

PN-AMM-500
ISN = 27790

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March 1979

Coastal Area Management:
Approaches, Problems and Guidelines

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Department of International Economic and Social Affairs
United Nations Secretariat
New York, New York. 10017

79-41771

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Ethiopia
Ecuador *
El Savador *
Finland
German Democratic Republic
Guatemala *
Italy *
• Republic of Korea
Mauritius
New Zealand
Panama *
✧ Philippines
Singapore
Spain *
✧ Sri Lanka
✧ Togo

* Information on these countries has not yet been included in the manuscript.

Preface

This study consists of three Parts. The first Part contains a survey of legislative measures in forty nations, promulgated either specifically for the purpose of coastal area management, or for general purposes that are nonetheless relevant to certain important coastal activities. The results, findings of the survey are arranged under the headings of planning, conservation and preservation, natural resources utilization, and marine environment. Information used in this Part is based on communications received from the respective governments and from materials supplied by consultants for the following countries: Kenya and Tanzania (Mr. G. Munoru); India, Pakistan and Sri Lanka (Mr. J. D. M. Derrett); Argentina, Brazil, Ecuador, Mexico, Peru and Venezuela (Ms. B. M. Carl); Bulgaria, German Democratic Republic, Poland, Romania and the Soviet Union (Messrs. R. Bierzanek and I. Bulska, and Ms. B. Czchowska). The valuable contributions made by these consultants are hereby acknowledged.

On the basis of an analysis of the survey results, a number of specific needs are identified in Part II. Many government agencies seem concerned mainly with fostering industrial or economic development and, thus, they may be expected to evidence greater concern with developmental goals than with other competing factors or values. It was found useful to include some general legislative and policy guidelines for managing the coastal area. They are set out in Chapter V, Part Two of this study. These guidelines stress that development should not disregard environmental considerations and that both factors should be considered together to attain sound resource management.

Two specific issues seem to deserve special attention in the context of coastal management: the establishment of criteria for selecting appropriate locations for industries and the control of oil pollution in the coastal area. Experience shows that proper siting of industrial facilities can often ensure better development, avoid costly alteration and reduce adverse effects on other attributes (e.g. scenic, water quality or conservation of wetland). Thus far not enough attention seems to have been given to the interactions which may exist. Oil pollution, the second issue, may constitute a major threat to coastal amenities and utilization of other resources, and must be effectively controlled. Some basic guidelines for the purpose of regulation are thus provided for in Chapters VI and VII.

The Third Part contains summaries of critical issues in different countries. The information is based on communications received from the respective Governments.

Coastal area management is still a new subject. It is not possible in the present study to provide a comprehensive treatment. Rather, this study endeavours, in a very limited way, to provide a range of examples of the kind of legislative and policy approaches that have been taken in different countries. Its basic purpose is to disseminate this information and to stimulate further interest in this new but important field.

Introduction: Coastal areas: Focal points for managing land and ocean resources.

The coastal area is that part of the land, sea and air meet and where they interact with each other, influencing the whole environment. Biologically rich and aesthetically pleasing, this area contains the vast majority of population, possesses some of the highest-grade agricultural land, accounts for the lion's share of the tourist trade, and is the growth pole of the expanding economic activity. The coastal area is therefore the ideal focal point for managing the uses of and interactions in not only that part of the land near the sea, but also the water and marine resources offshore.

Moreover, the seaward expansion of the resource jurisdiction of coastal states seems to have become a major trend. In the last few years, more than 80 states have claimed some form of marine/resource jurisdiction (generally a 200 nautical miles zone adjacent to their landmass). These zones, taken as a whole, contain a significant part of the sea's living and mineral resources. It is estimated that over 90 per cent of the total volume of the world commercial fish catch is taken from coastal and nearshore areas. These areas also include practically all known and presently exploitable mineral resources, and all of the world's proven reserves of offshore hydrocarbons and most of those having potential economic value in the next decade.^{1/}

The extension of resource jurisdictions over the ocean will necessitate the adoption of many different measures. Some coastal states will need to prepare maps for their territorial seas, economic zones and continental shelf, and to determine boundaries with their neighbours. This will not be an easy task. Information indicates that, as of today, many coastal states parties to the 1958 Geneva Conventions have not yet even delimited mutual territorial sea boundaries. Offshore boundary agreements only exist in the North Sea, the Persian Gulf, and the waters adjacent to Indonesia.^{2/} Delimitations pertaining to the continental shelf are

^{1/} "Economic significance in terms of sea-bed mineral resources of the various limits proposed for national jurisdiction", report of the Secretary-General, A/AC.138/87, 4 June 1974, pp. 37-38.

^{2/} UN Legislative Series on National Legislation and Treaties Relating to the Territorial Sea, the Contiguous Zone, the Continental Shelf, the High Seas and the Fishing and Conservation of the Living Resources of the Sea. United Nations Publications 1974.

almost nonexistent, since they are generally further seaward. While the absence of boundary agreements might have been the result of some political difficulties, the technical complexities involved must not be underestimated. Now that the new limits are even further seaward and the areas included are far larger than before, the tasks become correspondingly more difficult.

Coastal states may wish to conduct various activities in the ocean area, e.g. to erect installations for the production of energy from the water, current and winds in the zone, provided that they will not interfere with the use of recognized sea lanes essential to international navigation. A coastal state may therefore need to prepare laws and regulations in respect of maritime traffic, navigational aids, cables and pipelines, artificial islands, prevention of pollution, scientific research and customs, and immigration, which are issues associated with the exercise of jurisdiction over the extended resource area. Where necessary, sea lanes and traffic separation schemes may also be needed for regulating in particular the passage of oil tankers, and ships carrying dangerous substances. While these laws and regulations may already exist in some countries, they must be re-examined in the light of the extended jurisdictions, particularly from the point of view of their enforcement. In other countries, they must be established.

Resource management is probably the most important concern. With regard to living resources, a coastal state will need to determine, for example, the total allowable catch without depleting the stocks and its capacity to harvest, if foreign fishing vessels are to be allowed to share part of the resources. This affords the opportunity for the rationalization of fishing effort, so as to enable fishing to proceed at the level of the maximum sustainable yield. It may be possible to achieve the same catch level with a reduced fishing effort: it is, for example, estimated that the same or a higher catch could be obtained from the North Sea using half the vessels at present employed in fishing there.^{1/} Some coastal states will need to deal

^{1/} A.V. Lowe, "The New Law of the Sea Opportunities for Ocean Industries", Ocean Management, Vol. 4, 1979, Cf. p. 152.

with such matters as licensing, fishing vessels and equipment; species and quota which may be caught, seasons and areas of fishing, type, size and fishing gear that may be used, training of personnel, transfer of technology, enforcement procedures, and conservation of living resources.

As for mineral resources, even greater technical difficulties may be envisaged. Being a new field, exploitation can be a very costly undertaking. Some of the basic problems relate to the identification and assessment of resources, the accessibility of exploration data, methods of exploitation, and problems of the environmental impact of exploitation and beneficiation. Each of these items will require scientific studies and investigations and adoption of a wide spectrum of measures. The emerging new law of the sea is likely to resolve the doubts which formerly existed concerning the extent of coastal states' rights over the mineral resources of the continental shelf. Thus, for example, petroleum and gas in the outer portions of the margin, at depth of 600-10,000 feet, which may soon be commercially exploitable, would be clearly recognized as belonging to the coastal states. Licenses granted by such states, and investment and operation under them, would be secured.

Quite clearly, it is of paramount importance that each coastal state establish some kind of marine resource policy and management programme. The objectives of such a management programme would be to provide a system which would lead to proper planning and permit conscious and informed choices among development alternatives so as to maintain a balance between the sound utilization of resources and enjoyment of amenities. In view of the close interrelationship between the sea and land, this study advocates the need for an integrated management concept using the coastal area as the focal point for managing land and ocean resources.

Despite the obvious importance of the coastal area, particularly with the extension of resource jurisdictions, very few countries have introduced comprehensive management programmes^{1/} for the development and utilization of coastal resources. The coastal areas in most countries are not considered

^{1/} See Chapter I.

as a separate entity for purpose of planning or development. They remain, on the whole, under the laws governing land use, town and country planning or, in some cases, economic or fisheries zones. There exist, however, specific laws or regulations dealing with such subjects as fisheries, oil exploitation, waste disposal, zoning, tourism, pollution or coastal protection.^{1/}

In those countries where some form of resource planning or management exists, such planning or management is usually with reference to a narrow strip along the shoreline and coastal waters. This is the case, for example, in Cyprus (within 50 metres of the high water marks), Mauritius (from the coral reef to the shoreline of high water marks within one kilometre), Sri Lanka (the strip lying between a distance of three metres landwards and two kilometres seawards from the mean sea level) and Togo (from the high tide within the landwards area of 100 metres).^{2/}

As will be seen, most of the applicable laws for coastal related activities are single-purpose/^{and} development oriented. Seldom do they entail consideration of other geological or environmental factors which are equally important for a development decision. Even fewer laws clearly identify these factors. Given the special characteristics of coastal areas, it seems that a broader spectrum of elements should be taken into account in making a development decision. There is a need to identify those elements so as to ensure a rational decision-making processes, to avoid costly alteration at a later stage, and to reduce possible adverse effects which may prove to be irreparable.^{3/}

The original concept of "coastal area management" was first introduced in 1972 in the United States for dealing with a comparatively narrow strip of shore and waters. There were two basic concerns. The first was an environmental concern over the unique position of the coastal area which is

^{1/} See Chapters II to IV.

^{2/} See Chapter I.

^{3/} For further elaboration, see Chapters V and VI.

specially sensitive to the adverse consequences of congested human settlement, pollution and reduction of amenities caused by urban sprawl and industrial development. There was therefore the need for better planning and regulation of diversified activities impinged on the coastal area. The second concern related to the need for wiser use of natural resources, which was generated from the growing recognition of the importance of offshore minerals and living resources in the sea.

In recent years, there has been an increasing interest in coastal area management. Different types of legislation have now been introduced in various countries to deal with their perceived needs. As a result, the concept of coastal area management as a whole has been considerably broadened both in terms of substance and scope of application. Some legislative measures are designed for planning purposes e.g. regulations on zoning and siting of different activities and industries. Some are designed for resource utilization (e.g. minerals exploitation or tourism). Others have as their goals conservation, preservation or protection in coastal areas. Laws to establish nature reserves or sanctuaries, or to prevent oil pollution are examples of this type. Still others are designed to meet institutional needs; they either require better coordination among existing administrative units or establish a central coordinating unit to ensure consistent implementation of decisions by all agencies concerned.

It would appear that countries which are either in the process of preparing their legislation or are unaware of the need for/ coastal area management would be interested in having information on: the kind of problems existing in other countries; how those countries approached their problems; what solutions have been found; and how legislation is used to achieve the

objectives. Moreover, because coastal area management is a new discipline, existing literature is not only very limited but deals mostly with national or local concerns. There is therefore a need at the international level for collecting and disseminating information on the relevant legislative and policy measures taken in different countries. It is in recognition of this particular need that the present study was prepared.

In order to take into account all relevant legislative measures and national approaches, this study uses the term "management" to embrace a broad spectrum of concerns and interests, including planning, resource utilization, conservation, preservation, and administrative needs. For the same reason, a broad definition of the term "coastal area" is employed: i.e. seaward limit to coincide with the extended resource jurisdiction, and the landward boundary to include not only the narrow strip of the shore, the inter-tidal areas, salt marshes, wetlands, lagoons or river estuaries, but also the adjacent areas where the impact of a given activity may be felt or where the cause for concern originates. Under such a broad concept of coastal area management, the scope of activities which could be termed "coastal" and the coverage of laws described by the word "legislative" are inevitably voluminous. In order to keep this study within manageable size, a selection has been made on the basis of comparative importance, relevance and representativeness.

It should be noted here that certain basic issues in coastal management area are commonly shared among developing countries. Firstly, contrary to the role played by private enterprises in developed countries, the governments of developing countries play a central role in practically all important development activities through governmental agencies. These agencies

are staffed politically by the leaders who spearhead the development. Hence, coastal activities, whether exploitation or conservation of resources, have to be channeled through government circles. Even within the government, the central or state government can always overrule the organs of local government and give directives to these organs, whether municipal or commercial, as to how each is to use their powers. This result tend sometimes to stifle initiative and increase dependence upon the higher authority.

Secondly, many countries in Europe and North America seem to favour the co-operation of public and private agencies on a scale not hitherto envisaged. Local authorities in these countries have been given a new range of powers with financial support. Much emphasis is now laid on the importance of public participation and it is now accepted that members of the public have a right to be consulted about, and to take part in, the formulation of local planning policies. The habit of setting up public enquiries or commissions to consider controversial matters of public concern has yet to take root in developing countries.

But on the other hand, if the governments of the developing nations wish to move aggressively into management of their coastal zones, it appears they already enjoy a good deal of the requisite legal authority. The governments of many of these countries own the minerals deposits and other natural resources; in others, the state has significant legal control over resources exploitation. Water is considered public property in large

areas of the hemisphere; beaches are public in many countries and private owners of ocean front property are subject to important restrictions. Construction of hotels and development of tourism is under governmental supervision in most of these nations. If proper management of the coastal zones necessitates expropriation of certain private properties, many developing nations are in a position to do so more easily and less expensively than would be the case, for example, in the United States, where private property may be taken only through complicated legal proceedings and at prohibitively high costs.^{1/}

It would appear that many of the principles of coastal management can be implemented under existing legislation and, for many countries, within the development plan structure/^{already/}established by their town and country planning acts. However, successful management in coastal areas requires also to supplement the controls available under planning legislation by using such techniques as zoning or selection of sites. For those areas which are subject to intense pressures, additional

^{the}
^{1/} Payment of fair market value of such property renders government efforts on any scale very expensive. The relevant laws in developing countries, for example, in some Latin American nations, require only "prior indemnification", leaving the issue of value open. The Mexican Constitution provides property may be taken for "public utility" and the amount of compensation to be paid will be "the tax assessed value". Tax assessed value is usually less than fair market value. The Venezuelan Constitution provides that in case of taking of land for reasons of "serious national interest", payment may be deferred for a specified time period or may be made partially in government bonds. Similar patterns exist in a number of Latin American countries.

measures may also be needed. The urgent task is to identify these areas, their needs and the inadequacy of the existing legislation.

