Middleton 1995). The marine environment, therefore, serves numerous important ecological functions, on the one hand, while supporting extensive exploitation on the other. The rate of exploitation is, furthermore, increasing. The coastal zone is particularly heavily exploited, especially in small developing island states (Lazarus 1990; Clark 1996), with development of coastal zones outpacing inland development in many countries (Kim and Siong 1985). Some of the consequences of this level of exploitation and development in the coastal zone are discussed below.

2.3 The State of the Coastal and Marine Environments

In 1990, a joint Group of Experts on the Scientific Aspects of Marine Pollution (GESAMP) met under the auspices of the United Nations (UN) to assess the state of the marine environment. The Group noted that "In 1989 man's fingerprint is found

everywhere in the oceans” (Ingmanson and Wallace 1995: 445). While the Report considered that the open ocean remains relatively unpolluted, there was broad acceptance that severe stresses on many coastal environments were leading to deterioration in the quality and productivity of the marine environment (Lazarus 1990; Setamanit 1985). It was further noted that although the threat was not currently in itself global, the combined effect on many local forms of environmental problems could first become serious on a regional scale and then progress to a global scale (Prager 1993).

While depletion of coastal resources, destruction of critical habitats, disruption of ecosystem processes and water pollution in the marine environment are now evident all around the world (Middleton 1995; Marsh and Grossa 1996), signs of such stress can perhaps be most readily observed in all coastal nations. Among the many visible concerns listed in the GESAMP report were the destruction of beaches; microbial contamination of marine habitats; eutrophication; the progressive build-up of chlorinated hydrocarbons, especially in the tropics and subtropics; the pollution of the sea by plastic litter; and the accumulation of tar on beaches (Lazarus 1990). The loss of coastal resources, such as fish, sea turtles, coral reefs and mangroves, is also a common problem in many coastal countries. Habitat destruction is considered the most serious threat. Although such destruction is difficult to quantify, it has been observed that many critical habitats, such as coral reefs and mangroves, are being lost irretrievably (Middleton 1995).

Another significant problem is pollution. A United Nations Environment Programme (UNEP) report on the state of the world’s ocean stated that ‘the world’s coastlines are threatened with contamination’ (Lazarus 1990: 14). There are now clear indications that pollution has spread, especially since the early 1950s, to even to the remotest areas of the marine environment (Pickering and Owen 1994): areas of eutrophication are expanding, along with enhanced frequency and scale of unusual plankton blooms and excessive seaweed growth; and oil and tar pollution have become common problems in many seas (Ingmanson and Wallace 1995; Prager 1993). The disruption of coastal ecological processes is also of great concern and coastal erosion and siltation are now major problems in many countries around the world (Pickering and Owen 1994). The

major causes of these stresses on the coastal and marine environment are discussed in the following section.

2.4 Major Causes of Coastal and Marine Degradation

The growth of human population in the coastal zone and the development of coastal and marine resources have been very rapid over recent past decades. The root causes of coastal and marine degradation in many cases are population growth, socio-economic pressures, and sub-optimal resource management. Lack of management in fisheries has depleted populations of some of the major fisheries of the world. For example, the depletion of the anchovy fisheries off the coast of Peru during the 1970s resulted in a loss of 7.5 billion metric tons in one year, or approximately 80% of potential production had good management practices been in force (Miller and Catena 1991).

The Pacific sardine is another example of an overfished species, while the Atlantic salmon, though not in danger of extinction, has certainly been overfished. Its habitats in certain parts of Europe have been destroyed by the combined effect of dams, pollution, and the silting up of the gravel beds used by the salmon to lay its eggs (Ingmanson and Wallace 1995).

With the expansion of human settlement and economic activity in the coastal zone, pressure on coastal resources has increased in many areas (Setamanit 1985). A variety of human activities has led to the impoverishment or weakening of many coastal and marine ecosystems (Miller and Catena 1991). Nearly every coastal nation that actively harvests its coastal fishery stocks appears to have an overfishing problem (Middleton 1995) and fish and invertebrate communities in nearly all reef areas in the world are being overexploited (Johnson 1993; Miller and Catena 1991). Overexploitation of many coastal resources, along with marine pollution, is a reflection of these problems (Goldberg 1994; Lazarus 1990). Many of the world's poor reside in coastal areas and are highly dependent on coastal resources for their food and livelihood. Together with increasing urbanisation in coastal areas, this is a major cause of the deterioration of the coastal zone and depletion of coastal resources.

Depletion of fish stocks, for example, is attributable mainly to a dramatic growth in the global catch of marine fish. Between the 1950s and 1980s, the global catch of marine fish rose from 20 million to 70-80 million tonnes per annum (Pickering and Owen 1994). Intensive fishing pressures and the inappropriate fishing methods frequently used in some developing countries not only deplete fish stocks but also destroy coral reef ecosystems (Middleton 1995; Clark 1996) (Table 2.2).

Table 2.2 Human Induced Threats to Coral Reefs with Selected Examples from the Pacific Ocean

Threat	Example
Over-collecting	
Fish	Futuna Island, France
Giant clams	Kadavu and islands, Fiji
Pearl oysters	Suvarrow Atoll, Cook Islands
Coral	Vanuatu
Fishing methods	
Dynamiting	Belau, US
Breakage	Vava'u Group, Tonga ("tu'afeo")
Poison	Uvea Island, France
Recreational use	
Tourism	Heron Island, Great Barrier Reef, Australia
Scuba diving	Hong Kong
Anchor damage	Molokini Island, Hawaii, US
Siltation due to erosion following land clearance	
Fuelwood collection	Upolu Island, Western Samoa
Deforestation	Ishigakishima, Yaeyama-retto, Japan
Coastal development	
Causeway construction	Canton Atoll, Kiribati
Sand mining	Moorea, French Polynesia
Roads and housing	Kenting National Park, Taiwan
Dredging	Johnson Island, Hawaii, US
Pollution	
Oil spillage	Easter Island, Chile (1983)
Pesticide spillage	Nukunonu Atoll, New Zealand (1969)
Urban/industrial	Hong Kong
Thermal	Northwestern Guam, US
Sewage	Micronesia
Military	
Nuclear testing	Bikini Atoll, Marshall Islands (1946-58)
Conventional bombing	Kwajalein Atoll, Marshall Islands (1944)

Source: Middleton 1995

Apart from fishing, stocks of coastal resources are depleted and degraded as a result of mining for beach sand, rock or other construction materials in many coastal nations, and the extensive collection of coral reefs and sea turtles occurs in some island countries in

the Indian Ocean and Southeast Asia (Clark 1996; Pickering and Owen 1994). Mangroves, especially in tropical countries, are also being destroyed due to human economic activities, particularly for the development of aquaculture ponds. The other major coastal and marine environmental problem, pollution, is caused by numerous land and sea-based human activities (Table 2.3). As explorer and oceanographer Jacques Yves Cousteau succinctly put it, 'all pollution is ocean pollution' and 'there is only one pollution because every single thing, every chemical whether in the air or on land, will end up in the ocean' (Prager 1993: 26). Coastal communities and economic activities centred in the coastal zone have produced large volumes of waste which eventually reach the oceans. While the seas and oceans have been treated as the dumping ground for human waste for many centuries, the problem has become very serious, especially in the industrialised world of the twentieth century (Tze 1985). Coastal waters are the sink of the continents; they receive and concentrate contaminants that pose the greatest threat to the marine environment (Table 2.3).

Table 2.3 Primary Causes and Effects of Marine Pollution

Type	Primary source/cause	Effect
Nutrients	Runoff approximately half sewage, half from upland forestry, farming, other land uses; also NO _x from power plants, cars	Feeds algal blooms in coastal waters. Decomposing algae depletes water of oxygen, killing other marine life. Can spur toxic algal blooms (red tides) releasing toxicants into the water that can kill fish and poison people
Sediments	Runoff from mining, forestry, farming, other land uses; coastal mining and dredging	Clouds water. Impedes photosynthesis below surface waters. Clogs gills of fish. Smother and bury coastal ecosystems. Carries toxicants and excess nutrients
Pathogens	Sewage, livestock	Contaminates coastal swimming areas and seafood, spreading cholera, typhoid, and other diseases
Persistent toxicants (e.g. PCBs, DDT, heavy metals)	Industrial discharge; wastewater from cities; pesticides from farms, forests, home use and so on; seepage from landfills	Poisons or causes disease in coastal marine life. Contaminates seafood. Fat-soluble toxicants that bioaccumulate in predators
Oil	46% runoff from cars, heavy machinery, industry, other land-based sources; 32% oil tanker operations and other shipping; 13% accidents at sea; also offshore oil drilling and natural seepage	Low-level contamination can kill larvae and cause disease in marine life. Oil slicks kill marine life, especially in coastal habitat
Introduced species	Several thousand species in transit every day in ballast water; also from canals linking bodies of water and fishery enhancement projects	Outcompetes native species and reduces marine biodiversity. Introduces new marine diseases. Associated with increased incidence of red tides and other algal blooms
Plastics	Fishing nets; cargo and cruise ships; beach litter; wastes from plastics industry and landfills	Discarded fishing gear continues to catch fish. Other plastic debris entangles marine life or is mistaken for food. Litters beaches and coasts. May persist for 200-400 years

Source: Middleton 1995

Sewage is a major source of marine pollution. According to Ingmanson and Wallace (1995), eight million tons of raw sewage has been dumped every year since 1986 into the ocean at the Mid-Atlantic Bight, an area about 100 miles off the coast of New York and New Jersey. In many developing countries, the majority of the sewage is also untreated. In the Caribbean region, less than 10% of the sewage that is released into the sea has been treated (Clark 1996).

In addition to waste from human settlements and economic activities, humans also have used the ocean as a dumping ground for toxic chemicals and nuclear waste (Pickering and Owen 1994). How to dispose of the by-products created in the nuclear fuel cycle has been a serious and long-standing problem faced by the nuclear industry since its inception and one that has grown significantly in the last several decades (Prager 1993). Radionuclides from a number of sources, including nuclear installations, fall-out from weapons testing, and nuclear accidents, have increased radiation levels in sea water (Lazarus 1990). The beaches around the nuclear power station of Sellafield on the Irish Sea coast west of the Lake District in Britain were once popular recreational areas but are now contaminated with high levels of radioactive materials (Pickering and Owen 1994).

A wide range of land-based activities gives rise to air pollutants which are eventually deposited into the marine environment. Atmospheric pollutants, both nutrients and toxins, are proving to be a major source of coastal pollution. For example, it has been estimated that 25% of the nitrogen-containing pollutants entering Chesapeake Bay (US) are from airborne sources, deposited directly or washed with rain. Estimates of the proportion of toxic pollution from atmospheric deposition run as high as 40% in Europe's coastal waters and more in the open oceans, but data are sparse and the estimates rely to a great extent upon inference (Miller and Catena 1991).

Marine pollution is also caused by shipping and other sea-based activities. Worldwide, oil pollution has steadily grown with the increased transport and use of oil and with the growth of the oil and gas industries generally. Dramatic events over recent years have demonstrated the risks that pollution poses to the marine environment. Tanker disasters and oil spillages have caused extensive pollution of coastal waters and have left tar

residues on beaches. It is estimated that over 3.6 million tonnes of oil are spilt into the sea every year, mainly as a result of accidents involving oil tankers (Pickering and Owen 1994). While offshore oil exploration and production activities generally account for a very small proportion of marine pollution, pollution from transportation of oil in ships, spills or accidents (also involving shipping), discharges from the normal operation of drilling platforms and, to a lesser extent, the deposition of tar balls on beaches and coastal areas, are all increasingly controversial economic consequences of an industrial world dependent on fossil fuel for energy (Prager 1993).

The development of coastal infrastructure brings its own problems. Construction in the coastal zone damages coastal processes. Port and harbour development, industrial facilities, tourist facilities, aquaculture development, coastal defence structures and expansion of urban areas, all contribute to the irretrievable loss of critical coastal habitats and changes in the physical and chemical environment (Lazarus 1990). The activities with the most profound effects are the damming of rivers, land reclamation programmes, the dredging of inlets, and development on dune areas (Pickering and Owen 1994).

Intensified population pressures, fast growing urban centres, rapid industrialisation and the increasing tempo of economic activities on a world-wide basis are the major causes of degradation of the marine environment. The greater the rate of economic development, the greater the threat to environmental resources (Clark 1996). The impacts of this degradation on the coastal zone are discussed below.

2.5 Environmental Impacts of Coastal and Marine Degradation

Human settlement and coastal development have had many negative effects on the marine environment. The most common environmental impacts are the reduction of biological diversity, loss of environmental amenity, disruption of ecological processes, and human health problems. These may result from the accumulated environmental effects of human activities.

Habitat destruction is considered the most significant environmental impact of marine degradation. Coastal nursery grounds and shallow waters are being increasingly

degraded. In the US, for example, roughly 50% of the original coastal wetlands had been lost by the mid-1970s. Coastal marshes have been filled at a rapid rate in New England. In the Netherlands, hundreds of square kilometers of shallow coastal marshes and bays have been transformed into farmland through the construction of dikes, dredging, sediment relocation, and pumping out salt water (Pickering and Owen 1994). Land reclamation in coastal areas on a smaller scale is common and inevitably destroys inshore marshes and bays, the regions that support animal and plant life that is ultimately the food source for the sea. Commercial and recreational development of dune areas has also impacted upon the marine ecology. Mangrove destruction is very common in tropical countries. Table 2.4 shows the extent of mangroves and the major causes of their destruction in some selected Asian and African countries.

Table 2.4 Extent of Mangroves and Major Causes of Destruction in Selected Asian and African Countries in the Late 1980s

Country	Extent (km ²)	Pre-agricultural extent (km ²)	Major causes of destruction
India	3100	12 600	Agriculture urban development
Philippines	1000	4500	Charcoal production and fuelwood, fish ponds
Singapore	<5	75	Urban/industrial development
Vietnam	1600	3800	Herbicide spraying during Vietnam war, agriculture and fish ponds
Cote d'Ivoire	29	1600	Fuelwood
Ghana	3	2100	Charcoal production and fuelwood, salt extraction, wood for construction
Guinea	3000	4000	Agriculture, fuelwood
Guinea-Bissau	2400	3100	Agriculture
Sierra Leone	1000	6800	Agriculture, fuelwood, wood for construction

Source: Middleton 1995

Marine pollution is also an ever present danger to coastal ecosystems (Table 2.3). Algal blooms occurred along the coast of North Carolina, at Long Island in New York and in Guatemala in 1987. In 1989, an algal bloom in the Adriatic stretched over 400 miles. The combination of waste from aquaculture and sewage has combined to produce red tides of flagellates which devastated the oyster crops in 1978 and 1981 in Jinhae Bay, the largest bay in Korea (Goldberg 1994). The disposal of plastic material on land and from ships results in not only the littering of beaches but also the serious damages for marine wildlife, particularly sea mammals, diving birds and reptiles. Long-term waste disposal operations can lead to dramatic changes in the physical and chemical

characteristics of the bottom and of benthic organisms (Prager 1993). While very little is known about the long-term effects of oil and tar pollution on marine organisms, it is known that large oil accidents, such as the huge, war-related Persian Gulf "spill" in 1990, have severe impacts (Clark 1996).

The ultimate consequence of this substantial scale of habitat destruction and degree of change in environmental conditions is that the biodiversity of the marine environment is seriously threatened. Thousands of species and subspecies of wild plants and animals face extinction from habitat loss if unable to rapidly adapt to these environmental changes (Prager 1993). Numerous species, while not extinct, already exist in greatly reduced and scattered populations (Miller and Catena 1991). About 31 species of marine birds predominantly associated with the marine environment, for example, are on the endangered species list. In some cases, coastal nesting grounds have been destroyed or impaired by recreational activities (Ingmanson and Wallace 1995). Many marine reptilian species, such as crocodiles, sea turtles, and snakes, are also in trouble. All 12 living species of crocodiles are now endangered, as is the Atlantic salt-marsh snake and six species of sea turtles. Many marine mammals are also threatened. All three species of the order *Sirenia* endangered, the Amazon manatee, the West Indies manatee, and the Australian dugong (Ingmanson and Wallace 1995).

As well as depleting stocks, high levels of exploitation have resulted in damage to habitats and have altered food webs. Modern intensive fishing and hunting methods have caused quantitative, genetic, and social disruption in the populations of a multitude of marine fish, shell fish, turtle, and mammal species. The depletion of species caught incidentally and discarded also has serious consequences for complex marine food webs (Pickering and Owen 1994).

Human activities also lead to the loss of amenity. Nutrient contamination of coastal waters, oil and tar pollution, and litter disposal foul many beaches and negatively impinge on their attraction for tourism and recreation. Many beaches in the western Mediterranean are now not only unsightly but have been rendered a health hazard due to sewage pollution (Pickering and Owen 1994). The loss of natural beaches due to landfill, agriculture, transportation, industry and housing further impinges on the tourist

and recreational uses of the coastal zone. In the case of the Inland Sea and Osaka Bay regions of Japan, the length of the coastline suitable for swimming and other recreational activities diminished between 1950 and 1982 to such an extent that it has had major economic repercussions for the tourist industry (Goldberg 1994).

Many other human activities, such as mining for beach sand, coral mining, land reclamation, river damming, and development of dune areas, disrupt the coastal processes and exacerbate such problems as coastal erosion and siltation (Ingmanson and Wallace 1995; Clark 1996). Mining for beach sand, for example, can result in erosion and recession of the beachfront. Coral mining leaves the shoreline exposed to erosion and storm surges, causing serious loss of beach and shoreland and damage to coastal and marine resources habitats. River damming can lead to marine erosion of beaches and shorelines, and changes in salinity regimes of coastal waters (Middleton 1995). The extensive erosion of the shorelines of Washington, Oregon, and California has been attributed largely to river damming. Over the past 40 years, inlet dredging has become increasingly widespread, with the consequence that coastal erosion and sedimentation have been exacerbated (Clark 1996). Deforestation in the coastal zone also increases the problem of flooding. This destroys property, risks lives, inundates crops, and carries huge amounts of sediment, fertilizing substances, and organic and chemical pollutants into coastal waters where they cause siltation and have polluting impacts. The effects of these activities make coastal communities more susceptible to natural hazards such as floods, typhoons, or tsunamis (Pickering and Oven 1994).

Marine pollution poses direct risks to human health. The obvious immediate effect of marine pollution is to poison marine life. Some stocks, especially shellfish in a limited number of cases, have been declared unfit for human consumption. Pollution has rendered oysters inedible in Raritan Bay, New Jersey, and in San Francisco Bay in California (Ingmanson and Wallace 1995). In 1991, 26 people were killed due to paralytic shellfish poisoning in Guatemala (Prager 1993).

Microbial contamination from sewage causes many human diseases, including cholera and hepatitis A. It has also been responsible for widespread outbreaks of gastro-

intestinal diseases at ill-protected and crowded beaches and is suspected to be a cause of respiratory, ear and skin infections among bathers (Goldberg 1994).

2.6 The Need for Integrated Coastal Zone Management

The generally deteriorating state of the marine environment, and especially that of the coastal zone, is now acknowledged worldwide and which has been attributed to advances in science and technology, which have enhanced both human capacity to exploit coastal and marine resources and interfere with their ecosystems (Prager 1993). Unplanned and indiscriminate development has had a particularly large impact (Tze 1985). A commonly expressed concern, furthermore, is that the human population will continue to increase, leading to further development and associated deterioration of the coastal and marine environment (Pickering and Owen 1994). A near doubling of the coastal population is expected by 2025, with almost all of the world's large cities located in the coastal zone (Goldberg 1994). International tourism is expected to reach 637 million travellers by the year 2000. Urbanisation and tourism expansion will unavoidably lead to further pressure on water supplies and to irreversible changes in coastal environment. Increasing quantities of gaseous, liquid and solid waste will also further jeopardize the future of coastal and marine ecosystems and individual species. Such basic resources as fuel, water, fertile land, and fish stocks are already in short supply in many countries, and their future prospects are in grave doubt. Humans will inevitably turn again and again to the ocean for transportation, research and exploration, resource development, and other critical needs (Clark 1996).

The need to curb the degradation of the coastal and marine environment is therefore urgent. According to the 1987 Brundtland Report, *Our Common Future* (WCED 1987), sustainable development, if not survival itself, depends on significant advances in the management of the oceans. Coastal zone management plays a very important role in the sustainable development of the marine environment (Miller and Catena 1991).

While there are some encouraging signs that marine contamination is abating in some areas, the problems associated with managing the coastal and marine environment remains manifold. Recognition of these many problems and complexities has led to the

notion of enforceable coastal zone management plans which take into consideration the combined effects of all types of land use and coastal development and provide guidelines and regulations to control these developments. This type of management, known as integrated coastal zone management, recognises the interrelated functions of the coastal zone and the need to get away from segregated “sector” management, where particular activities are regulated without taking into account other activities affecting the same resources (Miller and Catena 1991; Clark 1996).

ICZM is becoming widely accepted as the most effective means of dealing with the multitude of coastal problems related to economic development. To work with the complexity of managing the coastal commons, many countries are now working out special ICZM strategies. The current trend is toward more comprehensive and broadly integrated coastal programmes of the ICZM type. An effective comprehensive programme can be the major force for maintaining coastal biodiversity, for resolving conflicting demands over the use of coastal resources, and for guaranteeing the long-term economic sustainability of the coastal resource base (Adede 1992).

2.7 Summary

The marine environment, especially the coastal zone, plays a very important role in supporting human life, but evidence of widespread coastal and marine degradation is abundant. Coastal and marine degradation is one of the main environmental problems which become the object of study and great concern (Goldemberg 1996). Although the of coastal and marine management is still considered as a relatively neglected area (Rowley 1992), it has emerged as a major item on international and national political agendas over the past decades. There are compelling reasons to believe that the need for ICZM is urgent in many cases and that coastal areas could recover if strong anti-pollution policies were adopted on global, national and regional scales and strong, coordinated national and international action is taken immediately. With the ecological knowledge and techniques that are now available to assist in ICZM, it is possible to reverse the trends of recent decades. Appropriate actions are available by which coastal communities can both conserve their natural resources and invigorate their economies (Clark 1996; Middleton 1995). The remainder of this thesis examines the evolution and

implementation of coastal and marine environmental management at the international, national, regional and local levels with a focus on ICZM. The following chapter begins this task by examining the development of coastal and marine environmental management at the international level.

CHAPTER 3

International Developments in Coastal and Marine Environmental Management

3.1 Introduction

It is now recognised that many contemporary environmental problems, such as marine pollution and the changing composition of the atmosphere, are intrinsically global in scope (Brenton 1994). International co-operation and agreement on resolving these global environmental issues, and marine environment issues in particular, however, has evolved gradually. Putting in place mechanisms to protect the coastal and marine environments has been an incremental process that has tended to be driven by specific events and sudden periodic shifts in public awareness and attitudes. The first such major shift occurred in the post-World War II period and the subsequent history of environmental management featured a small number of specific milestones, such as the United Nations Conference on Human Environment 1972 (UNCHE) (commonly known as Stockholm Conference) (Friends of the Earth 1972), the Law of the Sea Convention (LOSC) (Tsamenyi *et al.* 1996), the 1987 Brundtland Report (WCED 1987), and most recently, the United Nations Conference on Environment and Development 1992 (UNCED) (Johnson 1993). This chapter traces the history of coastal and marine environmental management at the international level, using these milestones as convenient divisions in that history.

3.2 Pre-1972 Stockholm Conference

Agreements between nations on environmental concerns are not a recent phenomenon. Multilateral agreements involving coastal and marine environmental management are listed in Appendix 1. The first such agreements were entered into around the turn of the century to protect commercially valuable species. In the 1950s, four of six of international negotiation on the environment was devoted to the coastal and marine

environments, with these treaties accounting for more than half of all the multilateral treaties negotiated (Brenton 1994). Attention turned to coastal and marine pollution and it was this issue that subsequently dominated international attention on the marine environment (Dahlberg *et al.* 1985). The first United Nations Conference on Law of the Sea (UNCLOS I), held in 1958, was a major event in the history of international law (discussed in section 3.5).

The 1960s and early 1970s saw the rise of the modern environmental movement and the establishment of many non-governmental organisations (NGOs) and environmental groups, such as World Wide Fund of Nature (WWF), Friends of the Earth and Greenpeace. This rise in public concern over environmental issues was paralleled by a significant increase in the number of international environmental agreements (Dahlberg *et al.* 1985). The number of such agreements reached in the 1960s was almost double that reached in the 1950s (Brenton 1994). In coastal and marine environmental management, marine pollution remained the issue on which the international environmental community focused its attention. With major accidents in the marine environment, such as the 1967 *Torrey Canyon* accident¹, and the Santa Barbara oil spill off the coast of California in 1969 (Cicin-Sain and Knecht 1993), several regional conventions on oil pollution damage establishing liability and control mechanisms were concluded. The dumping of toxic wastes at sea also became a major issue during the period. Over 20,000 tonnes of nuclear waste were dumped at sea in 1970, with a measurable effect on global marine radiation levels (Grubb *et al.* 1993). The 'Oslo Convention' 1972 which limited and regulated dumping waste at sea was concluded among the states of the North Sea and north-east Atlantic (Brenton 1994). In addition, wetland destruction also attracted international attention with a global conference on wetland protection, held in Ramsar, Iran in 1971.

International agreements during this period tended to be adopted in response to the increasing number and severity of oil spills (Caldwell 1990). International attention focused on a limited number of causes of marine pollution and on the protection of marine mammals. According to Grubb *et al.* (1993), these early international agreements

¹ In 1967, the 118,000 ton oil supertanker *Torrey Canyon* ran aground, causing a massive oil spillage in the English Channel, and depositing about 100,000 tonnes of crude oil into the sea in the largest oil spill the world had seen up to that date (Brenton 1994).

marine mammals. According to Grubb *et al.* (1993), these early international agreements failed to address the underlying causes of environmental problems in a coherent manner and many aspects of environmental management, such as land-based marine pollution, were overlooked or ignored. As a result, the pre-1972 Stockholm Conference era has been described as a “blank period” in terms of marine environmental management (Meng 1987).

3.3 The United Nations Conference on Human Environment 1972

In the late 1960s, Swedish scientists identified a broad range of pressing environmental issues whose resolution required co-operative approaches. These included pollution of the Baltic Sea, acid rain, and the accumulation of heavy metals and pesticides in fish and birds. These scientists proposed mitigation measures through co-operative inter-governmental action and, in 1968, the Swedish government proposed that an international conference on the environment be held. The proposal was quickly supported by many other industrialised countries and their governments. The result was the United Nations Conference on Human Environment, the world’s first major environment conference, held in Stockholm in 1972. It represented the first critical turning point in the recognition of the need for a co-ordinated, international response to global environmental problems (Brenton 1994).

The UNCHE 1972 was the first occasion on which senior members of governments throughout the world joined to debate environmental issues and delineate the ‘right’ of the human family to a healthy and productive environment (Grubb *et al.* 1993; WCED 1987). It was also the first time that the environment was identified as a critical dimension of successful development and guidelines for future handling of environmental issues within an international context were established (Brenton 1994).

One of the key outcomes of the Conference was the ‘Stockholm Declaration’, which was intended to serve as a foundation for future development and has since frequently been described as a crucial development in international environmental law (Koester 1990; Grubb *et al.* 1993). One of the four fundamental principles of the UN Stockholm Declaration was that states should adopt an integrated and co-ordinated approach to their development planning so as to ensure that development is compatible with the

need to protect and improve the human environment (Kenchington 1994). The Conference established an 'Action Plan' consisting of recommendations for governmental and inter-governmental action on environmental protection with a particular focus on improving environmental knowledge (UNEP 1982; Brenton 1994).

Another significant outcome of the Conference was the establishment of the United Nations Environment Program (UNEP) for implementing the recommendations in the Action Plan (Norse 1993). This mechanism represented the synthesis of ideas for action that emerged at the Conference (Dahlberg *et al.* 1985). UNEP was designed to ensure that governments gave adequate consideration to emerging environmental problems of potential global significance (Brenton 1994; UNEP 1982).

With marine pollution evident in many areas, such as the Baltic, Caspian, and Mediterranean Seas, it became a cause of major public concern (Brenton 1994). Other coastal and marine issues were of international relevance as they were considered to have the potential to trigger major conflicts if not resolved quickly. The coastal and marine environments were also perceived to be among the largest and most endangered 'commons' and the view that 'our life depends on the health of the ocean commons [just] as sheep depend on grass' (Friends of the Earth 1972) gained widespread support. For these reasons, marine pollution was singled out at the Conference for particular attention, as reflected in the adoption of the principle that 'the marine environment and all the living organisms which it supports are of vital importance to humanity' (Bliss-Guest and Keckes 1982) and 'must be safeguarded for the benefit of present and future generations' (UNEP 1982). Debate on coastal and marine issues at the Conference also included the issues of the freedom of the seas, placement of the high seas under international control, the control of the dumping of wastes at sea, and the control of land-based marine pollution. These discussions were, however, conducted largely between coastal countries with a vested interest in them (Brenton 1994). These countries recognised that the prevention and control of marine pollution were essential elements of coastal and marine environmental management (Bliss-Guest and Keckes 1982).

The Action Plan was developed with the intention of protecting the marine environment and its living resources against pollution and overexploitation by ensuring legal and management control of marine pollution, and by developing conservation policies,

including considering an international agreement and calling for a ten-year moratorium on commercial whaling (Friends of the Earth 1972). The Principles in the Declaration, on the other hand, provided guidelines for the control of discharge of toxic substances and other noxious substances and for the prevention of marine pollution. The Principles prohibiting damage to the environment of other states and to the areas beyond the limits of national jurisdiction were reflected in international provisions on marine pollution control (Meng 1987).

At the international level, the Conference recommended that a global convention to restrict ocean dumping be completed in 1972 and that the International Whaling Commission (IWC) be strengthened (UNEP 1982; Friends of the Earth 1972). It emphasised the need to strengthen international research programmes for the marine environment, for co-ordinated international marine research and monitoring. It also recommended that such work be undertaken through the co-operation of the Intergovernmental Oceanographic Commission (IOC) with the World Meteorological Organisation (WMO) and other interested inter-governmental bodies within the framework of the Integrated Global Ocean Station System (IGOSS) and the Global Investigation of Pollution in the Marine Environment (GIPME). It suggested that the Secretary-General of the UN, together with the sponsoring agencies, enable GESAMP to re-examine annually, and revise as required, its review of Harmful Chemical Substances with a view to further elaborating a qualitative assessment of risks, pathways and sources of marine pollutants (UNEP 1982; Friends of the Earth 1972; Brenton 1994). The Conference also advocated for the UN to co-ordinate a global 'Earthwatch' programme, monitoring and assessing environmental trends in oceans and the atmosphere (Murray 1972).

At the national level, the Conference recommended that governments accept and implement available instruments to control all significant sources of marine pollution, including land-based sources, and to co-ordinate their actions regionally and, where appropriate, on a wider international basis (Bliss-Guest and Keckes 1982). It also urged governments to participate fully in the 1973 Intergovernmental Maritime Consultative Organisation (IMCO) Conference on Marine Pollution and the Law of the Sea

Conference scheduled to begin in 1973, with a view to bringing all significant sources of marine pollution under appropriate control (Murray 1972).

The UNCHE 1972, therefore, signalled a major step in the management of the environment, and the coastal and marine environments in particular. According to Cicin-Sain and Knecht (1993), it acted as a catalyst in accelerating the adoption of several pending international agreements dealing with ocean dumping and vessel-source pollution. It has since been labelled a watershed of such significance that global environmentalism is best divided into pre- and post-Stockholm periods (Koester 1990).

3.4 The Post Stockholm Period

The period after the UNCHE 1972 saw significant gains in the management of the coastal and marine environments. The subsequent milestones, such as the LOSC, and the Brundtland Report, *Our Common Future*, have had a strong influence. This period also witnessed a considerable increase in the volume of international environmental management agreements. A survey of the existing treaties shows that since 1972, the protection of the marine environment has been the focus of numerous global and regional treaties (Adede 1992; Brenton 1994). The decade 1972-1982 also produced a substantial number of global and regional conferences designed to resolve pressing marine environmental issues, adding further to the growing web of marine pollution agreements (Dahlberg *et al.* 1985). According to many authors, such as Dahlberg *et al.* (1985) and Brenton (1994), the marine environmental management after the UNCHE 1972 had a well-developed international infrastructure conducive to further work, in contrast to the management of many other areas. This was augmented by the fact that the international community also had the political will to conclude the various international agreements dealing with marine pollution (Adede 1992). The two most significant international marine pollution conventions concluded at the time were the London Dumping Convention (LDC) and the International Convention for the Prevention of Pollution from Ships (MARPOL) (Brenton 1994; Norse 1993).

The LDC, which came into force in 1975, was in effect a global extension of the Oslo Convention 1972. It dealt with the problem of deliberate disposal at sea of wastes or

other matters from vessels, aircraft, platforms or other human-made structures at sea and covered all marine areas rather than just internal waters (Aplin *et al.* 1995).

MARPOL (1973/1978) has been described as 'the most important and most comprehensive treaty to fight marine pollution' (Brenton 1994). It extended the coverage of the 1954 International Convention on Oil Pollution from oil discharges by ships to discharges of all polluting substances. It also incorporated several innovations introduced by the shipping industry by requiring the installation of expensive new anti-pollution technology in all new tankers. Furthermore, it required co-operation between the parties concerning certificates, special rules on inspection of ships, enforcement mechanisms and detection of violations (Adede 1992; Norse 1993).