The principal need in many developing countries is perhaps to establish a unified legal scheme pulling together various administering agencies and the fragmented laws and regulations applicable to coastal activities. The Venezuelan Council on Renewable Natural Resources and the Norwegian natural resources law may prove a useful scaffold upon which a coastal area management scheme could be built.^{1/}

Another serious issue is that many laws and statutes look like perfect models, but it would be a mistake to suppose that they are all put into effect in their entirety. When it is a question of implementation, various factors are involved. Very often, the lack of funds, equipment or personnel impedes execution. Almost by definition, developing nations suffer from the lack of a management framework and a shortage of funds, trained technicians and managers to execute programmes. These are very important issues and they must be resolved.

^{1/} See Chapter II, Section E.

PART ONE

EXAMPLES OF LEGISLATIVE MEASURES

Chapter I Coastal Area Planning

of planning legislative measures/
Two broad types/are discussed here. The first type refers to those countries which have introduced some kind of special planning legislation the/ for/coastal area, whether on a nation-wide basis, for a portion of the coast or on an issue-by-issue basis. The other type represents the majority /for the coast as such./ of countries which have not yet introduced any particular measures/ In most cases, existing town and country planning law or land use planning law remains applicable. /In the following sections, / existing situations in a number of countries have been selected to illustrate how the issues involved in coastal area management are dealt within both of the above planning contexts.

1. Special Legislative Measures

Different legislative measures have been taken by countries to meet their specific needs. The United States, for example, adopted in 1972 the Coastal Zone Management Act, the basic objective of which is to provide Federal financial assistance and incentives for its coastal states to study, develop and implement coastal management programmes. Several European countries have introduced special measures to deal with specific issues in coastal areas (e.g. tourism or use of water). Spain, Sri Lanka, the United Kingdom (for Scotland), Yugoslavia, Indonesia and Israel, on the other hand, have prepared specific plans for managing certain parts of their coasts. Brazil and Venezuela have taken special measures to deal with critical issues of industrial pollution and use of natural resources.

(1) The United States Coastal Zone Management Act is primarily environmental in outlook.^{1/} The Act deals with the process of developing a programme through the establishment of various elements which a state must examine in structuring its coastal zone management programme. These elements include the determination of permissible uses and priorities among uses, the types of manpower and programmes required, the identification of areas requiring special attention, and co-ordination among the agencies and units of government at all levels with responsibilities for and concerned with the coastal area. The Act focuses on the process and leaves substance of the management programmes for the states to define, provided that the state programmes are committed to the management of the coastal area on a co-ordinated and comprehensive basis.

The legislation was adopted on two basic assumptions: 1) it is not possible to adopt regulations at the national level for the purpose of governing the uses of each individual tract of coastal lands or waters; and 2) the existing controls exercised by the local units of government with respect to coastal areas are not adequate. The system of government in the United States is a three-tier one which divides responsibilities between the national government, state governments and thousands of local units of government (such as cities and counties). A deliberate effort is therefore made in

^{1/} For an analytical treatment of the process of programmes development on the basis of the Coastal Zone Management Act of 1972, see Armstrong, Bissell, Davenport, Goodman, Hershman et Sorensen, Coastal Zone Management: the Process of Programme Development 1974, Coastal Zone Management Institute; Coastal Zone Management in the U.S. U.N. document E/CONF.70/TP/190, January 1977, paper submitted to the U.N. Water Conference held in Argentina March 1977. R. W. Knecht, "Coastal Zone Management: A Federal Perspective, Coastal Zone Management Journal, 123 (1974). For a survey of coastal state legislation in U.S., see J. M. Robbins and M. J. Hershman, "Boundaries of the Coastal Zone: A Survey of State Law", Ibid, p. 305.

coastal management to ^{co-ordinate/} ~~the~~ relationship among the three levels of government. The Federal role is carefully restricted to encouraging the states through providing financial assistance and guidelines as to what their coastal programmes must contain in order to qualify for continued Federal funding. ^{However, /} ~~the~~ main responsibility for coastal area management is given to the state. State governments are required to work together with the local units which are in the coastal areas. At the same time, state and local officials are also required to consult closely with those Federal agencies operating in the coast in the preparation of their programmes.

State management programmes, are to be based on a comprehensive strategy to guide future decisions on what is to take place in a coastal area. While programmes naturally differ from state to state, they generally aim to strike a balance between development needs and preservation requirements. One of the Federal requirements is that states designate coastal areas of "particular concern" on the basis of their environmental sensitivity. Special regulations might be called for in such areas, and a permit for any development activity was to be considered at the state level instead of at the local level only - the latter being the normal practice. State programmes are also required to identify which areas of the coast are considered suitable for industrial or large commercial development. By declaring in advance which areas are subject to special regulations and which areas are suitable for development, both preservation and development interests are served. Disordered development is thus prevented.

The preparation of a coastal management programme may take many years, for states need to collect basic data about their coastal areas, to identify the necessary agencies under state law to carry out a programme, and to settle such main issues as the boundary of the states' coastal zones. The

Federal government usually finances up to 80 per cent of/ the cost of / the preparation of a programme. Once a state has successfully completed preparation of a programme, setting out its goals and the means it has selected of achieving them, the programme will then be submitted for approval. Once approved, the programme is qualified for full funding. Sometimes an interim implementation phase may be necessary for states which need to pass legislations to give the coastal authority sufficient legal basis to meet the requirements.

One of the difficulties in connexion with coastal programmes in the United States relates to private property development, which is a source of potential conflict in many states. While most property owners recognize the right of local governments to regulate property use, some have resisted the idea that a measure of this control be exercised at the state level. Efforts are being made to maintain a balance which would respect the rights of private owners and at the same time recognize interest of the government in regulating private property use so that environmental or social damage is not caused.

Coastal Zone Management/
Although the/Act itself has an overtone of environmental concern, recent economic situations in the United States have led to emphasis on economic development and expansion as well. The implementation has been made more realistic than it would have been otherwise. At present, all 30 coastal states and three of the four territories eligible have introduced substantive management programmes and/or legislation. These programmes and legislation are shaped in the light of their perceived needs and the

geographical characteristics of the different states.^{1/} On the Atlantic side, much attention has been focused on protecting wetlands because of their tremendous value to coastal fisheries and other estuarine life and the danger to such estuarine areas from dredging and filling projects and other coastal developments.^{2/} The Gulf coast states have concentrated on methods for the allocation of exploitation rights, and have only begun to implement protective measures as effects of over-development have begun to threaten their coastal resources.^{3/} In the Great Lakes area, shoreland management programmes have been the major concern primarily in response to pressure on their inland lakes.^{4/} On the Pacific coast,^{5/} the emphasis has been placed largely on regulating the use of beach areas. Thus, the legislation

1/ Status of State Coastal Zone Management Efforts, U.S. Department of Commerce, 1975.

2/ See, for example, Report of the Conference on Marine Resources of the Coastal Plains States, December 1977, Williamsburg, Virginia, published by Coastal Plains Center for Marine Development Services.

3/ See, for example, Comparative Aspects of Coastal Zone Management: Background Information on the Law of Texas and other States in View of the Coastal Zone Management Act of 1972, Bates College of Law, University of Houston, 1973; E. G. Fruh, Establishment of Operational Guidelines for Texas Coastal Zone Management, University of Texas, 1974. Alabama Coastal Area Program, Alabama Development Office, 1974.

4/ See Annual Report for 1976, Great Lakes Basin Commission, 1977. J.M. Armstrong, Coastal Zone Management in the Great Lakes, paper presented to the 14th Conference of the Conference for Great Lakes Research, Toronto, 1971.

5/ See, for example, Statewide Planning Goals and Guidelines, adopted by the Land Conservation and Development Commission, 1974, Oregon Land Conservation and Development Commission, 1975. Recommendations for Development Activities in Florida's Coastal Zone, 1973, State of Florida, Department of Natural Resources Coastal Coordination Council; Suggested State Objectives, Policy and Criteria for Coastal Management in Florida, Florida Bureau of Coastal Zone Planning, 1977.

adopted by the various states covers a wide spectrum of concerns.^{1/}

A detailed breakdown by states may be seen from Table I below. As to the administrative machinery, the solutions adopted vary very greatly ranging from a total administrative re-organization, creating a single state agency having comprehensive jurisdiction, to interagency groups. Again, the administrative machinery selected represents what was considered most appropriate and necessary for a given case. An examination of the existing programmes shows that five distinctive approaches may be identified:

(i) Comprehensive planning: More than 15 coastal states have completed or are undertaking major studies of their coastal resources and on methods of their effective utilization. The results of the studies have been or will be used in the sequential development of a comprehensive management plan and an administrative mechanism to implement it. The planning programmes vary in their basic premises and differ in scope and sophistication.

(ii) Functional approach: Washington and Rhode Island established a functional management mechanism, which is equipped to deal with pressing developmental problems revealed by a quick inventory or ←

^{1/} The Seventh Annual Report of the Council on Environmental Quality September 1976, p. 67-70. For a detailed analysis of these programmes and legislation, see Bradley and Armstrong, A description and analysis of coastal zone and shoreland management programmes in the United States, University of Michigan, Technical Report No. 20, March 1972. About 14 ← states wished to protect wildlife and fishery, 12 states to preserve or protect coastal eco-system, 11 states to enhance aesthetics, 9 states to protect water resources and to conserve soil resources; 12 states, have laws to regulate coastal growth and development. See Zwicky et Clark, "Environmental Project Motivation in Coastal Zone Land Use Legislation", Coastal Zone Management Journal, 1973, No. 1 pp. 103-108.

survey. The activities are guided by a general statement of management philosophy and a loose and flexible set of long-range objectives. The programmes are designed primarily to give direct and immediate administrative action, and to avoid an extended pre-planning period.

(iii) Temporary moratorium: Some states under strong developmental pressure, e.g. California, Delaware, Oregon, and Texas, have introduced legislation which declared a general or selective moratorium on development within a defined coastal or offshore strip during a planning period of specified length. This approach represents an attempt to control short-term development and thereby establish a more favourable climate for long-range planning.

(iv) Land zoning: Some of the Great Lakes states, e.g. Wisconsin and Michigan, have chosen to encourage their county governments under the loose supervision of the state, to regulate coastal development through traditional single-use land zoning. The counties have been given a specified period to establish zones for certain permissible uses in a narrow coastal strip.

planning :
(v) Inclusion of coastal / Some other states (e.g. New York and Maryland) chose to expand the responsibilities of the existing administrative organs to include coastal planning and, to a lesser degree, management functions. They hoped thereby to avoid the normal frictions created by the establishment of a new bureaucracy within the existing administrative structure. The state of Hawaii took a similar approach. It had already instituted a state-wide land-use control programme and, after further investigation, it was decided to introduce in addition a coastal zone programme which covered such problems as shoreline set-back, beach access, marine management, and protection of natural areas.

The different approaches adopted in the United States are illustrations of some of the basic methods which could be used to suit different
← geographical locations, administrative set-ups and perceived needs.

Table I *

- 17 -

State	Type of program			Coastal zone management ^d	Wetlands management ^e	Power-plant siting ^f	Surface mining ^g	Designation of critical areas ^h	Differential assessment laws ⁱ	Floodplain management ^j	Statewide Shorelands Act ^k
	Comprehensive permit systems ^a	Coordinated incremental ^b	Mandatory local planning ^c								
Alabama				X		X	A			X	
Alaska		X		X		X			B		
Arizona		X				X			A	X	
Arkansas						X	A, B		A		
California		X		X		X	X		C	X	
Colorado		X		X	X	X	X	X	A	X	
Connecticut		X		X	X	X			B	X	
Delaware		X		X	X				A		X
Florida	X	X	X	X	X	X	A, B	X	A, C		
Georgia		X		X	X						
Hawaii	X	X		X		X	X	X	B	X	
Idaho			X				X		A		
Illinois				X		X	A, B		B	X	
Indiana		X		X			A, B		A	X	
Iowa							A, B		A	X	
Kansas							A, B				
Kentucky						X	A, B		B		
Louisiana				X	X	X					
Maine	X	X	X (LTD)	X	X	X	A	X	B	X	
Maryland		X		X	X	X	A, B	X	B	X	
Massachusetts				X	X	X			B		
Michigan				X			X		C	X	X
Minnesota		X		X	X	X	X	X	B	X	
Mississippi				X	X					X	
Missouri					X	X	X		A	X	
Montana		X	X			X	A, B	X	B	X	X
Nebraska			X			X			B		
Nevada		X	X			X		X	B	X	
New Hampshire				X	X	X			B, C		
New Jersey				X	X	X			B	X	

New Mexico		X				X	A		A		
New York	X	X		X	X	X	X	X	A	X	
North Carolina		X		X	X		X		B	X	
North Dakota						X	A		B		
Ohio				X		X	A		A		
Oklahoma							X		B	X	
Oregon		X	X	X		X	A	X	A		
Pennsylvania				X	X	X	A	X	B		
Rhode Island		X		X	X	X	A		B		
South Carolina				X		X	A		B		
South Dakota							A	X	A		
Tennessee						X	A, B				
Texas				X	X		X		B		
Utah		X				X	A		B		
Vermont	X	X			X	X	A		C	X	
Virginia			X	X	X	X	A, B		B		
Washington		X		X	X		A		B	X	X
West Virginia							A, B			X	X
Wisconsin		X		X	X	X	X	X		X	
Wyoming		X	X			X	A		A		

^a State has authority to require permits for certain types of development.