Soon after the conclusion of the LOSC, the UNEP initiated the preparation of principles/guidelines known as the Montreal Guidelines for the Protection of the Marine Environment against Pollution from Land-based Sources. This represented another milestone in the development of international marine law. The document was the first to provide detailed provisions aimed at assisting states in the design of their national programmes and in the development of appropriate bilateral, regional and multilateral agreements (Meng 1987).

In addition to the control of marine pollution, the decade 1972-1982 saw continued co-operation over the protection of marine mammals. While a ban on all commercial whaling had not been achieved by the end of the decade, catches of some species had been greatly reduced under a new management procedure implemented by the IWC in 1975 (Brenton 1994). The Global Plan of Action for the Conservation, Management and Utilisation of Marine Mammals (MMAP) aimed at the development and implementation of a policy that would be widely accepted by governments and the public (Norse 1993; Adede 1992). During the period, many coastal and marine national parks and reserves were declared or extended (UNEP 1982).

International efforts to combat marine pollution in the period after Stockholm, however, went into supposedly global agreements like MARPOL and LDC and numerous regional agreements (Adede 1992). Several Conventions, and stronger measures to reduce pollution, were adopted by regional groups of states that bordered a common

body of water, such as the North Atlantic, the North Sea, and the Baltic Sea (Appendix 1). This proliferation of regional Conventions were aimed at comprehensive protection of the marine environment from pollution. Together with long-term resource management, these regional agreements complemented both the principles and the effective enforcement of the general regulations adopted at the global level (UNEP 1982; Grubb *et al.* 1993).

In 1975, the UNEP decided to concentrate its efforts in key areas, one of these being the marine environment, and it subsequently pursued its 'Regional Seas Programme' to address common environmental problems in selected bodies of water by promoting co-operation on coastal and marine matters of regional common concern (Brenton 1994). According to Adede (1992), the bulk of the regional Conventions entered into at the time were the direct result of this programme, which encouraged states to conclude regional treaties for dealing with environmental issues identified by them. It resulted in about one-third of all significant international environmental agreements negotiated in the two decades after the UNCHE 1972. The UNEP's Regional Seas Programme made considerable progress in enlisting government co-operation to control pollution in the Mediterranean and other seas. It was unique in comprising assessment and management activities along with supporting measures (Dahlberg *et al.* 1985; UNEP 1982). A notable feature of these regional plans was the provision calling upon the coastal states to reduce pollution from land-based sources, something that went beyond the scope of any Intergovernmental Maritime Organisation's (IMO) treaties. By 1990, the programme had over 120 participating states and covered 10 regional seas, including the Red Sea, the Caribbean, the East Asian seas, and the South Pacific (Brenton 1994).

In summary, many significant gains in coastal and marine environmental management were made following the UNCHE 1972. Paramount among these was the development of a comprehensive plan for international environmental protection. The UNCHE 1972 also served as a precedent for a series of ad hoc UN conferences throughout the following decade, each of which had major environmental consequences. Among these was the United Nations Conference on Law of the Sea which marked a very significant step in marine environmental management (Dahlberg *et al.* 1985; Brenton 1994).

3.5 The United Nations Conference on Law of the Sea

Traditionally, international law of the sea has been governed by the concept of freedom of the sea (Hewison 1989). It was not until the early 1960s that the foundations of this old order of the seas began to be shaken by a combination of dramatic events in world politics and developments in marine science and technology. By then, expanding national claims of jurisdiction over the continental shelf, territorial seas and other areas, were increasingly leading to clashes of sovereignty (Thurman 1994), creating pressure for a review of the existing regime. Many coastal states with major interest in maritime affairs were eager to participate in the design of an international regime which would reflect and protect their interests. Contemporaneous developments in marine science and technology, such as offshore drilling and deep ocean mining, rapid growth of marine transportation, the arrival of large tankers, improvements in fishing techniques which threatened the fish stocks of some species to the point of extinction and the establishment of marine environmental science, further undermined the appropriateness of the traditional concept of freedom of the seas (Meng 1987; Norse 1993). With the demise of this central and dominant concept came the emerging view that an international agreement on new international laws which regulated activities in the marine environment was urgently required (Thurman 1994).

After many years of negotiation, the first comprehensive LOSC, dealing with all problems and considered to be the 'constitution' of the Law of the Sea, was adopted and came into effect in November 1982. The Convention explicitly adopted the philosophy that the oceans and seas should be managed by and for the benefit of humankind as a whole, conserved for future generations, and reserved exclusively for peaceful purposes (Pickering and Owen 1994). As the first comprehensive approach to the marine environment and a milestone in the global response to marine issues, it has provided the international community with a global directive for the marine environment (Schachte 1992). Although not all of the provisions of the Convention have been agreed to by all countries, many of the Convention's other provisions have been broadly accepted and have already entered into international law and practice (WCED 1987; Brenton 1994). According to McKinnon (1994) and Davis (1996b), it signalled a new area in oceans governance, and represented a major step towards an integrated management regime for the oceans. It encouraged national and international action to manage the oceans and

was the most ambitious attempt at developing an international regime for managing the oceans (WCED 1987).

3.6 The 1987 Brundtland Report, *Our Common Future*

Several initiatives on international environment and development issues followed on the heels of the initiatives of the 1970s and 1980s discussed above. Despite these initiatives, however, concern over the state of the marine environment continued to escalate. Environmental pollution was perceived to be worsening and to be progressively escalating from a set of local to regional problems, and from a set of regional to global problems. This led to the acceptance of the view that many of these environmental problems were ultimately and inextricably linked to broader aspects of social and economic development (Grubb *et al.* 1993). The late 1980s saw a second wave in popular environmental alarm in the West, prompted by a series of climatic and other disasters. Compared with the eruption of environmental awareness and concern 20 years earlier, this more recent rise in concern focused to a greater degree on pollution rather than resource depletion, and more on international issues than on domestic ones (Brenton 1994).

In response to calls for a review of progress since the UNCHE 1972 and for the examination of the general issues in environment and development and their interlinkages, the UN General Assembly appointed the World Commission on Environment and Development (WCED) under Norwegian Prime Minister Gro Harlem Brundtland 'to re-examine the critical issues of environment and development and to formulate innovative, concrete and realistic proposals to deal with them' and 'to strengthen international co-operation on environment and development' (WCED 1987: 7). The WCED Report (the Brundtland Report) analysed the socio-economic and environmental situations of the world nations and the interaction between them and concluded that the root cause of the environmental crisis was the failure to place the responsibility for preventing environmental damage on the 'sectoral' ministries and agencies whose policies caused it.

The Report's overall recommendations were that human activities could and should be redirected towards a pathway of 'sustainable development', which sought to meet the

needs and aspirations of the present without compromising the ability to meet those of the future (WCED 1987). Further, that the environment should be seen not as an obstacle to growth but rather than an aspect which needed to be reflected in policies if growth was to be sustained (Grubb *et al.* 1993). The concept of sustainable development was evoked to provide a framework for the integration of environment policies and development strategies. The pursuit of sustainable development required changes in both domestic and international policies and the transition to sustainable development needed to be managed jointly by all nations. The unity of human needs, furthermore, required functioning multilateral systems that respected the democratic principle of consent (Brenton 1994; WCED 1987).

According to the WCED (1987), although many essential components had been put in place for marine management, the sum of multiple conventions and programmes in place did not and could not represent an effective international means of dealing with the imperatives of ocean management. It maintained that an international ecosystem approach was required for the sustainable management of marine resources. For example, in the case of EEZs, where the EEZs of several states come together in semi-enclosed or regional seas, integrated management required varying degrees of international co-operation, such as joint monitoring and research on migratory species. Measures to regulate activities whose effects were transboundary in nature were also essential if the high seas beyond national jurisdiction were to be managed. The WCED considered that two marine management issues were imperative: the requirement of effective global and regional regimes due to the underlying unity of the oceans and the shared resource characteristics of many regional seas; and effective national actions based on international co-operation due to the major land-based threats to the oceans (WCED 1987).

The WCED believed that actions were urgently needed to improve regimes for marine management. The measures proposed were designed to:

- strengthen the capacity for national action, especially for developing countries;
- improve fisheries management;
- reinforce co-operation in semi-closed and regional seas;

- strengthen the control of ocean disposal of hazardous and nuclear wastes; and
- advance the Law of the Sea (WCED 1987).

By linking environmental and developmental issues through the concept of sustainable development, the Brundtland Report had a substantial impact (Brenton 1994). According to Brown (1997), the Report has drawn the world's attention to the need for integrated management of the global environment. Brown (1997) has further argued that by 1990, even the chief proponents of these two apparently conflicting sides, the OECD and the International Union for Conservation of Nature and Natural Resources (IUCN) (later renamed World Conservation Union), joined the WCED in accepting integrated social, economic and environmental management as a primary goal. A majority of governments, all the major international institutions and key NGOs have all since accepted and endorsed the concept of sustainable development as a central basis for future policy making, reflecting the world-wide desire to find a co-operative route forward (Starke 1990).

3.7 The United Nations Conference on Environment and Development 1992

3.7.1 Environmental Management at the United Nations Conference on Environment and Development 1992

On the twentieth anniversary of the UNCHE 1972, the UNCED 1992 was held in Rio de Janeiro, Brazil. Popularly known as the Rio Earth Summit, the UNCED 1992 had a long preparatory history and was the culmination of an unprecedented international political process. The Conference attempted to simultaneously address two immensely difficult tasks: the development of a consensual world view of the problems of environment and development, and agreement on solutions to these problems. The greatest threats to the quality of the environment on a global basis were considered to include poverty, unrestrained population growth, and unsustainable patterns of consumption (Vallejo 1993). According to Strong (1992), as a result, one of the major objectives of the UNCED 1992 was to forge a 'new global partnership' on environment and development based on common interest, mutual need and shared responsibilities with the overall goal of encouraging nations individually and collectively, and to work towards a transition to

a sustainable society - one with sustainable development, sustainable population growth rates, and sustainable patterns of consumption.

New major milestones were reached at the Earth Summit. Historic intergovernmental agreements on basic principles were incorporated into the Rio Declaration; a comprehensive and far-reaching programme of action was detailed in Agenda 21; the Conventions on Biodiversity and Climate Change were concluded; and a set of forest principles established a baseline for future behaviour and action (Cicin-Sain 1996).

According to many authors, such as Cicin-Sain (1993a), Adede (1992) and Vallejo (1993), the most significant outcome of this historic meeting was the identification of two central problems: the failure to consider environment and development as part of an indivisible whole that needed to be dealt with together within the framework of sustainable development; and the slow progress towards such integration. The resolutions of these two problems involved the adoption of an integrated approach within the framework of sustainable development and intergenerational equity (Knecht 1994; Grubb *et al.* 1993).

The establishment of a necessary model for integrating environmental dimensions into development policies more fully, and the need for a truly interdisciplinary approach to the task, was emphasised at the Conference (Adede 1992). To give effect to the concepts of sustainable development and integrated management, the UNCED 1992 encouraged innovative international legal and institutional mechanisms, dealing comprehensively with environment and development issues in an integrated manner (Kimball 1993; Adede 1992; Cicin-Sain 1993b). Brown (1997) believes that the Conference has grasped some of the implications of integration and attempted to present particular ways of achieving it - of seeing environment and economics as two equal and related factors.

The Commission on Sustainable Development (CSD) was established to monitor the implementation of Agenda 21, to rationalise the adoption of sustainable development into governmental decision-making on environment and development, and to make recommendations on any new arrangements needed to advance sustainable development. These were considered essential to the long-term achievement of the goals agreed to in Rio (Kimball 1993; Hammond 1995).

The UNCED 1992, therefore, offered a rare opportunity to persuade nations to look beyond their national interests in order to come to an agreement over the management of the planet (Pickering and Owen 1994). It also helped shape a new approach to sustainable development based on differentiated responsibilities (Kimball 1993). According to Strong (1992), the UNCED 1992 should be seen as a first effort to create a workable global partnership to manage the environment for the present and future generations.

3.7.2 Coastal and Marine Environmental Management at the United Nations Conference on Environment and Development 1992

Among the issues addressed in preparation for the UNCED, and at the UNCED itself, the marine environment was central. It was third among a list of nine issues highlighted in the Preparatory Process and was considered to be among the most sensitive and difficult issues to be faced at the UNCED (Knecht and Cicin-Sain 1993). Many coastal and marine issues were conflictual. According to Grubb *et al.* (1993), the UNCED focused a new global attention on marine issues, and on management issues in particular. The major UNCED prescriptions relating to the marine environment are found in the well-known Chapter 17 of Agenda 21 (17.21), although the two Conventions adopted at the UNCED are also of relevance (Cicin-Sain and Knecht 1995). Chapter 17 of Agenda 21, entitled 'Protection of oceans, all kinds of seas, including enclosed and semi-enclosed seas, coastal areas and the protection, rational use and development of their living resources', was the longest, most complex and substantive part of Agenda 21 (Johnson 1993). Recognising that use of marine resources and environmental protection are inseparable, and that integrated management is necessary to protect both (Sainsbury *et al.* 1997), it contained 137 recommendations relating to marine environmental management and included seven major programme areas (summarised in Appendix 2).

In line with other chapters of Agenda 21, the central concepts of 17.21 are sustainable development and integrated management. The introduction of 17.21 stresses the positive opportunity for sustainable development which the marine environment represents, a point highlighted at various stages in the UNCED process. Cicin-Sain (1993a: 17) has argued that 'in contrast to other areas, the marine environment presents excellent

opportunities for development, particularly for developing countries, and opportunities which, if conducted in a sustainable development mode, can yield significant economic and social benefits for coastal human settlements while, at the same time, protecting environmental integrity'.

The introduction of 17.21 stressed the importance of the marine environment as an essential component of the 'global life support system' and the key to atmospheric change (Johnson 1993). Chapter 17 also set out the many relationships that interactively affect coastal and marine ecosystems, such as agricultural and industrial development and population growth and human settlements (Kimball 1993). More importantly, a number of coastal and marine issues were considered. These included increasing human population pressure on the coastal zone, the evident progressive degradation of the coastal and marine natural resources, an ever-increasing awareness that the marine environment is a basic governing force of life on this planet, and that better understanding of the marine environment is essential to wise decision-making aimed at sustainable development (Naeye and Garcia 1995; Kullenberg 1995). By the time of the UNCED, management problems widely recognised included the sectoral approaches to managing the coastal and marine environments which failed to resolve many management problems (Johnson 1993). Most countries had weak and disperse management institutions and lacked capacities to manage current problems. The limitation of future choices for meeting the challenge of sustainable development' and the complexities and difficulties in establishing the ownership of, and responsibility for, the coastal and marine environments were also major problems. In addition, the prevalent view that the marine environment is common heritage and the many interpretations of simple open access resulted in an associated lack of responsibility on the part of many users, conflict among users and significant resource and environmental degradation. Reactive ocean legal regimes, and insufficient understanding of interactions between the oceans, the land (especially coastal zone) and the atmosphere created more problems for coastal and marine environmental management. According to Barcena (1992) and Kullenberg (1995), in general, there existed no efficient user-right system in the EEZ at the national level, nor in the high seas at the international level. These problems have been well demonstrated in coastal area problems at the national as well as international levels.

In response to these problems in marine environmental management, the UNCED 1992 emphasised that new approaches to coastal and marine area management and development were required at the national, regional and international levels, and that these approaches needed to be 'integrated in content and precautionary and anticipatory in ambit' (Johnson 1993: 308). The Conference also maintained that coastal and marine policies needed to be integrated across both the private and public sectors and that institutions needed to be revised in order to emphasise integrated planning and decision-making as distinct from sectoral approaches (Knecht and Cicin-Sain 1993). It took the view that the new perspective on coastal and marine management must recognise the need for proactive and anticipatory regimes that could avoid conflict, and prevent environmental damage and economic loss, as an alternative to the traditional view which has been centred on reactive responses to conflicts in resource use, environmental degradation and prescriptive action (Barcena 1992).

In summary, a broad international consensus was reached at the UNCED 1992 on the major problems in the coastal and marine environments and on principles to guide concerted action to address these problems (Cicin-Sain and Knecht 1993). Chapter 17 of Agenda 21 provided important challenges and opportunities for coastal states in the implementation of policies related to coastal and marine environmental management. It was, and remains, of great importance to the task of improving marine environmental management (Knecht and Cicin-Sain 1992). The mandates of 17.21 relating to coasts and oceans were ambitious, far-reaching and forward-looking. Under these mandates, nations have to choose priorities among the large number of important actions that are called for regarding oceans and coasts; key concepts need to be further defined and implemented; appropriate institutions and/or processes need to be strengthened or established; funding needs to be obtained and committed; and additional funding and technological assistance from international donors must flow to developing countries. The following section discusses the extent to which these obligations and recommendations of 17.21 have been implemented.

3.7.3 Implementation of Chapter 17 of Agenda 21

Significant progress has been made towards the implementation of 17.21 and further progress is expected in five areas: integrated coastal zone management; land-based

marine pollution; fisheries conservation (especially on the high seas); the strengthening of regional and international ocean management efforts; and the development of programmes designed to address the special needs of small developing island states. Many programmes already exist and are being further developed as a result of the UNCED in such areas as cleaner production, pollution control technologies, and capacity building (Dahl 1993). At the international level, a number of steps have been taken to co-ordinate the actions of the relevant UN entities. There are indications that a shift in focus in the relevant UN agencies to support the programmes in Agenda 21 in general, and of 17.21 in particular, has already occurred. The UN entities are making more extensive efforts to improve inter-agency communication and co-operation in order to support these programmes. Important reforms in major international organisations, such as the World Bank and the Global Environmental Facility (GEF), the major funding mechanism for the UNCED implementation, in favour of implementation of these programmes have also taken place. Many coastal and marine issues were among high priorities of the GEF International Waters Program Area in 1994 and 1995. NGOs have served as a catalyst in the implementation process by prodding national and local authorities to abide by the international agreements their governments have made (Cicin-Sain 1996).

With regard to the regional dimension, it is clear that the UNCED has strengthened regional institutions and programmes. An example has been the increased range of activities of the UNEP Regional Seas Programme to include land-based marine pollution. Further growth of active regional programs, such as those in the Mediterranean, the Caribbean and the South Pacific, and rejuvenation of some of the other regional efforts is also expected. According to Strong (1992), this results in increased capacity building in integrated coastal and marine management among developing countries in those regions. Considerable progress has been seen in the area of capacity building in ICZM. The major UN entities, such as IOC, UNEP, IMO, GEF, the United Nations Development Program (UNDP), the United Nations Division of Ocean Affairs and Law of the Sea (UNDOALOS), the Food Association Organisation (FAO), have expanded their own capacities in ICZM. These entities have also sponsored efforts to build capacity at national, regional and subnational levels, and have established a number of new training and teaching programmes in ICZM (Naeve and

Garcia 1995; Cicin-Sain 1996). The implementation of the programmes contained in 17.21 is discussed below.

3.7.3.1 Implementation of Section A: Integrated Management and Sustainable Development of Coastal and Marine Areas, including EEZs

The 1990s have witnessed further development of efforts in ICZM. Guidelines for ICZM have been developed for various levels of governance and implementation. These guidelines are being applied by countries as well as by technical assistance and financing institutions in a growing numbers of projects. Five major efforts to develop international guidelines in ICZM include the World Bank (1993), the World Coast Conference Report (1994), UNEP (1995), the World Conservation Union (1993) and OECD (1991)².

In addition, the concept of ICZM has already been further interpreted, operationalised and adopted as the central organising concept of many post-UNCED conferences. It has been endorsed as an important and relevant tool in connection with the implementation of the several global plans of action, such as the Plan of Action adopted at the global conference on land-based marine pollution, held in Washington, DC in 1995 (Naeve and Garcia 1995), and the Program of Action adopted at the Global Conference on Sustainable Development of Small Developing Island States, held in Barbados in 1994 (Cicin-Sain *et al.* 1995). The WCC'93, mentioned in Chapter 1 of this study, also recognised ICZM as 'the most appropriate process to address current and long-term coastal management issues including habitat loss, degradation of water quality and coastal resources, and adaptation to the impacts of global climate change' (IPCC 1993: 49). It examined the key principles and practices underpinning ICZM, and identified the 'elements' and 'obstacles' to such approaches (Haward and Hildebrand 1996).

The 'Call to Action' adopted at a major global workshop entitled 'Partnership Building and Framework Development' in the International Coral Reef Initiative Programme (ICRI) also contains a clear endorsement of ICZM as a 'framework for achieving the sustainable use of, and maintaining the health of, coral reefs and associated

² For details on comparison of these guidelines, see Cicin-Sain *et al.* (1995).

environments' (Cicin-Sain *et al.* 1995). Mieremet (1995) has described ICRI as a 'seed from the Earth Summit which now bears fruit'.

The concept of ICZM has also become a key concept in the implementation of the Convention on Biodiversity, which formerly lacked a coast and ocean emphasis. Two sessions of the Conference of Parties on the Convention on Biodiversity held in 1994 and 1995 highlighted the concept of ICZM which was seen as an important tool in the protection of coastal and marine biodiversity. It was considered that the use of integrated coastal and marine area management was the most suitable framework for addressing human impacts on coastal and marine biological diversity and for promoting conservation and sustainable use of this biodiversity. Parties was encouraged to establish and/or strengthen, where appropriate, institutional, administrative, and legislative arrangements for the development of integrated management of coastal and marine areas and their integration within national development plans (Cicin-Sain *et al.* 1995).

In support of the initiatives above, the relevant UN Agencies and mechanisms have developed a Co-operative Programme Framework for ICZM. The framework's objectives are to develop, across the UN system, a coherent and optimised approach to technical assistance provided to governments on ICZM, to improve access to available information on ICZM, and to contribute to the development of institutional capacity and human resources required for the implementation of ICZM at the national level (Naeve and Garcia 1995).

The UNCED 1992 has, therefore, stimulated a considerable amount of activity related to ICZM at the international level (Knecht and Cicin-Sain 1993) which has emerged as the designated framework of choice for the realisation of many of the goals of 17.21 in connection with the implementation of important aspects of both the Biological Diversity and Climate Change Conventions (Cicin-Sain 1996; Naeve and Garcia 1995).

3.7.3.2 Implementation of Section B: Marine Environmental Protection (including Land- and Sea-based Sources of Marine Pollution)

With the aim of developing approaches for addressing land-based activities, the global conference on land-based marine pollution mentioned above adopted a Global Plan of Action for the protection of the marine environment from land-based marine pollution on the basis of the 1985 Montreal Guidelines for the Protection of the Marine Environment from Land-based Sources of Pollution. A Washington Declaration highlighted the major aspects of the Plan of Action (Williams 1996a). These provided the basis for national and international action towards reduction of pollution of the oceans from land-based activities, thereby contributing to the improvement of coastal habitats and productivity, the reduction of threats to food security and safety, and the reduction of hazards to human health (Naeve and Garcia 1995; Cicin-Sain *et al.* 1995). It was recommended that states should focus on sustainable, pragmatic, and integrated environmental management approaches and processes such as ICZM, harmonised, as appropriate, with river basin management and land use plans (Naeve and Garcia 1995). While the Plan is in the category of 'soft law' and is not legally binding on states, it does deal in a comprehensive and definitive way with a wide range of land-based activities and their effects on the coastal and marine environments (Cicin-Sain *et al.* 1995).

The main forums in the field of sea-based marine pollution have stated their consideration of the consequences of 17.21. A number of activities were initiated by IMO in co-operation with other agencies. In 1993, the IMO Assembly adopted the Code on the Carriage at Sea of Irradiated Nuclear Fuel and Other Nuclear Material (INF Code) and is investigating ways in which ballast water can be controlled to avoid transfer of unwanted aquatic organisms and pathogens from one part of the world to another. In addition, an amendment to the LDC 1972 entered into force in February 1994, prohibiting sea disposal of radioactive and industrial wastes and the incineration at sea of industrial wastes and sewage sludge. The draft text of an annex to the MARPOL Convention on air pollution covering ozone depleting substances, incineration of wastes on ships, volatile organic compounds, SO₂, NO_x, and fuel oil quality, was scheduled for formal adoption during the 1996-1997 biennium. A diplomatic conference convened in early 1996 considered the adoption of an international convention on liability and compensation for damage in connection with

the carriage of hazardous and noxious substances (HNS) by sea (Naeve and Garcia 1995; Nollkaemper 1993).

3.7.3.3 Implementation of Sections C and D: Sustainable Use and Conservation of Marine Living Resources of High Seas and under National Jurisdiction

Implementation of Sections C and D dealt primarily with the establishment of a legal framework for protecting marine resources. The legal frameworks for sustainable use and conservation of marine living resources have been greatly improved since the UNCED 1992 as shown in Table 3.1.

Table 3.1 Agreements, Conventions and Conferences on the Management of Coastal and Ocean Fisheries and Biodiversity

Title	Major outcomes
Law of the Sea Convention (came into force in Nov. 1994)	<ul style="list-style-type: none"> established the rights and duties of states and provided the basis for international agreements and dispute resolution in relation to fisheries in the high seas and EEZs
"Compliance Agreement" (approved by the FAO conference in Nov. 1994)	<ul style="list-style-type: none"> reached agreement to promote compliance with international conservation and management measures by fishing vessels on the high seas; covered all high sea fishing vessels
Agreement for the Conservation and Management of Straddling Fish Stocks and Highly Migratory Fish Stocks (adopted in August 1995)	<ul style="list-style-type: none"> imposed important new conservation obligations on signatory nations to co-operate in the management and conservation measures for straddling and highly migratory fish stocks encouraged the strengthening or creation of regional and subregional fishery management arrangements
Code of Conduct for Responsible Fisheries (approved by the FAO conference in Oct. 1995)	<ul style="list-style-type: none"> provided the guidance necessary for management and conservation of fishery resources and associated or dependent species and their environment
Conference of Parties on Biodiversity Convention (held in 1994, 1995)	<ul style="list-style-type: none"> gave priority attention to coastal and marine biodiversity Decision II/10 on "Conservation and Sustainable Use of Marine and Coastal Biological Diversity"

Sources: Cicin-Sain 1996; Kimball 1993; Naeve and Garcia 1995

3.7.3.4 Implementation of Section E: Addressing Critical Uncertainties for the Management of Marine Environment and Climate Change

Agreement has been reached on the development of an approach, strategy and time-frame for the Integrated Global Ocean Observation System (IGOOS) of IOC, involving many national institutions and with the effective co-operation with a number of UN Agencies, such as WMO, UNEP, FAO, and non-UN organisations. Several regional IGOOS programmes have been initiated and there has been an increase in efforts to collect and share some critical types of data. In addition, significant progress has been

made in numerous scientific domains critical to the understanding of the oceans. For example, the ability to forecast changing environmental, ocean-related conditions (flooding, cyclones, tsunamis), and the capacity to apply such forecasts for warning and protective measures, has been improved. The assessment of the role of oceans in regulation of greenhouse gas concentrations, especially CO₂, has also been updated. The first three phases of the Global International Mussel Watch Programme have been completed and several following phases have been initiated (Naeve and Garcia 1995; Cicin-Sain 1996).

3.7.3.5 Implementation of Section F: Strengthening International, including Regional, Co-operation and Co-ordination

The creation of the Administrative Committee on Co-ordination (ACC) Subcommittee on Oceans and Coastal Areas itself has facilitated and improved co-operation among the UN bodies. Apart from joint integrated reporting on progress achieved in the implementation of Agenda 21, it has become a forum for joint programming. As a first step, a Co-operative Programme Framework for ICZM is being developed. GESAMP, originally founded to advise solely on marine pollution issues, has broadened its terms of reference to be able to fully respond to the needs of its sponsoring agencies for scientific advice on all aspects of marine environmental protection and management. The Aquatic Science and Fisheries Information system (ASFIS), co-sponsored by UNDOALOS/IOC/United Nations Educational, Scientific and Cultural Organization (UNESCO), FAO and UNEP, is responsible for the production of ASFA, the largest and most widely used database on fisheries and aquatic science. It has recently concluded a new agreement to produce (in addition to journals) a CD ROM version of the database, thus making it available to a much wider community (Naeve and Garcia 1995).

3.7.3.6 Implementation of Section G: Sustainable Development of Small Developing Island States

The Global Conference on Sustainable Development of Small Developing Island States aimed to adopt plans and programmes to support the sustainable development of small developing island states and the utilisation of their coastal and marine resources as well as measures that would enable them to cope with environmental changes, to reduce

threats, and to mitigate impacts (Cicin-Sain 1996). In the Program of Action which is now in the implementation stage (Naeve and Garcia 1995), the Conference called for a strengthening of the capacity for integration of economic and environmental policy in national planning and across sectors, dealing with national institutions and administration capacity. In addition, international organisations and donor nations were asked to support small developing island states in responding to vulnerable coastal nations to develop ICZM plans including the development of adaptive response measures to the impacts of climate change and sea level rise (Cicin-Sain 1996; Naeve and Garcia 1995).

Many actions have been taken in response to the Conference, including the establishment of a focal point and a task force within the UNEP to co-ordinate the programme's activities relevant to the Program of Action. Many of the UN organisations and bodies have taken concrete steps, often supported by decisions of their respective governing bodies, in support of this programme. In implementing it, appropriate attention has been given to the needs and vulnerability of small developing island states, and to taking an integrated approach within the UNEP's programme in addressing the issues of relevance to small developing island states. The 1996-1997 Work Programme of UNEP identified the following programme elements in which special consideration are given to small developing island states: caring for fresh water, coastal and marine resources, and caring for biological resources (Naeve and Garcia 1995). In addition, there is strong evidence of a significant growth of capacity in small developing island states in environmental management in general and in coastal and marine management in particular since the UNCED 1992. This is especially the case in the South Pacific where strong regional-level organisation has been very functional in the enhancement of national and local level capacity. However, there is growing disappointment and disillusionment with the implementation of this Program, due mainly to the lack of mobilisation of significant new resources to support it (Cicin-Sain and Knecht 1995).

3.8 The Earth Summit II

Five years after the UNCED 1992, the Earth Summit II³ was held to assess the degree to which outcomes of the UNCED had been successfully implemented. It was a small conference with fewer participating countries. This demonstrated a lack of political will compared to the UNCED. It was recognised at the Earth Summit II that the promises of the UNCED had failed. The *1997 Global Environmental Outlook*, produced by the UNEP, and the *State of the World 1997*, produced by the Worldwatch Institute maintained that the global environment had continued to deteriorate and that significant environmental problems remained deeply embedded in the socio-economic fabric of nations in all regions (Anon. 1997). The *State of the World 1997* argued that the main Treaties and Conventions had not been adequately implemented and thus this failure threatened the stability of the planet's climate and natural ecosystems.

One of the most important reasons for this failure was considered to be the tardiness of international decision-making processes. Global action requires agreement between almost 200 national governments. The international decision-making processes also lack democratic accountability which undermines effective public pressure for action (Earthaction n.d.). Another major reason identified for the failure of governments to implement Treaties and Conventions was a lack of commitment of financial resources to these problems.

3.9 Conclusion

There is an unprecedented level of international activity on global coastal and marine issues (DEST 1997a). The evolution of multilateral agreements on managing the coastal and marine environments, including the UNCHE 1972, the LOSC, the Brundtland Report 1987 and the UNCED 1992, has involved a shift in emphasis from preservation of the environment to the adoption of the sustainable development concept. Throughout this process, world attention is being focused largely on the marine environment, especially the coastal zone, with particular attention to the sustainable development of natural resources of these environments (Schachte 1992). The marine environment has

³ From 23 to 27 June 1997 the Earth Summit II was organised in New York to review the progress since the UNCED 1992 (Anon. 1997).

become of critical importance as a lead sector in international law and in providing a model for management for sustainable development. ICZM and sustainable development are now viewed as interdependent. These concepts are now well advanced and clearly articulated at international forums in such a way that they can be incorporated into international agreements and domestic law and policy. ICZM has also been found to be the most useful means of facilitating the development of a co-ordinated decision-making framework (Cicin-Sain and Knecht 1995). It is now accepted that coastal and marine management policy must be integrated horizontally, across disciplines, departments and specialised agencies and between the public and private sectors, as well as vertically, across levels of governance, national, regional and global, in a coherent system (Barcena 1992).

Over one hundred and forty coastal programmes are currently in place throughout the world (Sorensen 1993). Looking ahead, with foundations being built, capacity-building taking place, some funding beginning to flow and nations more acutely aware of coastal and marine issues, it is hoped that the new approaches to marine environmental management are successful at protecting and improving the marine environment for both present and future generations. The management of the coastal and marine environment has emerged as a major element of not only international agendas but also domestic political agendas over the past decades. The following chapter examines the management of the coastal and marine environments at the national level by using Australia as a case study.

CHAPTER 4

Australian Coastal and Marine Management

4.1 Introduction

In the post-UNCED era, governments throughout the world have been facing not only substantial internal political pressure to meet their responsibilities in addressing degradation of coastal and marine environments, but also increased external pressure in relation to managing the coastal zone. Coastal management is, therefore, an issue that is likely to remain on the policy agendas of governments for the foreseeable future.