^b State-established mechanism to coordinate state land-use-related problems.

^c State requires local governments to establish a mechanism for land use planning (e.g., zoning, comprehensive plan, planning commission).

^d State is participating in the federally funded coastal zone management program authorized by the Coastal Zone Management Act of 1972.

^e State has authority to plan or review local plans and the ability to control land use in the wetlands.

^f State has authority to determine the siting of powerplants and related facilities.

^g State has statutory authority to regulate surface mines. (A) State has adopted rules and regulations; (B) State has issued technical guidelines.

^h State has established rules, or is in the process of establishing rules, regulations, and guidelines for the identification and designation of areas of critical state concern (e.g., environmentally fragile areas, areas of historical significance).

ⁱ State has adopted a tax measure which is designed to give property tax relief to owners of agricultural or open space lands. (A) Preferential Assessment Program: Assessment of eligible land is based upon a selected formula, which is usually use value. (B) Deferred Taxation: Assessment of eligible land is based upon a selected formula, which is usually use value and provides for a sanction, usually the payment of back taxes, if the land is converted to a non-eligible use. (C) Restrictive Agreements: Eligible land is assessed at its use value; there is a requirement that the owner sign a contract, and a sanction, usually the payment of back taxes if the owner violates the terms of the agreement.

^j State has legislation authorizing the regulation of floodplains.

^k State has legislation authorizing the regulation of shorelands of significant bodies of water.

* Taken from The Seventh Annual Report of the Council on Environmental Quality, September 1976, pp. 68 and 69.

(2) In Europe, the issue of coastal area and resource management takes the form of coastal protection. The overall objective is to ensure both enjoyment of its amenities and sound utilization of its resources.^{1/} On the whole, there does not exist any coastal management programme on a comprehensive basis, comparable to that of the United States. Several European countries (e.g. the United Kingdom, France, Ireland, Sweden, Belgium and Italy) have conducted general studies and instituted programmes either covering their entire coast or aimed at the solution of certain problems (e.g. tourism, use of water, or pollution).^{2/} The measures taken in Europe may conveniently be grouped into three categories.

The first category of measures is the adaptation to the coastal area of town and country planning regulations. This is similar to the United States' Great Lakes states approach. The techniques used include: the establishment of building or non-building zones; the designation of protected zones in which planning schemes are subject to particular regulations; the imposition of building prohibitions or the acquisition of land as methods for controlling urban development in coastal areas; the incorporation of the communication network as part of the general planning; the designation of locations for industrial complexes; and the establishment of special regulations for tourism (e.g. public access, camping, etc.) Some specific examples may be mentioned here. Certain regions of Italy have promulgated laws which prohibit any construction on the coast measured 300 metres landwards from the point of the waves.^{3/}

^{1/} In 1973, the Committee of Ministers of the Council of Europe adopted a resolution on the protection of the coastline in which it recommended that the governments of the member states base their policies on the protective measures set out therein.

^{2/} See J. A. Steers, Protection des zones côtières, Le Centre européen d'Information pour la Conservation de la Nature. 1974, 87 pp. Amslek et Cohen, Mesures Législatives Prises ou à Prendre par Les états membres du Conseil de l'Europe pour la Protection des Cotes, Ibid., 1974, 149 pp.

^{3/} Two specific studies may be cited here: F. Fiorelli, Etudes italiennes pour le projet concernant les bandes côtières méditerranéennes", Instituto di studi per la Programmazione Economica; "Les phénomènes d'utilisation et de dégradation et les instruments de protection des bandes côtières italiennes", Società Tecneco, 1975.

← Both Denmark and Norway have adopted a ban on the development of new areas for the building of summer cottages in order to prevent the remaining open coastal areas from being covered by an unbroken chain of structures.

Under the Urban and Rural Zones Act and the Urban Planning Act, of Denmark, coastal areas are normally given top priority.^{1/} Industrial areas are laid out in urban zones in conjunction with urban planning. Industrial plants (except farms, forestry and fisheries installations) are not permitted to be placed in rural areas which include the coasts. There are special regulations on extraction of minerals from the beach.^{2/} Land-fills on the coast may be undertaken with permission from the Ministry of Public Works. Prior to granting any permission, the Ministry of the Environment is to be consulted to ensure that the proposed measures are not in conflict with any aspects of nature conservation, general planning or protection against pollution. There is a Coast Inspectorate whose tasks include administration of the territorial sea, dikes legislation, coastal fortification and construction projects. According to the Shore and Mountain Planning Act of 1971 of Norway, any construction within 100 metres of the coastline is banned, unless specifically approved. Certain laws and regulations are also made applicable to coastal areas regarding such aspects as free access to the beaches (the 1957 Open Air Recreational Act), site location for power plants and industries or coastal environmental protection (e.g. Water Pollution Act 1970, Nature Conservation Act 1970, and the Neighbour Act of 1961).

^{1/} See Landskabsanalyse for Ringkøbing amt, 1972; Status 1976, published by the Conservation Planning Committee of Copenhagen 1976.

^{2/} Act No. 292, 23 May 1973.

The second category of measures relates to the conservation of nature and historical reserves. Special legislation has been introduced in various countries for the protection of marine flora and fauna in general by the creation of parks or reserves ^{and/} /natural, historical and archaeological sites. There are laws and regulations regarding maritime hunting/ ^{and/} coastal fishing, for the protection of forests and dunes, and with respect to certain engineering works (e.g. building dikes), extraction of sand and gravel ^{and/} /drilling for minerals, nearshore or on the continental shelf, and for the preservation of wetlands and coastal marshlands. In Norway, for example, the Ministry of Environment is responsible at the national level for the making of environmental protection policy, the establishment of guidelines for pollution control, physical planning, ← conservation, and recreation. The Ministry is advised by various expert groups such as the State Pollution Control Authority, the State Council for Open Air Activities and the State Council for the Conservation of Nature. The overall principle is that planning should be done at the national level whereas the implementation is aimed at the local level.

The third category of measure relates to pollution control, particularly in the Mediterranean area.^{1/} There is general legislation prohibiting dumping of harmful substances into the sea, and arranging for regular inspection of the state of the marine environment and of authorized operations and discharges. Specific laws also exist to deal with particular types of pollution problem: e.g. bacterial or chemical pollution, noise, mosquitoes and waste.

^{1/} The State of Marine Pollution in the Mediterranean and Legislative Controls published by FAO, Rome September 1972. It contains summaries of relevant legislation of the countries bordering on the Mediterranean.

(c) Under the sponsorship of the United Nations Environment Programme (UNEP), the countries bordering on the Mediterranean have drawn up three regional instruments designed to combat marine pollution.^{1/} For each particular source of marine pollution, a number of specific actions are contemplated, including the preparation of additional protocols to be associated with the regional instruments. The question of land-based sources of pollution was considered by an intergovernmental group in 1977 and is now ready for governmental approval. It is expected that eventually the provisions in these international legal instruments and the actions contemplated thereunder will be transformed into national law.

A series of studies by national research institutions have been commissioned to specify likely development to the year 2000 in a variety of sectors, including urbanization, industrialization, agricultural development, transportation (maritime and land), offshore exploration and exploitation, and energy production and use. It is hoped that these studies, properly conducted and supported by Governments, would aid national planners and decision-makers by improving the quality of information on which their actions are based.^{2/} In addition, as part of

^{1/} These are the Convention for the Protection of the Mediterranean Sea against Pollution; the Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircraft, and the Protocol Concerning Co-operation in Combating Pollution of the Mediterranean Sea by Oil and other Harmful Substances in Cases of Emergency. See Activities of the United Nations Environment Programme for the Protection and Development of the Mediterranean Region, UNEP publication, October 1976, p. 82-86. For a summary of the techniques used in preparing the instruments, see Drafting of Regional Legal Instruments for Marine Environment Protection: the Case of the Mediterranean, a document submitted by FAO to the UNEP Task Force on Legal Instruments for Regional Seas held in Nairobi, November 1976.

^{2/} M. Tolba, "La Méditerranée, une éco-région pour demain", 2000, La Documentation Française, Paris, pp. 2-7, 1976; R. Bourone et M. Tangi, "Un plan bleu pour des actions en Méditerranée", Ibid, pp. 40-42.

Action Plan for the Protection and Development of the Mediterranean Sea Area, adopted in February 1975, programmes on Mediterranean marine parks and wetlands have been carried out. An intergovernmental body is working on guidelines and technical principles for the establishment and management of protected areas.^{1/}

In response to a project concerning the Mediterranean coastal zones launched by the Organization for Economic Co-operation and Development, the Institute of Studies for Economic Planning in Italy prepared in 1974 a comprehensive study on the coastal environment in that country.^{2/} The study analysed the problems in the coastal area (urbanization, industries' location, tourist development, fishing, mineral resources), coastal environment and the applicable laws. Further to that study, some long-term policies designed to integrate land use and marine resources in different areas were also proposed for future action.^{3/}

(d) In 1973, concern for the coastline prompted the French Interministerial Committee for Regional Development and Planning to create a study group on the "long-term perspectives of the French shoreline".^{4/} The group prepared

^{1/} Report of Expert Consultative on Mediterranean Marine Parks and Wetlands, Tunis, (Memographed), January 1977. See also Activities of the United Nations Environment Programme for the Protection and Development of the Mediterranean Region, October 1976, p. 3.

^{2/} "Phénomènes d'utilisation et de dégradation et instruments de Sauvegarde des littoraux Italiennes", Apport au projet concernant les bandes côtières méditerranéennes lancé par l'OCDE. Ministero del Bilancio e della programmazione economica, Istituto de studi per la Programmazione Economica. 1974, 324 pp.

^{3/} L'Organisation Territoriale des Bandes Côtières Italiennes, Ibid. 207 pp. with maps.

^{4/} The report of this group together with technical annexes are produced in Littoral français, Documentation français, Paris 1973, 266 pp.

a report and recommended certain measures to be taken. One of the group's findings was that while there is sufficient law which can be brought into force for coastal management, a major problem seems to be that of actually applying the regulations.^{1/} Between 1973 and 1975, a quasi-independent governmental body, the "Conservatoire du littoral et des rivages lacustres", was created the purpose of which is to acquire saltwater shoreline property (or property which lies around freshwater lakes over 1,000 hectares (2,471 acres) in size) in order to protect such land from urban encroachment or in order to protect the "ecological balance" of chosen areas and to enhance public access to the shoreline.^{2/} An initial 5 million francs was apportioned in 1976 for that purpose. The sum has increased to 10 million francs for 1977-78. As of 1977, a total of 3,274 hectares have been acquired under the fund.

In France /
/there is a National Administrative Council which is composed of ministerial representatives (12), representatives of shorelands Councils (10), members of Parliament and Senators (5) and "qualified individuals (3). The Council administers not only the fund but also defines its policies. This National Administrative Council is the only major institution in France whose sole objective is intervention in the process of coastal development. At the sub-national level, there are five regional shoreland Councils, each of which consists of elected representatives (between 12 to 18) from surrounding planning regions. The Shoreland Councils are

^{1/} Ibid. and speech given by President Valéry Giscard d'Estang in Vanues on 8 February 1977 on "Politique nationale d'aménagement et de protection du littoral".

^{2/} It was set up by Law No. 75-602 of 10 July 1975, Journal Officiel 11 July 1975 discussed in D. Legrain, "Le conservatoire de l'espace littoral" Espaces, vol. 15-16-17, 1975, pp. 53-58.

purely consultative in nature but are supposed to make recommendations concerning proposed, and desirable land acquisitions.

(e) The problems affecting the coastal areas of Britain are mainly associated with the demands of industry and commerce, the needs of an increasing and more mobile population with more time, money and desire for open-air recreation (especially that which is water-based), the growing numbers of those who wish to retire and live in close proximity to the sea.^{1/} Measures have been taken to deal with specific areas and issues. A comprehensive study of the coastline of England and Wales by the Countryside Commission during 1966-70 led to recommendations that certain stretches of undeveloped coast of particular scenic beauty should be treated as "heritage coast". These measures are dealt with below in the context of nature reserves and parks.^{2/} Mention should, however, be made here of the special guidelines established in Scotland for the use of planning authorities in dealing with demands on the coastal areas for oil and gas development.^{3/}

The basic principle is that exploitation can only take place in those areas designated for that purpose. This is to avoid a scatter of industrial development, to permit full use of existing labour, housing and public services, and to ensure the possibility of diversification so as to cushion any subsequent decline. These guidelines appear to be established on the basis of economic, physical and environmental considerations. The

^{1/} Part of the information is based on communication received from the Government, dated 5 March 1976.

^{2/} See Chapter II, Section A (nature reserves and parks) below.

^{3/} North Sea Oil and Gas: Coastal Planning Guidelines, Scottish Development Department, P/HD/29/12/7/1, 15 pp.

guidelines set out various criteria for establishing preferred zones for development or conservation. The preferred development zones are those areas that are able to be expanded without incurring the risk of reverse economic or social decline; that have some flat land on the coast and in the hinterland able to absorb major development; that/ possess suitable ports and harbours with some potential for developing the dockside land; or in which environmental recovery and rejuvenation are feasible. The preferred conservation zones are: those places vulnerable to development because of their scientific, ecological or scenic features; sections of the coastline where an existing or proposed use (e.g. bathing) would be incompatible with major oil and gas development; areas of coast containing small scale communities where expansion might cause serious economic and social problems. Commercial/ development is also excluded from the tourist and recreation areas, and areas of the coast with towns and villages whose historic character should be protected. These criteria can be usefully considered for countries needing guidelines for development in the coastal area.

(f) Spain recently prepared an Indicative Plan for Uses of Publicly Owned Coast from Torredembarra to Cambrils (Tarragona)^{1/} The total area is 45 kilometres, covering urban settlement, tourist centre fishing and recreation areas. The techniques used for the preparation of the plan are worthy brief mentioning.^{2/}

Detailed studies were first carried out regarding the various aspects of the coast: physical aspects of the coastline, its lithological composition, current uses of the publicly owned land, population distributions (between permanent and transitional population, and between coastal and inland population), access to the coast from public roads and promenades, and an inventory of beaches. Each of these aspects was examined in connexion with the dynamics of the coastline and an analysis of the current conditions of each particular stretch regarding the capacity of the beaches and existing installations. In evaluating the beaches' capacity and current needs, the first ten metres from the water/ were treated as the active area, the next 30 metres as the resting area, and the remainder for setting up beach facilities.

On the basis of these studies, a master plan for future uses and needs was then prepared. The plan dealt with various issues: forecast of uses, necessary access roads to the various sectors of the coast, promenades, shipping facilities or extension of facilities, beach protection, regeneration capability, areas for improvement. Three planning phases were used: immediate (1975), medium-term (1975-1979, coinciding with the completion of the fourth Development Plan), and

^{1/} The following information is based on a report submitted by the Government of Spain to an interregional seminar sponsored by the United Nations Ocean Economics and Technology Office on development and management of resources of coastal areas held in Berlin (West) in June 1976.

^{2/} Information referred to here is also partly based on communication received from the Government of Spain, dated 14 January 1976.

long-term (to 1985). The whole coastal area under the plan was divided into zones according to the proposed uses: (i) the tourist and recreation zone, dealing/ with the predominant use in the area, covers not only sectors already devoted to this purpose, but also includes places currently described as having "no specific use" (ii) the industrial zone covers basically the area south of the port of Tarragona; no industrial installations are permitted outside this area. (iii) port zones include Tarragona (commercial port) Salou (recreation port) and Cambrils (fishing and recreation port). Plans are being made to expand the port and to build/ of Tarragona as far as Salou /two additional recreation ports along the coast; marinas for small pleasure craft are also included.

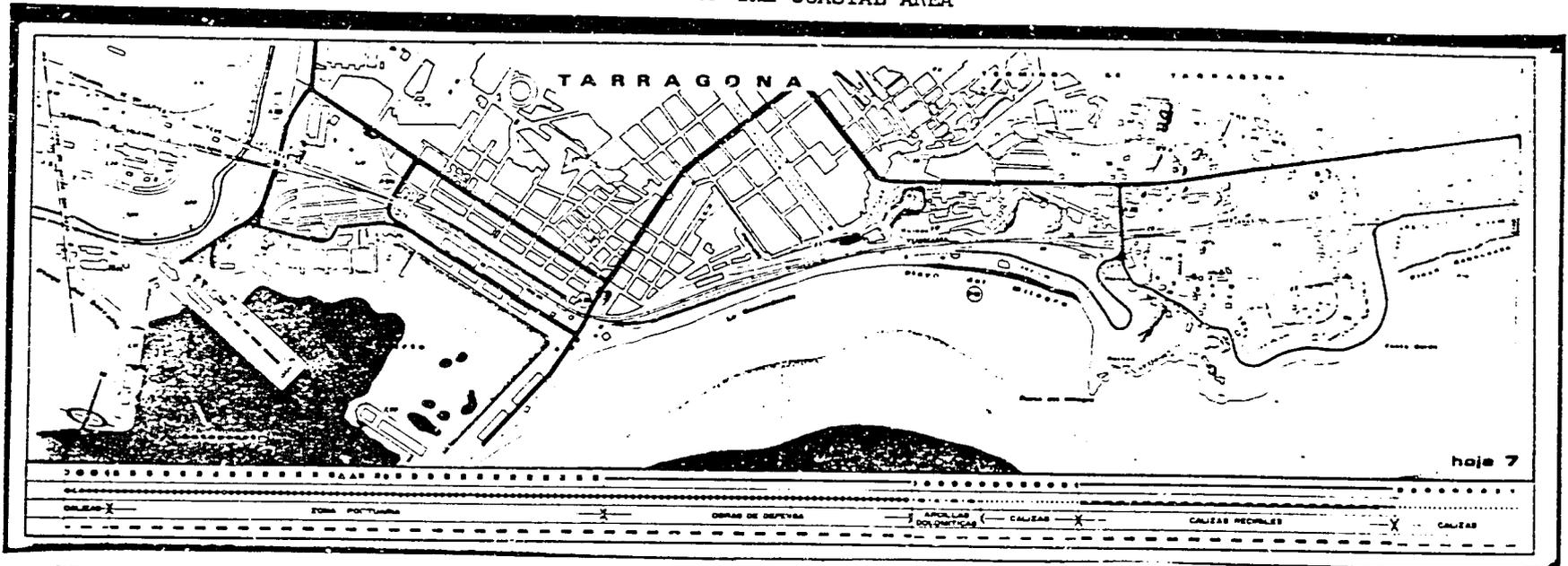
← (iv) zones for free use or development: these are marked in order to encourage initiatives; (v) nature reserve areas are created to keep them in their wild state; access roads are planned.

On the basis of the plan, indicative maps (scale 1:5,000) were prepared by using aerial photographs. Each map contained not only the basic general information (beaches, wooded areas, highways, access roads etc.), but also symbols indicating specific aspects (e.g. existing uses, natural features, lithology and stability of the beaches, projected uses). In this manner, the interrelationships of the conditions and the various activities are visually discernable. Mistakes, if any, can be easily checked; information acquired is put to use to the fullest extent. Some samples of the maps are attached here to illustrate this approach.

In view of the rapid increase in the number of tourists visiting the Spanish Mediterranean coast, and, in particular, in order to meet the pressing need for drinking water, sanitation and the treatment of sewage resulting in certain parts of the coast from tourists, Spain recently prepared Sanitation Infrastructure Plans for tourist areas. While the plan was originally designed for the Mediterranean and Balearic coast, it has now been extended to all areas where tourists are concentrated. At present, there are 24 plans, 12 of which relate to the Mediterranean coast and cover from the Costa Brava to the Costa del Sol, including the Balearic islands. These plans were formulated by the Ministry of Public Works in co-operation with provincial and local authorities, and approved by the Inter-Ministerial Commission for Provincial Plans.

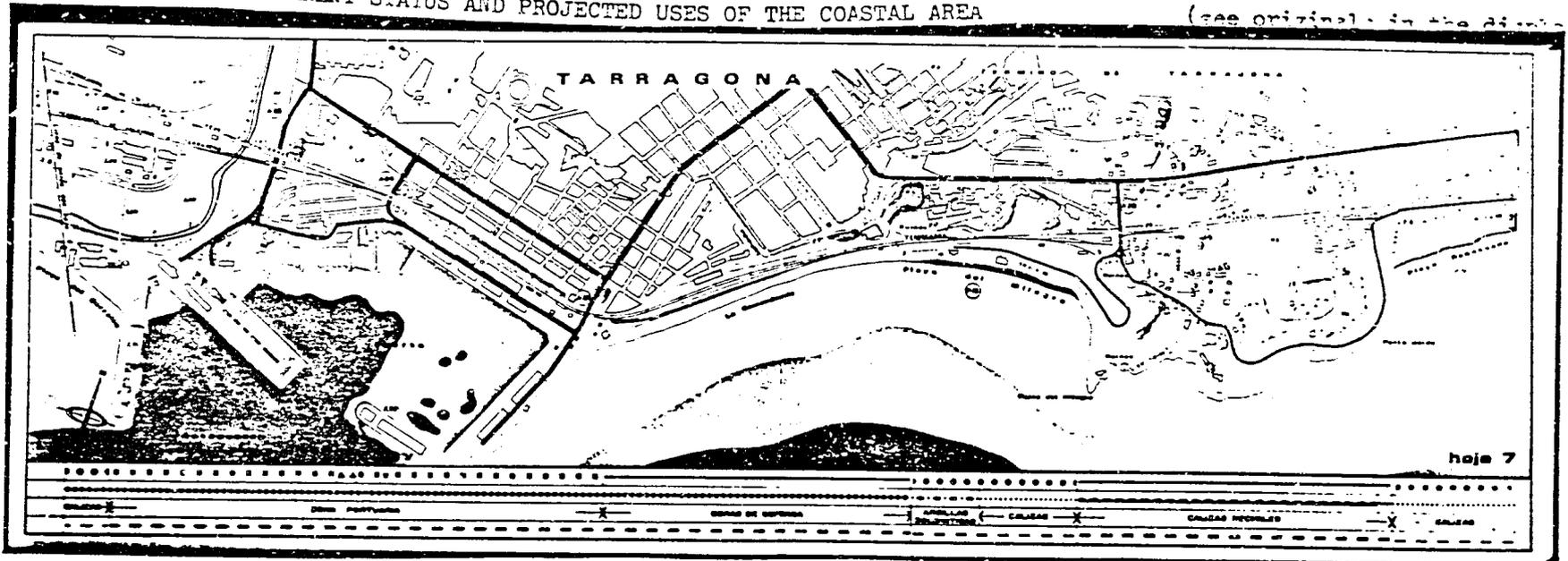
Each plan deals with a specific region or area regarding drinking water supplies, and the evaluation and treatment of sewage. The proposed solutions vary according to the characteristics of each specific area, population factors and facilities for obtaining water resources and for drainage. The costs form the economic basis for the exploitation. In principle, they must be sufficient to cover both financial charges arising from loans and the cost of maintaining and operating the facilities. They should also, in addition, facilitate the creation of economic conditions which will enable the service to finance future expansions on its own, so that needs may be dealt with as they arise, thus, avoiding the recurrence of any lag between the time a need is identified and the time when it can be met.

DESCRIPTION OF CURRENT STATUS AND PROJECTED USES OF THE COASTAL AREA



DESCRIPTION OF CURRENT STATUS AND PROJECTED USES OF THE COASTAL AREA

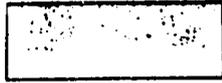
(see original in the print)



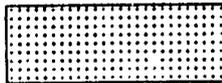
KEY TO SYMBOLS USED IN SKETCH MAP
PROJECTION OF FACILITIES REQUIRED



BEACHES TO BE LEFT IN THEIR CURRENT LOCATION AND CONDITION (Yellow)



PLANNED NEW BEACH AREAS (Orange)

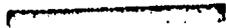


EXISTING WOODED AREAS (Green dots)



NEW WOODED AREAS (Green)

VEHICLE ACCESS RCADS



EXISTING (Orange)

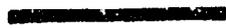


TO BE IMPROVED (Orange)



NEW (Orange)

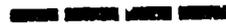
PROMENADES



EXISTING (Green)



TO BE IMPROVED (Green)



NEW (Green)



PROTECTION OR REGENERATION OF BEACH



CREATION OF NEW BEACH



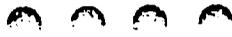
WATER SPORTS



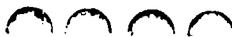
MARINA

KEY TO SYMBOLS USED IN PLAN
Projection of Facilities Required

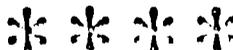
PROJECTED USES (Top line on plan)

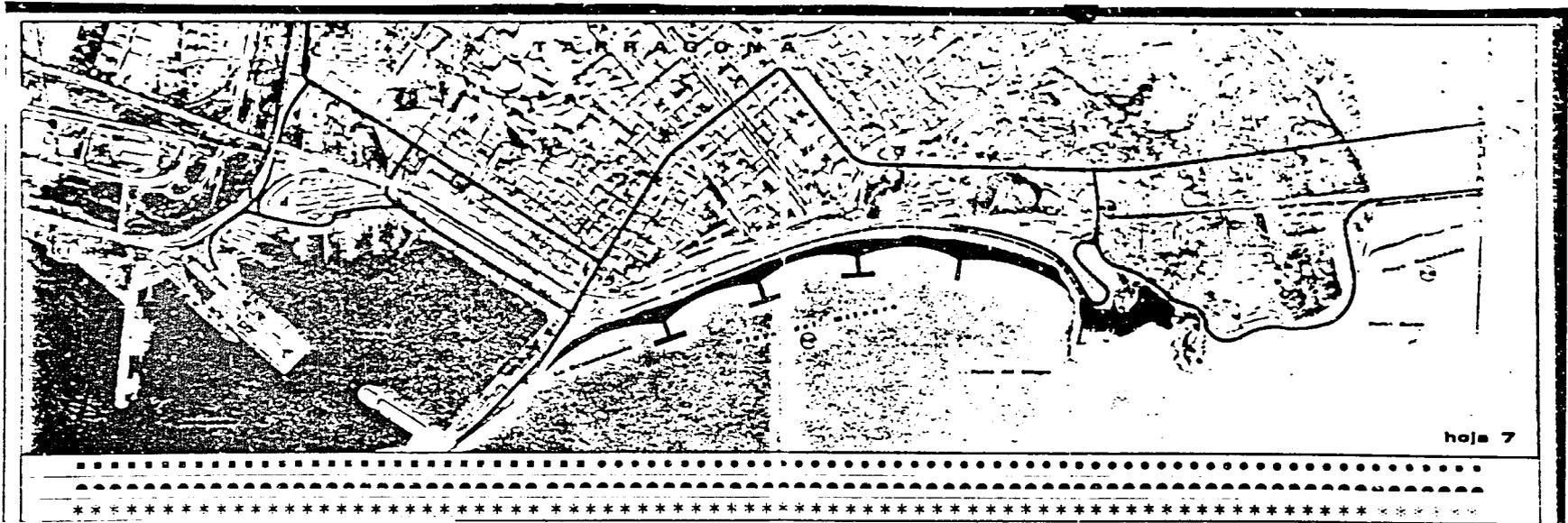
-  TOURISM-RECREATIONAL (Orange)
-  FISHERIES (Dark blue)
-  COMMERCIAL PORT (Orange)
-  INDUSTRIAL (Black)
-  MARINA (Blue)
-  FREE USE OR DEVELOPMENT (Dark blue)
-  NATURE RESERVE (Green)