In Australia, the Commonwealth Government has recognised its responsibilities in this area and, in particular, its responsibilities associated with the importance of the programmes outlined in Chapter 17 of Agenda 21. This recognition has been reflected in both its domestic policy and international relations (Haward and Hildebrand 1996). Implementing these policies and principles, however, has meant contending with several serious difficulties. One of these has been the need to overhaul the traditional approach to coastal zone management in Australia, which has been fragmented, land-based and focused on the physical aspects of the coast (Anutha and Johnson 1996). Another major obstacle has been the fact that jurisdiction over the Australian coastal zone is shared by the Commonwealth, state and local spheres of government. Numerous inquiries into the management of coastal and marine environments have pointed out that this tripartite intergovernmental dimension has seriously exacerbated the problems associated with the traditionally sectoral approach to coastal and marine management. Developing frameworks which facilitate greater integration between and within governments has, therefore, been a major challenge (Haward 1995; Cullen 1990).

As considerable as these challenges are, due to the increased visibility and political salience of ICZM (Haward and Hildebrand 1996), progress has been made by the Commonwealth Government. Coastal management as a discipline is being redefined in Australia to encompass integrated policy development and strategic planning. (Anutha and Johnson 1996). At the same time, there has been a shift in focus from the physical to the strategic aspects of coastal zone management while domestic ocean and coastal management has increasingly been integrated, with clear indications of support for an integrated approach to management of both the coastal zone and the EEZ. Furthermore, a crucial obstacle hindering progress towards a more integrated approach to coastal management in Australia has been the constitutional, legal and political frameworks. So much of the work at the Commonwealth level has focused on the creation of legislative and institutional arrangements which will facilitate ICZM (Haward 1995).

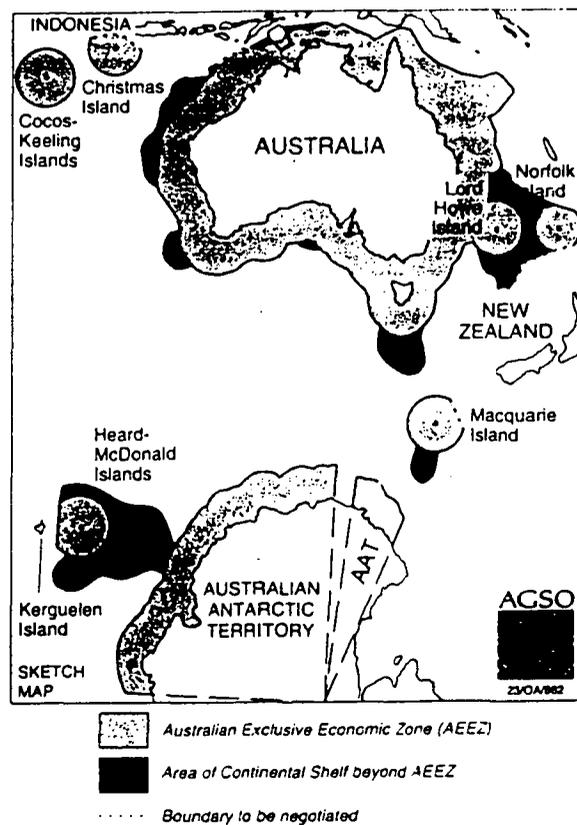
Driving this increased attention on ICZM on the part of the Commonwealth Government has been the concern over the sustainability of coastal resources, the perceived need to improve management frameworks and institutional arrangements, and an increasing level of inter and intragovernmental policy integration. These concerns or issues have been at the core of the ecologically sustainable development process and many other plans, strategies, and programmes initiated by the Commonwealth Government over the past decades (Haward and Hildebrand 1996).

This chapter provides an overview of coastal and marine policy making and management at the Commonwealth level, including national inquiries into marine and coastal pollution and coastal zone management, the development of a legislative and institutional framework, and the ecologically sustainable development process. It also examines the major Commonwealth programmes such as the OR 2000 Program and the Marine Program, the Commonwealth Coastal Policy and the Coastal Action Plan (CAP), the recently released Coasts and Clean Seas Initiatives (CCSI), and the Oceans Policy.

4.2 Australian Coastal and Marine Environments and the Perceived Need for Integrated Coastal Zone Management

Australia, an island continent with seven external territories, has a maritime area under its jurisdiction that is larger in area than the Australian continent itself. This maritime area (Figure 4.1), moreover, contains an extremely diverse range of climates, ecosystems and habitats, many of which are highly productive and contain a high diversity of specialised animals and plants, many of which are endemic. Australia's southern coastline, for example, has the world's highest diversity of red and brown algae (approximately 1,150 species), bryozoans (lace corals), crustaceans and ascidians (sea squirts) and distinctive fauna and flora, with around 80% to 90% species in most groups being endemic (Zann 1995). Several national inquiries have stressed the significance of the coastal zone as a natural asset and the contribution of the industries associated with these marine resources to national economy is considerable (Appendix 3).

Figure 4.1 Australian Offshore Responsibilities



Source: VanderZwagg *et al.* 1996a

Increased international attention to the problems of the world's coastal and marine environments, together with domestic concerns over the degradation of the coastal zone have contributed to the rise in the political salience of coastal and marine management as an issue in Australia over the past decades (Haward and Bergin 1991; Haward and Hildebrand 1996). With the ratification of the LOSC by Australia in November 1994, the nation's responsibilities associated with managing this vast and productive maritime area were significantly increased.

Meeting these responsibilities, however, has not been a simple task. Despite the fact that Australia has an extensive coastal area and a relatively small population, the problems associated with the marine environment under its jurisdiction, and the coastal zone in particular, are numerous and, in many cases, serious (Appendix 4). The reason for this apparent paradox is related to the country's general aridity which has meant that much of its economic and development activity has been located within the coastal region. These activities accelerated with post World War II population growth and industrial expansion (RAC 1992a). Today, 86% of the Australian population reside in coastal areas. Furthermore, all of Australia's major metropolitan areas, except Canberra, are located in the coastal zone. Almost half of all population growth in Australia over the past decades has occurred in coastal areas outside the capital cities (RAC 1993a). The Gold Coast, the Sunshine Coast and the New South Wales mid and north coasts are examples of such major foci of urban growth which have experienced high rates of population growth in the 1980s (RAC 1992b).

Recreational and tourist activities have also increased dramatically in Australia over recent decades. Most of these activities have, again, been concentrated along the coastal fringe, the only real exception being a small number of alpine areas along the Eastern Ranges and tourist sites in central Australia. Tourist development in the country has, to a large extent, been restricted to the eastern coastline between south eastern Victoria and Cape York (Graham 1989).

Many other economic activities are also concentrated in this coastal zone. Nearly all of Australia's commercial fishing catch, for example, is taken within the continental shelf,

inshore areas or major estuaries. Over three-quarters of Australia's intensive cropping and livestock production areas are also located within the coastal zone (Graham 1989).

Numerous national inquiries and the State of the Marine Environment Report (SOMER) have attempted to identify the combined impacts of these activities on the coastal zone. The SOMER concluded that the greatest problems were the declining coastal and marine water/sediment quality (attributed mainly to poor use of catchments); the loss of coastal and marine habitat; the unsustainable use of coastal and marine resources; the lack of long-term research and monitoring; and the lack of strategic integrated planning (Zann 1995).

If, as most demographic projections suggest, future economic development and growth in Australia continues to occur in coastal areas, the pressure on these resources and competition for access to coastal resources will intensify (Young 1996). More efficient and effective coastal zone management strategies will be required to deal with these tensions (RAC 1992a). Therefore, the challenge for governments, coastal managers, NGOs, and members of the community is to develop cost effective management strategies capable of balancing these demands (Hunt 1993; Lal, Whitham and Young 1994).

ICZM appears to be the management tool most able to overcome the limitations of existing coastal zone management strategies (IPCC 1993). National inquiries into coastal zone management undertaken in the past decades have urged responsible authorities to work to achieve ICZM. These inquiries have also expressed the view that protection and improvement of the coastal and marine environments requires a co-operative national strategy. The following section examines the response of the Commonwealth Government to the issue of coastal and marine management.

4.3 Major Commonwealth Initiatives in Coastal and Marine Management

Australia's federal system of government, with a partial division of responsibility between the Commonwealth, state and local governments, has made the development of coherent policies difficult (Rothwell 1996). Responsibility for environmental policy and natural resources management has been assigned under the Australian constitution to the

states, with the result that the Commonwealth has very limited and unclear powers in areas such as coastal zone management. These powers are restricted mainly to the regulation of lighthouses, navigation and shipping, and issues relating to external affairs and defence. Other than various conservation and development programmes, the Commonwealth has, therefore, traditionally lacked the ability to act unilaterally (Rothwell 1996; Davis 1991).

Through major changes in legislative frameworks, discussed later in this chapter, and along with the implementation of various international agreements, however, the Commonwealth has gained clear interests and responsibilities in coastal zone management over recent decades and has undertaken many initiatives (Haward 1996; Morvell 1996). In addition to the strategies, policies, programmes and conferences which are relevant to coastal and marine management, it has been the advances made towards achieving ICZM in Australia that have been most significant. These include national inquiries into coastal and marine management, the development of legislative and institutional framework, the OR 2000 Program and Marine Program, the Commonwealth Coastal Policy and the CAP, the CCSI, and the Oceans Policy. These initiatives are discussed at greater length below. There have also been a number of Commonwealth initiatives facilitating coastal zone management at the local level. These initiatives are discussed in Chapter 6.

4.3.1 National Inquiries into the Coastal and Marine Environments of Australia

4.3.1.1 National Inquiries into the Coastal Zone

The problems of coastal and marine management in Australia, especially those in the coastal zone, have been the subject of numerous studies and inquiries. Among these, the inquiry conducted in 1979-80 by the House of Representatives Standing Committee on Environment and Conservation (HORSCEC), the inquiry undertaken in 1990-91 by the House of Representatives Standing Committee on Environment, Recreation and the Arts (HORSCERA), and the inquiry carried out in 1992-93 by the Resource Assessment Committee (RAC), were the most intensive and made a significant contribution to Australian coastal policy and management. In addition to emphasising the importance of coastal resources and highlighting the present and potential threats from continued

degradation, a number of problems in existing coastal management were identified and solutions to these problems suggested. Appendix 5 summarises major issues covered in findings and recommendations of these inquiries.

It is apparent from Appendix 5 that these inquiries reached similar conclusions concerning the significant limitations on coastal zone management in Australia and made similar recommendations for future management. The common finding of the above inquiries was that Australia's coastal zone has been dominated by a sectoral approach to management, exacerbated by the division of responsibilities between Commonwealth, state and local governments for managing and regulating activities. According to Haward and Hildebrand (1996: 167), 'traditional arrangements have been strongly regulatory, generally top-down in nature and have had limited integration between or within these Governments'. Management was described as both costly, ineffective at halting the steady degradation of the coastal zone. This lack of effectiveness has been attributed to the nature of the underlying problems and the difficulty of finding solutions to such problems. Pitts (1993) and Kenchington (1994), for example, noted that the problems associated with the Australian coastal zone are complex and display the six characteristics of complex 'wicked' problems as defined by Mason and Mitroff (1981)¹.

The above inquiries highlighted the need to develop a national approach to managing Australia's coastal resources. The RAC Inquiry emphasised the urgent need for the Commonwealth, state and local governments to act co-operatively to protect the coastal zone (RAC 1993a). According to many authors, such as Haward and Hildebrand (1996) and Davis (1996a), these inquiries have been an important vehicle for developing a

¹ The six characteristics of complex wicked problems identified by Mason and Mitroff (1981) include:

- a) interconnectedness: strong connections link one problem with another;
- b) complicatedness: numerous elements including feedback loops;
- c) uncertainty: wicked problems exist in an uncertain environment which creates a need to accept risk, perhaps incalculable risk;
- d) ambiguity: the problems can be seen in a quite different way depending on a person's characteristics and experience. There is no single 'correct' view;
- e) conflict: competing claims, conflicts of interests that are unlikely readily to enter co-operative arrangements; and
- f) societal constraints: social, political and technological constraints bear on perceptions of the feasibility and desirability of solutions.

more integrated approach to coastal zone management. Although the conclusions of several previous inquiries have failed to be translated into policy and action by the governments (Hunt 1993), the Commonwealth Government has responded to these inquiries by undertaking a number of initiatives and these are discussed at length later in this chapter.

Among the greatest problems associated with the management of the coastal and marine environments in Australia is pollution (Zann 1995). For this reason, national inquiries have also been an important basis for information on coastal and marine pollution and strategies for its remediation. The Marine and Coastal Pollution Inquiry, for example, was conducted in 1995 and the release of the resulting report from the Senate Environment, Recreation, Communications and the Arts Reference Committee in October 1997 contributes to the understanding of this matter. The following section examines this inquiry.

4.3.1.2 Marine and Coastal Pollution Inquiry

In June 1995, the Senate Environment, Recreation, Communications and the Arts References Committee was directed to inquire into the management of water and biological nutrients in Australia. Particular emphasis focused on the loss of nutrients from the terrestrial environment into Australia's coastal and marine environments, caused by way of pollution from land run-off, stormwater and sewage outfalls (Williams 1996b). The Committee concluded that the coastal and marine environments were under increasing strain. Pollution of coastal waters and shores from a variety of point and diffuse sources was described as very serious. Land-based marine pollution was seen as the most significant issue needing to be addressed. Among the major threats to the coastal and marine environments noted were the elevated levels of nutrients and sediments entering the coastal and marine environments, the release of sulphuric acid of acid sulphate soils around the eastern and northern coasts of Australia, the use of pesticides, exotic pests, coastal development and aquaculture activities. According to the Committee, the most serious issue is the elevated levels of nutrients and sediments and its effects on the widespread die-back of seagrass beds and the threat they pose to the corals of the Great Barrier Reef (Australia 1997a).

Coastal and marine management emerged as a major theme during the course of the Inquiry. The complex, multi-sectoral, and multi-jurisdictional nature of the administration of the coastal zone and the lack of integrated management across sectors, geographical areas, and spheres of government in dealing with specific problems were stressed. The ICZM framework has been recognised as the only effective way of dealing with the issues involved. Major recommendations from the Inquiry include inter-governmental co-ordination, research and information management and community involvement and education (Australia 1997a).

According to Williams (1996b), together with the release of the SOMER and the Commonwealth Coastal Policy, the Inquiry signalled that the Australian Government was taking coastal and marine management responsibilities seriously. Williams (1996b) has further argued that the true commitment of the Government, however, will be the degree to which the findings and recommendations of the Inquiry are translated into action and result in tangible environmental improvements.

4.3.2 The Legislative Framework for Coastal and Marine Management

The legal framework for coastal and marine management consists of international treaties and related instruments, Australian Commonwealth legislation and intergovernmental agreements between the Commonwealth and states. Although the Commonwealth under the Australian Constitution lacks the power to legislate with respect to the coastal zone in the states, it has been able to use either its trade and commerce power (Section 51 (i)) or the corporations power (Section 51(xx)) to substantially regulate certain activities within the coastal zone that may impact upon the environment. On two occasions since 1976², the High Court of Australia has ruled in favour of the Commonwealth when there has been dispute over the Commonwealth ability to use these powers. These two rulings have been particularly instrumental in supporting the Commonwealth's capacity to use these powers. As a result, the Commonwealth has considerably increased its involvement and influence in coastal

² See the decisions in *Murphyores versus Commonwealth*, *Commonwealth Law Reports*, 136 (1976) 1; *Commonwealth versus Tasmania*, *Commonwealth Law Reports*, 158 (1983) 1.

zone management and federal authorities have been able to gradually impose their will on the states in recent decades (Davis 1991).

Because Australia has traditionally been dependent on ocean transport for communication and trade, it has also been active in the development of international law relating to the oceans. As signatory to international and regional agreements concerning the coastal and marine environments, Australia has obligations which have a marked impact on domestic laws. In addition, the interest in offshore exploration has encouraged the Commonwealth to provide a framework for continued development of offshore resources. The Commonwealth has expanded its interest and involvement in the protection and resource management of the coastal and marine environments by passing a package of key legislation and agreements which have provided the basis for its increased involvement in environmental policy making (Davis 1985; Rothwell 1996). A great range of Commonwealth legislation dealing with the management of the coastal and marine environments now exists (Haward 1995). These laws provide for responsible resource management and meet Australia's international obligations, including the prevention of overexploitation of Australia's coastal and marine resources, using and conserving them in a sustainable manner, and protecting the coastal and marine environments from pollution. Some of these laws and agreements have significantly contributed to the management of the coastal and marine environments and have created the parameters within which Australian ocean and coastal management policy must operate (Rothwell 1996) (Appendix 6). For example, the *Seas and Submerged Lands Act 1973* has largely resolved the uncertainty over the extent of the Commonwealth's offshore constitutional powers (Rothwell and Haward 1996), while the *Great Barrier Reef Marine Park Act 1975* has been seen as a cornerstone of national environmental policy (Davis 1991). In response to the LOSC, the Commonwealth enacted the *Maritime Legislation Amendment Act 1994*, creating the basis for Australian maritime claims³.

³ Four maritime claims in Australia are territorial sea, contiguous zone, EEZ, and continental shelf. Up until 1990 Australia claimed a 3 nautical mile territorial sea and extended this from 3 to 12 nautical miles on 20 November 1990. Australia's claim to a 24 nautical mile contiguous zone became effective on 1 August 1995. The EEZ was proclaimed on 1 August 1994 (Prescott 1995). The first continental shelf claim was asserted in 1953. In 1994 there was an amendment to the Act so as to allow for a new continental shelf proclamation, consistent with the terms of LOSC (Rothwell 1996).

conflict and controversy between jurisdictions over management of offshore resources was significant (Opeskin and Rothwell 1991). Intergovernmental agreements, such as the Offshore Constitutional Settlement 1979 (OCS) and the Intergovernmental Agreement on the Environment 1992 (IGAE), have significantly contributed to the resolution of these problems. According to Haward and Hildebrand (1996), these agreements are important dimensions in the Australian legislative framework on which the Commonwealth has had to rely to achieve desired environmental outcomes. The significance of these agreements in articulating and implementing sustainable development as a basis for future implementation of Australian coastal and oceans policy, has been highlighted by many authors, such as Haward and Hildebrand (1996) and Rothwell (1996). According to Rothwell (1996), the OCS has also created a further constitutional law framework for Australian coastal and marine management. Although the IGAE has had little direct application to date in the marine domain, it promises a great deal and is likely to become a significant element in future discussions over the marine environment (Toyne 1994; Hunt 1993). Appendix 6 details the existing intergovernmental agreements.

Numerous inquiries have concluded that this confusing plethora of legislation and regulation has been a major reason for the failure to develop an integrated approach to coastal zone management in Australia. Rothwell (1996) has argued that effective coastal and marine management has also been made difficult by the complexity of Australia's domestic legal framework. Although the Commonwealth has taken a more active interest in Australian coastal management over the past decades, there remains considerable scepticism over whether these Commonwealth policy initiatives will result in changes to legislative management within the current framework (Haward 1996). However, it can be concluded that the legislative framework for the management of the coastal and marine resources which complement, extend or operationalise (through administrative arrangements) the issues of jurisdiction, action and enforcement are now in place to ensure that the states and Commonwealth can resolve coastal problems (Rothwell 1996; Haward 1996).

Although there is still significant room for improvement in this legislative framework⁴, it has provided the key elements of Commonwealth and state government responsibilities in relation to coastal and marine resource policy. The increased legislative and administrative activity concerning the coastal and marine environments has been paralleled by a concomitant increase in co-operation and collaboration between the Commonwealth and state governments. The development of this legislative framework has mandated a growing role for federal agencies and authorities governing coastal and marine resources (Davis 1996b). The following section examines the institutional framework within which Australia manages its coastal and marine environments.

4.3.3 Institutional Framework for Coastal and Marine Management in Australia

An institutional framework for coastal and marine management has received attention at international forums. For example, the question of institutional design to improve integration between and within governments involved in decision-making process, and the 'elements' of and 'obstacles' to such a process, was emphasised as a crucial component at WCC '93 (Haward and Hildebrand 1996). This concern is shared in Australia where responsibilities for coastal and marine affairs are divided among several federal ministries at the national level. Numerous national inquiries into the coastal zone have highlighted the lack of action in tackling the question of adjusting institutional arrangements to improve integration between and within governments in Australian coastal zone management. Because Australian coastal zone policy is characterised by fragmentation, institutional arrangements providing mechanisms for increasing policy co-ordination between the Commonwealth and the States have been created (Davis 1996a). Parallel to the increased role and responsibilities of the Commonwealth, there has been an increase in the size and range of Commonwealth agencies with coastal and marine responsibilities. According to Haward (1995), this co-ordination and collaboration between agencies has in principle been strengthened by the introduction of broad 'whole of government' approaches such as that embodied in policy commitments to ecologically sustainable development. Davis (1996a) has also argued

⁴ Sainsbury *et al.* (1997) have criticised the current legislative framework as being overly complex and cumbersome and thereby, inhibiting the development of an integrated approach.

that the proclamation of Australia's 200 nautical mile EEZ and the ratification of the LOSC has enhanced collaboration between key Commonwealth maritime agencies, especially those which are responsible for coastal and marine research. These agencies will enhance knowledge of, and contribute to, the integrated management of Australia's offshore estate.

Institutional frameworks are very important in shaping Australian coastal and oceans policy and management. The Commonwealth Government has experienced the difficulties of establishing workable institutional arrangements in a multi-jurisdictional political system and recognised the importance and an urgent need to establish an appropriate institution design as a synthesis between 'top-down' and 'bottom-up' approaches to achieve greater integration of coastal and marine management (Haward 1996; Haward 1995). It has been argued that the existing institutional arrangements can provide a means to achieve more integrated coastal and marine management policies. In addition to the recognition of state and local government responsibilities in any national coastal and marine approach, Haward (1996) has argued that it is necessary to provide adequate resources and authorities for co-ordinating mechanisms within and between governments to ensure that the current effort towards integrated management is achieved and sustained. Within this legislative and institutional framework, ecologically sustainable development is a major principle affecting Australian coastal and marine management (Haward 1996). The following section examines the ecologically sustainable development process in Australia.

4.3.4 The Ecologically Sustainable Development Process

The ecologically sustainable development process was one of Australia's responses to the WCED report and an initiative pursued by the Commonwealth once it became a signatory to the principles and Conventions developed at the UNCED 1992. A review of Australian environmental and resource management in terms of sustainable development was initiated by a Prime Ministerial statement in July 1989 (Australia 1989). Then, following a summit between the Commonwealth Government and peak industry, union and environmental organisations, the Commonwealth released a discussion paper, *Ecologically Sustainable Development*, in June 1990 in which it

proposed the establishment of nine working groups to advise governments on future policy directions and proposals for implementing them. The Working Groups released draft reports in August 1991 which provided the basis for the National Strategy for Ecologically Sustainable Development (NSED) (Haward and Hildebrand 1996). Recognising the implicit influence of intergovernmental processes, institutions and outcomes in the implementation of ecologically sustainable development, the Draft NSED emphasised that 'the cross-jurisdictional nature of ecologically sustainable development required close co-operation between all levels of government in order to effectively monitor and review the progress of the NSED' (Australia 1992a: 12). The NSED was released in late 1992 and became a central element of Australian environment and resource management. It was endorsed by Australian Commonwealth and state governments in the same month. A further commitment to the principles of ecologically sustainable development was included in Prime Minister Keating's 'Statement on the Environment' released on 21 December 1992 (Haward and Hildebrand 1996).

Coastal management was considered as part of the process. Coastal zone management was addressed in the reports on fisheries, energy production, tourism and intersectoral issues which included for the development of a national coastal zone management strategy. The NSED emphasised the adoption of an ecosystem approach to management which would resolve management boundaries between the Commonwealth and the states and between adjoining states. ICZM is supported by the NSED (Haward 1995). The need for ICZM was identified among a number of cross-cutting issues identified by the working groups (Australia 1992b; Kenchington and Crawford 1993). The issues directed toward ICZM, such as maintaining sustainability of coastal resources, improving management frameworks and institutional arrangements, and increasing the level of inter and intragovernmental integration, were emphasised in the outcomes of the ecologically sustainable development process (Haward and Hildebrand 1996). The application of ecologically sustainable development principles to coastal management was facilitated by the work of Ecologically Sustainable Development Sub-Group 21, a group of Commonwealth and state officials with interests in coastal management, formerly established as part of the ecologically sustainable development process. This group worked on the application of ecologically sustainable development

to the coastal zone and enhanced the integration between different Australian governments and their environmental protection agencies (Haward 1996).

Ecologically sustainable development has emerged as a central concern for governments in national environmental policy, including ICZM (Brown 1997). It has been argued that ecologically sustainable development and coastal zone management are 'organising principles' that are one in the same (Keely 1994). Each seeks to balance the conservation and development of coastal resources. Lal, Whitham and Young (1994) have argued that the ecologically sustainable development process yielded principles appropriate as broad objectives for coastal zone management and that could be applied by all levels of government. As one of the cornerstones of the recommendations of both the RAC Coastal Zone Inquiry and the National Coastal Action Plan, the principles of ecologically sustainable development are the basis of any coastal initiative at Commonwealth or state level (Haward 1996), such as the OR 2000 Program, discussed at length in the following section.

4.3.5 Ocean Rescue 2000 Program (OR 2000 Program) and the Marine Program

Unlike the HORSCEC 1980 inquiry, the recommendations of which were ignored by the Commonwealth Government, the HORSCERA 1991 inquiry attracted more attention from governments, policy makers and researchers and led to the establishment of the OR 2000 Program, administered by the Portfolio Marine Group, in collaboration with the Biodiversity Group and the Great Barrier Reef Marine Park Authority (Kriwoken and Côté 1996).

The OR 2000 Program was a decade-long Commonwealth programme focusing on marine environmental protection (Kriwoken and Côté 1996; Zann 1996). It was launched by the Hawke Government and was subsequently strongly supported by the Keating Government. Keating declared in his 1992 'Statement on the Environment' that:

we are committed to establishing a national representative system of marine protected areas. OR 2000 is the first national intergovernmental program of its kind in the world. It begins the tasks of promoting the conservation and sustainable use of our coastal and marine assets (in Kriwoken and Côté 1996: 216).

The Program was built on existing conservation and management programmes and other environmental initiatives such as Landcare, Save the Bush, and the National Strategy for the Conservation of Australia's Biological Diversity (Haward and Hildebrand 1996) while aiming to provide a policy basis for the conservation and sustainable use of Australia's 200 nautical mile EEZ. The primary objective of the Program was to develop and implement a national marine conservation plan based upon the principle of ecologically sustainable development to guide the use and management of Australian coastal and marine resources. The Program supported the strategic, integrated planning in the coastal and marine environments and consists of six major elements (Table 4.1).

It was also intended that the OR 2000 Program be a changing program, as understanding and knowledge of the marine environment increased and as a national approach to the conservation and sustainable use of the marine environment developed. This has significantly affected the operation of the OR 2000 Program. The last two years, for example, have seen an increased emphasis placed on the marine protected areas (MPAs) component of the Program, primarily in relation to the establishment of the National Representative System of MPAs. The contribution of the other elements of the OR 2000 Program towards this component has also been emphasised recently, as part of their work on marine conservation activities more generally. For these reasons, the OR 2000 Program has changed considerably over the last five years, and in 1997 operates in a way significantly different from its original design (DEST 1997b). The OR 2000 Program has now been restructured with a new name, the Marine Program, which will replace the development of the Australian Marine Conservation Plan with an Australian Oceans Policy developed under the Coasts and Clean Seas Initiatives and will support other elements of the OR 2000 Program. For example, the MPAs component of the Program was maintained during the 1996/97 financial year and the achievement of a National Representative System of MPAs is a priority for the government. Table 4.1 provides an evaluation of the OR 2000 Program to date and shows the contribution of other elements to the MPAs component. One of the great difficulties associated with any discussion of such Commonwealth programmes, however, is the lack of effort that has been put into the evaluation of their effectiveness. The evaluation in Table 4.1 therefore emphasises what has been done rather than the outcomes. This holds true for the other programmes discussed in this chapter.

Although there have been some deficiencies in the implementation of the OR 2000 Program, such as the shortcomings in the development of SOMER (see Zann (1996)), the Program has been a significant catalyst for Australian coastal and marine management. It has addressed many issues raised in the ecologically sustainable development process and the RAC inquiry (Kriwoken and Côté 1996). The Program, along with Commonwealth commitment to ecologically sustainable development as a key element of future policy making for the coastal and marine environments, provides an important domestic policy framework supporting key elements of Chapter 17 of Agenda 21. The following section examines the coastal and oceans policies in Australia.

Table 4.1 Evaluation of the Ocean Rescue 2000 Program

Elements	Achievements
Marine Conservation Strategy and Programme	<ul style="list-style-type: none"> • Under the Coasts and Clean Seas Initiative, the development of an Oceans Policy will subsume this program.
State of the Marine Environment Report (SOMER)	<ul style="list-style-type: none"> • released on 13 February 1995. SOMER was published (technical and non-technical style for popular release and wide distribution). • seen as a cornerstone for the future planning and management of coastal and marine resources and is vital to the success of the OR 2000 Program.
Marine Protected Areas (MPAs)	<ul style="list-style-type: none"> • Numerous MPAs projects covering a range of areas have been undertaken and completed. Progress with the regionalisation projects, the strategic MPAs projects, and the successful collaborative approach used to progress work on MPAs, form the main outputs of the National Representative System of MPAs element of the OR 2000 Program to date. • Some States have undertaken a number of short-term projects while others have consolidated work into a smaller number of major, on going projects. A number of these projects, those involved with regionalisation and biological survey work, have fed into the Interim Marine and Coastal regionalisation of Australia (IMCRA), which is being developed to provide a biogeographic regional planning framework for Australia's coastal and marine environments to assist in planning for conservation and sustainable use. • There have also been a number of workshops supported under the OR 2000 Program. Most of the proceedings which have been used as an extension of the information dissemination aspect of the Program and had a useful educative function.
National Marine Education Programme	<ul style="list-style-type: none"> • The National Marine Education Program has produced a wide range of communication and education materials, has involved the community in key events, such as Sea Week and Ocean Care Day, and worked to give the OR 2000 Program and marine conservation in general an effective public profile. • It has addressed the need to promote understanding and appreciation of MPAs through a number of mechanisms which focus on MPAs specially, and build on other initiatives to raise awareness of marine conservation issues in general.
Marine and Coastal Community Network (MCCN)	<ul style="list-style-type: none"> • There are particular Network activities which relate directly to MPAs. • The Network maintains a Homepage on the World Wide Web and produces a quarterly newsletter entitled <i>Waves</i>, which disseminates information on a range of topics including MPAs. Membership of the MCCN has grown steadily over the life of the Program - current membership stand at almost 5000 with a variety of backgrounds and interests in marine conservation.
National Marine Information System (NatMIS)	<ul style="list-style-type: none"> • NatMIS, launched in 1997, now contains a diverse range of marine information of a technical and general nature. This information is accessible on-line as part of the Portfolio Marine Group's web-site on the internet and, as a partially distributed system, people can contribute information into the System. • As a focal point for locating marine information, NatMIS, in addition to presenting marine information held within the Environment Portfolio, continues to build links to other data directories and bases around Australia. Such links include the Coastal Atlas and the Blue Pages Marine and Coastal Data Directory (which was funded under the OR 2000 Program). • The main contribution which NatMIS will make towards the development of the National representative System of MPAs is the collation and presentation of marine regionalisation data to support identification and selection of candidate areas. This ties in with IMCRA and the MPAs database being developed by the Biological Group.

Sources: Kriwoken and Côté 1996; DEST 1994; Haward 1996; DEST 1997b

4.3.6 Commonwealth Coastal and Oceans Policy and the Coasts and Clean Seas Initiatives

4.3.6.1 Commonwealth Coastal Policy and the National Coastal Action Plan

In response to the report of the RAC Coastal Zone Inquiry 1993, the Commonwealth Government developed the Commonwealth Coastal Policy, released as *Living on the Coast* in May 1995. The Policy outlined the Commonwealth's responsibilities, objectives and a series of principles for coastal zone management. It aimed to improve the ecologically sustainable development of Australia's coastal zone and to provide a framework within which the Commonwealth could operate in coastal activity (Australia 1995). Based on the recommendations of the RAC Report, a series of specific objectives for sustainable resource use, rescue conservation, public participation, knowledge and understanding, capacity building and Australian international obligations and responsibilities are intended to achieve through a program of action, the National Coastal Action Plan (Williams 1996a).

Over 30 coastal management initiatives were contained within the Plan. Special attention was given to public participation in coastal zone management. In particular the Coastal Policy and CAP both pay considerable attention to the roles and responsibilities and interests of indigenous peoples in coastal management. A range of activities was set for sustainable coastal resource use. The CAP proposed to establish demonstration projects for local water quality management and eradication and control of introduced marine pests. In addition, the Coastal Policy identified the need to address the most pressing coastal problems, including pollution of coastal waters and marine pollution from land-based activities (Williams 1996b). Given the issue of pollution from coastal waters, water quality management was given a high priority in the CAP. In terms of land-based marine pollution, the Commonwealth sees itself 'in a unique position to facilitate at a national level the adoption of best practices and to enhance the ability of managers to effectively manage land-based marine pollution' (Williams 1996b: 105). The Coastal Policy outlines a number of ways in which the Commonwealth Government is already involved in tackling marine pollution from land-based activities. Examples are the National Water Quality Management Strategy, the National Landcare Program

and the Building Better Cities Program. The Commonwealth Government also supports OR 2000's establishment of a National Representative System of MPAs and the continued development of an Australian Marine Conservation Plan to oversee the conservation and sustainable use of resources in the Australian EEZ (Haward 1996).