URGENCY OF BEACH REGENERATION WORK (Second line on plan)

-  NO REGENERATION REQUIRED (Black)
-  IMMEDIATE REGENERATION (1 year or less) (Orange)
-  MEDIUM-TERM REGENERATION (Less than 4 years) (Green)
-  LONG-TERM REGENERATION (More than 4 years) (Dark blue)

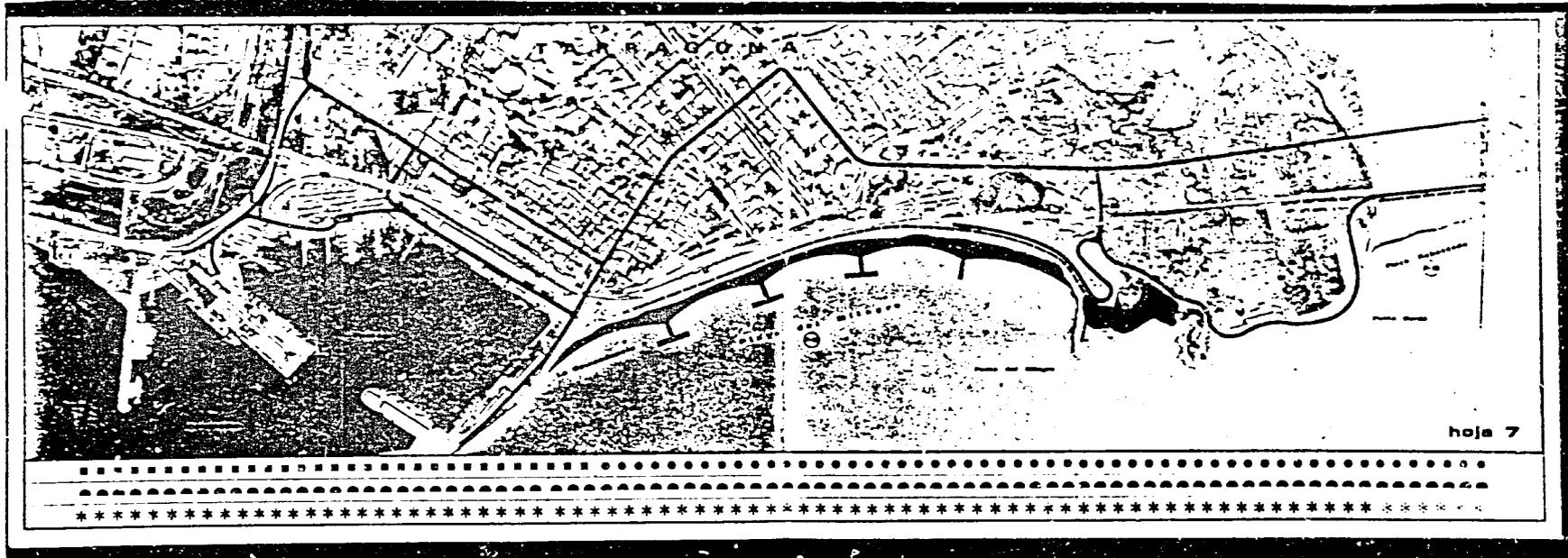
URGENCY OF BEACH IMPROVEMENT (Third line of plan)

-  IMPORVEMENT COMPLETED OR NOT NEEDED (Black)
-  IMMEDIATE IMPORVEMENT (Less than 1 year) (Orange)
-  MEDIUM-TERM IMPROVEMENT (Less than 4 years) (Green)
-  LONG-TERM IMPROVEMENT (More than 4 years) (Dark blue)



PROJECTION OF FACILITIES REQUIRED

(see originals in the display)



PROJECTION OF FACILITIES REQUIRED

KEY TO SYMBOLS USED IN PLAN

Description of the Current Status and Projected Uses of the Coastal Area

CURRENT USES (Top line on plan)

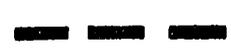
-  TOURISM-RECREATION (Yellow dots)
-  FISHERIES (Blue)
-  COMMERCIAL PORT (Green)
-  INDUSTRIAL (Black)
-  UNSPECIFIED (Black)

NATURE OF COASTAL AREA (Second line on plan)

-  ROCKY
-  LOW-LYING
-  PEBBLE BEACH
-  COARSE SAND
-  FINE SAND
-  SAND AND PEBBLE MIXTURE
-  MAN-MADE STRUCTURES

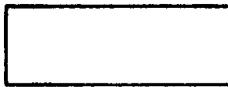
LITHOLOGY (third line on plan)
As Indicated

STABILITY OF BEACHES (fourth line on plan)

-  PROGRESSIVE (Yellow)
-  STABLE OR UNSPECIFIED (Yellow)
-  REGRESSIVE (Yellow)
-  ERODED BEACH (Maroon)
-  NO BEACH (Maroon)

KEY TO SYMBOLS USED IN SKETCH

Description of the Current Status and Projected Uses of the Coastal Area



BEACHES (Yellow)



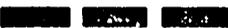
WOODED AREAS (Green and sky blue on sepia)



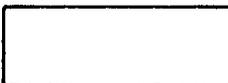
HIGHWAYS AND ACCESS ROADS (Red)



PEDESTRIAN PROMENADES (Green)



PEDESTRIAN PROMENADE UNDER CONSTRUCTION (Green)



AREAS NOT COVERED BY THE ABOVE SYMBOLS (Beige)



LIMITS OF THE MARITIME-TERRESTRIAL ZONE (Black)

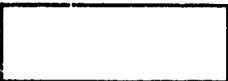
A-1 of A-41

HIGHWAY AND ACCESS ROAD REF. NOS.

P-1 of P-32

BEACH REF. NOS.

DEPTH OF WATER



0-5 metres (Light blue)



5-10 metres (Mid-blue)



over 10 metres (Dark blue)

A.

TREES

Af.

FRUIT TREES

E.

UNCULTIVATED LAND

H.

ORCHARD

Ma.

HIGH HILL

Mb.

LOW HILL

Tc.

ARABLE LAND

(g) In Norway, the central government is responsible for the preparation of national guidelines for the use and management of the country's natural resources and for establishing criteria for settlement patterns. These national guidelines provide the basis for county, regional, municipal, and local planning. A local plan is a detailed zoning plan for a given area and covers all aspects of the physical environment within that area. The plan defines and delimits residential, recreational, industrial and commercial areas and parks. No development may occur when it is in conflict with a local plan.

In 1971, a Shore and Mountain Planning Act^{1/} was adopted to promote the co-ordinated utilization of land in shore and mountain areas, with a view to preserving their natural assets and public availability, as well as to ensure that development of the areas for recreation and tourism occurs on the basis of the best interests of the community as a whole.

According to this Act, in shore-areas along the coast, the erection of buildings, structures and installations may only be undertaken in conformity with approved shore plans.^{2/} Shore-areas include inland and the shoreline which are of significance for the siting of holiday dwellings and tourist developments. In general, no building or construction activity is permitted on the shore within 100 metres from the shoreline measured horizontally at normal high water.^{3/}

^{1/} Act No. 103 of 10 December 1971 concerning Planning in Shore and Mountain Areas (Shore and Mountain Planning Act) with Amendments of 7 June 1973 (unofficial translation).

^{2/} Ibid. Special programmes are made for Shore Plans in Sections 7-10 of that Act.

^{3/} Ibid., Section 3. Exceptions are made for special areas required for military or other approved uses (Section 6).

The Country Governor is in charge of the preparation of a given Shore Plan. He issues guidelines and calls for meetings of all the known landowners involved. For the preparation of a Shore Plan, special powers are given to appropriate authorities to summon landowners to attend meetings to prepare draft plans which may be adopted by a simple majority.^{1/} The draft plan will then be reviewed by the local Building Council which may return the plan for reconsideration. The draft plan also is to be posted for a reasonable period of time for public comments.^{2/} Once the Building Council approves it, the plan is then be submitted to the Municipal Council which may again approve or reject the plan. This process is designed to ensure better coordination at all levels and of all parties concerned.

(h) In Israel, in response to the need to preserve the coast and antiquities, to control development, and to ensure public access to the seashore,^{3/} an Outline Scheme covering an area of 300 square km. along the coastal strip was established.^{4/} The Outline Scheme is binding on all authorities and / agencies/ whose activities are in any way connected with physical planning in that coastal strip, so as to ensure that the development of the coast is consistent with the directives of the national planning bodies, and to prevent haphazard decisions based on local considerations only. While some of the techniques used are based on traditional town and county planning, the scheme is instructive in its overall approach.

1/ Ibid, Section 8.

2/ Ibid, Section 10.

3/ See Planning and Building Law 5725, 1965.

4/ Outline Scheme of Israel Coastal Strip, Ministry of the Interior, Planning Department, Jerusalem, 1974, 50 pp (in English and Hebrew).

The whole coast is demarcated into various areas according to their existing and proposed uses: e.g. residential areas, semi-urban residential areas, central business districts, villages and cemeteries. Different conditions are laid down for each of these categories. Special areas are assigned for national parks, nature reserves, afforestation, bathing beaches, coastal reserves, hotels, tourism, sports centres, mineral water resorts, jetties, antiquities and archaeological sites. In addition, some areas were designated for communication or for factories or workshops (i.e. industrial zone), engineering plants, power stations, salt plants, reclamation, and agriculture.

The Scheme was established on the basis of certain guiding principles: Preservation of the natural coastline and safeguarding the view of the sea, free access to all parts of the shore for purposes of bathing, rest or recreation; preservation of part of the coast as national parks, nature reserves or seashore reserves; preservation and restoration of antiquities; allocation of areas for engineering and defence projects which have to be situated near the sea; ensuring that main roads are not built near the coast; preventing the location of industries liable to pollute the sea near the coast; grouping of hotels in selected localities along the coast, and not in every town and near every settlement; rational dispersal of land uses along the entire length of the coast, with the aim of preventing undue concentration in the central sector; prevention of residential development along the sea-shore, even within municipal areas.^{1/}

^{1/} See E. Efrat, Physical Planning Aspects of Israel's Coastal Strips, Ministry of the Interior, Planning Department, Jerusalem, 1973.

Since the Scheme cannot allocate enough areas along the Mediterranean and the Elat coasts to satisfy all requirements, a division has to be made: thus, for example, 50 per cent of the Mediterranean coast was allocated for bathing beaches; 15 per cent for national parks and nature reserves; 4 per cent for engineering projects; 5 per cent industry and transport and 24 per cent for other uses.

✓ (i) A coastal conservation law in Sri Lanka was approved by the National State Assembly in 1976^{1/}. The introduction of this legislation was in response to the need to combat coastal erosion, particularly along the south-west coast where several miles were lost because of sea erosion. While coastal erosion in Sri Lanka forms part of the natural process because of the tilting of the island, the situation is seriously aggravated by sand and coral mining and by the construction of outlets for drainage. The pollution of coastal waters by human and other wastes degrades water quality and seriously affects the growth of natural reefs. A new division under the Ministry of Shipping, Aviation and Tourism is being organized for the planning and development of the coastal area and for the effective implementation of the proposed legislation. The

Director of Coastal Conservation is empowered to declare certain areas of sea as "prohibited areas" for the dumping of any soil or material. Certain coastal areas may be excluded from excavation of materials from or under the sea shore.

^{1/} See The Gazette of the Republic of Sri Lanka, Part II of 30 July 1976, Supplement, Coastal Conservation. The purposes of the law are very broad: to consolidate the law relating to coast conservation and the administration, control, custody and management of the coastal zone and to make provisions for matters connected therewith or incidental thereto.

X
(j) A draft law for the management and development of the Togolese coastal zone is being considered in connection with the five-year plan. This proposal deals with the development aspects of the coastal zone in the light of Togo's coastal needs and problems, for example, roads, coastal highways, erosion (particularly near Lomé), tourism, the creation of urban zones for petroleum industries and the preservation of forest and agriculture. To ensure recreation and public access, protection zones will be established along the coastal line within a strip of 100 metres/^{width /}and along the major river mouths, lakes, ponds, and lagoons.^{1/}

(k) The province of North Sumatra (Indonesia) has adopted a coastal area development plan for 1975-1978.^{2/} It is basically an economic development plan for the coastal villages: on the east coast (Strait of Malacca) and on the West coast (Indonesian Ocean).

The basic policy is to develop the maximum potential of the region. The principal development activities are: sea and inland fisheries, aquaculture, farming (tidal irrigation of rice-fields), coconut plantation, livestock breeding and home industry. Development funding is being made available and is to be distributed to the region according to the density of population. There is a Guiding Team which is responsible for the implementation of the plan.

Detailed implementation is set out in the plan for each development activity. Thus, for example, regarding smallholders farming, the means include: to open up tidal rice fields, to provide guidance in fieldwork, to provide ^{and/}training / technical cultivation courses; to develop tools for processing land and for crop protection; to provide loans to supply fertilizers; to build rice mills, etc. The plan also identified areas where further research is needed.

^{1/} An economic background information on the coast of Togo may be found in Y. Aziaha's contribution made to the Interregional Seminar on Development and Management of Resources of Coastal Areas, Berlin (West). In K. H. Szekiela and B. Breuer (eds.), Development and Management of Resources of Coastal Areas 1977 published jointly by German Foundation for International Development and the United Nations, 546 pp.

^{2/} Coastal Area Development in the Province of North Sumatra, the Three-Year Programme, 1975-1978, Badan Perencanaan Pembangunan, Propinsi Sumatra Utara, 1975. Development Planning Agency, North Sumatra Province, 1975, 197 pp. The actual implementation of the plan has been delayed.

(1) In Yugoslavia, / ^{the/} pressure of tourists on the Adriatic coast has led to the destruction of natural attractions and special features of the countryside.^{1/} The Yugoslav government, assisted by the United Nations, prepared a long-range development plan for tourism in the South Adriatic region. Existing urban legislation has served as a basis for the preparation of new proposals. The concept of planning has been introduced as a continuous process to provide flexibility in the plan, identifying hierarchies and relationships between plans at different levels (e.g. regional studies, master plans and urban studies for new tourist settlements).^{2/} In accordance with the Project, new tourist settlements are to be situated away from the shore and absorbed into green belts, thus providing, within the area of development, green areas for leisure and recreation.

The regulations suggested in the plan for the physical development of the South Adriatic coast cover not only the study and co-ordination of all legal matters necessary for implementation of the proposals, but also legal measures to ensure the protection of the human environment as an integral part of the proposals. Since three republics are involved in the plan, a special Inter-Republican Co-ordinating Committee was created to assume a supervisory function.

^{1/} /^{See} Čar, Cicvarié, Radic, Sekulié, De quelques effets économiques du tourisme étranger en Yougoslavie, in La planification et le développement de l'industrie touristique dans la région de la CEE, CEE, New York Acte du Colloque 13-18 octobre 1975. ECE/SEM.1/4 pp. 152-167.

^{2/} For example, the Jaz cover (near Budva) is completely undeveloped and it is planned to locate the centre and services for 5,000 tourists.

(m) Brazil enacted in 1975 a law requiring industries ←
to ← take measures to prevent pollution and to correct damage
caused by contamination of the environment.^{1/} "Industrial pollution"
is defined as anything which will cause harmful changes in the
environment and which may injure the health, safety, or well being of
the people, the flora and fauna, or any other natural resource. The
Ministry of Interior is to issue the necessary regulations, and, within
the areas of their authority, the state and municipal government may
also make rules and take measures to prevent or correct industrial
pollution. However, industrial establishments "of high interest"^{2/}
to national security or economic development may be given special
exemptions. Both the federal and the state government may adopt
emergency measures to reduce pollution; Rio de Janeiro and Sao Paulo
have been declared "critical areas". In approving the location
of industrial projects, the governmental agencies are to avoid aggravating
the situation in critical areas by granting incentives for private
investments.

^{1/} Diario Ley, 1,413, 14 August 1975.

^{2/} The term is not defined. Presumably these would include
petroleum and electricity.

(n) In Venezuela, the concept of coastal area management has been used mostly on a case-by-case basis. Though strong elements of coastal zone management exist, a system's approach has not yet been developed.^{1/} Special legislative measures have been taken in relation to the use of water resources, prohibition of certain activities in mangrove areas, tourism on the coast, the establishment of protected zone. There has been established also a National Technical Commission of Ports and a basic scheme for rational uses of natural resources. Details of these elements will be discussed under the appropriate sections in this study.

Special reference should, however, be made here to the creation of a commission in May 1974, the purposes of which are to study and recommend solutions to the problems which confront the renewable natural resources in the Venezuela coastal areas. A series of decrees was adopted for those purposes.^{2/} The specific duties of the Commission are as follows: (a) to effect an evaluation of all the problems that confront the renewable resources of the coastal zone; (b) to undertake a census of the existing population within the coastal area with an indication of ownership; (c) to elaborate a legal, sociological, sanitary and economic framework, with the recommendations necessary for the solution of the diverse problems that exist in the coastal area; (d) to propose wildlife refuges in coastal areas which will serve as protected zones and recreation areas; (e) to propose means to prevent activities which may damage coastal ecology. Thus, there is a basis for taking the necessary action in the coastal areas.

^{1/} See A. R. Graefe et al., Towards Coastal Zone Management in Venezuela, Department of Management, Department of Recreation and Parks, Texas A and M University, College Station, Texas, June 1976 (mimeographed) pp. 117-132.

^{2/} These decrees may be found in Gaceta Legal - Ramirez and Garay, vol. 370 pp. 14-23.

Indeed, the Commission has identified a wide variety of problems and issues in the coastal area and recommended to the President the establishment of a permanent governmental body of a unique and definitive nature for the preservation of the environment with special attention to the coastal zone of Venezuela.^{1/}

There is a basic framework in Venezuela for tourism development in the coastal area. Under the Law of Tourism, the National Tourism Corporation may request the President of the nation to declare any region, place or building as being "of public utility", when desirable for the development of tourism.^{2/} The Corporation has been given jurisdiction over land and other areas on the shores of the oceans, rivers, lakes and lagoons in a zone extending from the low water line to 500 metres inland. The Corporation is responsible for the inspection, maintenance, order, and conservation of these areas. No buildings may be constructed, works undertaken or services rendered in this zone without prior approval of the Corporation. The corporation may also purchase land or personal property for the purpose of tourism development. Only companies, organizations and persons registered with the Corporation may operate in the tourism industry. Violations of the laws or of the Corporation's rulings may be punished by fines or by revocation of tourism industry permits; the Ministry of Development, upon request of the Corporation, enforces these penalties.

The Paraguana Peninsular, the San Luis Beach, and Tortuga Island have all been declared as being "of public utility and touristic interest".^{3/} The shores

^{1/} Informe para el Decreto No. 112 del 26-5-74.

^{2/} Law of Tourism 22 July 1973 and Decree 1,673 of 9 March 1974.

^{3/} Decree 456 of 3 October 1974; Decree 144 of 5 June 1974; Decree 1,675 of 9 March 1974.

of the "Capital Region" have also been so classified; the Corporation is charged with designing a plan for the best development of this area from a touristic and recreational standpoint. An area around the place where the Copey Channel meets the Caribbean Sea has likewise been declared. Both the Corporation and the State of Miranda are empowered to buy or expropriate land within this region.^{1/} The Corporation is to plan the construction of tourist and recreational facilities in the zone; the plan is to be executed by the Ministries of Public Works, of Development, and of Foreign Relations.

^{1/} Decree 251 of 31 July 1974.

2. Examples of the General Situation

In most countries where no special measures have been ^{taken/}the general planning law (e.g. town and country planning or land use planning) remains applicable. The following examples are intended to illustrate how the existing planning framework in certain countries applies to coastal areas and how some of the issues are dealt with: United Kingdom, New Zealand; India, Sri Lanka; German Democratic Republic, the Soviet-Union, Poland, Romania, Yugoslavia, Bulgaria, Czechoslovakia; Kenya and Tanzania; Singapore, Mauritius, Bahamas, and Cyprus.

(1) Mention has already been made of the special measures taken in the United Kingdom.^{1/} Apart from those special measures, coastal area management as a whole in Britain is one aspect of the land-use planning system. Certain planning studies of the coastline have been carried out, and development plans prepared by the local maritime planning authorities provide the basis of decision-making for all forms of development.^{2/} Under the Town and Country Planning Act 1971 for England and Wales, all "development" requires the prior consent of the local planning authority. An exception is development undertaken by a Government department which by law does not require planning permission. The term "development" is broadly defined as the carrying out of building, engineering, mining or other operations in, on, over or under land, or the making of any material change in the use of any buildings or land.

When deciding upon an application for planning permission, the authority must keep in mind the provisions of the development plan for the area concerned and any other material considerations, for example, the effect of the proposal on road safety or the beauty of the surroundings, the effect on public services, such as drainage and water supply. ^{3/} If the

^{1/} See Section 1(e) above.

^{2/} Information received from the United Kingdom, dated 5 March 1976.

^{3/} Ibid.

proposals for development do not accord with the plan, the local planning authority can/^{still/}give its consent if it believes that they do not involve a substantial departure from the plan or affect the whole of the neighbourhood. In the case of other departures from the plan, the authority must (if it proposes to permit the development) give public notice of the application, asking for representation, and must send a copy of the application to the appropriate Minister whose interest may be affected. The Minister does not normally intervene unless it appears that important planning principles or issues of more than local significance are involved.

After considering an application for planning permission, the local planning authority can refuse its consent, grant unconditional permission, or give its consent subject to such conditions as it thinks fit (there may require, for example, the new use of land to cease, or ^a the building or works to be removed, at the end of/specified period). There is a right of appeal to the Minister responsible against refusals or conditions attached to a grant of permission.

There is an important series of acts and procedures, other than those concerned with planning, designed to protect the environment and to supplement the planning system. In many instances, conformity with the requirements of these acts and procedures is necessary ^{1/} before development can proceed.

The reclamation of derelict industrial land is assisted by government financial grants to local authorities for restoring and bringing into positive use the abandoned sites. Outside the development and special

^{1/} E.g. the Dumping at Sea Act 1974 prohibits, except by licence, the permanent deposit of any substance or article in the sea or tidal waters from a vehicle, ship, aircraft, hovercraft or marine structure or from a land structure such as a conveyor belt. The Coast Protection Act 1949, referred to in Chapter II, Section 5, is another example.

development areas, an application for planning permission that will lead to the creation of industrial floorspace of an area greater than 5,000 square feet in the South East, and greater than 10,000 square feet elsewhere, must be supported by an industrial development certificate.

(2) In New Zealand, coastal area planning is viewed in the context of the making and enforcement of regional and district schemes which are provided for under the Town and Country Planning Act of 1953 and is carried out by regional and district planning authorities.^{1/} The Act applies to all city and suburban areas, where in general the coastal area is significantly built-up. Most of the coastline is situated in areas controlled by ^{a/}county council. Local authorities in rural areas and counties are governed by the Counties Act 1956.^{2/} Under this Act, specific powers are given regarding subdivision of land, road, minimum frontage and area requirement, water supply, sewage disposal, road formation and reserves. Of particular interest are those provisions which reserve along ^{the/}seashore and ^{the/}banks of lakes and rivers areas for public recreation when land is subdivided.^{3/} The requirement for foreshore reserves (i.e. that area of land which is held in public ownership immediately above and/or below the mean high water mark (about 66 feet) for public access) has led to a substantial portion of the coastal areas being accessible to the public.

^{1/} The Act and Regulations (1960) provide for comprehensive land use planning and development control at a district and regional level.

^{2/} This Act (and its subsequent amendments) deals comprehensively with local government functions in counties.

^{3/} The County Act, Section 29.

Regional and district planning involves the formulation of the objectives of the community concerned, the examination of alternative policies for the achievement of these objectives, and the selection of policies which best achieve the objectives. The selected policies are then stated in the regional or district planning scheme. It is through these means that regional and district policies, integrated with policies of central government, can be clearly stated and implemented. The 1953 Act was recently amended to declare that the preservation of the natural character of the coastal environment and the protection of the coast from unnecessary subdivision and development are matters of national importance which must be recognized and provided for in regional and district schemes.

The major technique for implementing land use objectives and policies is zoning. The type of zone depends on the objectives and policies adopted by a local authority. A number of local authorities have adopted zoning laws for their coastal areas. For example, the Code of Ordinances^{1/} specifies the "predominant uses" allowed in a zone, the restrictions to which each predominant use is subjected, and the "conditional uses" which may be permitted in a zone. Conditional use provisions are intended to cater to uses which are not suitable everywhere, but which may be suitable in some locations under certain conditions.^{2/}

^{1/} It is the detailed "rule-book" for the administration and implementation of the policies set out in the scheme statement.

^{2/} See Town and Country Planning Act 195 , Second Schedule and Regulation, 15(4).

A district scheme usually deals with:

- (i) the preservation of objects and places of historical or scientific interest, or natural beauty;
- (ii) the designation of reserves for national, civil, cultural, and community purposes; for afforestation and water catchment purposes; for recreation grounds, ornamental gardens, parks and children's playgrounds or for open spaces;
- (iii) the designation of land for public works or for proposed public works, differentiating between government and local works;
- (iv) the designation of land or buildings used for purposes of value to the community but not intended to be owned by the Crown, the council, or any other local authority;
- (v) control of subdivision, including restraint on unnecessary encroachment or urban development on land of high actual or potential value for production of food;
- (vi) control of development in areas likely to be affected by earthquake, geothermal activity, flooding, erosion, land slide;
- (vii) access and parking space, transport terminals, and public transport systems, sewerage, drainage, and rubbish disposal, lighting and water supply;
- (viii) land subdivisional standards in relation to any permitted use and minimum site areas, dimensions in relation to uses of land and buildings, and finally the period during which a stage of development is to be undertaken.

It may be readily be seen that these various aspects dealt with in a district scheme cover to a certain degree the concerns in coastal areas and provide a basic framework for action.