Integrated coastal management strategies based on a partnership between the three spheres of government was emphasised in the CAP. The CAP included several major initiatives related to the role of local government in ICZM and announced that the Commonwealth would establish a Coastal Integrated Local Area Planning Program to encourage best practice and ICZM regional strategies based on partnership between the three spheres of government, using the Integrated Local Area Planning Approach (ILAP). The CAP also included a set of initiatives for capacity building and research in coastal zone management. The Commonwealth's continued support for South East Asian and Pacific region forums was also emphasised (Haward 1996).

The Commonwealth Coastal Policy is an important milestone after years of inquiries, analyses and reportage on Australian coastal management. *Living on the Coast* and the CAP are critical elements in the development of an integrated approach to management of Australia's coastal zone and provide a philosophical and practical framework in which to operate coastal activities (Haward 1996; Morvell 1996). With the recognition of the importance of the contribution of the other spheres of government completing the national perspective necessary for integration in coastal zone management, the CAP initiatives extended and developed arrangements, policy and practice which should further improve the degree of integration in coastal zone management. Haward (1996) has argued that the CAP has tackled the issue of integration between and within governments, especially within the Commonwealth level while the Commonwealth Coastal Policy has become the Commonwealth's blueprint for achieving ICZM in Australia, providing an important commitment to improving the level of integration within and between governments. All three levels of Australian Government have responded to the CAP. Because Australia still faces some difficult challenges in fully developing ICZM policies, programmes and practices, the state and local government's support for the Commonwealth Coastal Policy and the CAP has been a major determinant of the successful implementation of such policies, programmes and

practices (Haward 1995; Morvell 1996). The CAP has since been replaced by the CCSI following the change of federal government in 1996 as examined in the following section.

4.3.6.2 Coasts and Clean Seas Initiatives

On 22 July 1997, following the change of federal government in 1996, the Natural Heritage Trust, the foundation set up by the Howard Government to fund environmental programmes on the conservation of the nation's native vegetation, land, biodiversity, water resources and coasts and the seas, launched the Coasts and Clean Seas Initiatives. Based on partnerships between the governments, community and industry, the programmes in these initiatives will target coastal and marine pollution, threats to marine biodiversity and habitat degradation, and promote the sustainable use of coastal and marine resources. These programmes support on-the-ground action, with such new activities as a clean seas programme; marine species protection programme; introduced marine pests initiative; accelerated development of the coastal resource atlas; coastal and marine planning programme; fisheries action programme; and oceans policy development. These programmes will also complement ongoing programs, including: Coastcare; Marine Protected Areas Program; Capacity Building; Coastal Monitoring and Vulnerability Assessment. In addition, these initiatives will link closely to the Trust's native vegetation, land, biodiversity and river programmes to ensure a comprehensive approach to conservation and sustainable use of the Australian environment (Australia 1997b).

Australian Oceans Policy

With the advent of the UNCED 1992 and the LOSC entry into force, and especially Australia's ratification of LOSC and the related declaration of an EEZ in August 1994, the challenge the Commonwealth Government now faces is how to manage and exploit these resources while ensuring the conservation and protection of the marine environment (McKinnon 1994). This has provided a great impetus for a greater focus on oceans policy (Rothwell 1996). Like coastal zone management, Australian oceans management remained sectoral, territorial and a testing ground of jurisdiction and management between the Commonwealth and states (Davis 1996b). Numerous

commentators have drawn attention to the fragmentation of maritime strategy in Australia and the lack of a coherent and cohesive oceans policy, but little remedial action has been taken (Howard 1994; Bergin 1986; McKinnon 1994).

According to McKinnon (1994) and Davis (1996a), there is a strong need for a more national comprehensive approach to the management of Australian oceans. These authors have argued that the time has come for the development of an oceans policy which will provide the strategic framework to manage the marine environment in a sustainable manner and meet all international obligations. The Commonwealth Government has committed itself to working co-operatively with the states, as well as industry and the community, to develop a comprehensive and integrated Oceans Policy (Australia 1997c). In the statement given in Canberra on 8 December 1995, the then Prime Minister Paul Keating emphasised that an integrated oceans policy for Australia was essential in dealing with problems in the marine environment, taking the opportunities offered by the marine areas, and meeting the obligations under the UNCLOS for the EEZ (Keating 1995).

Under the current Howard Government, the Australian oceans policy will be developed under the CCSI which is discussed above. Environment Australia is co-ordinating the development of the oceans policy on behalf of the Commonwealth (Australia 1997c). The Oceans Policy is being developed as a whole-of-government policy through an ongoing consultative process with relevant Commonwealth agencies, state and local governments, community, industry and environmental groups. An Oceans Policy Consultation Paper, *New Horizon*, was released in early 1997. The Paper sets out a draft vision, goal and the objectives for the Oceans Policy. It also includes an indication of some of the broad issues relevant to an Oceans Policy, as well as briefly introducing some of the features of the oceans. Further consultations will be held later in 1997 and early 1998. The final Oceans Policy will be in place by early 1998, the International Year of the Oceans (Australia 1997c).

Recognising the importance of a sound base to ecologically sustainable development of Australian oceans, a Marine Science and Technology Plan is being developed in conjunction with the Oceans Policy. The Plan will provide a strategy consistent with an

Oceans Policy for integrated and innovative science, technology and engineering. A Scoping Paper for the Plan was released in early 1997 (Australia 1997c).

4.4 Summary

The Chapter demonstrates that developing an integrated sustainable approach to coastal and marine management in the face of constitutional, legal, administrative and political obstacles created by a federal framework is not an easy task. It is apparent from the discussion above that the Commonwealth Government has made many efforts to establish an appropriate framework for coastal and marine management in Australia. While it is far too early to assess the effectiveness of this framework, the Commonwealth has adopted and implemented the concepts and principles of sustainable development and integrated resource management into its decision-making processes and applied them in broader policy issues (VanderZwagg *et al.* 1996b). It has recognised that improved coastal zone management requires full recognition of the role and responsibilities and the involvement of all three spheres of government in policy and program development and implementation. The Commonwealth has attempted to accommodate the division of responsibilities for coastal zone management between the Commonwealth, state and local governments necessary for implementing ICZM. In addition to a focus on intergovernmental co-ordination, the Commonwealth also centres on other factors, such as community participation, and capacity building for coastal zone managers and indigenous people. However, has been the case as in other nations (Miller 1996), the Commonwealth Government has found it difficult to move from the planning to the implementation stage. There has not been significant progress in the implementation of the programmes since their design. Furthermore, there has been a dearth of effort put into evaluation of the effectiveness of the Commonwealth programmes.

While the sustainability era has therefore been ushered in by UNCED, numerous challenges remain in the implementation of coastal and marine management programmes. According to many authors, such as Haward (1996), VanderZwagg *et al.* (1996b) and Rothwell (1996), coastal and marine management issues still require further interdisciplinary research, public debates and practical experiences. This problem has

been exacerbated as planning has been increasingly superimposed on political systems that are adopting short-term views. Governments in general are finding it difficult to find the resources to fund the planning and implementation of ICZM programmes. Regional ocean management arrangements have only initially been addressed and efforts are essential to better manage the coastal and marine environments. VanderZwagg *et al.* (1996b) have argued that Australia has only made the initial steps towards a post UNCED vision and sustainable coastal and marine environments still appear to be a distant goal. In the following chapter, the implementation of ICZM at the state level, with Tasmania as a case study, is examined.

CHAPTER 5

Tasmania's Coastal and Marine Management: A Case Study at the State Level

5.1 Introduction

Under the Australian Constitution, the states and territories have primary responsibility for environmental management. In terms of coastal zone management, a number of issues, such as national heritage and fisheries, transcend state boundaries and the Commonwealth has increased its influence over such issues. The Commonwealth Draft Coastal Policy, for example, emphasised that 'the management of the coastal zone, its resources and the offshore waters are shared between the Commonwealth, state, Northern Territory and local government' and that 'the legislative base for planning and management of the coast is primarily provided by the states, with local governments generally responsible for the day-to-day decision-making' (Australia 1992b: 12). The RAC (1993a) has also recognised that the states' jurisdictional responsibilities in relation to coastal management are significant: collectively state and local governments are responsible for 95% of expenditure on ICZM programmes and activities. Moreover, Haward and Hildebrand (1996) have argued that it is likely the state governments themselves will determine the most appropriate vehicles to improve integration within this sphere of government. The national coastal zone inquiries, discussed in Chapter 4, have concluded that state governments have recognised the importance and sensitivity of the coastal and marine environments, the need for information on these environments and especially, the urgent need for greater investment in management. This has resulted in considerable initiatives of state governments in coastal zone management in recent years.

This chapter provides an overview of coastal zone management at the state level in Australia and focuses on Tasmanian coastal and marine management as a case study. It describes Tasmania's major initiatives in coastal zone management, such as specific coastal zone studies, the Resource Management and Planning System (RMPS), the development and implementation of the State Coastal Policy, the Coastal and Marine Program, and the marine farming planning process.

5.2 An Overview of Australian Coastal Zone Management at the State Level

All state governments in Australia have actively responded to the major Commonwealth initiatives, such as the national coastal zone inquiries and the ecologically sustainable development process, discussed in Chapter 4. They have contributed in the application of ecologically sustainable development to intersectoral issues such as ICZM and the CAP. As mentioned above, numerous Commonwealth Government inquiries have highlighted the role of state governments in coastal zone management, examined coastal zone management regimes and problems, and provided a wide range of suggestions (Appendix 5). These inquiries have recognised the considerable diversity in approaches adopted by different states and accepted that all state governments have been attempting to respond to the problems of management. Table 5.1 summarises the various coastal management arrangements in the states. It can be seen from Table 5.1 that state governments have put in place a wide range of specific and generic legislation and institutions aimed at affecting the way in which coastal zone resources are used and managed. State governments have undertaken significant reviews of existing legislation, policies and/or practices which can provide frameworks for better management (Graham 1993; RAC 1993a). According to Anutha and O'Sullivan (1994), as state coastal policies are being reviewed, the opportunities to gradually incorporate the findings of the RAC Coastal Zone Inquiry and other Commonwealth initiatives increase, gradually improving the level of integration in coastal zone management over time. The reform of state and local government development approval processes has been seen by RAC as 'helping to achieve greater integration of these processes and thus reducing some of the inefficiencies that exist' (RAC 1993a: 381).

Table 5.1 An Overview of Coastal Management Systems in Australian States*

State/Territory	Current Status	Outline of Current or Proposed Coastal Management System	Main Instruments	Supporting Documents
New South Wales	New State Coastal Policy approved and scheduled for release early mid 1997. New membership of Coastal Council to be formed under the Coastal Protection Act, 1979	Based on a state-wide coastal policy which is implemented through a number of planning and environmental management instruments; also supported by manuals and guidelines	Coastal Policy, State Environmental Planning Policies; Regional Environmental Plans; Local Environmental Plans; Development Control Plans; coastline management plans; estuary management plans	Coastline management manual; estuary management manual
Victoria	Coastal Management Act (1995) created the Victorian Coastal Council and Regional Coastal Boards	Proposed to be strategies and plans overseen by the Coastal Council and Regional Coastal Boards through new legislation	Draft Victorian Coastal Strategy; local Coastal Action Plans (private and public land), Coastal Management Plans (public land); Planning Schemes for coastal areas	
Western Australia	Coastal Zone Council established May 1996. The Council is currently updating the 1983 Government Position Paper on coastal management	Continuation of current non-statutory coastal management system based on regional and local coastal management plans with the coastal activities of various government agencies coordinated by the Coastal Zone Council	Coastal Management Position Paper (1983); regional and local strategic planning documents; statutory planning instruments	Coastal Planning manual (in preparation)
South Australia	Discussion (Green) Paper released in 1992; currently working to update Coastal Protection Act	Specific coastal management legislation - the Coastal Protection Act 1972 overseen by a statutory Coastal Protection Board which develops coastal protection plans implemented by local government	Coastal protection district management plans, policy on coast protection and new development; supplementary development plans (local government)	
Queensland	The Coastal Protection and Management Act 1995 commenced 1 February 1996. State coastal management plan and 4 of 14 proposed regional coastal management plans are being drafted.	Specific coastal management legislation provides for statutory plans. The plans use other instruments especially local government for delivery. The plans create control districts in which special coastal development controls and management apply.	Coastal Protection and Management Act 1995; State Coastal management plan (proposed); regional coastal management plans (proposed); control districts	State coastal management plan likely to contain guidelines
Northern Territory	A review of the policy has been proposed as the current system is largely defunct	The coastal management system of the Northern Territory is based on the 1985 Coastal Management Policy which is implemented through Coastal Management Plans for areas under pressure	Coastal Management Policy; coastal management plans; Darwin Foreshore Protection Plan	

* excluding Tasmania (the Tasmanian coastal management system is discussed at length later in this chapter).

A significant element of state-based management regimes is that coastal management and protection objectives in all states are based on ecologically sustainable development. Many state-based management plans which were developed prior to national initiatives, such as the NSESD and the IGAE, are now being revised in light of ecologically sustainable development principles (RAC 1993a). States are also involved in developing their own policies and practices and all Australian states have announced coastal policies and/or strategies in the last five years. These policies and strategies are implemented through planning instruments (including strategic and statutory plans or specific coastal management plans at the regional or local levels or both).

In order to enhance the co-ordination between various agencies responsible for coastal zone management, most state governments have already developed mechanisms for co-ordinating various aspects of coastal management. For example, New South Wales and Western Australia have developed supporting materials such as guidelines, manuals or handbooks and educational materials (Anutha 1994b). The following sections illustrate these common elements by discussing coastal zone management in Tasmania.

5.3 Tasmania's Coastal and Marine Environments and the Need for Integrated Coastal Zone Management

Tasmania is Australia's only island state consisting of a group of islands that feature a range of coastal environments. Appendix 7 summarises the main characteristics of the State's coastal and marine environments. Surrounded by a number of islands, Tasmania has a long coastline and has more coastline per unit/area than any other state in Australia and no place in Tasmania is more than 115 km from the sea (SDAC 1996a). As is generally the case in Australia (Zann 1995), Tasmania's coastal and marine environments have yet to be completely described or documented. Moreover, the diversity of Tasmania's coastal and marine environments makes the task of description more challenging. The coastal and marine ecosystems are often sensitive and fragile to natural processes, such as erosion and climate changes, as well as to human activities, and therefore require protection. Rocky shorelines with semi-lithified Tertiary and Quaternary sediments, for example, are particularly susceptible to erosion and subject to change. Mudstones, silt stones, sandstones, clays and other poorly consolidated

sedimentary rocks belonging to the Parmeener Super Group (Permian and Triassic sediments) are also susceptible (SDAC 1996a).

As elsewhere, Tasmania's coastal and marine environments have a significant ecological role. These environments are made up of many dynamic terrestrial and marine ecosystems that contain a wide range of habitats and biodiversity of global significance. Of particular importance are seagrass meadows found around Tasmania and in a number of coastal lagoons in the east and north-east of the State and on the Bass Strait islands. Shallow bays and estuaries represent important nursery areas for many species, such as Australian salmon, flounders, garfish, mullet, whiting, trevally, flathead, morwong, bream and sharks (Tasmanian Department of Environment and Planning 1991). In addition, the latitude and geography of Tasmania make its coastal zone an important breeding and feeding area for migratory species of mammals and birds that inhabit both the Southern Ocean and the Arctic Tundra (SDAC 1996a).

With the majority of the population living on or near the coast, Tasmania's coastal zone is an area of intense economic and social activity and has been a focus of human activity for at least 35,000 years (Tasmanian Department of Environment and Planning 1991). The coastal and marine resources have been used by humans since the earliest period of human habitation, with the pace accelerating with the arrival of Europeans. These environments have been settled and exploited differently and have played an important part in Tasmania's economy, trade, transport and way of life (Appendix 7).

The Sustainable Development Advisory Council (SDAC) points out that significant pressures from human activities are exerted in the coastal zone, and have led to a number of coastal and marine problems which are evident in the more populated areas even though Tasmania is regarded as a region subject to a low level of development in a global and national context (SDAC 1996b). However, SDAC (1996a) states that degradation of coastal, estuarine and marine environments often continues for many years before it is recognised in Tasmania. According to DELM (1991), these pressures are expected to continue and will most likely increase. Around the State there are significant localised pressures on Tasmanian coastal and marine environments. The lack of information on many of Tasmania's coastal and marine environments means that their actual conditions are still uncertain. However, the available data indicate that while

some ecosystems are in very good condition, others are seriously degraded. Sections of some of Tasmanian major estuaries are highly polluted (DELM 1994; SDAC 1996a). Even the areas which encompass some of the most pristine regions in Tasmania, such as Macquarie Island and the World Heritage Areas of the south-west, have been affected by pollution and other human impacts. Further harm to Tasmanian coastal and marine systems risks not only their integrity and intrinsic worth, but the State's economic well-being. The major causes and effects of this degradation are similar to those in other states in Australia and elsewhere in the world.

As discussed above, Tasmanian coastal and marine environments are important from many points of view: economy, science, culture and recreation (ABS 1996). Tasmania's important coastal industries - fishing, marine farming, forestry, agriculture and tourism - rely on the quality and sustainable utilisation of the coastal environment. Being the centre for Tasmania's main concentrations of population and for a diverse range of human activities, these environments have been, and continue to be, subject to pressures that could jeopardise their ability to sustain themselves in their present form (SDAC 1996a).

Given the importance of Tasmania's coastal and marine environments, the on-going pressures are of concern. Since the 1970s, the Government and community have become increasingly aware of the human impact on the coastal and marine environments. A 1992 survey found that 34.7% of Tasmanians were concerned about ocean pollution (ABS 1996). Both industry and the Government authorities have become increasingly involved in coastal and marine research and in preparing environmental impact assessments. Most of these assessments, however, have been limited in scale and duration and provide only a fragmented baseline against which future changes can be assessed. In terms of coastal and marine management, the information has been considered to be ineffective and inadequate, leading to further degradation of these environments (SDAC 1996a).

Integrated coastal and marine management is, therefore, an approach required to ensure the sustainable use of these resources and to conserve their economic, social and natural values. A number of the State Government's major initiatives have been established to improve Tasmania's coastal and marine management. These include specific coastal

zone studies, the RMPS, the development and implementation of the State Coastal Policy and Coastal and Marine Program, and the marine farming planning process. The following sections examine these major initiatives in detail.

5.4 Major Initiatives in Tasmania's Coastal and Marine Management

5.4.1 Tasmania's Coastal Zone Studies

A significant gap exists in the knowledge of the coastal and marine environments in Australia in general, and in Tasmania in particular. The studies summarised below are the main ones focusing on planning and management of coastal resources in Tasmania as a whole or a Tasmanian region. All these studies emphasised the need for an integrated framework for managing the coastal zone in Tasmania.

5.4.1.1 Coastal Tasmania

As a consequence of its involvement in coastal issues, the Tasmanian Conservation Trust (TCT) became aware and concerned about the intensity and diversity of human demands and uses of the coastal zone, while also recognising the significant gaps in coastal zone information. With financial support and other assistance from the Tasmanian Government, this non-governmental organisation released *Coastal Tasmania* in 1980. It was the first extensive survey of the entire coastline and the first attempt to produce information understandable to coastal zone managers. *Coastal Tasmania* comprised an inventory and the conclusions of the Trust's *Coastal Tasmania: Tasmanian Coastal Environment Study* (TCT 1978). In addition to highlighting the significant role of Tasmania's coastal resources and the fragile and complex nature of the coastal environment, *Coastal Tasmania* concluded that the coast was being increasingly overused and that there was significant deterioration of the State's coastal environment. It also recognised that the coastal zone was the focal point of many problems and conflicts due to increasing competition between users. The report highlighted overlaps of function and the lack of integration and co-ordination among the authorities responsible for the coast. It also concluded that, despite the advent of the Department of the Environment and Planning (the predecessor to the Department of Environment and Land Management (DELM) and a wide-ranging set of State

environmental laws and policies, Tasmania's environmental problems in general, and coastal problems in particular, were far from resolved (Goldin 1980).

5.4.1.2 Integrated Coastal Zone Management Project, South East Tasmania Case Study

Tasmania and the Great Barrier Reef Marine Park were among the Australian case studies for the *Integrated Coastal Zone Management* Project undertaken by the OECD Environment Directorate. The Australian Government provided funding to the Tasmanian Government to prepare and complete its case study in 1991. The study area for the Tasmanian Project was the South East Coastal Zone. The study area contained a wide variety of geographical features with varying degrees of resource utilisation and protection. The report provided a description of the study area, including its socio-economic and bio-physical features and an analysis of the legislation and the administrative and institutional arrangements relevant to selected case studies. It concluded that pressures on the Tasmanian coastal zone were intensifying rapidly as demand for residential, aquaculture, industrial, recreational and tourism sites grew. Using specific examples, it provided an ICZM model intended to resolve the problems arising from a lack of:

- Government policy with regard to the protection of the coastal zone;
- clear principles for coastal management;
- an official focus for information and research;
- co-ordination between spheres of Government involved in decision-making; and
- practical guidelines for approving/refusing activity at particular coastal sites (Goldin and Associates 1991).

5.4.1.3 Resource Assessment Commission Coastal Zone Inquiry 1993:

Tasmanian Case Study

As part of the RAC Coastal Zone Inquiry already discussed, a case study of the Huon River/D'Entrecasteaux Channel area in South East Tasmania was undertaken. The study identified and described current and proposed arrangements for the allocation and

management of coastal zone resources, involving mariculture, tourism, building and associated developments. It proposed the procedures for obtaining approval to use coastal zone resources and the arrangements for their on-going management. The study concluded that the major issues concerning coastal zone management were related to increasing pressure on resources, both on land and in the water. Population, social, industrial, and general economic trends in the region resulted in major changes to land and water use and often resulted in conflict over the allocation and use of coastal resources. Existing coastal management arrangements in the study area were said to be complicated and uncoordinated due to the involvement of too many agencies across three spheres of government as well as community groups, industry and individuals. This complexity in the case study, as elsewhere in the State, contributed to unnecessary duplication, difficulties in co-ordination, unacceptably long decision-making processes, and a lack of communication about those processes to the public. The study highlighted the need for more effective coastal management arrangements in Tasmania (Tasmanian Department of Environment and Planning 1993).

5.5 Tasmania's Legislative and Institutional Framework in Coastal and Marine Management

5.5.1 Key Acts and Agencies

Tasmania has jurisdiction over all land and marine areas as far as 3 nautical miles seaward of low water mark and concurrent legislative power within the same area (Brown 1997). The Tasmanian Government has management responsibility for approximately 83% of the foreshore. The remaining 17% of the coastline is private land or is under the jurisdiction of local governments, which derive their powers from the *Local Government Act 1993* (SDAC 1996a). In addition to responsibilities under a number of international and national agreements (mentioned in Chapters 3 and 4), the State Government has substantial coastal management powers which are given effect through a wide range of laws. The key pieces of legislation which currently apply to the management of coastal and marine environments in Tasmania are shown in Figure 5.1. Many of them are under the RMPS, examined in the next section.

The lead agencies responsible for coastal land are DELM and Forestry Tasmania, while the lead agencies responsible for the marine environment are the Department of Primary Industry and Fisheries (DPIF), DELM, and a number of marine boards¹ and port authorities (SDAC 1996a) (Figure 5.1).

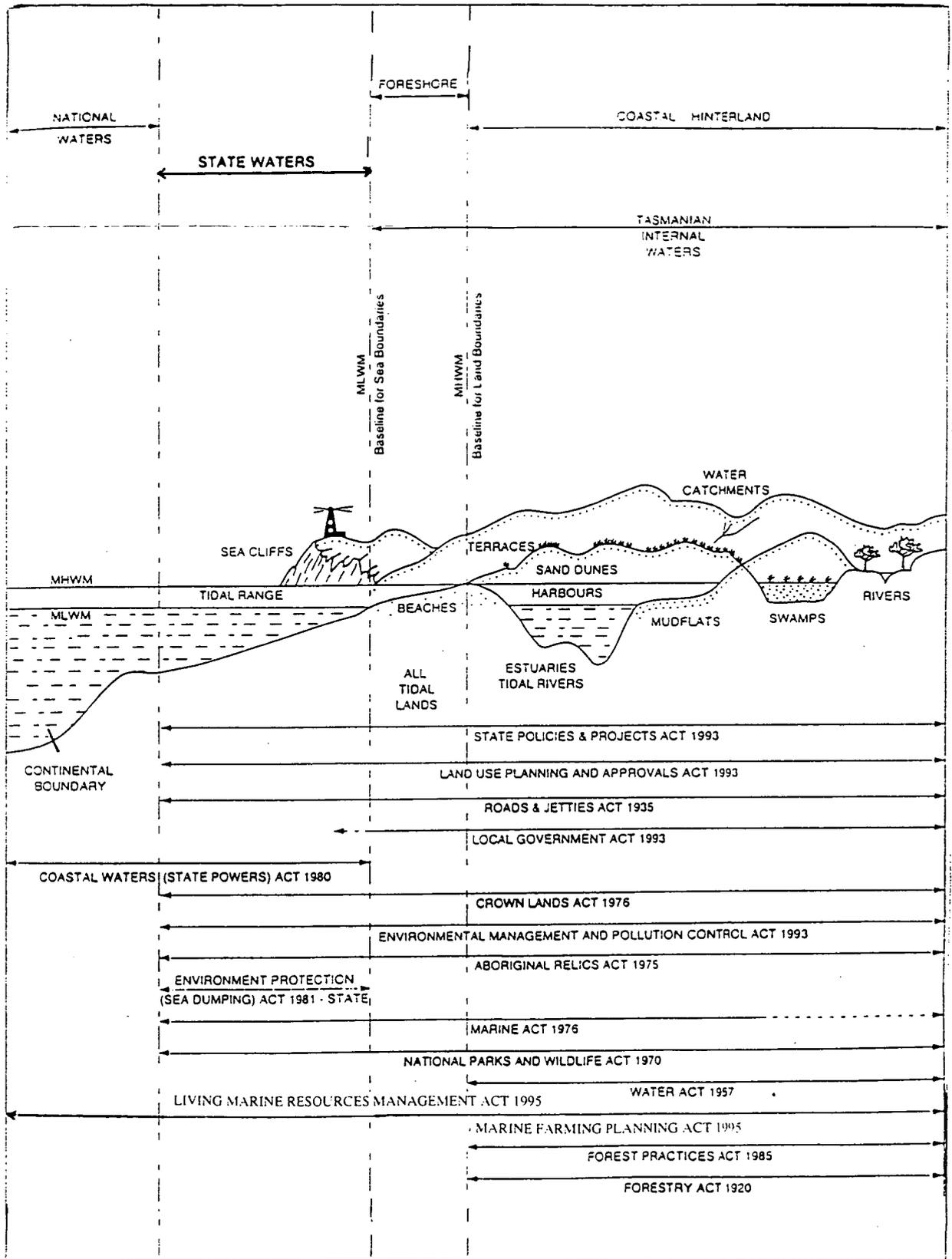
5.5.2 The Resource Management and Planning System

Of particular importance to natural resource management are Tasmania's new laws that comprise the RMPS. After two decades of highly acrimonious natural resource controversies (Davis 1996c), the Tasmanian Government introduced, in 1993, a comprehensive reform package of land use planning and resource management legislation after undertaking a comprehensive review of a wide range of administrative and legislative reforms. Largely based on New Zealand's *Resource Management Act 1991*, the RMPS is an integrated system of land use planning and environmental management. Appendix 8 details the objectives of the RMPS, which are common to all its Acts². The objectives are derived from international forums and relate to national policy and intergovernmental agreements on sustainable development. They are, therefore, also the basic rules for coastal management. The RMPS is intended to be a 'whole of government' approach in partnership with industry and the community. All State agencies and also local governments are required to give effect to the system which is intended to make reforms by seeking to apply sustainable development objectives, with emphasis at the local level (Haynes 1996).

¹ Marine Board has been superseded by Marine and Safety Authority under the *Marine and Safety Authority Act 1997* (Tasmania 1997).

² The RMPS includes several Acts which have a bearing on coastal management, including: *State Policies and Projects Act 1993*; *Land Use Planning and Approvals Act 1993 (LUPAA)*; *Resource Management and Planning Review Tribunal Act 1993*; *Local Government Act 1993*; *Environmental Management and Pollution Control Act 1994*; *Public Lands (Administration and Forests) Act 1991* (DELM 1996b).

Figure 5.1 Key Tasmanian Coastal and Marine Legislation



Source: SDAC 1996a

The RMPS can be seen as Tasmania's response to global responsibilities and to the principles outlined in the IGAE and other domestic agreements. It has greatly improved the legislative framework of the 1980s (Sainsbury *et al.* 1997). The RMPS not only provides an integrated statutory and administrative framework for resource management and strategic planning in all spheres of government in Tasmania, but is intended to achieve sustainable development (DELM 1996b). According to Anutha and Johnson (1996), the RMPS and its integrated management philosophy have influenced the way Tasmanian Governments manage their environments. The SDAC (1996a) has argued that the RMPS has provided an impetus to support sustainable development initiatives.

DELM commissioned TBA Planners Pty Ltd to prepare a document entitled *Integrated System of Planning Instruments for the Tasmanian Resource Management and Planning System*, with the aim of identifying and detailing an integrated set of planning instruments most suitable for delivering the new RMPS (DELM 1996a).

However, there is significant room for improvement of the RMPS, especially in terms of coastal and marine management. The management of aquaculture, a major use in the coastal and marine environments, is not fully integrated into the system (this issue is discussed at length later in this chapter). Another example is the management of marine protected areas. The *National Parks and Wildlife Act of Tasmania 1970*, administered by DELM, provides the legislative base for the declaration of marine protected areas or reserves, but it cannot be used to regulate or prohibit activities such as fishing within these reserves; this requires the application of the *Living Marine Resources Management Act 1995*.

There have been many problems in the operation of the system. The Committee for the Review of the State Planning System (1997) concluded that a lack of Government leadership and a lack of understanding by both the public and the administrative authorities was severely hindering the RMPS operation. The following section examines the State Coastal Policy developed under the RMPS.

5.6 The Development and Implementation of the Tasmanian State Coastal Policy

5.6.1 The Tasmanian Coastal Policy Discussion Paper

In 1991, the Tasmanian Department of Environment and Planning produced a coastal policy discussion paper, *Footprints in the Sand*. This provided the basis for development of a State Coastal Policy and identified many of the pressing issues for coastal management in Tasmania, including the trend for subdivision and residential development, its associated environmental problems, and the increasing competition for coastal resources by potentially conflicting uses. The paper highlighted the problems with the existing management system, including an overlap of government jurisdiction, a lack of integration and communication between the different departments responsible for management and the absence of a single set of policies or guidelines for the coast. It concluded that there was a real need for a simpler and more effective administrative system to deal with resource allocation on water and land (DELM 1994) and for an ICZM framework (Kriwoken and Anutha 1993). The paper also put forward a range of management options for resolving all major issues surrounding the conservation, use and enjoyment of the coast (Tasmanian Department of Environment and Planning 1991). It suggested that coastal zone management employ an ecosystems approach to defining the coastal zone to be complemented by integrated catchment management. It also suggested that the focus of a coastal policy be on the active coastal area (i.e., the immediate hinterland subject to marine or tidal influence and the marine area subject to influences from activities on land), while acknowledging the linkages between the active coastal area and the catchment and marine areas (Anutha 1994a).

5.6.2 Draft State Coastal Policy

Three years later, coinciding with the *National Coast to Coast '94 Conference* held in Hobart, the State Government released a draft Tasmanian State Coastal Policy (the Draft Policy) that was launched by DELM under the *State Policies and Projects Act 1993* as an official Ministerial document. The document represented the next step from *Footprints in the Sand* in that it addressed the urgent issues of the coastal zone and the need to improve the coastal management system in Tasmania. It included broad strategic

statements on a number of coastal issues, including the impact of industry, and contained a set of principles and outcomes for the coastal zone. The Draft Policy was intended to guide all use and development of Tasmania's coastal zone resources. It interpreted ecologically sustainable development objectives in the context of enabling sustainable development of the coastal zone, while also incorporating the existing objectives for development, conservation and management of marine living resources governed statutes relevant to coastal management (DELM 1994). The Draft Policy stated that existing decision-making mechanisms and departmental responsibilities were to be guided and directed by the State Coastal Policy so that these responsibilities could be carried out in an integrated and co-ordinated manner. It also proposed a number of management mechanisms such as regional planning strategies and planning schemes through which the policy could be implemented. Under the *State Policy and Projects Act 1993*, the Draft Policy was reviewed by the SDAC, an independent statutory body responsible for sustainable development policies, Projects of State Significance, and State of the Environment Reports in August 1994. The SDAC assessment process is discussed in the following section.