Although a comprehensive land planning process exists in New Zealand, there is, however, no overall control of the use of coastal waters and the sea-bed. Legislation such as the Harbours Act 1950 is only concerned with controlling development (e.g. reclamation, erection of structures and removal of sand and shingle), and does not provide a system for the formulation and periodic review of demands and their effect on the resources.^{1/} Often, the responsibilities under the different acts are not integrated together; this is the situation between land and water, between the Town and Country Planning Act and the Harbours Act. For example, the jurisdiction of 1953 Planning Act stops at the mean high water mark, and thus, reclamation can be authorized under the Harbours Act prior to their landward implications being examined. Reclaimed areas only become part of the planning district once they have been approved. Structures on the foreshore can also be approved without prior planning approval. It has been suggested that the Town and Country Planning Act and the Harbours Act should be reviewed to avoid any gaps which may exist so as to provide a more effective system to help resolve these issues.^{2/}

The relationship between the Town and Country Planning Act and the Water and Soil Act is another example. In the past, land use decisions have not taken into account their impact on the quality or

^{1/} The information referred to here is based on communications received from the Government of New Zealand, dated 24 November 1977.

^{2/} Ibid.

use of natural water, or their impact on the coastal marine environment. In many cases, co-ordination is needed amongst the competent authorities with a view to integrating their different responsibilities. Legislation has been passed to effect local government reform and to create effective regional government to remedy the fragmented nature of local government. A further aspect of this is the need at a national level to develop policy which provides a framework within which regional and local authorities can plan.

Reclamation of land in coastal areas generally falls within the Harbours Act of 1950 and is subject to special procedures in order to ensure proper control and management.^{1/} The procedure for approving reclamations varies according to the purpose and size. Those in excess of 10 acres in area may only be authorized by special act of Parliament. Such an application must first be made to the Local Bills Committee, which receives submissions of bills from interested persons and bodies. The bill is then referred back to Parliament where it receives a second and third reading. It may be debated in the House, and following this may either be enacted or abandoned. With the introduction of environmental impact procedures, an impact report is required to accompany any local bill and it forms part of the submission. For a proposed reclamation of 10 acres or less, an application may be made for an Order in Council by the Governor-General. The procedures include consideration of public rights of navigation and the public interest by the Ministry of Transport before a recommendation is made

^{1/} The Act distinguishes between reclamations for agricultural purposes and reclamations for harbour "works" or for any other purposes such as industrial land, mariners or recreational reserves.

to the Governor-General. Procedures are also made for the issuing of foreshore licences for activities such as boat-sheds or repairing ships.

(c) In India there are five levels of activity with which any coastal development scheme must be concerned: the Central government, national corporation, the state, municipalities or village councils, and the private owners or occupiers of the land.

The Central government has full powers not only in Union territories, but also by delegation and otherwise in the States (or Provinces). Planning as such is both a Central and a State concern, but the implementation of the plans may be the work of agencies set up both in Union territories and in the States by the Central government. In such diverse areas as archaeology and industries, the Central government may take the initiative regarding an area and exclude other and competing interests.

The Central government's purposes may be achieved through the establishment of national corporations, some of an advisory character, some executive. To enable these to function, the special powers of government are available. For example, if an oil refinery is needed in some coastal area, the government will acquire the land for it, or the corporation may do so itself if government's powers are delegated to it. The basic scheme common to India, Pakistan, Bangladesh, and in some measure Sri Lanka is as follows: Once a field for activity is identified, a corporation (a Board or Trust) may be created by a statute. This body would be the channel through which the politically-conceived purpose is to put into effect.

The body is set up with its own constitution with such rights as to hold and dispose of property, to borrow funds and to lend, and to acquire property. The constitution and working and dissolution of the corporation are regulated by rules promulgated from time to time by the government under which it is set up. The corporation operating within these statutory rules makes its own regulations or bye-laws for its operation, and for its dealings with the public. The public are governed by the regulations as if they were contained in the statute. The obligatory nature of both rules and regulations is exactly the same as that of the statute. The corporation is armed with powers to take positive actions and to prevent its functions being frustrated. The statute usually provides penalties for interference with the corporation's activities and protects the officers from suit for damages when they act in good faith.

The state government has powers of an equally pervasive character provided it does not trespass on ground preempted by the Central government or in fields reserved to the Central government in the constitution. The state likewise can create agencies or corporations in, for example, town planning, and housing, which exercise powers of government within their particular scope. The powers of the corporation are similar to those already mentioned above.

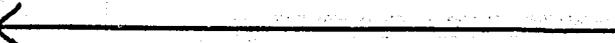
The municipalities, village councils, and the like exercise wide powers with reference to amenities and they may even play some role in planning. The fact that in practice these bodies are dominated by the state government does not alter their powers or responsibilities.

Generally, all coastal areas come within the jurisdiction of a municipality or a village panchayat. Questions such as open spaces, roads, sanitation, buildings, drainage, water supply or reclamation, all fall within the competence of the local government. Any coastal area development scheme involving these matters must seek co-operation from and indeed, implementation by the local government.

In India, Housing Boards play an important role in land use and development. With the exception of the slum areas, the Housing Boards have, alone or in conjunction with other organs of government, powers to undertake housing schemes, to purchase and lease land, to evict occupiers and to enter for survey.^{1/} ←

← Housing and improvement schemes may provide for recreation and transport facilities, sanitary arrangements, conservation and prevention of injury to or contamination to rivers and other sources or means of water supply, reclamation or reservation of land, parks, and /fuel depots. Any coastal development project could presumably be undertaken within schemes by the housing Board. A large number of tourist schemes have included rehousing, street construction, land development, coordination of housing activities, acquisition and disposal of land. ←

^{1/} See for example, West Bengal Housing Board Act, 32 of 1972, amended by 35 of 1973.

Town planning is often a part  of a comprehensive housing planning enactment. This does not mean that all aspects of town planning are subsumed. There is separate legislation ^{1/} under which the competent authority is given power to requisition and acquire land for any "development" purpose. Some local laws authorize a master plan to be set up or provide that in notified areas, no development of land may take place without application to the Planning Authority.^{2/}

R In this connection reference is made to the Dacca Metropolitan Development Authority Ordinance, 1974. Although Dacca is not a coastal city, the Ordinance appears to be instructive. The Dacca Metropolitan Development Authority (which deals with an ancient city haphazardly developed since 1947) prepares a master plan relating to land use, zoning, and land reservation; water supply, sewerage, and drainage; roads, highways, and traffic circulation; community planning, housing, slum clearance, and slum improvement. All land use and development must then be in conformity with this plan. All buildings and land are vested in the Development Authority. The Authority may take measures and exercise powers to carry out the purposes of the Ordinance. It coordinates

^{1/} For example, (Kerala) Town Planning Laws (Amendment) ordinance, 1976; Bengal Development Act, 16 of 1935 as amended by 1 of 1963; the West Bengal Development Corporation (Amendment) Act, 20 of 1963.

^{2/} E.g. The Orissa Town Planning and Improvement Trust Act, 10 of 1957, amended by 23 of 1969 and the Bombay Town Planning Act, 27 of 1955.

schemes and supervises the execution of schemes. Thus, the Ordinance empowers the Authority in the widest possible terms and clearly and unequivocally erects its supremacy in the field covered by the approved plan.

The real difficulty of development in south Asia is not the resistance of land-owners and other vested interests, but the conflicts between different local and national authorities and perhaps the lack of clear mandates and the need for better coordination. A simple statute like the above strives to clear the ground and make a fresh start, at least in structural terms.

One of the basic questions is whether land could be acquired for  coastal area development. The Land Acquisition Act is the basic statute.^{1/}

The basic purpose of the Act is to enable land to be acquired when it is needed for "public purposes" defined in general terms or for the use of a company specifically created by a statute.

Where it appears to the appropriate government that land in any locality is likely to be needed for any "public purpose", a notification is published in the Official Gazette and the Collector causes public notice to be given in the locality. The Collector causes the land to be marked out, measured and a plan to be made. 

He enquires into objections and awards compensation, and then takes possession. Those who do not accept the award may require the Collector to refer the matter to the Court.

^{1/} Land Acquisition Act, 1 of 1894.
← The Act was amended in India by 31 of 1962; In Pakistan, there are Land Acquisition amendment Acts of 1957, 1965, 1968 and 1969. In Burma, the Act was amended by 67 of 1954.

Some Indian States have their own acquisition act and the powers are sometimes more specific. For example, in Kerala, land may be acquired for established projects and the State government also has power to acquire land in project areas to avoid sudden rises in land values.^{1/} In Sri Lanka, acquisition of land may be authorized for purposes of a public corporation (e.g. tourism or settlement), the necessary declarations being made by the Minister to whom the subject of that corporation has been assigned.

Eviction of squatters

and slum clearance could be used as a vehicle for development.^{2/}

Under the general scheme, a "competent authority" may declare any

^{1/} See two Kerala Land Acquisition amendments: Land Acquisition Act, 21 of 1962 and President's Act 4 of 1966.

^{2/} For example, (India) Public Premises (Eviction of Unauthorized Occupants) Act, 32 of 1958, the Amending Act, 32 of 1968. The term "public premises" include property of any company, 51 per cent of whose share are owned by the government. Slum Areas (Improvement and Clearance) Act, 96 of 1956, amended by 43 of 1964; Calcutta Slum Clearance and Rehabilitation of Slum Dwellers Act; West Bengal Act 20 of 1958; Madras Slum Improvement (Acquisition of Land) Act, 11 of 1954.

area to be a slum area, and require buildings unfit for human habitation to be improved. The Central government or the representative of the competent authority may acquire land with compensation and make it available for development or other purposes. As a rule, the State Housing Board ceases to exercise powers when a slum improvement area has been declared and the Slum Improvement Board has begun to function in respect of it. Panchayats (village councils) may be established to carry out improvement functions. This machinery permits a degree of participation by the public. The government can always supersede a Board when it fails to function. It leaves to the Board to determine which are slum areas, and how to deal with those areas. The Board is vested with the power to implement its decisions by positive action and negatively by preventing contrary action on the part of individuals. The availability of the compulsory purchase of land for slum clearance is a powerful means if any development project is intended.

In 1974, an Integrated Area Development Plan was prepared for the Pondicherry Territory. Special attention was paid to questions of fisheries, sanitation, and water supply. The result is that the Planning Department of the Government of Pondicherry is in a position to put an end to casual and unplanned development of the town and port of Pondicherry and its environs.

(d) Coastal area development in Eastern Europe is inseparable from the concept of state ownership and national economic planning. In these countries, the basic means of production, banks, and the/ building and transport sectors are state-owned. Under the Constitution of the German Democratic Republic, for example, mineral resources, mines, power stations, barrages and large bodies of water, resources on the continental shelf, industrial enterprises, bank and insurance companies, nationally owned farms, traffic routes, the means of transport of the railways, ocean shipping, civil aviation, post and telecommunications are either nationally owned property or activities which are organized by states. In Bulgaria and the USSR, water resources are under the same category. Bulgaria and Yugoslavia consider fish and other sea animals being state property. Thus coastal area development activities have to be done largely at the state level. The government authorities decide the most appropriate use and development of natural resources in coastal areas/ in the light of the strategy for social and economic development adopted at a given period for the whole country.

Generally, the national economic plan is drawn on the basis of a long-term projection (for a period of 25 to 30 years), a short-term projection (usually 5 years concerning the growth and distribution of productive resources), and regional development requirements which include aspects

of local planning. Regional plans provide the necessary framework for dealing with such issues as allocation of industrial and agricultural enterprises, cities and urban centres, transport, communications, water-supply, sewerage, protection of nature, improving working and sanitary conditions, and recreation facilities.

In the Soviet Union, the users of a given resource are required to keep the necessary record showing the quantitative and qualitative utilization^{1/} ←————— Land utilization is based on the land cadastre as seen from the point of view of quality of land and the changes occurred on the land surface. It is obligatory to keep cadastres for all natural resources.^{2/}

(e) Poland has a law on planning of industrial and residential development,^{3/} the purposes of which are to ensure proper development of particular regions of the country, → to establish a proper relationship between areas of production and of service facilities, and to establish the best conditions for development and for protection of natural resources and values. Plans are made at the national, regional and local levels. The Planning Commission is responsible for making national and regional plans. The Ministry of Administration, Regional Development and Protection of Environment is responsible for local plans. All this applies to the planning and development of the coastal area. The use of land in sea-ports and in coastal belt

^{1/} For RSFSR that is the Law of 29 October 1960. Vedomosti Verhovnogo soveta RSFSR, 1960, No. 40.

^{2/} By virtue of the Law of 29 October 1960.

^{3/} Law on Planning of Industrial and Residential Development, 31 January 1961.

is subject to the Law on Grounds Administration in Towns and Urban Settlements;^{1/} in each case of development, special consultation with the appropriate authority of sea-administration and National Councils is required. Building, construction, bridges, tunnels, roads, railroads, reservoirs, industrial plants are regulated by the Building Law.^{2/} The law requires that the architectural shape of any building should harmonize with the neighbourhood and landscape, and should improve the beauty of the surroundings. Buildings or industrial plants must not affect the water, air, soil or landscape quality established by the State. The conversion of green terrains to other uses must be justified for social or economic reasons, capital gain alone is insufficient.

The development of tourism in Poland's coastal regions is contained in the general comprehensive plan of tourist industry development of ← up to 1990.^{3/} The long range development programme for coastal areas takes into account facilities necessary for both domestic and foreign tourists mainly from Czechoslovakia, the German Democratic Republic, Scandinavia and the USSR. The entire Polish coastal area is treated as one of the five zones divided for tourist development purposes. The fundamental conditions of the implementation of a tourism development programme in coastal regions include: (i) the maintenance of the natural and cultural heritage of the country; (ii) the

^{1/} Law of 14 July 1961 on Grounds Administration in Towns and Urban Settlements, Dziennik Ustaw 1961, No. 21, Item 159.

^{2/} Building Law 24 October 1974.