5.6.3 SDAC Assessment Process

According to SDAC (1995a), the Draft Policy generated a reasonably high level of interest with the result that it received a considerable amount of information that required scrutiny and assimilation. In order to present a further report on the Draft Policy to the Minister for the Environment by the end of 1995, the SDAC conducted a formal public consultation process. The process took place during the first half of 1995 and involved relevant Government agencies, local governments, industry, individuals and community groups. At the end of the process, two reports were released (Table 5.2). These reports significantly contributed to the final SDAC report which was released in October 1995 (Table 5.2), prior to being submitted to the Tasmanian Government. This report has furthered the sustainable development objectives and made the Draft Policy a Tasmanian sustainable development policy. It incorporates information from the above two reports and SDAC's own deliberations, and provides the modified State Coastal Policy. As the first report made to the Minister by SDAC on a referred State Policy under the *State Policies and Projects Act 1993*, it was a significant milestone in the application of the RMPS's legislative framework (SDAC 1995a).

Table 5.2 Summary of the Sustainable Development Advisory Council Reports

SDAC Reports	Summary
<p>The <i>SDAC Preliminary Report on the Draft Coastal Policy</i> (released in November 1994)</p> <p>The <i>SDAC Summary of Public Submissions to the Draft State Coastal Policy</i> (released in March 1995)</p>	<ul style="list-style-type: none"> • 28 of 78 of the agencies* invited to make a submission on the Draft Policy responded. Agencies that responded included planning authorities (both Local government and Marine Boards), State agencies and statutory authorities, peak industry bodies and community groups. • There was a total of 47 public submissions from a variety of individuals, community groups, industry groups and Government agencies. • Most submissions generally supported the need for a Coastal Policy for Tasmania and stressed the importance of the values of the coastal zone to the State. Comments generally related to the five key issues: definition of the coastal zone; policy scope and detail; strategic planning and management; implementation/integration; and State coastal council. Some general observations on each of these themes from these two reports include.
<p>The <i>Report on the Draft State Coastal Policy to the Minister for Environment and Land Management by the SDAC</i> (released in October 1995)</p>	<ul style="list-style-type: none"> • Tasmania's coastal zone and inshore waters remain in relatively sound condition, yet action is essential. • Assessment of the Draft Policy, legal issues relating to the State Coastal Policy, implementing the State Coastal Policy, conclusions and recommendations; and proposed modification to the State Coastal Policy. • Stressed that implementation is a critical element of policy success and must be considered carefully and in some detail. • Suggested that the most appropriate institutional arrangement is the establishment of a non-statutory State Coastal Advisory Committee comprising the key representatives of State and Local government and the community.

Source: SDAC 1994; SDAC 1995a; SDAC 1995b

*Note: 'Agencies' are defined in the *State Policies and Projects Act 1993* to include State and Commonwealth Government departments and authorities, planning authorities, the Local Government Association of Tasmania and any person undertaking a function for the public benefit. SDAC has interpreted the meaning of 'agency' broadly to afford the initial opportunity for input to as wide a group of interested parties as possible (SDAC 1995a).

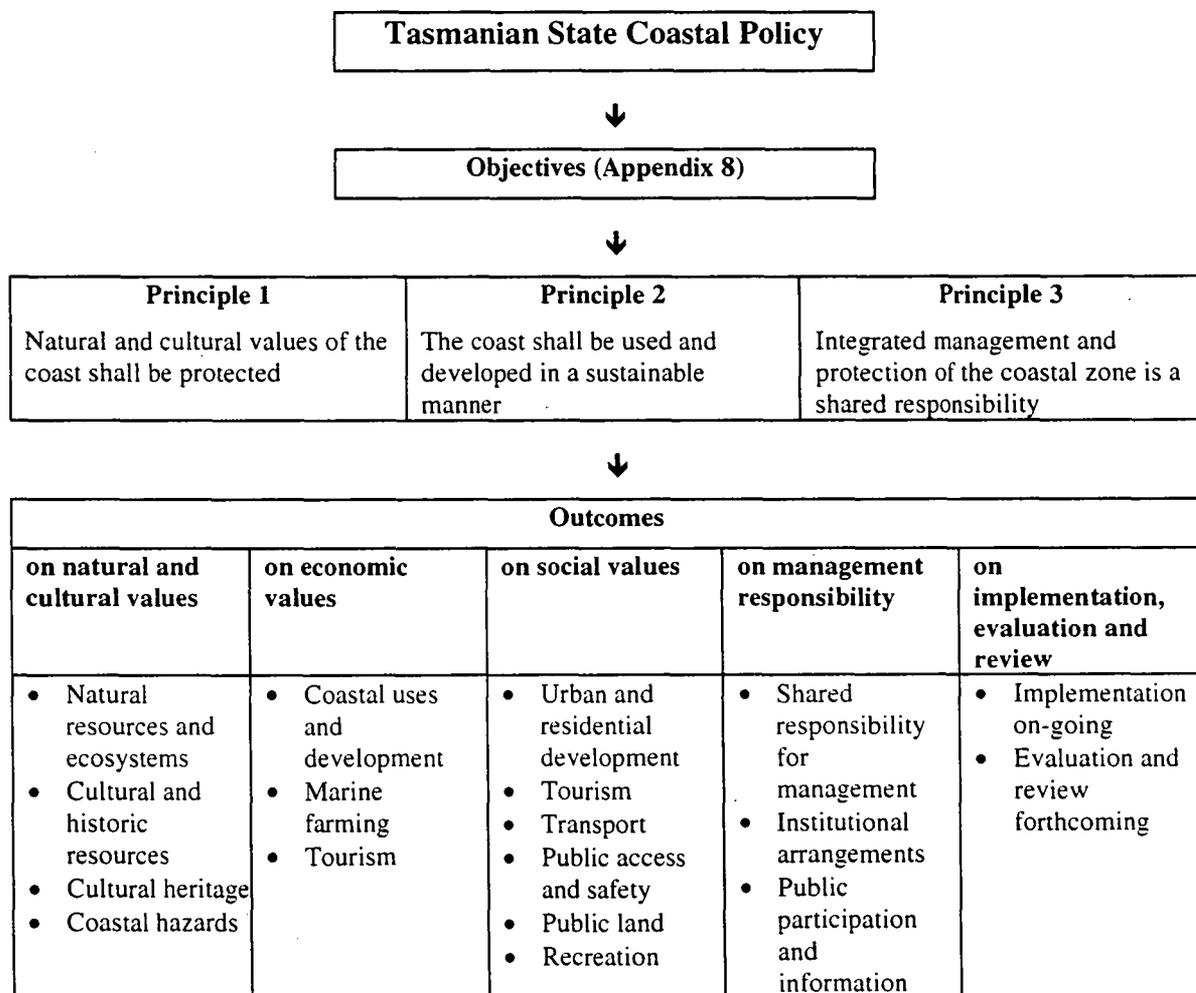
5.6.4 The State Coastal Policy and its Implementation

5.6.4.1 The State Coastal Policy

The State Coastal Policy (the Policy) came into operation on 10 October 1996. It is considered to be the first dimension of the Tasmanian Government's response to coastal zone management needs (DPIF 1995) and is seen as part of a continually evolving process to develop sustainable management regimes (SDAC 1996a). The Policy seeks to guide decision-making and facilitate the integration of planning for the coastal zone, and is seen as the cornerstone of Tasmania's attempt at ICZM. It also provides guidance and support to all Government agencies as well as local government in decision-making relevant to the coastal zone under existing and future legislation. As a statutory document, the Policy legally binds all State agencies and local governments to

implement the State Coastal Policy in planning and day-to-day management activities (SDAC 1996b). Together with the key Acts dealing with coastal management, the State Coastal Policy provides the setting for coastal management in Tasmania by conferring on the State Government substantial coastal management powers (DELM 1994). Figure 5.2 shows the basic structure of the Tasmanian State Coastal Policy.

Figure 5.2 Basic Structure of the Tasmanian State Coastal Policy



Source: Tasmania 1996a

5.6.4.2 The Implementation of the State Coastal Policy and the Coastal and Marine Program

Considerable attention has already been paid to the need for full implementation of the State Coastal Policy. DELM has acted as the lead agency for coastal management and thus implements the State Coastal Policy whilst developing the Coastal and Marine Program as the main administrative unit in Government dealing with coastal policy matters. Operationalised by an executive Steering Committee drawn from the Divisions

of DELM, the Program aims to achieve sustainable development within the framework of ICZM, and to these ends, has undertaken many activities to improve coastal zone management. One of the major achievements of the Program has been its involvement in the implementation of the State Coastal Policy. According to the 1996-97 Annual Report of the Coastal and Marine Program, the resources of the Program focused on the co-ordination and provision of advice on the implementation of the State Coastal Policy. Table 5.3 provides a brief summary of the implementation of the State Coastal Policy to date.

Table 5.3 Implementation of State Coastal Policy

Progress to Date	<ul style="list-style-type: none"> • Draft Implementation Strategy prepared (Appendix 9) • Paper on SDAC and draft Terms of Reference prepared • Advice to Councils on implementation of policy in planning schemes • Coastcare Program established • Information needs of coastal managers assessed • Training requirements of coastal managers assessed
Current activities	<ul style="list-style-type: none"> • On-going policy implementation through advice to State agencies, Councils, community, Applications Assessment Panel • Management of Coastcare program • Preparation of consultants brief for West North West Tasmania coastal management strategy (CCSI) • Finalisation of curriculum and course delivery details for Coastal Management Short Course training (CCSI) • Development of guidelines for coastal public land management • Development and trial of coastal management CD ROM (Sea Eagle Project)
Proposed Activities and Milestones	<ul style="list-style-type: none"> • Establishment of State Coastal Advisory Committee • Renegotiation of CCSI Memorandum • Implementation of or involvement in all CCSI programmes • First delivery of Short Course Training Program • Preparation of Policy Interpretation Manual
Issues	<ul style="list-style-type: none"> • Limited staff and costs allocation to implementation • Lack of DELM funding allocations to Coastcare funding pool for 1997-98 • Need to promote the State Coastal Policy to coastal users

Source: DELM 1997a

In addition to assisting the implementation of the State Coastal Policy, the Coastal and Marine Program also aims to achieve integration of the decision-making process between DELM and the Commonwealth and other State agencies, local government and the community in coastal and marine management (DELM 1996c). It has carried out many functions and undertaken many activities which significantly contribute to improving coastal zone management in Tasmania. Table 5.4 lists these activities.

Table 5.4 Functions of the Coastal and Marine Program, DELM

-
- involved in chairing and co-ordinating the departmental Marine Working Group to co-ordinate DELM's response to coastal and marine planning and development initiatives, and in particular with the marine farming planning process
 - representing DELM on the Marine Farm Planning Advisory Committee, the Water Safety Working Group, the Water Quality Monitoring Strategy Committee and the State Landcare Assessment Panel
 - being a point of referral for public, local government and State agency comment and inquiry on coastal and marine matters
 - developing networks in Tasmania and Australia with relevant groups at government, industry and community levels
 - presenting papers and lectures to conferences, workshops and University students on coastal and marine policy, management and planning issues
 - participating in the development of Tasmania's first State of Environment Report, convening the Coastal, Estuarine and Marine Reference Group and having membership on the Management Committee
 - involved in continuing representation of the State Government on the project's steering committee for the Department of Environment, Sports and Territories funded, *Dorset, Break O'Day and Glamorgan/Spring Bay Marine and Coastal Management Strategy*
 - managing initiatives under the Commonwealth CAP
 - establishing and providing secretariat support to the CAP Co-ordinating Committee (CAPCC) to implement the initiatives in the CAP
 - providing Tasmanian representation on the Intergovernmental Coastal Reference Group which provides national co-ordination for the National Coastal Action Plan and the implementation of the Commonwealth Coastal Policy
 - establishing Coastcare (with an allocation of A\$118 000 in 1995-96 and A\$160 000 in 1996-97) and providing support for a State Coastcare Assessment Panel
 - developing a coastal and marine information system for Tasmania with funding from the OR 2000 Program, researching the information needs for coastal managers, planners and community as a basis for training and information provision projects in 1997-98
 - involvement in commenting on coastal Crown land development applications to the Department's Applications Assessment Panel, and Development Proposal and Environmental Management Plans on other coastal development
-

Source: DELM 1996c; DELM 1997b

The various initiatives and reforms in the legislative framework discussed above were designed to facilitate integrated coastal and marine management. However, in practice, the process for the management of some uses has tended to remain sectoral in nature. The following sections examine the practical management of one of the major uses of coastal and marine environments in Tasmania, the aquaculture industry.

5.7 Tasmania's Coastal Aquaculture Management

Coastal aquaculture, one of the coastal uses examined in the key national inquiries into the coastal zone, is an important and growing industry in Australia. Aquaculture has expanded and diversified significantly, and attracted substantial public attention (Anutha and O'Sullivan 1994). Although coastal aquaculture is a relatively new industry to the State, it has quickly established itself and now provides jobs and contributes

considerably to Tasmania's total catch weight and value³ (ABS 1996) (Appendix 7). Tasmania was Australia's second largest producer of seafood in 1995 (McLoughlin 1996). The production of most edible species such as oysters, salmon and trout has been concentrated in Tasmania where the industry has grown rapidly since the establishment of shellfish culture in the 1960s and finfish farming in the 1980s (SDAC 1996a).

The development of Tasmania's aquaculture industry has added substantially to the pressure on Tasmania's coastal resources. The industry relies completely on natural marine areas and some aquaculture operations utilise marine and foreshore areas which have been leased from the Government (Brett 1997, pers. comm.). As a result, a number of resource use conflicts with other coastal users have emerged over the past decades. Faced with these increasing conflicts, the Tasmanian Government has introduced a new aquaculture planning process under the administration of the DPIF, putting the State at the fore of aquaculture planning in Australia (Anutha and Johnson 1996). This planning process, as discussed below, is separate from the RMPS which does not have jurisdiction over fisheries or aquaculture activities.

5.7.1 The Development of the Marine Farming Planning Legislation

From a resource management perspective, the administrative system and legislation (the *Fisheries Act 1959* and *Amendment Act 1982*) that regulated the marine farming industry in Tasmania proved inadequate as a modern regional planning system for aquaculture (Anutha and O'Sullivan 1994; McLoughlin 1996). The development of the management plan for aquaculture in Norfolk Bay in south east Tasmania demonstrates this inadequacy. In 1990, in consultation with other state agencies, local governments, the aquaculture industry and some local community groups, the then Sea Fisheries Division of the DPIF made the first attempt at aquaculture planning by developing a draft management plan for aquaculture in this area. The Draft Plan was intended to serve as a management tool for the Sea Fisheries Division and for established prospective marine farmers. Although it attempted to integrate aquaculture with all other major coastal uses, according to the law at the time, the only role the Plan could play was that

³In 1994/95, total value was AUS\$215 million, of which aquaculture production accounted for approximately \$110 million. The 'farm gate' value of aquaculture produce represented 51% of Tasmanian total seafood production (McLoughlin 1996).

of providing general guidance for marine farm applicants. The Plan did, however, generate support for the concept of planning for aquaculture, and thus had an important catalytic effect on the strategic processes for aquaculture (Anutha and O'Sullivan 1994).

In 1995, the Tasmanian Government sought to address a number of recognised deficiencies in the *Fisheries Act 1959* by introducing a new legislative package concurrent with the development of regional coastal aquaculture plans encompassing management and expansion of the industry (Anutha and Johnson 1996). According to Tasmanian Fishing Industry Council (1995), the aim was to achieve sustainability in both fish resources and their habitats and to enable the responsible development of the marine farming industry, thus bringing more employment and exports.

The *Marine Farming Planning Act 1995*² provides for the preparation of statutory marine farming development plans. According to McLoughlin (1996), these plans are the most innovative feature of the new process and constitute its basic mechanism. Figure 5.3 illustrates the process involved in preparing marine farming development plans. It is envisaged that these plans will be prepared for all major aquaculture areas in the State. According to DPIF (1996), marine farming development plans must further the sustainable development objectives of the Resource Management and Planning System, a key component of the State Coastal Policy. Marine farming development plans designate certain areas of water as marine farming zones, types of species which may be farmed, and the maximum area within each zone. The marine farming development plans prepared or proposed by DPIF are listed in Table 5.5.

Table 5.5 Marine Farming Development Plans Prepared by the DPIF

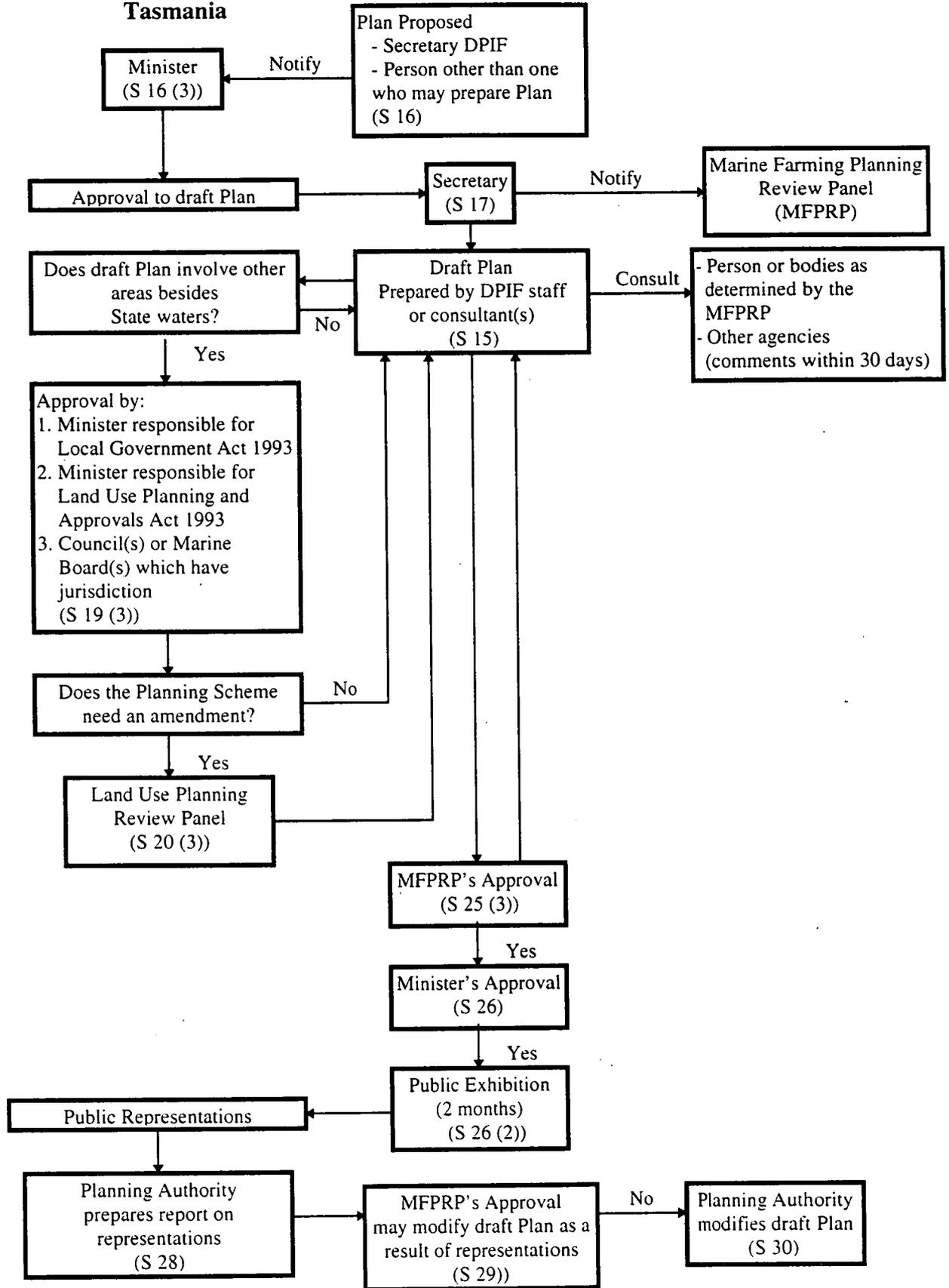
Marine Farming Development Plans	Current Status
• Huon River Estuary, Tasman Peninsula, Norfolk Bay and D'Entrecasteaux Channel	completed, implementation underway
• Furneaux Islands	released to public for comment
• Great Oyster Bay and Mercury Passage	released to public for comment
• Macquarie Harbour, Far North West	initiated
• Blackmans Bay, Pittwater, Pipeclay Lagoon	yet to be initiated
• Trumpeter Bay (offshore salmon)	completed by a consultant

Source: Brett 1997, pers. comm.

In order to ensure that the industry operates in an environmentally sustainable way, the *Marine Farming Planning Act 1995*, through the marine farming development plans requires extensive environmental monitoring programmes (McLoughlin 1996). DPIF is undertaking some studies on the environmental impact of finfish farming while the Commonwealth Scientific Industrial Research Organisation is studying nutrients in marine farms in the Huon area. There is also an opportunity for broad community input into the development plans, due to the process requiring a series of public meetings in the relevant area, as well as meetings for specific groups (McLoughlin 1996).

Under the new Act, the Board of Advice and Reference was established to recommend the appropriate method for allocating marine farm zones, for assessing marine farm applications, and for making recommendations to the Minister. The new Act also integrates the administration and planning roles required by the State Government in that marine farms are controlled under their leases and licences. Environmental conditions are embodied in individual quality assurance agreements tailored for each lease and reflected in licence conditions (McLoughlin 1996).

Figure 5.3 The Process to Prepare Marine Farming Development Plans in Tasmania



Source: Anutha and Johnson 1996

5.7.2 Strengths and Weaknesses of Tasmanian Aquaculture Management

5.7.2.1 Strengths

The strengths discussed below largely reflect the opinions of Richard McLoughlin (1996) who was the Manager of DPIF's Marine Farming Branch. In some cases, these arguments have been challenged and contradicted by other writers.

It could be argued that the Tasmanian Government has made a serious attempt at managing aquaculture in a sustainable manner. Anutha and Johnson (1996), for example, contend that the new Tasmanian process for marine farm planning may be close to meeting the requirements of the strategies set out by the National Strategy for Aquaculture (Australia 1993), a key document providing a mandate for greater emphasis on planning in aquaculture development. The strengths of the process relate to the existence of a statutory planning process for aquaculture and the use of the zoning strategy. This strategy, which aims to give coastal users a clear indication of which areas are available for different uses, is used to allocate areas of water which are suitable for future marine farming in the preparation of marine farming development plans. According to McLoughlin (1996), the identification of marine farming zones in the Marine Farming Development Plans is considered to provide the best and clearest approach. This helps minimise the conflict between competing coastal users. Anutha and Johnson (1996) have also argued that the zoning concept provides continuity with adjacent terrestrial zoning, allowing for better integration of planning for the management of the coastal areas in the future.

Directed by marine farming development plans and their associated environmental documents, the process provides greater certainty to industry and the community alike and avoids the lengthy and ad hoc approval processes of the past. In addition, with the administration of marine farms under leases and licences from a single State Government agency, the Tasmanian Government has been able to be a stronger advocate of the industry than might otherwise have been possible (Anutha and O'Sullivan 1994). According to Brett (1997, pers. comm.), the process also places an emphasis on clean environment outcomes.

McLoughlin (1996) has argued that the success of the process rests on both identifying new areas available for marine farming, and on providing substantial increases in the area of existing farms with active community involvement and consultation. The increases are reflected in results from the first few plans (Table 5.6). Substantial increases in production, income, and employment in the region are forecast in the next few years.

Table 5.6 Proposed Increase of Aquaculture Areas Following the Introduction of the Marine Farming Planning Process

Plans	Total leasable marine farm area (hectares)	Proposed Increase (%)
Huon River Estuary	125 to 385	300*
D'Entrecasteaux Channel	355 to 893	251
Tasman Peninsula and Norfolk Bay	235 to 540	229

* This 300% increase in area from the Huon River Estuary Plan was achieved with only two objections, both of which were resolved by the Review Panel via the public hearing process.

Source: McLoughlin (1996)

5.7.2.2 Shortcomings

Many shortcomings of the process have been identified. During the development of the process, many strong objections from the public to the proposed legislation and the draft marine farming development plans were received. Among the many concerns and objections were those concerning the division of Tasmania's coastal waters into marine farming zones and other areas, the mechanisms for community involvement and third party appeals, the exclusion of all other values along Tasmania's coastline apart from the potential for aquaculture leases, and the lack of comprehensive environmental impact statements and environmental information in the marine farming development plans. A submission from Bryan (1995) of the TCT on the proposed legislation argues that the approach is 'unreasonable and totally unacceptable'. It stated that 'the draft proposed legislation is a disaster waiting to happen' and 'threatens the marine environment, civil liberties and natural justice' because zoning from a marine farming perspective is a case of the 'tail wagging the dog'. Bryan (1995) has argued that strategic planning should, instead, start by looking at all interests in the coastal zone.

Much has been said about the sectoral nature of the marine farming planning process. There are a number of ways in which the process could be regarded as meeting the

requirements of an integrated system. These include the use of a single set of sustainable development principles in all relevant legislation and cross-membership on respective planning bodies such as the Land Use Planning Review Panel (LUPRP) and the MFPRP (Anutha and Johnson 1996). As in most Australian states, however, aquaculture has on the whole been managed separately from other coastal activities in a form of single resource use planning conducted by a sectoral agency responsible for fisheries management with limited jurisdiction.

According to Anutha and O'Sullivan (1994), solving the conflicts in coastal resource use is often beyond the responsibility and jurisdiction of fisheries management agencies, and may rest with a number of different State and local government bodies. The authors add that the development of marine farming legislation in Tasmania has actually encouraged aquaculture planning to adopt a sectoral approach rather than integrated planning. Half of the proposed principles upon which the governance of marine farm planning is based appear, in fact, to directly benefit aquaculture rather than other coastal uses⁴. In the preparation of management plans, the effects of other uses on aquaculture and of aquaculture on other uses are regarded only from an aquaculture perspective. This does not provide guidance to other marine sectors except by excluding them from areas zoned for marine farming. Anutha and Johnson (1996) have argued that the current sectoral approach to management is not able to adequately address and accommodate such cross-sectoral and multi-disciplinary issues, and thus does not constitute integration in coastal resources management.

There is also no requirement in the legislation for management plans to be in accordance with State policies such as the State Coastal Policy which includes a broad statement on aquaculture⁵. SDAC (1995b) has also argued that the proposed marine legislation does not contain a clear statutory link with the State Coastal Policy. It reported that many

⁴ In developing the marine farming legislation, the following general principles were proposed for governing marine farm planning: fairer allocation; more effective farm utilisation; greater accuracy of location; minimum alienation of water areas; extensive community consultation; security of tenure; and increased environmental responsibility on marine farmers (Anutha and Johnson 1996).

⁵ Section 2.2 of the State Coastal Policy states that 'marine farming will be planned, developed and conducted in the coastal zone having regard to sustainable development considerations and in accordance with the *Marine Farming Planning Act 1995* and other relevant terrestrial and marine resource management and planning legislation and consistent with this Policy' and 'marine farming development plans will be prepared, approved and gazetted under the *Marine Farming Planning Act 1995* and consistent with the objectives, principles and outcomes of this Policy' (Tasmania 1996a).

submissions to the SDAC report on the Draft State Coastal Policy objected strongly to the exclusion of fisheries activities from the Policy.

Another major shortcoming of the process is that it does not require the marine farming development plans to adopt a precautionary approach. When confronted with a lack of environmental information in the allocation of marine farm zones, this often leads to conflict with the sustainable development objectives. According to Anutha and Johnson (1996), this issue could be addressed by environmental monitoring to be established by the DPIF. It can be seen from the marine farming development plans that they contain very little environmental information. Decisions have been made and monitoring will often be conducted in the absence of baseline data (Moore 1997, pers. comm.).

Anutha and Johnson (1996) have argued that the preparation of marine farming development plans (Figure 5.3) duplicates an existing land use planning process. It closely follows the preparation of land use planning schemes of local government under the LUPAA. Moreover, unlike land use planning schemes, they focus on a single use rather than multiple uses (Anutha and Johnson 1996). The MFPRP also appears to an extent to duplicate the process of the LUPRP. Notwithstanding the beneficial cross-membership of both Panels, this may result in more complex communication, consultation and co-ordination (Anutha and O'Sullivan 1994). Alternatively, decisions could be made in the absence of such consultation and co-ordination. In addition, the issue of industry and community participation does not seem to have been widely addressed in current management arrangements, although it often is an important element in resolving resource use conflicts relating to aquaculture and an essential part of any integration of resource management.

The community has often been ignored in the process. In the submission on the Draft Marine Farming Development Plans for the D'Entrecasteaux Channel, Bryan (1995) argued that the genuine concerns and objections by the TCT to the Zone 15C (due to its proximity to the Ninepoint Marine Reserve) had been completely ignored. Bryan also contends that the Tasmanian Conservation Trust has been concerned and involved in discussions with Marine Resources about marine farming activities. To date, however, these communications have allegedly not had any significant effect on the approach Marine Resources takes to developing and managing the aquaculture industry so as to

minimise its environmental and social impacts (Bryan 1995). Bryan's submission also criticised the lack of a representative of the local community on the MFPRP. Another issue concerning public involvement is the application process. All applications have to be processed and advertised in the press, even if the proposals apparently have no chance of going ahead. This creates further conflict with the public and false expectations for the applicants. Anutha and O'Sullivan (1994) have argued that better public participation would lead to better integration of decision-making since management plans are successfully implemented where they have been based on extensive public consultation.

5.7.3 ICZM as a Solution for Sustainable Aquaculture Development

As discussed in Chapter 1, ICZM is a major tool to achieve sustainable development of the coastal zone and solve coastal problems that have been identified. In terms of aquaculture, it is argued that instead of expecting fisheries agencies to be able to accommodate the full spectrum of coastal activities and issues in making a decision for each new aquaculture development proposal, an integrated approach to coastal zone management can offer a more co-ordinated and appropriate framework for the successful development of aquaculture in the future (Anutha and O'Sullivan 1994). GESAMP (1991) states that 'sustainable coastal aquaculture requires adequate consideration of the interactions among social, economic and ecological changes'. This can be achieved through an integrated approach to planning and management of coastal aquaculture within the framework of ICZM. The UN FAO has also adopted, as a priority in the follow up to the UNCED 1992, the preparation of guidelines on the integration of the agricultural sector (including fisheries) into coastal area management and planning (Anutha 1994c). In the *Guidelines for the Promotion of Environmental Management of Coastal Aquaculture Development* published by FAO (1992), ICZM is proposed as a means for improving the environmental management of coastal aquaculture development (Barg 1992).

Recent Commonwealth initiatives, such as the Fisheries and Intersectoral Reports of the Ecologically Sustainable Development process and the recommendations of the RAC Coastal Zone Inquiry have also supported the need for integration of sectoral interests into broader coastal management arrangements (Anutha 1994c). At the Fourth

International Tasmanian Aquaculture Conference held in July 1993, many issues relating to coastal planning and management for aquaculture were identified. Among these issues, the dominant concern was the need to promote aquaculture as an ecologically sustainable industry requiring equitable access to natural areas and resources through integrated allocation and management of these resources. These arguments have been based on the benefits of ICZM to aquaculture. According to Anutha and O'Sullivan (1994), ICZM provides a framework for better decision-making and a greater level of security and flexibility for the aquaculture industry. These authors have argued that, under such policies as a national or state-wide coastal policy, respective resource management and allocation agencies agree on a number of common outcomes for the use of the coastal zone and, therefore, conflicts of competing interests in the coastal zone can be resolved more effectively. Resource needs have to be accommodated and the needs of the aquaculture industry can be identified along with competing interests during consultation processes with industry and the community (Anutha and O'Sullivan 1994; Anutha and Johnson 1996). In order to compete successfully for resources and areas, the aquaculture industry must be able to coexist in a multiple-use environment with other use groups. Some of these competing uses offer opportunities which can enhance and benefit aquaculture development rather than place constraints on the operation and development of the aquaculture industry. ICZM is by nature cross-sectoral and multi-disciplinary, and can thus address some of the opportunities presented to aquaculture rather than focusing merely on the removals of constraints (Anutha and O'Sullivan 1994).

5.7.4 Summary of the Marine Farming Planning Process

Most commercial fisheries in Australia and Tasmania, are at or near full exploitation and face threats from a number of sources, including overfishing and habitat destruction (Kearney *et al.* 1996). The Tasmanian Government has, therefore, recognised the significance of the planning and management of aquaculture because of the industry's potentially significant role in Tasmania's economic future. While fisheries management is increasingly being viewed within the broader context of management of the coastal and marine environments (Kenchington 1990), it has adopted the sectoral planning approach for aquaculture in preference to the integrated approach. According to Anutha and Johnson (1996), the process provides an interesting integration of resource

management while largely maintaining a sectoral institutional structure based on an inherent assumption that aquaculture has special status and requires separate planning arrangements. This has resulted in the problem that decisions about marine farms have been made in isolation from broader coastal management considerations, leading to ad hoc decisions and the potential for inconsistency in decision-making and conflict in the community. Anutha and Johnson (1996) have argued that ICZM has the potential to benefit the aquaculture industry in providing easier access to resources and protection from conflicting resource use and activities. It has been concluded that the industry cannot exclude itself from the ICZM framework and will find its place within this framework important for future coastal management (Anutha and Johnson 1996; Anutha and O'Sullivan 1994).

5.8 Summary

Tasmania's spectacular coastal and marine environments have their own intrinsic and unitarian values which must be protected. As in other states of Australia, Tasmania is in the process of addressing the weaknesses of current coastal zone management approaches. From the above discussion regarding the development of a coastal management system and aquaculture planning, it can be seen that the Tasmanian Government has developed a new system for ICZM with the introduction of a State-wide coastal policy as part of its resource management and planning reforms. It has undertaken a number of planning exercises to accommodate future use and development of these environments, especially for aquaculture. It is clear, however, that although the Tasmanian Government has developed the State Coastal Policy, there is little evidence to indicate that it has been successfully implemented. This has been largely due to the negative perception many have of the policy, including local government, an issue which is further discussed in the following chapter.

Unfortunately, with the introduction of the marine farming planning process, Tasmania has adopted two separate planning systems for the coastal and marine environments, resulting in a more complex management system. Although the two systems will not be fully implemented and operationalised for a number of years, it can be concluded that the State Government has failed to establish a single integrated planning system for the coastal zone to date. According to Anutha and Johnson (1996), a number of factors have

contributed to this failure. These include: the limitations of current Australian land use planning systems due to the fact that their primary focus for coastal zone management concerns land rather than marine areas; the lack of expertise and experience in designing ICZM; the inclusion of aquaculture in fisheries portfolios; the difficulty in accounting for informal integrating mechanisms; and the influence of political and historical factors which may lead to sectoral outcomes. A major challenge for coastal managers in Tasmania in particular, will be to overcome these limitations, and to seek new ways to manage and integrate users and uses in the coastal zone. The following chapter examines coastal zone management at the local level.

CHAPTER 6

Coastal Zone Management at the Local Level

6.1 Introduction

The important role of local government in environmental management has been recognised by international forums, such as the UNCED 1992, as well as by many national governments. Recognition of the fact that many environmental problems have their roots in local activities led the UNCED 1992 to emphasise the participation and co-operation of local authorities as a determining factor in fulfilling its objectives (Johnson 1993). It has been pointed out that local governments are, most often, ultimately responsible for the practical implementation of international or national environmental policies and that, globally, compared with national governments, local governments both invest more money in environmental protection and often execute more environmental policies (Otto-Zimmermann 1994).

The importance of local governments has been acknowledged within the Australian context. While local government is not formally recognised in the Australian Constitution (Haward and Hildebrand 1996), it is a legitimate sphere of government and is increasingly responsible for many issues, including environmental management. This sphere of government plays a critical role in integrated resources management and in helping to fulfil Australia's responsibilities to redress global environmental problems (Brown 1997). Further, recent local government reforms have placed them in the best position to undertake the environmental initiatives established by the different spheres of government in recent years (RAC 1993a; Brown 1997).

Local government is also responsible for many day-to-day decisions on the use and management of coastal zone resources. It is recognised by the Commonwealth that local government plays a crucial role in managing the coast (Verhey 1996) and is the most significant sphere of government for ICZM and the most practical unit of coastal

management (Haward and Hildebrand 1996; Brown 1995). Verhey (1996), however, stresses that local government efforts must be co-ordinated to ensure that they share the same vision. Given the important role, local government now plays in implementing national and state coastal and marine policies, a discussion about their role in terms of these higher levels of governments will now be presented, in particular, the direction and capacity building they provide to local governments for coastal management.

The role of local government has not been fully addressed at international forums, such as the UNCED 1992 (Otto-Zimmermann 1994), nor in developing and implementing environmental management systems in Australia by the Commonwealth and state governments (Brown 1997). This chapter discusses the failure of the UNCED 1992 to take into account the role of local government in coastal zone management. It describes the evolution of the role of local government in environmental management and in coastal zone management in particular, the major Commonwealth initiatives for coastal zone management at the local level, and the problems that local government authorities face in fulfilling their roles and responsibilities in Australia. The Chapter also provides an example of coastal zone management at the local level, using Tasmania as a case study. It describes major local government reforms in Tasmania and their implications for coastal zone management. It also discusses the limitations in the capacity of local government to manage the coastal zone.

6.2 The United Nations Conference on Environment and Development 1992 and the Role of Local Government in Coastal Zone Management

As discussed in Chapter 3, Agenda 21 is a global sustainable development programme for the 21st century (Brown 1997). Chapter 28 of Agenda 21, entitled *Local Authorities' Initiatives in Support of Agenda 21*, highlighted the role of local government by stating that:

Local authorities construct, operate and maintain economic, social and environmental infrastructure, oversee planning processes, establish local environmental policies and regulations, and assist in implementing national and subnational environmental policies. As the level of governance closest to the people, they play a vital role in educating, mobilising and responding to the public to promote sustainable development (Johnson 1993: 423).

Chapter 28 of Agenda 21 identifies local authorities as the key to implementing Agenda 21 principles. While Chapter 28 is not specific to coastal zone management, it offers

broad direction for local government action on environmental management. Chapter 28 also encourages the adoption of Local Agenda 21 by local government (Johnson 1993). Local Agenda 21 is one of the powerful programmes emerging from the UNCED aimed at implementing the sustainable development agenda locally. It is a shared management programme for a given locality, incorporating the goals of all stakeholders in the community and balancing social, economic and environmental resources (Brown 1995).

While there was widespread recognition at the time of the UNCED that Agenda 21 required strong action at the local level (Brown 1997), other chapters, including Chapter 17 (see Chapter 3 of this study) have not sufficiently addressed the practical reality of coastal management for local authorities. Otto-Zimmermann (1994) has further argued that Chapter 17 has also ignored the financial, regulatory and development challenges faced by local government. He maintains that, while Chapter 17 makes vague references to the 'local level' or to 'local communities'; only in one sentence is the term 'local administration' used, and this is simply to indicate that 'local authorities should be partners, in consultation with the business community, the academic sector, resource user groups, and the general public'. In terms of land-based marine pollution, Chapter 17 fails to recognise that local authorities have the primary role in organising and managing the coastal settlements, which account for more than half of the world's population. Although Chapter 17 embraces global and local issues and aims to promote new approaches to ocean management with the integration of local realities into global priorities (Barcena 1994), it can be concluded that with regard to the role of local authorities, Agenda 21 in general, and Chapter 17 in particular, are severely deficient (Otto-Zimmermann 1994). As mentioned above, this is also a major deficiency in coastal zone management directives from the national level in terms of a clear and acknowledged role for local government. The following sections critically discuss the role of the Commonwealth Government in promoting and facilitating a local government involvement in coastal management.

6.3 Commonwealth Initiatives in Coastal Zone Management at the Local Level

6.3.1 The Role of Local Government

Along with other issues, the role of local government in coastal planning and management in Australia has been examined in various coastal zone inquiries (see Chapter 4) as well as in a study conducted by Brown (1995), examined later in this chapter. The 1992 TASQUE study into the role of local government in environmental management in Australia has also contributed to the understanding of this matter.

The studies mentioned above have stressed the significant role local government has in a range of day-to-day management activities such as a planning authority, a deliverer of planning services, a land manager, and a regulator and facilitator of local activities. Local government has the greatest responsibility for the management of the coastal zone and is responsible for significant expenditure on infrastructure, spending well over \$1.5 billion annually on water supply, sewerage and urban stormwater drainage (Australia 1997c). Brown (1997) has argued that sustainable and integrated management of social, economic and environmental resources needs to occur at the local level because 85% of development applications are processed, 90% of the country's waste is handled and the health of the population is monitored at this level. Brown (1997) has further argued that local government is a key player in achieving a long-term balance between the needs of people, the economy and the environment. Verhey (1996) has also agreed that local councils have become the primary strategic manager of the land and environment both within their boundaries and at the regional level.

The role of local government in coastal zone planning and management around Australia varies between states according to the extent to which coastal policy is legislated or is non-statutory (Anutha 1994b). In many instances local government owns substantial tracts of coastal land, manages areas of public land, and has a central role in the zoning of private land along the coast and the processing of development applications to achieve strategic objectives for coastal zone management (Anutha 1994b).

The HOSCRERA Coastal Zone Inquiry 1991 has demonstrated that land use planning by local governments provide the basis for state coastal management (Australia 1991). Similarly, the RAC Coastal Zone Inquiry 1993 identified the key role of local government, highlighting the important role that local authorities play in the implementation of the CAP. It emphasised that it is especially important that local government in the coastal zone is fully aware of the objectives and principles of the CAP so that it can fully participate in the Plan (RAC 1993a). It is also worth noting that Commissioner Bob Graham disagreed with the emphasis on a national approach taken by the other Commissioners. He supported the strengthening of local government in day-to-day coastal activities and the encouragement of community involvement and participation (Haward and Hildebrand 1996).

It is, therefore, clear that while local government's responsibilities to the coast may have been limited in the past to matters such as cleaning the beach and the provision of parking and change room facilities, their role and responsibilities today are far more complex and changing (Verhey 1996). The need for a much more focused management programme has been the driver for an increase in the importance of the role of local government in environmental management (Graham 1992). According to Brown (1997), the role of local government in resource management will continue to evolve. It is expected that both local communities and other spheres of government will assist local government to perform more effectively in managing the use of natural resources, including coastal zone resources.

Local government becomes the focus for decision-making on the use and development of these resources at the local level. In doing so, it has to identify and apply resources for use in coastal zone management. Local government is also responsible for integrating management at the local level. It needs to work co-operatively with local community groups to achieve better on ground management. From a regional management perspective, local government also has to join with other local authorities to achieve more regionally focused approaches. More importantly, in order to improve the co-ordination between different spheres of government, local government has to integrate with Federal and state governments in policy and strategy development and implementation (Graham 1993). The 1992 TASQUE study has concluded that, in recent years, local government has been developing a range of environmental functions,

becoming directly involved in environmental management programmes that have significantly enhanced its role in environmental management. The next section provides an overview of coastal zone management initiatives undertaken by the Commonwealth government at the local level in Australia.

6.3.2 Commonwealth Programmes in Coastal Zone Management at the Local Level

Based on major recommendations from the studies mentioned above, the Commonwealth Government has paid more attention to improving coastal zone management at the local level. There are various kinds of committees and agencies which have a strong interest in coastal management policies, such as the Council of Australian Government and the Intergovernmental Committee on Ecologically Sustainable Development. These bodies have established many powerful programmes with the aim of supporting local government in natural resources management. These programmes have significantly contributed to the improvement of coastal zone management at the local level. Among them, the Integrated Local Area Program (ILAP) is considered to have the potential to make a major important contribution to coastal zone management (RAC 1993a).

Funded by the Commonwealth Department of Health, Housing, Local Government and Community Services, the ILAP has been developed jointly by the Commonwealth and a number of local authorities (Brown 1997). It is a management method based on eight core strategies: local governance, intergovernmental co-ordination; community partnership; integrated social, economic and environmental planning; optimum use of resources; shared vision; local ownership; and sustainable change (Brown 1997). The ILAP principles recombine social, economic and environmental concerns, and the interest of the three spheres of the government, and councils with their community, under local leadership. Promoted by the Australian Local Government Association, it is an important future-oriented initiative seeking to redress the increasing fragmentation of local governance and to provide local government with the means of tackling some of these deficiencies (Graham 1993). According to Brown (1997), the ILAP offers a vehicle for co-ordinating the process of social change and for integrating the broader objectives developed by the Commonwealth or state governments into local practice. It

involves the development of a holistic attitude towards the development and management of local areas, implying a significant shift away from the way in which local government currently develops and implements its programmes (Graham 1993). The RAC (1993a) has argued that the ILAP provides the opportunity for reviewing the organisational structures of local government so that it is more able to integrate local authority activities.

The ILAP is particularly relevant to local government management of the use and development of the coastal zone resources. Brown (1995) has argued that the ILAP is playing a significant role in the integration of the activities and administration of local authorities which is very important for improving ICZM at the local level. According to Graham (1993), the ILAP not only emphasises far greater responsibility and accountability for local government, but also provides a basis for significantly improving the ability of local governments to deal with coastal zone management. This is an important initiative in building skills in ICZM. The ILAP provides local councils with access to skills in integrated management as well as and in integrating environmental management into core management so that they can cope with their increasing responsibilities (Brown 1995). The RAC (1993a) has argued that the promotion and implementation of the ILAP approaches can provide the basis for a significantly enhanced contribution by local government to the management of coastal zone resource use and development. According to Haward and Hildebrand (1996), the RAC Coastal Zone Inquiry 1993 encouraged greater integration of local government activities through the ILAP programmes and process. These authors have argued that the ILAP approach provides the opportunity to facilitate the implementation of many goals and objectives contained within the CAP at the local or community level. In addition, the RAC (1993a) also emphasised that the ILAP facilitates integrated management not only within local authorities but also between local authorities and others.

In addition to the ILAP, the following environmental programmes and activities focus on education and training and on developing information systems for coastal zone management at the local level.

- The Australian delegation to the UN Commission for sustainable development reports to all three spheres of Australian Government on the progress of Chapter 28 of Agenda 21. Along with the other signatory countries, Australia has agreed that

local authorities will develop a Local Agenda 21 plan for their own districts (Brown 1997). About 100 local councils have developed a Local Agenda 21 (Cotter 1997; pers. comm.). In order to assist councils in preparing Local Agenda 21 plans, Environment Australia has produced a guide entitled *Managing for the Future: A Local Government Guide* (Brown 1995).

- A comprehensive education strategy which provides educational development for councillors, council staff and local community leaders has been developed by the Office of Local Government, Department of Housing and Regional Development (Brown 1995).
- Short courses in all professional and occupational training programmes on the key skills of integrated management have been offered by professional organisations, such as the Institution of Engineers, the National Institute of Environmental Health, and the Institute of Municipal Management, and the University of Canberra Master of Environmental Education Program. Strategies for all occupational areas have been developed in *Towards Local Sustainable Development: A Toolkit of Strategies* (Brown 1995).
- Regional workshops which allow all sectors to synthesise their understanding of local needs have been provided by non-government agencies, such as Greening Australia, Landcare and the West Australian Foreshore Management Plans (Brown 1995).
- A national strategy for an integrated information system for local managers has been developed through the Local Government Development Program (Department of Housing and Regional Development) (Brown 1997).
- National systems for accessing information have been established. A number of agencies, such as, Environmental Resources Information Network (Department of the Environment, Sport and Territories), National Resource Information Centre (Department of Primary Industries and Energy), State Geographic Information System, have the responsibility to monitor and provide open access to information (Brown 1995).
- Newsletters, electronic network systems and human networks, such as Marine and Coastal Community Network of the Ocean Rescue 2000 program and CouncilNet

have been established. In addition, information can be accessed through formal systems such as libraries, and electronic databases held by special interest groups (such as, Australian Surveying and Land Information Group coastal mapping, Australian Bureau Statistics demographic profiles and Commonwealth Scientific and Industrial Research Organisation (CSIRO) research collections) (Brown 1997).

- Under the national Landcare Program, groups have been established in all coastal regions. From these Dunecare and Beachcare programmes have evolved as well as urban Landcare groups which link the surrounding coastline to the city residents who use it for recreation (Brown 1995).

6.4 Coastal Zone Management at the Local Level in Australia

6.4.1 Recent Progress in Coastal Zone Management at the Local Level

There have been significant advances in environmental management practice at the local level in Australia in recent years. Based on the recommendations of both the 1992 TASQUE study and the RAC Coastal Zone Inquiry 1993 that local government should review coastal management approaches to the implementation of environmental policies and programmes, most states have revised the legislative and organisational arrangements dealing with the powers and responsibilities of local government (Graham 1993; RAC 1993a). In New South Wales and Tasmania for example, new local government Acts were introduced in 1993.

In a number of states, local government has received support and assistance from the State agencies responsible for coastal management to prepare coastal plans for local areas (Anutha 1994b). In Western Australia, coastal plans ranging in scale from regional to site specific, have been prepared for over half the coastal councils (RAC 1993a). In South Australia, management plans for five of the seven coastal regions of the State have been prepared (Rose 1994). These plans often included specific descriptions of coastal resources and issues and frequently, well defined action plans. The issues requiring an immediate response from local government found in these plans include urban expansion; problems of human impact on coastal resources, including pollution, erosion, flooding and storm damage; rapidly expanding tourism industry and recreational use; the desire to facilitate local economic growth, with limited

consideration of the environment; and an opportunity to reflect on long-term outcomes (Rose 1994). Anutha (1994b) has argued that these plans are generally strategic in nature, setting out objectives and strategic actions for pressured coastal areas. They are often implemented through the statutory planning processes and development approval processes available to local government. According to Rose (1994), these plans indicate that local councils throughout Australia and their communities are adopting an integrated approach for managing the coastal environment.

Local government is also becoming increasingly involved in regional strategic planning. Based on the findings of the HORSCERA 1991 and RAC Coastal Zone Inquiry 1993, local government has recognised that it is necessary to consider resource management in a regional context. It has also recognised that regional approaches enable resources to be managed effectively and efficiently and act as a means of overcoming the three major difficulties arising from the fragmented nature of decision-making, the multiplicity of public agencies, arbitrary boundaries, and the tyranny of small decisions (Australia 1991; RAC 1993a). Many local authorities are now involved in regional co-operation. Approximately 50 voluntary regional organisations of councils, covering 40% of all councils, have been formed in the last decade. Some of these organisations have been specifically formed to deal with coastal issues. These have facilitated various aspects of regional co-operation, including shared expertise in the management of such resources as water catchments and estuaries (RAC 1993a). Assistance has been provided by the Commonwealth Government, through such bodies as the National Voluntary Regional Co-operation Program conducted by the Department of Health, Housing, Local Government and Community Services (RAC 1993a). The Coastal and Marine Strategy prepared for the Dorset, Break O'Day and Glamorgan/Spring Bay Councils in Tasmania, discussed later in this chapter, is a case in which councils have co-operated to prepare a regional coastal strategy in conjunction with the Tasmanian and Commonwealth Governments and the community (Anutha 1994b).

The release of the report, entitled *Turning the Tide - Integrated Local Area Management for Australia's Coastal Zone* (Brown 1995), significantly contributed to the understanding of ICZM at the local level in Australia. The study examined the way in which the stakeholders in coastal zone management work together, their priorities for information, their management processes and their future needs. According to Anutha

(1994b), the study explained why integration has to be both vertical and horizontal and be based on a holistic understanding of the real issues at the local scale.

In addition to identifying some serious obstacles to ICZM, the study offered considerable positive signs for ICZM at the local level. It showed that coastal managers have a strong desire to integrate information from the social, economic and environmental spheres in coastal zone management. More than half of the managers (52.8%) integrate their information at the regional or local scale. The study also showed that managers are already employing management tools to achieve this integration (Brown 1995).

Turning the Tide also indicated that local managers agree on the key information that is required to manage the coastal zone. These managers also acknowledge the active role of the community, industry and conservation groups and express ideas for co-operation with them. The results of Brown's study revealed that 'coastal managers are working against extreme pressures from fragmentation of information, polarisation of occupations and isolation of government agencies' (Brown 1995: 40).

A major advance in coastal zone management at the local level can also be sought from the participation levels of local government in the development and implementation of the CAP. The Australian Local Government Association has been the representative of local government in this process. Memorandums of Understanding on the CAP, which commit all three tiers of government to the Plan have been signed in all states. Verhey (1996: 48) asserts that the CAP:

breaks new ground in that it fully recognises the role and, indeed, the track record of local government in managing the coast in a manner that is sensitive to the environment and the needs to coastal communities. It is an important distinction as the development and implementation of the Coastal Action Plan is being achieved in a partnership arrangement between all spheres of Government.

6.4.2 Problems

Despite the advances mentioned above, local government faces many problems which limit its capacity to contribute to environmental management. Local government authorities face many difficult issues in managing the coastal zone in particular and in many cases, they are being presented with increasing responsibility for the environment without adequate funding or the necessary staff and expertise (Australia 1997a). The

following problems identified by the studies mentioned above are also relevant to coastal zone management.

- The role of local government has been understated or ignored. The relations that have developed between the Commonwealth, state, and local governments in environmental management are not clearly defined nor specified (Graham 1992; RAC 1993a).
- Local government has generally not been integrated in policy development with other spheres of government. Its involvement and contribution to environmental management receives only limited recognition (Graham 1992). Local government was omitted from the National Strategy for Ecologically Sustainable Development and was not represented on any of the nine Ecologically Sustainable Development Working Groups or on the ANZECC. It has only one representative on the National Environment Protection Agency and one on the Council of Australian Governments, compared to the states' seven representatives (Brown 1997). Nor is it directly involved in any of the ministerial councils covering environmental matters (Graham 1992).
- Although local government is responsible for significant expenditure on infrastructure, many local government authorities have no specific coastal policies or objectives relating to their areas of jurisdiction. They only have sectoral objectives that indirectly affect the coastal zone management (Australia 1997a).
- Local coastal plans have often been insufficiently implemented, or recognised by local managers due to the lack of local ownership and, in some cases, a lack of integration with planning legislation. The many obstacles to implementation of these plans include the frequent lack of: recognition of the evolving nature of visions and objectives; assignment and acceptance of responsibility, time lines and budgets for implementation; recognition of the obstacles to strategy implementation; processes for monitoring and review; and adequate local involvement in, and ownership of, the development (Rose 1994).
- Local government planning is generally concerned with land use zoning rather than with ICZM. It is usually confined to the boundaries of the particular council rather than to a broader regional context (RAC 1993a). Many problems demand a regional

response, but single local governments are often left trying to deal with them (Australia 1997a).

- Local government often has to liaise with many state government agencies and occasionally with Commonwealth agencies that have coastal responsibilities when considering a development project. The goals of state agencies operate with different objectives and priorities from those of local government and are remote from local interests and needs. This at times leads to confusion within the local community (Australia 1991). Furthermore, there is a lack of integration of the wide range of sectoral interests at the state level (Rose 1994).
- Local government rarely has adequate information for coastal planning and management (Brown 1995).
- Local government often lacks the necessary technical and financial resources to carry out coastal management. Its capacity to fund coastal management is often limited by its rate base. At times local government depends upon professional advice from state agencies about coastal management matters regarding planning, development and natural hazards. State government agencies with responsibilities for coastal zone management provide advice and limited financial assistance to local authorities and community groups for the preparation and implementation of coastal management plans data collection (RAC 1993a). Some federal programmes have been established with different priorities and objectives to those needed in local coastal areas (RAC 1993a; Brown 1995).
- Local government is often under considerable pressure to respond quickly to development proposals. Combined with inadequate information and resources, this means that some decisions made by local government may have a long-term detrimental effect on the coast (RAC 1993a; Brown 1997).
- There is, in general, no framework which councils can use to guide decision-making and no mechanism to allow local government to develop the time, expertise and staff to administer its responsibilities adequately (Australia 1997a). There is a lack of practical guidelines for planners and engineers involved with coastal land use and management decisions (Brown 1995).

- Public participation in local land use decision-making is often limited to the environmental impact assessment processes (RAC 1993a).
- Improved techniques and methods, as well as many of the concepts in environmental management in general, and in coastal zone management in particular, are still in the development stage and are poorly understood (Graham 1992).

6.4.3 Coastal Zone Management at the Local Level: Tasmania as a Case Study

6.4.3.1 Recent Reforms in Local Government in Tasmania and their Effect on Coastal Zone Management at the Local Level

Recent Reforms

In recognition of the role of local government in achieving sustainable development, the Tasmanian government established a programme in 1991 called Local Government Modernisation Program which aimed to undertake a comprehensive review of governance at the local level. A major focus of the Program was to revise the *Local Government Act 1962*. The *Local Government Modernisation Program Discussion Paper* pointed out the deficiencies of the Act, concluding the fact that the Act 'is a framework that narrowly prescribes Council activities and, in a changing environment, increasingly restricts or inhibits their operations' (Tasmanian Department of Environment and Planning 1993). As a result, the new Local Government Act was introduced in 1993.

A reduction in the number of municipal councils, from 46 to 29, was also an outcome of the Program (Tasmanian Department of Environment and Planning 1993). Local government in Tasmania is currently administered by 29 councils, including the city councils of Hobart, Launceston, Glenorchy, Devonport, Burnie and Clarence (ABS 1996).

In addition, the Program focused on the relations between state and local governments. A protocol agreement between the State Government and the Municipal Association of Tasmania was made in May 1992. This led to a new direction in intergovernmental relations within Tasmania (Tasmanian Department of Environment and Planning 1993),

with local government now enjoying a positive working partnership with the State Government (ABS 1996). These reforms are directly linked to the new planning and environmental management legislation which has established the RMPS. The next section discusses the legislative context in which the coastal zone is managed at the local level in Tasmania.

The Legislative Framework for Coastal Zone Management at the Local Level

The planning and environmental management Acts of the RMPS are of central importance to local government, which has control over the development and management of the local area as its core function (ABS 1996). One of the major components of the RMPS is the establishment of a system whereby local government plans become the key delivery mechanism for State policy at the local level (Haynes 1996). Among the core Acts of the RMPS, the LUPAA is of great significance to the local management and planning of the environment in general, and the coastal zone in particular. Under both the LUPAA and the *Local Government Act 1993*, local government has planning responsibility and jurisdiction to low water mark (SDAC 1995b). With the inclusion of water in its definition of land¹, the LUPAA enables both land and water planning (Fowler 1996). Section 7 of the LUPAA provides for local government to become a planning authority with the responsibility for the preparation and administration of planning schemes regulating day-to-day operations and development proposals; the determination of planning permit applications for the use and development of land; and the enforcement of planning scheme provisions and permit conditions (DELM 1996b). Section 7 has since been amended (by creating paragraph d) under the *Marine (Consequential Amendments) Act 1997*, increasing local governments' power to include marine areas in planning by stating that 'any area of the sea directly adjoining its municipal district in, on, over or under which any use or development is related to, or affects, the use of any adjacent land' (Tasmania 1997).

¹ land includes

- (a) buildings and other structures permanently fixed to land; and
- (b) land covered with water; and
- (c) water covering land; and
- (d) any estate, interest, easement, servitude, privilege or right in or over land (Tasmania 1993a).

Planning schemes operate within a strategic framework of State Policies and are approved by an independent State body, the Land Use Planning Review Panel. The Act requires that a planning scheme must be prepared in order to:

- further the objectives of the RMPS and of the planning process established by the LUPAA;
- accord with State Policies; and
- pay due regard to the use and development of the region as an entity in environmental, economic and social terms (Tasmania 1993a).

The State Government has recently developed a new model planning scheme for the State, which is intended to conform to the requirements of the RMPS and to achieve consistency across the State in planning scheme structure (DELM 1997c). Based on a 'performance', or 'outcomes', based approach rather than prescribing controls, this model focuses on strategic and policy issues in the planning scheme (DELM 1997d). The final form of the model planning scheme is yet to be determined and the scheme will be subject to a consultation process conducted by the Land Use Planning Review Panel and a final decision by the State Government (TBA Planners Pty Ltd and Brownlie 1997).

Under the LUPAA, a planning scheme must also pay regard to the council's strategic plan as required under the *Local Government Act 1993*, which came into effect from the beginning of 1994. The *Local Government Act 1993* is widely regarded as part of the RMPS although it is not explicitly stated as such in the legislation (TBA Planners Pty Ltd and Brownlie 1997). Sections 66 and 67 of this Act require local councils to prepare a strategic plan which state the council's social, environmental, economic and financial objectives, and an annual operational plan containing strategies for achieving them including procedures for community consultation. In addition, the *Local Government Act 1993* makes provision for local authorities to form Joint Authorities for regional management, which could further some of the regional objectives in the LUPAA as mentioned above (Tasmania 1993b).

Under the *Local Government Act 1993*, the Local Government Association of Tasmania was established with local councils as members. This agency represents Tasmanian

local governments and provides an important link between local government and other spheres of government. According to Brown (1997), local government associations in each state play an important role in providing supportive leadership and information on management practices, relevant legislation, state and regional strategies and policies, and other aspects of resource management.

During the 1990s, Tasmanian local government has undergone more change than at any time since its establishment, and this trend appears set to continue until the turn of the century. These recent changes in structure and legislation have considerably influenced the operation of local government (ABS 1996). More powers and responsibilities have been conferred on local government in Tasmania by the Acts mentioned above. The *Local Government Act 1993* provides the 'constitution' for the operation of local councils (ABS 1996). It has been argued that, in terms of environmental management, local government is playing a more positive role than in the past. With the reforms discussed above, local government will be better placed to effect a more co-ordinated and integrated resource development and management approach at local and regional levels.

6.4.3.2 Effects of Recent Reforms on Coastal Zone Management at the Local Level

A questionnaire was used to obtain information on coastal zone management at the local level (Appendix 10). All 23 local governments with coastal areas in Tasmania were sent a questionnaire containing 15 questions covering such issues as: the role of local government in coastal zone management; coastal plans and strategies; the implementation of the State Coastal Policy and the regional coastal strategies; and the problems that local governments face in coastal zone management. The questionnaire was mailed in October 1997. Twelve local governments responded. The results of the questionnaire on coastal zone management at the local level in Tasmania indicate that the role and responsibilities of local government in coastal zone management has been increasingly recognised. Local government is now a major player in developing strategic plans for the use and development of land within its coastal zone. Local government authorities also highlight the role of public participation in coastal zone management and recognise their role as facilitators of action for community groups. This has been part of a more active role in environmental management in general. According to the

Circular Head Council in Northern Tasmania, local government has become more open and accountable in coastal zone management, an area of growing interest and activity by local councils. Of particular interest were the responses in relation to local government participation in Commonwealth and Tasmanian coastal management initiatives and in regional coastal planning and management. These are discussed below.

Participation in Commonwealth and Tasmania's Coastal Management Initiatives

Local government has recognised that the developments in its management approach need to occur in the wider community - both within Tasmania and the Commonwealth as a whole - especially in relation to effective sustainable environmental management and increased operational efficiency. Local government has actively participated in the Commonwealth and Tasmanian programmes in coastal zone management discussed in Chapters 4 and 5. The Local Government Association of Tasmania, as the representative of local government, has signed the Memorandum of Understanding of the CAP, which sets out its responsibility to promote among its member councils the adoption of coastal management policies and practices (Tasmania 1996b). These policies and practices must be consistent with the goal, the objectives and the principles of this Memorandum, and the objectives of the Tasmania's RMPS, and the State Coastal Policy. The Memorandum also emphasised the establishment of mechanisms for consultation with other coastal managers and coastal interest groups. Many programmes emerging from the CAP, such as Coastcare, have operated at the local level. This Program is strongly supported by local government, such as the case in the West North West region. The proposed coastal and marine strategy for this region, which is discussed below, aimed to identify and address Coastcare's priorities in the region (TBA Planners Pty Ltd and Brownlie 1997).

The Local Government Association of Tasmania is also one of the three major participants of the Memorandum of Understanding of the Coasts and Clean Seas Initiatives currently being negotiated. The programmes in these Initiatives, which directly involve local government, are the Clean Sea Program, Coastal and Marine Planning Program, Coastcare and Coastal Monitoring and Vulnerability Assessment. Many projects in the CCSI are being developed (Rees 1997, pers. comm.).

Local government has been particularly active in Tasmania's initiatives in coastal zone management, especially the development and implementation of the State Coastal Policy which provides guidance and support to local government in decision-making relevant to the coastal zone under existing and future legislation. Submissions to the draft State Coastal Policy were received by the SDAC from local councils and members of the Local Government Association of Tasmania. Under the State Coastal Policy, local government is required to implement the Policy in day-to-day management activities to ensure that a consistent and co-ordinated approach is maintained throughout the State as set out in S.5(1)(c) of the *State Policies and Projects Act 1993* (SDAC 1996b). Section 3.1.6 of the Policy also requires local councils to regard the principles, objectives and outcomes of the Policy in the preparation of strategic and operational plans for their municipal areas. The results of the questionnaire show that local councils have been implementing the State Coastal Policy with the Local Government Association of Tasmania as the lead agency for co-ordinating and promoting coastal policy among local councils in Tasmania. Local managers have been provided with advice and short course training on ICZM by DELM under its Coastal and Marine Program (see Table 5.3 in Chapter 5 of this study).

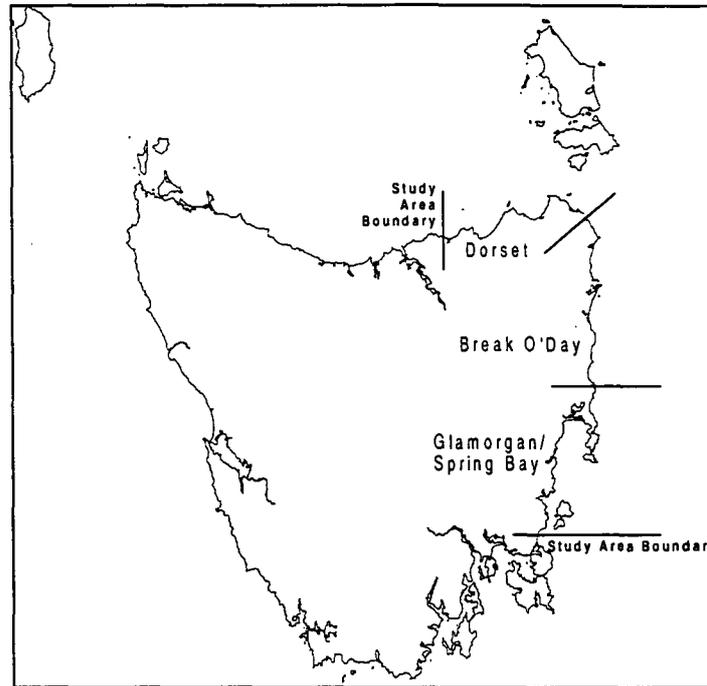
It has been suggested (SDAC 1995b, Anutha 1994b and RAC 1993a) that planning schemes and strategic plans provide guidance for resource allocation and development and are the principal regulatory instruments for local councils to facilitate effective ICZM and further coastal zone management objectives. The statutory plans, such as strategic plans, planning schemes, and other regional and local coastal management plans have been prepared to be broadly consistent with the State Coastal Policy. All local councils have been involved in the development and implementation of these plans in which coastal zone management is included. With the adoption of the ILAP principles, all local councils have prepared strategic plans which are consistent with the sustainable development objectives of the RMPS and the State Coastal Policy. Most councils have been preparing new planning schemes or have amended their old planning schemes. There have been four planning schemes which have come into operation since the introduction of RMPS (Committee for the Review of the State Planning System 1997). In general, planning schemes outline the overall development and environmental objectives of the planning authority and offer a long-term direction for the growth of a specified area. They generally address matters that relate to the use and development of

land and include a range of controls over the use of land (Gutteridge Haskins and Davey Pty Ltd 1996). According to TBA Planners Pty Ltd and Brownlie (1997) and Gutteridge Haskins and Davey Pty Ltd (1996), planning schemes are able to regulate the use, development, conservation and protection of land and water and represent a management tool to assist planning authorities to plan for the orderly development and use of land within any given area. Although planning schemes do not deal specifically with the coastal zone, their implementation will help to further the proper management of the coast. Gutteridge Haskins and Davey Pty Ltd (1996) has further argued that planning authorities will have a key role in sustainable development of the coastal zone.

Regional Planning and Management in Coastal Zone Management

According to Brown (1997), local councils in Australia have increasingly realised that they can be more efficient and effective in carrying out many of their operations if they work together with neighbouring councils. As elsewhere in Australia, regional environmental planning and management has been increasingly given a focus in Tasmania. As discussed above, the LUPAA highlighted the significance of regional environmental planning and management. In terms of coastal zone management, the State Coastal Policy encourages regional coastal planning and management by stating that 'councils will be encouraged to function in a co-ordinated and collaborative manner with adjacent councils and other planning authorities' (Tasmania 1996a: 20). With the involvement of State and Commonwealth agencies, the three councils of Break O'Day, Dorset and Glamorgan/Spring Bay have developed an integrated coastal and marine management strategy for the region in the north east and east coast of Tasmania, covering about 20% of the State's coastline (Figure 6.1). According to TASQUE (1995), the Strategy is a national pilot for coastal zone management. Prepared in accordance with the principles of the ILAP approach (Brown 1997), the purpose of the Strategy is to provide local councils and communities with practical tools to manage the use, and development, of resources in one of Australia's premier coastal and marine environments (TASQUE 1995).

Figure 6.1 Study Areas for Marine and Coastal Management Strategy for Dorset, Break O'Day and Glamorgan/Spring Bay Councils



Source: TASQUE 1995

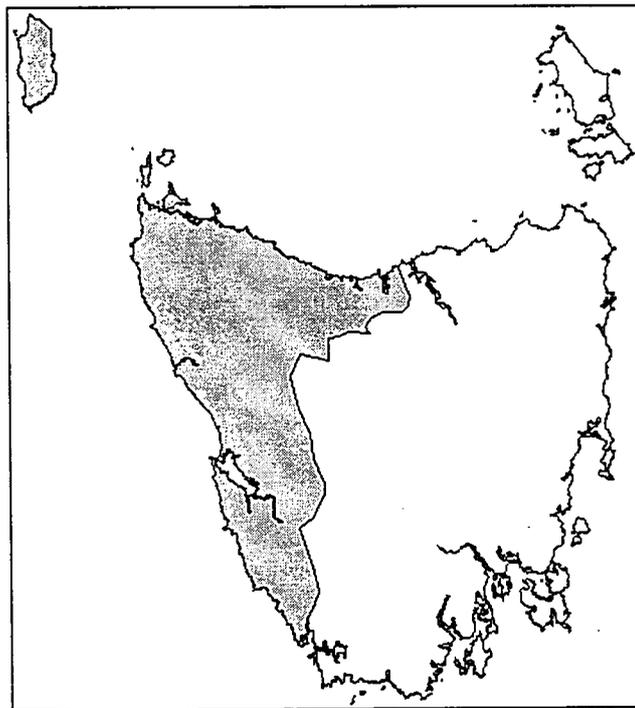
Anutha (1994b) has argued that the Strategy is consistent with the Tasmanian State Coastal Policy and is being implemented through statutory planning instruments and councils' activities generally. The three Councils are primarily responsible for implementing and facilitating action in accordance with the Strategy. The Strategy is being implemented on a staged basis involving the community, Councils, National Parks and Wildlife Service and other land managers. The most important achievements have been universal recognition of the need for coastal and marine management and the greater integration in dealing with coastal issues between the three Councils involved. The three Councils have, overwhelmingly, agreed on the major limitation in the implementation of the Strategy: the lack of resources in terms of time and money. To date no resources have been made available for commencement of the full implementation of the Strategy. In addition, the implementation is also delayed because council zoning is not complete.

Although the Strategy has not been implemented as it could have been (Boardman 1997, pers. comm.), it has become the management tool for coastal and marine management and has either been integrated (in the case of Dorset Council), or become a schedule to, municipal planning schemes (in the case of Break O'Day, Glamorgan/Spring Bay Councils). Gutteridge Haskins and Davey Pty Ltd (1996) has argued that the Strategy

has added value to the Dorset Planning Scheme which overarches the Dorset Sustainable Development Strategy and Integrated Catchment Management.

Following the Coastal and Marine Strategy for Dorset, Break O'Day and Spring Bay/Glamorgan Councils, another regional project has been undertaken for the region in the West North West of Tasmania's coast, covering about 30% of the State's coastline (Figure 6.2). The councils in the region have also recognised that coastal management is a major environmental regional issue and a regional integrated strategy is needed (West North West Tasmania Municipal Region 1997).

Figure 6.2 Study Areas for Integrated Coastal and Marine Strategic Management Plan for the West North West Tasmania Municipal Region



Source: West North West Tasmania Municipal Region 1997
(shaded area: West North West Tasmania Municipal Region)

This proposal was prepared by the West North West Tasmania Municipal Region² and the Local Government Association of Tasmania in close consultation with the councils in West North West Tasmania Municipal Region and State agencies. A regional Coastal and Marine Steering Committee has been established to manage and oversee the project. The local councils will also incorporate the objectives of the Strategy into their strategic

² The West North West Tasmania Municipal Region is a voluntary regional organisation of Councils and consists of the following local authorities: Burnie City Council; Central Coast Council; Circular Head Council; Devonport Council; Kentish Council; King Island Council; Latrobe Council; Waratah-Wynyard Council; West Coast Council (West North West Tasmania Municipal Region 1997).

plans and therefore, the Strategy will assist local councils to meet their statutory obligations under the LUPAA and the State Coastal Policy (West North West Tasmania Municipal Region 1997).

In addition to regional coastal strategies, the development of regional land management plans for some local councils also contributes to improved coastal zone management at the regional level. Recognising that taking a regional approach to resource management and planning has a range of benefits, the Waratah Wynyard and Circular Head Councils have developed a Strategic Land Management Plan in partnership with their communities (TBA Planners Pty Ltd and Brownlie 1997). Coastal zone management is included in this Plan. One of the core elements of the Plan is providing for the sustainable development of the coast, including protection of natural coastal processes and environmental values and integrating land and water planning (TBA Planners Pty Ltd and Brownlie 1997).

6.4.3.3 Limitations in Coastal Zone Management at the Local Level

It is apparent from the results of the questionnaire that local government in Tasmania faces the same problems in coastal zone management as discussed in section 6.4.2. Together with a lack of political will at a State level, and to a lesser extent at a local level, these problems are the major causes for the ineffective and insufficient implementation of coastal and marine practices at the local level. Some local councils have expressed their concern over the financial support for some coastal programmes, such as Coastcare, and have stated that this programme could be at risk if local government does not have on-going financial support. In addition, local government can also have problems understanding the policies and strategies it is required to implement in its day-to-day management activities. Some local councils are confused by the State Coastal Policy and claim that it has been poorly drafted. The Committee for the Review of the State Planning System (1997) lent support to this view in arguing that the State Coastal Policy has attracted criticism for its complexity.

The results of the questionnaire also show that, although there are encouraging changes in the way local government manages the coastal zone, management of the coastal zone does play a minor role in local council's overall environmental management. Most local councils do not have any specific coastal and marine programmes, nor have they

adopted specific coastal zone management objectives for their municipalities. No local councils in Tasmania have developed a Local Agenda 21 (Boardman 1997; pers. comm.).

An incident in May 1996 at the Break O'Day Council further illustrates a lack of concern over the implications of council actions on the coastal environment and contempt for the legislative system designed to protect it. The Break O'Day Council deliberately released between 10 and 20 megalitres of secondary treated effluent into Wrinklers Lagoon, a coastal lagoon in the Scamander township. The Council failed to notify DELM of the release. Following complaints from residents, the Council was charged under sections 33 and 51(1) of the *Environmental Management and Pollution Control Act 1994* with one count of serious environmental harm and one count of non-notification of the incident to the Director of Environmental Management, DELM. These charges had, initially, been served on the four employees involved and the body corporate for each of the eight releases but later reduced, with the releases being considered as one contravention. The Council argued that they had acted responsibly in the circumstances given the problems they encountered with their lagoon sewerage treatment system. DELM's position was, however, that 'Council has caused the most serious environmental harm by choosing to release the effluent in the manner chosen' (Dettrick 1997; pers. comm.). The Magistrate supported DELM and the Council was ordered to pay \$30, 000 into the Environment Protection Fund as well as the cost of DELM's investigation. They were also ordered to undertake monitoring to prevent possible blue green algae blooms. This case highlights a lack of concern for the implications of releasing effluent into the coastal environment and a failure to integrate coastal management into other aspects of environmental management. In addition, the delay in informing DELM about the incident is particularly concerning.

Another major limitation of coastal management system at the local level rests in the development of planning schemes. A large number of planning schemes have been prepared and Tasmania has 101 active planning schemes which have little consistency and are outdated (DELM 1997c). Among them, 88 are more than ten years old. Some, such as the Triabunna Planning Scheme, date back to the 1950s. These planning schemes adopted an early style of planning which is not consistent with the new resource management and planning legislation. Thus, they do little to further the

Resource Management and Planning Scheme and are seen by many to be a hindrance to development and protection (Committee for the Review of the State Planning System 1997).

6.5 Summary

The role of local government in environmental management and particularly in coastal zone management has been evolving and its importance is now recognised globally and nationally. According to authors such as Haward and Hildebrand (1996) and Brown (1995), local government should have the most important role in achieving integrated coastal zone management in Australia. Where local government has been given a greater role and increased responsibilities, it has generally coped well. However, overall, local government has frequently been ignored as a key player in coastal zone management. Although many efforts have been made to improve coastal zone management at the local level, local government is still isolated from other spheres of government and has not been an equal partner in the development and implementation of Commonwealth and State coastal practices. The high level of resources required by the existing system, such as Tasmania's RMPS, places heavy demands on local government. These governments, then, remain underequipped to effectively manage the coastal zone (Committee for the Review of the State Planning System 1997).

It has been stated that 'the turn of the tide from rapid coastal exploitation to ecologically sustainable development of our coastal zone will depend on whether the tide of increasingly fragmented, multi-tiered governance can be turned towards integrated locally responsive management' (Brown 1995:7). This change in tide will require shifts in the focus of decision-making and resource allocation. Without such a shift, the local sphere of government is likely to remain largely impotent in terms of its input into coastal zone management. The following chapter provides a summary of coastal and marine management at various levels of government and the changes required for more effective management of coastal and marine environments.

CHAPTER 7

Summary and Conclusions

7.1 Summary

This study has been based on two central propositions: (i) that the need for action to address coastal and marine degradation is pressing, and in many cases even urgent, and (ii) that both the development and implementation of policies and programmes designed to do so will be difficult for a number of reasons: the processes behind degradation of these resources are both complex and multiple and will therefore require co-ordination between many actors; coastal and marine degradation are transboundary in nature and their resolution therefore requires co-ordination between jurisdictions; not only will co-ordination be required between many nations but also between the various tiers of government within nations themselves; and the development and implementation of policies will tend to conform to a top-down model of policy making and implementation will therefore tend to be characterised by many of the types of weaknesses associated with that approach.

With regard to the first of these propositions, the study has shown that there is ample evidence to support the argument that coastal and marine degradation is both widespread and serious. It is without doubt a problem that needs to be addressed as a matter of some urgency. The cause of degradation is, in broad terms, related to the economic importance of these resources. Rapidly increasing population and the immense concentration of various and often unplanned economic activities in these areas have put great pressure on coastal and marine environments, many of which are relatively sensitive environments. It is also clear that stabilising or reversing this situation will be possible only with major effort on the part of all nations, states and communities involved.

Underscoring this picture of the situation, however, is the view that, based on the available evidence, coastal and marine environments are capable of recovering provided strong measures are adopted at the global, national and regional levels. This optimism is buoyed, furthermore, by the fact that coastal and marine degradation have become an item of increasing importance on the political agenda of national and state governments.

With respect to the second proposition of the study, there is no doubt that coastal and marine management has proved to be an ambitious undertaking that requires the coordinated input of planners, administrators, scientists, and experts of many kinds on the one hand, and the co-ordination of policies between governments and levels of governments on the other. The development of mechanisms capable of dealing with these complexities and difficulties has been at the heart of international efforts to address these issues.

The history of international efforts aimed at developing multilateral frameworks to guide the response of nations supports the contention that achieving co-ordination between nations in order to resolve these problems has not been straight forward. The first such efforts date back to the beginning of the century and reaching agreement between nations has often been a tortuous and slow process. In many instances, these efforts have been pioneering in nature and have set precedents in international law. For this reason, international efforts at managing coastal and marine environments are often at the vanguard of attempts to resolve global environmental problems.

There has also been a clear progression in the development of these international frameworks from an emphasis on preservation of coastal and marine environments towards a philosophy of managing these resources in a manner that achieves a long-term balance between the maintenance of economic and environmental values. The concept of sustainable development embodies this philosophy and has been formally adopted by the international community as the guiding principle for resources management. Developing the concept, however, is one aspect, while putting it into practice another. Finding workable means by which sustainable development can be built into policy has been a major challenge. The most useful tool developed to date for putting this concept into practice in the coastal and marine policy areas has been that of ICZM. It has also

been found to be the useful in facilitating the development of a co-ordinated decision-making framework.

The potency of ICZM lies in its ability, relative to segregated management strategies, to deal with the multiple uses and multiple conflicts that are evident in the coastal zone (Miller 1996). It is a dynamic management process in which decisions are made from the perspective of use, development, and protection of coastal and marine resources. It is a process which also recognises the distinctive character of the coastal zone and the need to manage these resources for both current and future generations (Cicin-Sain 1993a).

Marine environmental management has therefore become a leading area in terms of international environmental law and in the provision of a management model for sustainable development of natural resources. The concepts of integrated resource management and sustainable development are now well incorporated into international agreements relevant to coastal and marine management (Cicin-Sain and Knecht 1995).

In the ultimate analysis, however, ICZM has to be adopted and implemented and the question central to this study has been how effective various countries and levels of government within countries have been in translating the ideas and mechanisms developed at the international level into practice. Many now consider that as moving out of the nineteenth and into the twentieth century, global environmental strategies have become increasingly accepted as essential frameworks for improving environmental management in many nations throughout the world (Davis 1996a). To the extent that the experience in Australia is a valid representation of the experience in other countries, it is now clear that coastal and marine management has emerged at the national level over the past decades in line with the new international agenda and that communities have come to accept that present levels of exploitation of coastal and marine resources may not be sustainable (Young 1996). Unlike the advanced level of management of the coastal and marine environments at the international level, however, the management of these environments at the national level is as yet in its infancy (Davis 1996b). While strategies such as ICZM are useful theoretical approaches, the process of integrating social, economic and environmental considerations has simply proved too complex and difficult for nations to put into practice. Numerous stakeholders and powerful vested

interests involved in a multiple use, multiple jurisdiction issue renders integration of planning and management exceedingly difficult (Brown 1995; Kenchington 1994). It is apparent that this view has more than a ring of validity and that coastal managers have taken on some very complicated challenges (Miller 1996).

The Australian case study indicates that national governments have undertaken a wide range of initiatives aimed at improving coastal and marine management within their territories. They have been moving towards establishing better integrated coastal management arrangements for the purpose of managing and reducing conflict over resource use in the coastal zone (Anutha and Johnson 1996). The concepts of integrated resources management and sustainable development have been adopted and implemented to facilitate the development of a coordinated decision-making framework. It may be difficult to assess the level of integration in a system merely on the basis of outward factors such as the existence of particular institutional arrangements, coordinating bodies or multiple use planning documents. From the evidence presented in this study, however, it can be concluded that an appropriate framework to achieve the sustainable development objectives of the coastal and marine environments has been put in place.

The *implementation* of coastal and marine management policies, however, has received less attention in the literature on coastal and marine issues than has *policy design* and the most difficult aspect of ICZM has proven to be getting authorization to move the programme from the planning to the implementation stage (Clark 1996). In this regard, there is strong evidence at the national level. While it is too early to assess the effectiveness of the frameworks and programmes put in place by the Australian Government to manage coastal and marine environments which have incorporated the concepts of sustainable development and the ICZM, the existence of an implementation problem due to the significant lack of political will to enforce regulations is already evident.

This study has demonstrated that awareness and understanding of coastal and marine environmental issues has increased at the international and national, and at the state and local levels. The practical difficulties and complexities of establishing appropriate frameworks, especially those arising from the federal system of government in which all

spheres of government have legitimate interest and responsibilities in the coastal zone, are very real and have been acknowledged. In federal systems of government, the task is particularly difficult as numerous constitutional, political, legal and administrative obstacles have to be overcome. While implementation of integrated coastal and marine management requires co-ordination of policies between national and provincial/local authorities, the Australian case study demonstrates that this is not an easy task.

On the question of the extent to which coastal and marine policy development and implementation conform to a 'top down' approach versus a 'bottom up' approach, the evidence is mixed. In the Australian case, it is apparent that the federal government has recognised the roles and responsibilities of all spheres of government in policy and programme development and implementation. It is also clear that even in centralised political systems, the importance of incorporating local concerns in integrated coastal management processes is recognised, particularly where these involve inland areas or coastal lands. On the other hand, it is also accepted that the national government's role becomes more and more dominant as one goes further offshore (Cicin-Sain 1993a).

As with national governments, state governments have demonstrated an increasing awareness of their environmental responsibilities and have implemented many measures to address coastal and marine environmental matters. In Tasmania's case, the State Government has put in place over the 1990s major reforms in the areas of land use planning, environmental management and pollution control, natural resource management and local government. This has been undertaken through a package of legislation, the Resource Management and Planning System. A new system for ICZM has been developed with the introduction of the State Coastal Policy as part of its resource management and planning reforms, and a number of planning exercises to accommodate future use and development of these environments, especially for aquaculture, have been undertaken.

With the introduction of the marine farming planning process, however, the Tasmanian Government created a more complex system for managing coastal and marine environments. It demonstrates the point made by Clark (1996) that it is important for advocates of ICZM to avoid both unrealistic goals and excessive complexity. In the case of Tasmania, the State Government has failed to establish a simple and appropriate

framework for ICZM. In addition, the State also faces a major problem in the implementation of coastal and marine programmes/strategies similar to that faced by the Commonwealth Government in that there is a major focus on policy design rather than implementation. As in the case of the national level, there is lack of political will to enforce regulations at the state and local levels.

While it is widely recognised that no global, national or state environmental strategy will succeed without local action, coastal zone management at the local level has been adequately addressed by neither the international communities nor national and state governments. This failure has had serious ramifications in terms of the implementation of these strategies. Local government has not been treated as an equal partner by the other spheres of government and lacks the resources to undertake coastal zone management activities. Many efforts at improving coastal zone management have been made at the local level by the development and implementation of local coastal plans. Too often, however, these plans have been created as end products in themselves focus on planning without adequate consideration of implementation. The problems faced by local government are the major causes of this failure.

7.2 Conclusions

The essential point that emerges clearly from this study is that coastal and marine degradation is an issue where society must think globally and act locally. Yet this appears to have been overlooked by many policy makers and planners. It is vital that this state of affairs is overturned and it is possible to offer a few comments on what changes are required in order for this to occur. This state of affairs, changes need to be made at all levels.

At both the national and state levels, governments need to be bolder in their attempts to transpose policies into action on the ground. There is a need to muster greater political will to not only develop programmes, but to fully implement them, and to not merely prepare regulations but to enforce them. There also needs to be greater effort on the part of both national and state governments to revise the top-down approach and to not only involve local governments in decision and policy making, but to also provide local government with adequate resources to implement those policies and programmes. Intergovernmental frameworks should be further developed to enable agreed national

goals to be achieved locally and state government needs to ensure that their state coastal policies are clear and enhance the development of coastal and marine plans/strategies of local councils. Federal government needs to work with state and local government to develop coherent and effective policies and management practices at local level which protect coastal and marine environments. These frameworks should include clear guidelines and enforceable environmental standards for residential, commercial and industrial developments.

A considerable education programme is promoted to enhance the capacity of local governments to effectively contribute to the management of the coastal zone so that local managers are capable of setting the agenda for dealing with local environmental issues rather than have it imposed by the state government. Local governments and the public should be made fully aware of the ICZM programmes. In addition, the strong tendency for policy design to take predominance over implementation at the local level as well as the state and national levels means that local councils with coastal jurisdiction need to adopt more specific coastal objectives rather than relying on the overall environmental objectives. Local governments should also be given clear responsibility and powers in managing coastal and marine environments. They should ensure that development proposals are subject to full environmental impact assessment and that adequate monitoring of development follows approval.

Only when changes such as these have been put into place are concepts such as sustainable development and tools such as ICZM likely to be translated into meaningful outcomes.

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Appendices

Appendix 1 International and Regional Initiatives Related to Coastal and Marine Environmental Management

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- Treaty for the Preservation and Protection of Fur Seals (1911)
 - International Convention for the Regulation of Whaling (ICRW) (1948)
 - International Whaling Commission (IWC) created (1948)
 - International Convention for the Prevention of Pollution of the Sea by Oil (1954)
 - Convention on the Intergovernmental Maritime Organisation (1958)
 - Intergovernmental Maritime Organisation (IMO) established (1958)
 - UNCLOS I (1958)
 - UNCLOS II (1960)
 - Intergovernmental Oceanographic Commission (IOC) was established (1960)
 - International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties (1969)
 - Bonn Agreement on the control of oil pollution in the North Sea (1969)
 - Denmark-Finland-Norway-Sweden Agreement Concerning Co-operation in taking measures against pollution of the sea by oil (1971)
 - Ramsar Convention on wetland protection (1971)
 - Oslo Convention on the dumping of waste at sea (1972)
 - London Dumping Convention (1972)
 - UN Conference on Human Environment (1972), Stockholm
 - International Convention for the Prevention of Pollution from Ships (MARPOL) (1973)
 - Protocol Relating to Intervention on the High Seas in Cases of Pollution by Substances Other than Oil (1973)
 - Baltic Marine Environment Convention (1974)
 - Helsinki Convention on the Protection of the Marine Environment of the Baltic Sea (1974)
 - Paris Convention for the Prevention of the Marine Pollution from Land-based Sources (1974)
 - International Convention on the Establishment of an International fund for Compensation (246 Norse)
 - United Nations Environment Programme's Regional Seas Programme established (1975)
 - Kuwait Regional Convention for Co-operation on the Protection of the Marine Environment from Pollution (1978)
 - Global Plan of Action for the Conservation, Management and Utilisation of Marine Mammals (MMAP) (1978-1983)
 - UNCLOS III (1982)
 - Convention for the Protection and Development of the Marine Environment of the Wider Caribbean Region (Cartagena Convention) (1983)
 - Montreal Guidelines for the Protection of the Marine Environment against Pollution from Land-based Sources (1985)
 - *Our Common Future* (Brundtland report) (1987)
 - International Convention on Oil Pollution, Preparedness, Response and Co-operation (1990)
 - UN Conference in Environment and Development (UNCED) (1992), Rio de Janeiro
 - World Coast Conference (1993)
 - UN Conference on Straddling and Highly Migratory Fish Stocks (1993)
 - Global Conference on Sustainable Development of Small Developing Island States (1994)
 - Conference of the Parties of the Biodiversity Convention (1994, 1995)
 - United Nations Conference on Land-Based Marine Pollution (1995)
 - International Coral Reef Initiatives 1994
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Sources of data: Brenton 1994; Norse 1993; Clark 1996; Cicin-Sain and Knecht 1993

Appendix 2 Summary of the Seven Programme Areas in 17.21

Programme area	Summary
Section A: Integrated management and sustainable development of coastal and marine areas, including EEZs	<ul style="list-style-type: none"> the commitment of coastal nations to integrated management and sustainable development of coastal areas and the marine environment under their national jurisdiction an important boost given to the concept of ICZM represented a paradigm shift from sectoral, multiple-use framework to an integrated approach to management of the coastal area emphasised the need to reach integration, the application of preventive and precautionary approaches, and full public participation; the need for greater information and greater education and training in ICZM and the emphasis of traditional ecological knowledge provided a series of actions for an integrated planning framework called for co-operation among states in the preparation of national guidelines for ICZM and the undertaking of measures to maintain biodiversity and productivity of marine species and habitats under national jurisdiction
Section B: Marine environmental protection (including land- and sea-based sources of marine pollution)	<ul style="list-style-type: none"> called for coastal nations to increase their efforts 'to prevent, reduce, and control degradation of the marine environment so as to maintain and improve its life-support and productive capacities' stressed the need for a precautionary and anticipatory, rather than reactive approach highlighted in particular the urgent need to deal more effectively with land-based marine pollution listed a number of actions considered useful or necessary in addressing land-based marine pollution and also called upon nations to employ coastal planning and management to strengthen existing activities and regional co-operative efforts dealing with regulation of land-based marine pollution pointed to the need to relate control of land-based marine pollution to ICZM and to consider updating, strengthening and extending the Montreal Guidelines (Table 3.1), to promote new regional agreements where appropriate called for a global conference on land-based marine pollution controlled sea-based marine pollution with the improvement, acceptance and implementation of existing rules rather than the development of new ones. called for states to support the ongoing activities of the IMO
Sections C and D: Sustainable use and conservation of marine living resources of high seas and under national jurisdiction	<ul style="list-style-type: none"> the commitment of nations to the conservation and sustainable use of marine living resources in the high seas and in EEZs and other areas under their national jurisdiction reaffirmed that the UNCLOS provided the basic framework for management of marine resources identified objectives of development of fisheries and major fishery management problems highlighted problems related to coral reefs and other coastal and marine habitats, such as estuaries and mangroves recommended that states manage and conserve these resources in a sustainable manner and provided the measures by which this could be achieved encouraged international and regional co-operation on improved seafood availability, including minimising waste and by-catch, be upgraded, particularly for developing countries called on a global conference on straddling and highly migratory fish stocks
Section E: Addressing critical uncertainties for the management of marine environment and climatic change	<ul style="list-style-type: none"> underscored the view that the marine environment is an important system within the global ecosystem and vulnerable to climate change better information on the present state of the marine environment and greater ability at predicting future conditions to assess the roles that oceans played in driving global systems were required for rational use of coastal/marine areas stressed the many uncertainties over climate change, and about the possible extent of sea level rises in particular called for a long-term co-operative research commitment to provide the data required for accurate global climate modelling needed to reduce these uncertainties the commitment of nations to improving the understanding of the marine environment and its role on global processes by promoting scientific research and systematic observation, to co-operation in exchanging data and information
Section F: Strengthening international, including regional, co-operation and co-ordination	<ul style="list-style-type: none"> underlined the role of international co-operation in supporting and supplementing national efforts stressed a need for greater co-ordination and the strengthening of links among existing international and national organisations so that a multi-sectoral approach to marine issues could be developed at all levels the commitment of nations to the promotion of institutional arrangements necessary to support the implementation of these programme areas and to the developments of better linkages among regional and international organisations
Section G: Sustainable development of small developing island states	<ul style="list-style-type: none"> covered special characteristics of small developing island states and their problems in the marine environmental management called for the first global conference on the sustainable development of small developing island states recommended measures that can improve the quality of life for island people, as well as enable small developing island states to cope effectively, creatively and in a sustainable manner with environmental changes and to mitigate the impacts on and reduce the threats to coastal and marine resources called upon international organisations to recognise the special development requirements of such states and to give adequate priority to them in the provision of assistance

Sources of data: Brenton 1994; Naevé and Garcia 1995; Cicin-Sain 1996; Kimball 1993;

Nollkaemper 1993; Johnson 1993; Dahl 1993; Laughlin 1993; Grubb *et al.* 1993

Appendix 3 Australian Coastal and Marine Environments

(a) Major Characteristics of the Australian Coastal and Marine Environments

(Population (people))	(17,627,000)
Length of coastline (km)	36,735 (the world's longest ice-free coastline)
Terrestrial area (km ²)	7,682,300 (plus Australian Antarctic Territory 6,044,065)
Maritime area (million km ²)	8.94 (200 nm EEZ, excluding Australian Antarctic Territory)
Australian Fishing Zone (million km ²)	8.94 (the third largest in the world)
States and territories with maritime jurisdiction	Queensland, Victoria, New South Wales, Tasmania, South Australia, Western Australia, Australian Capital Territory, Northern Territory
External territories	Ashmore and Cartier Islands, Australian Antarctic Territory, Christmas Island, Cocos (Keeling) Islands, Coral Sea Islands, Heard Island and McDonald Islands, Norfolk Island
Oceans	Pacific, Indian, Southern
Islands	12,000
Biogeographical representation	tropical, sub-tropical, temperate, subpolar, polar
Latitudinal variation	60 degrees, Torres Strait to Antarctica
Major habitats	estuaries (783 major estuaries), coastal lakes and lagoons, shores, saltmarshes (13,595 km ²), mangroves (the third largest area in the world), seagrasses (the highest biodiversity of seagrasses in the world, the largest areas of temperate seagrass and one of the largest areas of tropical seagrass)
Species of high conservation value	loggerhead and green turtle, dugong, whale
Marine protected areas: numbers, area	303; 463,200 km ²
Conservation association (many of which have a particular interest in coastal and marine issues)	280
Species of high economic value	rock lobster, prawn, abalone
Value of marine resources	A\$17 billion
Fisheries - value of total export	A\$1.37 billion
Oil and gas production - value of total export	A\$5.5 billion

(b) Summary of Ecological, Economic and Social Values of the Australian Coastal and Marine Environments

Ecological significance	<ul style="list-style-type: none"> provide critical habitat for many important marine species (dugong, turtles), for migratory species and for rare species (the orange bellied parrot in Victoria), and for terrestrial species (birds, possum, koalas, and bats) Australia's oceans are a vital barrier to the transfer of disease and are used to assimilate effluent (New South Wales's coastline has 46 sewage outfalls, Victoria 17)
Economic significance	<ul style="list-style-type: none"> provides substantial non-living resources (oil and gas, mineral sand, sand and gravel, building and construction materials), living resources (fish and seafoods) provides important habitats for many commercial species (nearly 79% of species, by value, in the commercial fisheries harvest in New South Wales derives from species that are dependent on estuaries at some time in their life cycle), considerable advantages for fish farming, such as a long coastline, relative lack of pollution, wide range of climates, absence of serious disease provides important natural tourist and recreational resources (prominent attractions to tourism, with areas of international significance such as the Great Barrier Reef, Fraser Island (Queensland), south west Tasmania) shipping is the major method of transportation of imports and exports an area of intensive agricultural production with approximately 1/3 of the coastal land being used for agricultural and pastoral purposes (large areas of the coast zone

	<p>are devoted to agricultural production; for example, vegetable production in central coastal Victoria, the Sydney region and south west Queensland; wheat production in north and west of Adelaide and around Geraldton (Western Australia); sugar cane and tropical fruits industries in coastal Queensland and north eastern New South Wales; areas sown for pasture and fodder crops in the coastal zone of Victoria, New South Wales, south eastern South Australia, south western Australia)</p> <ul style="list-style-type: none"> • a significant fraction of the forest industry occurs in the coastal zone • a focus for building activities and service • marine industries create jobs (in 1990-91 tourism employed 450,800, 5.8% of the national workforce; some 100,000 people are directly employed in recreational servicing)
Social and cultural significance	<ul style="list-style-type: none"> • provides a place to work, live and relax for Australians • important to Australia's indigenous peoples (an indistinguishable part of the clan estate and culture, important for the sustenance of coastal Aboriginal people) • important to Australian heritage, contains many places of maritime cultural heritage
(c) Australian Coastal and Marine Industries	
Oil and gas production	<ul style="list-style-type: none"> • largest marine industry, of great economic and strategic importance • petroleum production 1986-87: A\$5.1 billion, 1990-91: A\$7.672 billion • current production of oil: over 3.5 million barrels of oil; over 1,100 wells drilled offshore and around 2,800 million barrels of oil extracted
Quarrying for building and construction materials	<ul style="list-style-type: none"> • sand mining: the world's largest producer; 1975-76: A\$151 million, 1987: A\$324 million, 1989: A\$554 million; • late 1980s: 126 million tonnes of building and construction materials were produced annually
Commercial fisheries and aquaculture	<ul style="list-style-type: none"> • a number of high value export fisheries (abalone, rock lobster, prawns) and a large cultured pearl industry • Australia's fish catches: 200,000 tonnes annually, commercial fishing fleet: 10,000 vessels, 200 different species of fish, 60 species of crustaceans, 30 species of molluscs are fished • fisheries: 1973-75: A\$100 million, 1975-76: A\$147 million, 1990-91: A\$1,000 million; 1993-94: A\$ 1610 million • aquaculture: 1985: A\$50 million, 1987-88: A\$105 million, 1989-90: A\$220 million, 1991-92: A\$260 million; 60 aquatic species, from seaweeds to crocodiles, are farmed
Tourism and recreation	<ul style="list-style-type: none"> • significant contribution to the national economy, • has been growing very fast in recent years • marine ecotourism: whale watching in Whitsunday Island (Queensland) to Albany (Western Australia), dolphins of Monkey Mia (Western Australia), whale sharks at Ningaloo Reef (Western Australia), great white sharks at Port Lincoln (South Australia) • 5.2% GDP (surpassed wool industry, the traditional export commodity earner as the nation's premier export carrier), A\$16.3 billion (domestic), A\$6.5 billion (international), 5.8% workforce; 1991: 2.3 million international tourists, 49 million trips as domestic tourists • recreational value for Australians and international tourists (over 4.5 million Australians went fishing at least once a year and over 800,000 of these went fishing at least 20 times a year; spending on fishing and related activities was at \$2.2 billion each year; in 1993 over 120 000 international tourists spent \$210 million on fishing while in Australia)
Marine transport	<ul style="list-style-type: none"> • main ports, the fifth largest user of shipping in the world. Each year there are around 12,000 overseas shipping arrivals and almost 380 million tonnes of freight carried in Australian waters • Australia's trading fleet comprised 50 coastal and 27 overseas vessels over 2,000 dead-weight tonnes

Sources of data: Zann 1995; RAC 1992b; RAC 1993a; Haward and Bergin 1991; Kearney *et al.* 1996; VanderZwagg *et al.* 1996a; AMISC 1996

Appendix 4 Australian Major Coastal and Marine Environmental Issues and Examples

Issues	Examples
Declining water quality and sedimentation (probably the most serious issue)	<ul style="list-style-type: none"> • of the estuaries which have been studied, 64% in New South Wales and 22% in Victoria are considered to have poor water quality • poor bathing water quality, especially in Sydney beaches in 1980s
Eutrophication (one of the most serious, large-scale threats to Australia's nearshore marine environment)	<ul style="list-style-type: none"> • the Peel Harvey system and Cockburn Sound (Western Australia), the Gippsland Lakes and Port Phillip Bay (Victoria), Holdfast Bay and Barker Inlet (South Australia), Lake Illawarra, Lake Macquarie, Tuggerah Lakes, and Georges River (New South Wales)
Sedimentation and erosion	<ul style="list-style-type: none"> • Twofold Bay (New South Wales) and Mallacoota Inlet (Victoria), Tasmania and South Australia
Heavy metal pollution	<ul style="list-style-type: none"> • Botany Bay, Lake Macquarie (New South Wales), Port Pirie (South Australia), Cockburn Sound (Western Australia), the Derwent and Tamar Rivers (Tasmania)
Hydrocarbon pollution	<ul style="list-style-type: none"> • in Port Phillip Bay, Western Port Bay, and the Yarra River (Victoria), the Brisbane River (Queensland), the Parramatta River (New South Wales)
Organochlorine problem	<ul style="list-style-type: none"> • the Brisbane River (Queensland), sewage outfalls of Sydney (New South Wales), Homebush Bay, Port Phillip Bay and Corio Bay (Victoria)
Ocean and beach litter (widespread and more than unsightly, highly conspicuous along shores near metropolitan areas but not even remote beaches are free from ocean litter)	<ul style="list-style-type: none"> • Port Phillip Bay (Victoria), Anxious Bay (South Australia) • the incidence of seal entanglements in net fragments and other synthetic material in Tasmania is one of the highest in the world • it is estimated that at any one time, around 500 seals in Tasmanian waters and 45 seals at Victoria's Seal Rocks have 'collars' of plastic litter
Loss of habitats	<ul style="list-style-type: none"> • overall, the Australian National Parks and Wildlife Service estimates that at least 50% of Australian wetlands have been destroyed since European settlement
Degradation of estuaries and coastal lakes	<ul style="list-style-type: none"> • most of estuaries have moderate to serious sedimentation and eutrophication
Declines in temperate seagrass	<ul style="list-style-type: none"> • Victoria's Westport Bay has lost most of its seagrass beds • serious die-backs of temperate seagrass beds in southern Australia • half of the seagrass in the estuaries of New South Wales has been lost • locally serious declines in seagrass in Tasmania, South Australia and Western Australia • major loss of sub-tropical seagrass in Hervey Bay (Queensland)
Loss of mangroves	<ul style="list-style-type: none"> • significant areas of mangroves have been cleared or killed around metropolitan areas of Australia • about 20% of the mangrove in Moreton Bay near Brisbane have been cleared • significant die-back of mangrove near Adelaide (South Australia)
Loss of saltmarshes	<ul style="list-style-type: none"> • although the total loss of saltmarshes has not been great, most has been concentrated in the south-east where the initial area was small and where biodiversity and endemism is highest
Loss of biodiversity	<ul style="list-style-type: none"> • Australia has a high rate of species extinction since European settlement. Half of the world's mammal extinction in the past 200 years have occurred here. The Australian National Parks and Wildlife Service noted that nationally the coastal zone has the greatest density of threatened species. The coastal zone from Cairns to Adelaide and especially the north-east New South Wales and south east Queensland region is of particular concern. The eastern seaboard has the highest

	<p>concentration of threatened land plants in the country</p> <ul style="list-style-type: none"> • major mortality of dugong due to loss of seagrass habitat in Hervey Bay in Queensland • some 14 species or subspecies of Australia's seabirds (13% of the total) are considered to be threatened
Introduced species	<ul style="list-style-type: none"> • bloom of introduced toxic marine algae are a serious marine environmental and fisheries problems in Tasmania and Victoria • outbreaks of the exotic Northern Pacific seastar are spreading along eastern Australia, threatening marine life, aquaculture farms and scallop and abalone fisheries <p>at least 55 species of fish and invertebrates and a number of seaweeds have been introduced into Australia. 6 species are regarded as pests. Principal organisms of concern are the toxic alga <i>Gymnodinium catenatum</i>, which cause red tides, the seaweed <i>Undaria pinnatifida</i>, which smothers native kelps, the Northern Pacific seastar <i>Asterias amurensis</i>, and fish pathogens such as <i>Mxosoma cerebralis</i></p>
Population outbreaks of certain native species	<ul style="list-style-type: none"> • crown-of-thorns starfish have caused considerable damage to Indo-Pacific reefs, including parts of the Great Barrier Reef and Australia's Tasman Sea Reefs. This is regarded as one of the most serious management issues in the Great Barrier Reef Marine Park • <i>Drupella</i> snails: million of small coral-eating have devastated around 100km of Ningaloo fringing reef (Western Australia)
Unsustainable use of marine and coastal resources	<ul style="list-style-type: none"> • of the 17 major managed fisheries in Australia, about 13 are considered either fully exploited or overexploited, sometimes to a 'dangerous' level. The level of exploitation of the remaining fisheries is unknown and uncertain • serious overfishing of southern bluefin tuna, southern sharks, gemfish, rock lobsters and other species has occurred, leading to declines in some commercial fisheries, particularly southern bluefin tuna, southern sharks, gemfish. There are now serious concerns that the high catches of the long-lived, deep sea orange roughly cannot be sustained • inappropriate fisheries practice: trawling and scallop dredging on sea floor communities • major concerns are possible overhunting of dugongs and whales

Sources of data: Zann 1995; RAC 1992a; RAC 1993a; RAC 1993b

Appendix 5 Major Findings and Recommendations from Various Commonwealth Inquiries on the Coastal Zone

Major Limitations in Existing CZM	1980	1991	1993
Limited role of the Commonwealth	*	*	*
Conflict among users due to the multitude activities conducted in the coastal zone	*	*	*
Existing coastal zone management is fragmented and poorly co-ordinated and does not provide for long term management of the coastal zone	*	*	*
The plethora of legislation and regulation		*	*
Major management difficulties arising from the accumulated impact of numerous uncoordinated development decisions (tyranny of small decisions)		*	*
Lack of national policy with clearly stated goals and strategic integrated planning	*	*	
Lack of integration between all levels of government and within these governments and between social, economic and environmental goals in the policy, and lack of instruments for integration		*	*
Lack of information for decision making and long term research and monitoring	*	*	*
Lack of action in response to the earlier inquiries			
Dominance of short-term management over long range planning	*	*	*
Problems in coastal zone management at state level:		*	*
<ul style="list-style-type: none"> • States lack resources to undertake coastal zone management (comprehensive research and preparation of management plans) • the plethora of State agencies and programs, often with competing and conflicting objectives and priorities, are involved in the coastal zone. • There is an absence of focus, common purpose, vision or even coordination, as State Departments often pursue narrowly defined, agency specific goals at the expense of a broader view. 18 • Poor coordination between state government agencies has led to conflicting advice being given to local government about coastal matters. • State arrangements also tend to be focused on the terrestrial environment and there appears to be inadequate integration of the terrestrial and marine components of management regimes. • State activities are constrained by an inadequate policy base and inadequate processes for the evaluation of particular developments and their cumulative impact in a regional planning framework. 			
Major Recommendations			
Develop national coastal zone management strategy incorporating agreed national objectives, goals, priorities, implementation and funding programmes and performance criteria	*	*	*
Develop integrated coastal zone management		*	*
Increase role of the Commonwealth	*	*	*
Commonwealth should provide financial assistance for states and territories to conduct activities for coastal zone management	*	*	*
State and local government should develop regional coastal plans		*	*
Encourage public participation at the local level		*	*
Develop intergovernmental agreement	*	*	*
Enact a coastal zone management legislation		*	*
Improved research and education	*	*	*
Focus research on specific issues		*	*
Establish new national institution for improved co-ordination at all levels of government as well as interdisciplinary co-ordination			
Establish Australian Coastal Management Council	*		
Establish Environment Protection Agency		*	
Establish National Coastal Management Agency			*
Integrate local government		*	*
Improve regional and local management #			*
Develop approval systems and EIA			*
Increase the use of economic and financial instruments			*
Surveillance and quarantine			*
Involve indigenous matters in coastal zone management			*

Sources of data: Australia 1980; Australia 1991; RAC 1993a

The dissenting view of Special Commissioner Bob Graham of the RAC Inquiry Committee who disagreed with the emphasis on a national approach taken by the other commissioners and advocates an approach which focuses on managing the way in which people use resources in order to modify behaviour so as to achieve broadly agreed goals through the use of appropriate management tools. Graham supported building on existing community involvement and strengthening and supporting local government in day-to-day coastal activities. Although an alternative report in one sense Graham's report can be seen as complementing much of the material in the majority report (Haward 1996).

Appendix 6 Key Australian Legislation and the Two Intergovernmental Agreements Relevant to the Management of the Coastal and Marine Environments

Key legislation	Summary
The Seas and Submerged Lands Act 1973	<ul style="list-style-type: none"> • introduced by the Whitlam government • declared Commonwealth sovereignty and jurisdiction from land water mark • had a fundamental impact on offshore federalism • in part purported to implement the Convention on the Continental Shelf • provoked legal challenges from all the states and opened the way for following constitutional challenge at the High Court of Australia • the Seas and Submerged Lands Case of 1975 (the High Court Decision in upholding the 1973 Seas and Submerged Lands Act) confirmed the Commonwealth sovereign rights over the territorial sea and continental shelf • adopted an expanded interpretation of the Commonwealth external affairs power under the Constitution, with the result that the Commonwealth now poses extensive powers over Australian offshore. Therefore, this can be seen as the "high tide" of Commonwealth offshore jurisdiction
Maritime Legislation Amendment Act 1994	<ul style="list-style-type: none"> • entered into force on 1 August 1994 • sought to amend various pieces of Commonwealth legislation so as to ensure that Australian law dealing with its offshore territories incorporates the major features of LOSC into Australia domestic law with the LOSC coming into force globally • introduced for the first time into Australia law the concept of a contiguous zone and EEZ; provided a definition of and indicated the limits to the contiguous zone, outlined Australia's rights and control over the zone, and made allowance for the preparation of appropriate charts • provided that the AFZ is now to be defined consistently with the EEZ and reflected amendments to various other pieces of Commonwealth legislation which previously dealt with the AFZ (the most substantial amendment occurred to the Fisheries Management Act 1952 and up until these recent changes provided the legislative regime to support the AFZ)
Offshore Constitutional Settlement 1979	<ul style="list-style-type: none"> • first proposed in 1977 by the Fraser Government (1975-83), agreed in 1979, enshrined in legislation in 1980, implemented on 14/2/1983 • multilateral agreement that included packages, called Offshore Australia, establishing a "co-operative federalism" in offshore energy resources (oil and gas); other seabed minerals; fisheries, inshore and offshore; ship-sourced marine pollution; ocean dumping; the Great Barrier Reef Marine Park; other marine protected areas; historic shipwrecks; and crimes at sea • legislative anchors: the Coastal Waters (State Powers Act) 1980, extending State jurisdiction offshore to the 3 nm boundary; and the Coastal Waters (State Titles) Act 1980, returning legal ownership to the seabed from land water mark to 3 nautical miles to the States. The legislative design of the OCS overcomes some of the problems of fragmentation by enabling the establishment of co-operative intergovernmental arrangements. It must be recognised, however, that the OCS arrangements reinforce a sectoral, rather than an integrated, basis to marine resource management which limits its effectiveness as a vehicle for promoting an integrated policy (Haward 1996) • emphasised the important roles in the management of the marine environment of both Commonwealth and States governments (State governments as important actors, Commonwealth has the powers to ratify international conventions which have had great influence in shaping the domestic political order) • returned jurisdiction from low water mark to 3 nautical miles baseline to the states • allowed considerable flexibility in the management of the marine environment • allowed joint Commonwealth-State government, which facilitates marine environmental protection, to take place where appropriate • involved amendment to existing Commonwealth legislation governing fisheries

and oil and gas to ensure that the agreed arrangements were not invalidated (an addition to the framework established by the OCS: the Sea Installations Act 1987 which governs tourist accommodation at sea)

- provided a range of legislative and institutional arrangements which recognise the intergovernmental dimension in management of the marine environment
 - a very useful model for federal states struggling to reach a compromise over the offshore territories and for resolving the contentious issue of jurisdiction, concluded 2 decades of intense negotiation over jurisdiction in the territorial sea
 - has been the most ambitious and significant intergovernmental framework for Australian marine policy, a useful start to oceans governance from 1980 onwards
 - limitations: does not include specific references to coastal zone management; is less successful in achieving a settlement of intergovernmental tensions between the Commonwealth and the states over marine resources policy; does not prevent bickering between the Commonwealth and states about both inshore and offshore fisheries, energy exploration rights, oil and gas royalties and a variety of conservation and development project proposals. While the OCS has been a success, there remain some areas of difficulty where conflict of law and policy can arise. This certainly exists in the case of coastal management
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Intergovernmental Agreement on the Environment 1992

- negotiated in 1990 and entered into force in May 1992
 - attempted to end 20 years of acrimonious debate between the Commonwealth and states about resource management issues
 - pursued the effective integration of economic and environmental considerations in decision making processes, in order to improve community well-being and to benefit future generations, and pursued the principles of ESD
 - primary aims: to provide a mechanism for: a co-operative national approach to the environment; a better definition of the roles of the respective governments; a reduction in the number of disputes between the Commonwealth and the states and territories on environmental issues; greater certainty of government and business decision making; and better environmental protection, the avoidance of duplication of effort; making the total costs and benefits of policy choices more explicit; and trying to foster community involvement in environmental issues
 - an improved mechanism for resolving conflict and improving co-operation in marine management
 - a major watershed in Commonwealth-state relations over the environment, offered a new way forward in Commonwealth-state relations
 - moved fisheries to stock based rather than jurisdictional based management, therefore States can manage fisheries to the borders of AFZ
 - provided for joint management of marine parks which transcend the 3nm boundary as does the Ningaloo Reef Marine Park in Western Australia
 - land use planning in the littoral zone has been made the responsibility of local government, subject to state government regulation and Commonwealth guidelines while responsibility for fisheries management is shared between the Commonwealth and state government
 - may provide an alternative mechanism to facilitate the development of ICZM
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Sources of data: Bates 1995; Bergin 1992; Rothwell and Haward 1996; Evans 1996; Davis 1985; Haward 1989; Haward 1993; Davis 1995

Appendix 7 Tasmanian Coastal and Marine Environments

(a) Major Characteristics of the Tasmanian Coastal and Marine Environments

(Population (people))	(450,000)
Length of coastline (km)	about 4900km (not including Macquarie Island)
Terrestrial area (km ²)	64 086
Maritime area (million km ²)	
Tasmanian Fishing Zone (million km ²)	
External territories	Macquaries inland is situated at 54.38' south, 158.53' east in the Southern Ocean.
Seas	The coastline is bounded by the Southern Ocean on the south and west and the Tasman Sea on the east, while the approximately 240 kilometres-wide Bass Strait separates the island from the Australian mainland.
Islands (3963 km ²)	Badger (12km ²), Bruny (355), Cape Barren (462), Clarke (82), Flinders (1341), Hunter (71), King (1094), Macquarie (123), Maria (101), Prime Seal (12), Robbins (99), Schouten (28), Three Hummock (70), Vansittart (8), Other islands (105)
Biogeographical representation	sub-tropical, temperate, subpolar, polar
Latitudinal variation	The Tasmanian mainland extends from latitude 40.38' south to 43.39' south, and from longitude 144.36' east to 148.23' east.
Major features of the coastal zone	headlands interspersed with sand beaches and lagoons in north-east; cliffed coasts, sheltered bays and drowned river valleys in south-east; cliffed coasts and sand beaches in south; sand beaches, headlands, river estuaries and harbours in west; and open coast and river estuaries with numerous islands in the north
Major habitats	subtidal aquatic beds (kelp beds, seagrass meadows), rocky marine shores, all types of beaches, estuarine waters, intertidal mud, sand or salt flats, intertidal marshes, brackish to saline lagoons, and freshwater lagoons and marshes in the coastal zone
Four main biogeographical marine provinces	<p>The Maugean province: the cool waters of the Maugean province occur along the southeastern coast of mainland Australia and around Tasmania, with its core located along the east coast of Tasmania. This province is one of the world's smallest marine provinces holding some species with very restricted distribution. One organism, the sea star (<i>Patiriella vivipara</i>), for example, has been recorded at only three locations comprising a total area of no more than three hectares.</p> <p>The Flindersian province is centred in eastern South Australia and extends through western Victoria to Tasmania in Bass Strait.</p> <p>The Peronian province: the temperate waters of the Peronian province extends from the east coast of mainland Australia south to the Bass Strait islands and the Tasmanian east coast.</p> <p>The Insulantarctic province is represented by waters around subantarctic islands such as Macquarie Island</p>
Species of high conservation value	delicate basket stars and sea dragons, kelp forests, seagrass beds, sponge gardens, rarely seen endemic handfish, crustaceans, plankton, fairy penguins, great white sharks and migrating whales
Eight marine species are completely protected under the Fisheries Act 1959	elephant snail, handfish, limpets, pipehorse, sea dragon, seahorse, pipefish and threefin blenny
Marine protected areas: numbers, area	The 19 maritime reserves declared in Tasmania cover

(km ²)	2692 km ² (approximately 0.13% of the total area declared in Australia). Identified using the new strategy, four new marine reserves covering 2205ha have been declared since 1991: Maria Island, Governor Island, Tinderbox and Ninepin Point. potential marine reserves
Coastal reserve	6544 ha
Species of high economic value	abalone, rock lobster, orange roughy, shark and jack mackerel.

(b) Tasmanian Coastal and Marine Industries

Oil and gas production	<ul style="list-style-type: none"> • largest marine industry, of great economic and strategic importance • petroleum production 1986-87: A\$5.1 billion, 1990-91: A\$7.672 billion • current production of oil: over 3.5 million barrels of oil; over 1,100 wells drilled offshore and around 2,800 million barrels of oil extracted
Quarrying for building and construction materials	<ul style="list-style-type: none"> • In 1989-90 mineral commodities provided some 40% of Tasmanian total foreign export earnings. Extracted or mined minerals makes a further significant contribution to the State's economy by accounting for 21% of turnover in the manufacturing sector • Value of mining and mineral processing sectors: 1992-93: A\$ 1 024 740; 1993-94: A\$ 1 055 584 • Mineral exploration and development in 1993-94: Tasmanian expenditure A\$ 10.2 million, Tasmanian as per cent of Australian expenditure: 1.29 • Value of the mining industry in Tasmania: 1992-93: 38 488, 1993-94: 32 406
Commercial fisheries and aquaculture	<ul style="list-style-type: none"> • Total wild fisheries: 1992-93: A\$99.1 million; 1993-94: A\$ 122.1 million; Total aquaculture: 1992-93: A\$ 65.7 million, 1993-94: A\$ 74.8 million • The fishing industries has been and continues to be an important resource based, export oriented Tasmanian industry with an estimated gross value of \$142.1 million (1989-90). This value includes total landings from catch fisheries and aquaculture production, Export earnings from sea fisheries contributed about 6% of total export earnings; and fishing and hunting provided 0.8% of Tasmanian employment (0.2% for Australia as a whole). Landings of fish, molluscs and crustaceans were estimated at \$104.3 million. Aquaculture was estimated at \$20.5 million for Atlantic salmon, \$8.3 million for trout, and \$9million for Pacific oysters. The aquaculture sect important growth sector of the fishing industry • Tasmania contributes 12% of Australia's total fish production, with the local fishery increasing from a landed value of \$19.6 million in 1981/82 to \$216 million in 1994/95; of which 51% came from marine farming • At \$110 million in 1994/95 the 'farm gate' value of aquaculture produce represented 51% of Tasmanian total seafood production. There are 142 marine farms operating throughout Tasmania and many are licensed to grow several species • a number of high value export fisheries (abalone, rock lobster, prawns) • Seafood exports in 1993-94: total fish: 3 816 tonnes, A\$ 51.265 million; total shellfish: 1255 tonnes, A\$ 85.509 million • Australia's fish catches: 200,000 tonnes annually, commercial fishing fleet: 10,000 vessels, 200 different species of fish, 60 species of crustaceans, 30 species of molluscs are fished • fisheries: 1973-75: A\$100 million, 1975-76: A\$147 million, 1990-91: A\$1,000 million; 1993-94: A\$ 1610 million • aquaculture: 1985: A\$50 million, 1987-88: A\$105 million, 1989-90: A\$220 million, 1991-92: A\$260 million; 60 aquatic species, from seaweeds to crocodiles, are farmed
Tourism and recreation	<ul style="list-style-type: none"> • significant contribution to the national economy • The coast is one of Tasmanian most important tourist and recreation resources. Tourism generated direct employment for around 5% of the workforce and contributed 3.4% to GSP in 1989-90. Interstate and overseas visitors accounted for 2/3 of this contribution with the balance attributable to Tasmanian residents traveling within the State • has been growing very fast in recent years • marine ecotourism: whale watching in Whitsunday Island (Queensland) to Albany

(Western Australia), dolphins of Monkey Mia (Western Australia), whale sharks at Ningaloo Reef (Western Australia), great white sharks at Port Lincoln (South Australia)

- 5.2% GDP (surpassed wool industry, the traditional export commodity earner as the nation's premier export carrier). A\$16.3 billion (domestic), A\$6.5 billion (international), 5.8% workforce; 1991: 2.3 million international tourists, 49 million trips as domestic tourists
- recreational value for Australians and international tourists (over 4.5 million Australians went fishing at least once a year and over 800,000 of these went fishing at least 20 times a year; spending on fishing and related activities was at \$2.2 billion each year; in 1993 over 120 000 international tourists spent \$210 million on fishing while in Australia)
- Tourism generated direct employment for around 5% of the workforce and contributed 3.4% to GSP in 1989-90. Interstate and overseas visitors accounted for 2/3 of this contribution with the balance attributable to Tasmanian residents travelling within the State. Visitors will generally visit the coast, staying in coastal settlements such as Bicheno, St. Helens, Stanley or Strahan. Wilderness tours such as the Gordon River cruise or a flight into Cox Bight to start the South west Coast walking track are based on coastal locations.
- During 1994, some 873, 310 passengers (including Tasmanians returning home to the State) arrived in Tasmania, an increase of 7.8% since 1993 and a 28.4% increase in 1990. Sea travel is becoming more popular, with passengers numbers increasing from 1993 by 11.5% to 128,644 in 1994. Since 1990 marginal increases in the level of close-to-nature outdoor activities have occurred. Trout angling; canoeing, boating and sailing; and caving and visiting show caves all showed growth with visitor numbers increasing in 1994 by an average of 5.3% on 1993. During 1994, visitors spent nearly A\$ 420 million in Tasmania, an increase of 15.2% (A\$ 55.5 million) on 1993.
- A recent report published by the Centre for Regional Economic Analysis (CREA), *The Contribution of Tourism to the Tasmanian Economy in 1992*, estimates 17,290 jobs resulted from tourist activities in Tasmania in 1992
- Recreation in the CZ makes use of the natural resources near the shore, both on land and in the water.. Shacks or holiday homes are popular recreation retreats around the coast. In some areas their uncontrolled development and spread has had severe environmental and aesthetic impacts on the coast
- The most popular activities were walking, fishing and swimming with participation rates of 32.9%, 14.6% and 12.2% respectively
- A 1994 ABS sport and recreation survey found that fishing was the second only to walking as the most popular physical activity of Tasmanians. An estimated 30,900 people regularly fished during the 12 months to October 1994. Some 80% of these (24,800 people) were males. Most recreational fishers fished frequently, with 81% fishing at least once a month The DPIF has estimated that, in 1983 over 80% of fishers fished in salt water.
- Recreational fishing is also popular among visitors to Tasmania. In 1992 about 7% of all visitors (27,500 visitors) fished during their trip to Tasmania, with 4% of all visitors (16,000) fishing in salt water.
- In the 12 months to April 1992 an estimated 24% of Tasmanian households (40,600) had members who caught seafood. This compared with the Australian average of 18%. Those in Tasmanian households caught 1,191 tonnes of fish, compared with an estimated commercial catch of 37,510 tonnes for the year ended June 1992
- Important marine recreational fisheries in Tasmania include crayfish, scallops, abalone, game fish and a range of scale fish, squid and octopus.
- Recreational fishing catch, year ended April 1992 (tonnes) Tasmania 1 191.1, Australia 30 943.2

Marine transport

- In 1991/92, 5.92 million tonnes of materials and goods were shipped into Tasmania; exports by sea totaled 5.87 million tonnes. Of these goods, foreign exports were worth \$1439 million and imports from overseas were worth \$287 million (Australian Bureau of Statistics 1994). The majority of this trade is conducted by sea, with about 1600 trading vessels using the four main ports of Hobart, Launceston, Devonport, and Burnie. In addition to the many ships from
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interstate and overseas using Tasmanian coastal waters, there were also 1193 Tasmanian commercial vessels registered in the State in 1994/95. Of these, 792 were fishing vessels, 187 trading vessels, 35 combined fishing and trading, 29 lighters, and 659 hire/dive vessels.

- Ferries
- Bass Strait services: in the 12 months ended June 1994, the Abel Tasman and the Spirit of Tasmania carried 229,705 passengers, 63,637 vehicles and 19,122 Total Equivalent Units (TEU) of freight; Bruny Island service (p. 265)
- Tasmania has a number of ports capable of accommodating overseas vessels; they are situated on the Derwent River and Huon Rivers in the south (Hobart and Port Huon); in Spring Bay on the east coast; on the Tamar River in the north (Inspection Head, Long Reach and Bell Bay); on the Mersey River (Devonport), in Emu Bay (Burnie) and at Port Latta, all in the north west.
- Tasmanian seaport trade (major ports: Hobart, Launceston, Devonport, Burnie) 1993-94 (revenue tonnes): inwards: 6 560 493; outwards: 8 853 740 ; total 15 414 233
- main ports, the fifth largest user of shipping in the world. Each year there are around 12,000 overseas shipping arrivals and almost 380 million tonnes of freight carried in Australian waters
- Australia's trading fleet comprised 50 coastal and 27 overseas vessels over 2,000 dead-weight tonnes

Sources of data: SDAC 1996a; DELM 1991; Rees 1993

Appendix 8 Objectives of the Resource Management and Planning System and of the State Coastal Policy

- (a) to promote the sustainable development of natural and physical resources and the maintenance of ecological processes and genetic diversity;
- (b) to provide for the fair, orderly and sustainable use and development of air, land and water;
- (c) to encourage public involvement in resource management and planning;
- (d) to facilitate economic development in accordance with the objectives set out in paragraphs (a), (b), and (c) ; and
- (e) to promote the sharing of responsibility for resource management and planning between the different spheres of Government, the community and industry in the State.

Sources of data: DELM 1996b; Tasmania 1996a

Appendix 9 Summary of the Draft Implementation Strategy for State Coastal Policy

Main aspects	Summary
A Framework for Implementation	<ul style="list-style-type: none"> • based on a whole of government approach • RMPS as the primary framework for policy implementation • overseen and assisted by a new, non-statutory body, the State Coastal Advisory Committee • implemented at local and state governments as well as community level • State of the Environment Report provides an important monitoring and evaluation function for the whole system and will assist in assessing the implementation of the Coastal Policy
Implementation priorities	<ul style="list-style-type: none"> • support the recommendations of the LUPRP and planning authorities to remove all inconsistencies between State Coastal Policy and a planning scheme by amending planning schemes where necessary • assist implementation of the State Policy at State government and community level, focus on awareness raising/education/training, provision of information and data to decision makers, and better mechanisms for managing coastal areas owned by the State • develop non-statutory mechanisms suitable for implementing the Coastal Policy, such as guidelines for various types of coastal use and development, codes of practice, co-operative working arrangements between departments or spheres of government and the like
Implementation through the CAP	<ul style="list-style-type: none"> • the components of the CAP relevant to the implementation of the State Coastal Policy are listed below: <ol style="list-style-type: none"> 1. Coastcare Community Grants Program 2. Short coastal management training course 3. National Code of Practice of Coastal Planning 4. Other National Codes of Practice in preparation (tourism, recreational fishing, aquaculture) 5. Other components of the CAP related to Natural Heritage Trust (e.g. Strategic Coastal Planning Program)
Staged Implementation Process	<ul style="list-style-type: none"> • Priorities of the three year implementation program of the State Coastal Policy are addressed
DELM's responsibilities in implementing the State Coastal Policy	<ul style="list-style-type: none"> • The Coastal and Marine Program will provide the secretariat for the new State Coastal Advisory Committee which is to be established after the adoption of the Policy. It is within this Program that any new tools required for implementation of the Policy will be co-ordinated and/or developed • DELM will be responsible for developing implementation tools and mechanisms which assist coastal managers and decision makers in all spheres of government and the community in meeting their responsibilities under the State Coastal Policy • DELM can only provide guidance and advice on possible approaches to implementing and interpreting the State Coastal Policy. Over time, decisions made under the Resource Management and Planning System by bodies such as the Resource Management and Planning Appeal Tribunal will provide more concrete interpretations of the Policy
DELM's Staff Resources for Coastal Policy Implementation	<ul style="list-style-type: none"> • At present the Coastal and Marine Program in DELM has 1.76 full time employees providing services to state, federal and local government and the community. Responsibilities of the Program include day-to-day advice to the Secretary and Minister on coastal matters, ministerial correspondence, State Coastal Policy support, secretariat functions for the CAP, co-ordination and administration of the national Coastcare Program and the provision of advice on coastal management to other agencies as well as membership of a number of government and intergovernmental committees and working groups

Source: DELM 1997a

(a) Who is primarily responsible for these programs/strategies/plans?

(b) Have these programs/strategies/plans been implemented?

(c) What are the achievements and limitations of their implementation?

8) Has the Council responded to the Commonwealth initiatives in environmental management at the local level, such as ILAP? If so, have any coastal management initiatives been taken as a result?

9) Has the Council undertaken any initiatives to implement the State Coastal Policy? If yes, please give some details.

10) Has the Council undertaken any initiatives to implement the Coastal and Marine Program developed by DELM? If yes, please give some details.

11) What is the role and responsibility of your Council in the Marine Farming Planning Process?

12)What is the involvement/participation of the public in coastal zone management projects in your Council?

13)Are there active Coastcare groups in your Municipality? Please name any and briefly indicate their achievements.

14)What do you see as your Council's major problems in coastal zone management?

15)Has the Council prepared a Local Agenda 21 plan?

Thank you for your time.