^{3/} Plan of Tourist Industry Development of Poland 1990 prepared in April 1973 by the Institute of Tourism for the Planning Commission at the Council of Ministers. Besides the general plan, regional plans were also drawn up which in turn include local plans worked out by local and town planning bodies. The local plans deal with such issues as beaches, use of dwelling houses in holiday resorts, tourists development of coastal areas, and development of sports and water navigation.

development of tourist infrastructure and industry; (iii) the creation of an economic and financial basis for the implementation of the programme; and (iv) implementation of the programme by effective institutional means. A number of coastal cities including Gdańsk and Szczecin are considered very attractive for tourists. The Old Town in Gdańsk has been restored and plans have been made to build a number of modern hotels and motels in the coastal region and also to develop transport for tourist purposes.

(f) Romania has a law on spatial planning for the whole territory to ensure optimal land utilization.^{1/} Any emplacement on land must be preceded by special emplacement studies which take into account established guidelines ^{and/} environmental requirements. Any activity dealing with mining, industry, energy, roads, agriculture or tourism must follow this procedure and to be approved by the local spatial planning Commission and then by State Committee of Planification.

Special legal regimes are established for different categories of land (e.g. agricultural, forests, areas designated for industrial and building purposes). The use of land for mining, industries and recreation is also subject to special decrees prescribing various environmental requirements.^{2/}

(g) In Yugoslavia, a new spatial organization has been initiated in the Adriatic region. Efforts are being made to link this area to the hinterland so as to bring this region within the framework of Yugoslavia and the Mediterranean. The approach adopted is to integrate settlements in existing urban areas to the extent that is possible, open new settlements as an integral part of the overall plan, and improve existing settlements and repair damaged environment.

^{1/} Law on Spatial Planning of Territory, Town and Rural localities, 29 October 1974.

^{2/} E.g. the Law of Environmental Protection 1973. Decree of Council of Ministers No. 311, 1963 on water pollution; Decree No. 541 1965 on Sanitation.

(h) Bulgaria, German Democratic Republic, Poland, the Soviet Union and Czechoslovakia all have legislation regarding protection of waters, air, soil and forest, and construction, space planning, urbanization, recreation and tourism, which are equally applicable to the coastal regions. The protection schemes cover maintenance, restitution and rational exploitation of all natural resources.

Existing legislation of most Eastern European States imposes obligations on enterprises whose activities may affect the environment, particularly that of the coast. They must ensure proper and rational use of the environment and its resources and minimize damage to it. They are required to install necessary equipment for the protection of the water, air, soil, forests and to introduce technological changes in their plants to preserve environment quality. Expenditures for treating pollutants and developing facilities for protecting environmental quality are regarded as necessary production costs, and, as such, are subject to deduction. In these countries, special regional and urban planning plays an important role in protection, development and rehabilitation of the environment. The degree of integration of that planning into the general economic planning is however different in each country.

(i) In Kenya and Tanzania, coastal area planning falls within town and country planning legislation.^{1/} Provisions are made in the legislation for the establishment of planning institutions for local areas so that local characteristics can be considered. Machinery exists in each country for the evaluation of planning schemes. Tanzania has an independent body, i.e. the Planning Control Board, to supervise and coordinate all development projects of the country, including those proposed by the Government itself. Since the Government is itself a developer and in order to ensure that all planning requirements are taken into account, the Government Director of Town Planning is an official member of the Board.

The Tanzanian legislation gives a clear indication of what matters may be provided for in the planning schemes:^{2/} for example, (i) the location, density, and reservation of land for open space, roads, car parks and bus stations; (ii) dwelling houses, flats and tenements of various classes and densities; (iii) shops, offices, trading premises and other commercial development with or without residential accommodation; (iv) zones or areas in which development of any kind is restricted or prohibited for any period; (v) the size, height, or spacing of buildings; (v) industries of various classes, warehousing and service trades or

^{1/} Cf. Town and Country Planning Ordinance, Chapter 378, Laws of Tanzania; (Kenya) Land Planning Act, Town Planning Act and the Local Government Regulations.

^{2/} Section 26 of the Town and Country Planning Ordinance.

any particular industry or trade. These regulations are equally applicable to coastal areas.

Kenya's legislation is very general on this aspect and leaves a lot of discretion to the planning authorities. The Development and Use of Land Planning Regulations (1961) under the Land Planning Act simply require that an application for development show the existing development in the area as well as proposed roads, density zones and the area in which sub-division is permitted. No other requirements are specified. Regulation 11(2) requires that an application indicate the part of the land which the applicant intends to surrender for "public purposes" (e.g. educational, medical and local government purposes). This regulation thus may be used to improve the conditions in the area in which development is intended to be carried out. The Government and the planning authorities presumably have guidelines on this aspect of planning from which they have been regulating the development in the country. More clarity could be achieved if those guidelines were made public or were incorporated in the planning legislation.

At present, most of the buildings in the coastal area of Kenya were put up by private developers. The consequences of their activities have resulted in ad hoc development, traffic strangles, over-crowded schools and shopping centres. The provision of land for basic and adequate living space and of water, sanitation, sewage and transport has been a serious problem, and better use of regulation 11(2) is called for.

(k) While the problems confronting the island states, e.g. Singapore, Mauritius and Bahamas, may not be all that different, certain characteristics need to be considered. In Singapore,^{1/} for example, the coastal area is not treated, for geographical and economic reasons, as a separate planning entity but constitutes an integral part of national planning due to the considerable proportion of the total area occupied by the coastal area. Various laws are applicable to the coastal activities as well as to the state as a whole. The Planning Act and the State Land Act (sand and gravel extraction), for example, apply to the whole country, including the coast; the Foreshore Act and the Prevention of Pollution of the Sea Act are primarily designed to regulate coastal activities. Because of the size of Singapore, even the interior of the country interacts intensively with the sea. There is therefore a great pressure on the land and marine resources. The reconciliation of the varied and sometimes conflicting requirements of important coastal activities such as port development, recreation, fisheries and the preservation of the ecological balance appears to be one of the challenges faced by the Government. Major land reclamations are carried out in the main island not only for the development of port works but also for airports, highways, industrial sites, housing complex, parks, marinas and other recreational facilities. Reclamation has also been carried out around offshore islands and the reefs. Since the limited coastal areas must be given to priority uses, offshore islands are being developed for public recreation purposes.

^{1/} Communication received from the Government of Singapore, dated 8 December 1975.

(1) The coastal area of Mauritius is regarded for physical planning purposes, both as a separate entity and as a part of national planning.^{1/}

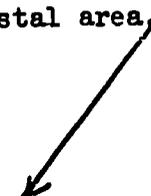
The coast is dealt with as an entity in respect to recreation. But for housing development, sanitation, water supply and education, the problems in the coastal area are regarded as the same as those in the rest of the country and come under the Town and Country Planning Ordinance of 1954. Coastal land is part of state property, and/ planning can take place via decisions on leasing the land on the coast. For the purpose of planning, coastal areas begin from 1 kilometre inland of the high water mark to the end of the coral reef (about 50 metres). The Town and Planning Ordinance is the principal law governing primarily the reservation of land for roads, transport, communications and other public utility services. On the basis of this Ordinance, existing use pattern on the coast has been analyzed and proposals for future uses are being made. There are separate laws governing protection of historical objects, building construction, sanitary conditions and removal of sand. These laws are applicable to the coast as well as the rest of the island. Special regulations also exist regarding port areas. For example, along Port Louis the coastal land within the city boundary is assigned for harbour and industrial uses only.

(m) In Bahamas, development plans are being prepared on an island-by-island basis, treating the coastal area as a separate planning entity.^{2/} On the basis of a recent land resource survey, priorities of uses within the coastal area have been assigned to recreation, tourism, harbours,

^{1/} Communication received from the Government of Mauritius, 9 January 1976.

^{2/} Communication from the Commonwealth of the Bahamas, dated 18 February 1976.

residential development, preservation, and conservation. Zoning orders are issued to cover all areas of outstanding natural beauty, historical and archaeological sites, scenic vistas, parks, and recreation areas. Planning guidelines for the control of land use and development, which incorporate the classical treatment of land use, have recently been published.^{1/} While these guidelines are applicable to areas both inland and shoreland, special rules are established for the coastal area.


The setback

requirement for building in the coastal area is not fixed by limit but by requiring "a view of the sea", whereas in the city, the limit is set by distance (from 15 to 30 feet) from the street.^{2/}

(n) The Town and Country Planning Law of Cyprus^{3/} requires the Minister of Finance to carry out a survey of the Republic and submit to the Council of Ministers for approval an "Island Plan".^{4/} The Plan is to indicate the general policy to be followed in promoting and controlling development, and specifically the location of population, industry and commerce, tourism, public transportation and conservation of areas of

^{1/} See Planning Guidelines for the Control of Land Use and Development in the Commonwealth of the Bahamas, published by the Government (no date).

^{2/} Ibid, Section 8.2 and 9.19.

^{3/} Town and Country Planning Law, 1972 (English translation prepared at the Ministry of Justice), Nicosia, published by the Government, No. 90 of 1972.

^{4/} Ibid, Part III, Section 7.

special social, historic, architectural or cultural interest or natural beauty. The Island Plan is subject to constant review. Under the same law, the Minister may also be requested to prepare "local plans" for specific areas or detailed proposals for any part of a local plan.^{1/}

In addition, there are detailed regulations governing streets and construction and alteration of buildings in the country and in the coastal areas.^{2/}

Any "development" (which includes the carrying out of building, engineering, mining or other operations in, on, over or under immovable property) must obtain first a development order (i.e. a planning permission).^{3/}

^{1/} Ibid, Part IV, Section 10.

^{2/} The Streets and Buildings Regulation Law (incorporating amendments made by Laws passed up to 31 December 1973) Nicosia, February 1973.

^{3/} Town and Country Planning Law, 1972, Ibid, Section 20(1).

This Chapter contains examples of legislative measures adopted by various countries in relation to the setting up of nature reserves and parks, and protection of shorelands, and preservation of archaeological sites. While these measures are not confined to coastal areas, they frequently find application in those areas, as the following illustrates. As will be seen, only a very limited number of developing countries have such legislation. Some of the approaches used may be suitably adopted by other countries facing similar situations.

1. Nature Reserves and Parks

(a) Under National Parks and Access to the Countryside Act (England) 1949, areas of ecological importance, which include beaches and dunes and swamps and marshes, can be safeguarded by being declared National Nature Reserves or Local Nature Reserves. The Nature Conservancy Council has a duty under the Act to notify the local planning authority of any "sites of special interest" by reason of its flora, fauna or geological or physiographical features. About 70 coastal reserves out of 153 national nature reserves have been declared in England, Scotland and Wales to protect rare species of flora, peat islets or limestone.^{1/}

Comprehensive studies of the coastline of England and Wales conducted through the National Park Commission (which became the Countryside Commission) during 1967-70 resulted in collection of a great amount of information. Recommendations were made that certain stretches of undeveloped coast of particular scenic beauty should be treated as "heritage coast".^{2/}

1/ For details, see J.A. Steers, "Saving the Coast: The British Experience", Coastal Zone Management Journal, Vol. 4, Nos. 1 and 2, 1978, pp. 7-24, Cf. p. 19.

2/ The Planning of the Undeveloped Coast, Circular 12/72. Department of the Environment, February 1972. ← In order to establish a baseline for measurements, the high water mark of mean tides as shown on one inch to one mile ordinance survey maps, was selected to represent the "coastline". Offshore islands other than small rock stacks and inlets (as arms of the sea) were included in the Commission's measurements. For Scotland, however, a ferry point is not used to mark the limit of the inlets; inlets and estuaries are measured where they are over one quarter of a mile long. For measurement purposes, the "coastal belt" was taken to include all level, whether or not it is intermittently covered by water, within one mile to landward of the arbitrary datum line. Land lying between the high water mark is excluded.

Many parts of the coasts (over 400 miles) are now acquired and managed by the national or local Trusts, which are independent bodies from the government. Trust ownership means that nothing less than an act of Parliament can bring about any change and thus ensures the status of these special coastal areas.

As already mentioned, in Scotland, a study of the coast by the Scottish Development Department, with the help of other agencies, resulted in the preparation in 1974 of Coastal Planning Guidelines for North Sea oil and gas development^{1/}. These Guidelines suggest the establishment of preferred zones for conservation. For example, the Nigg and Udale Bays coastal nature reserve covering an area of 750 hectares of international importance to migratory wildfowl has been established and the reserve is near the site of the proposed Nigg Oil refinery.

(b) The Conservation of Nature Act of Denmark makes provision for the establishment of beach protection zones everywhere in Denmark and the establishment is enforceable by local conservation boards. The Act provides protection against construction and landscape changes in a one hundred-metre coastal zone.^{2/} Recently the Ministry of the Environment has drawn up new guidelines for the protection of coastal landscapes, prohibiting the building of summer houses within a protected belt of 1 to 3 kilometres from the coast. The specific distance depends on the particular characteristics of the stretch of coast.

(c) On a similar basis, Italy, France, Sweden and Greece have also used their legislative power to set up pro natura, maritime hunting reserves, or aesthetic forests^{3/}. In Sweden, there are about 900 ←

^{1/} For a description of the Guidelines, see Chapter I, Section 1.

^{2/} Information from the Government of Denmark, dated 26 January 1976.

^{3/} For example, under the Protection of Nature Conservation Law (Greece, No. 996, 1971) the President may decree areas as "aesthetic forests". In France, the Minister of Culture and the Environment can establish maritime hunting reserves.

nature reserves (the largest being 593 hectares). Major tasks in these reserves are: to keep protective watch over the reserves while other areas should be allowed to develop without hindrance, to ensure that lumbering and agriculture techniques are consistent with natural conditions and to check and limit forms of exploitation so as to reduce damage.^{1/}

← In France, the Minister of Culture and the Environment and the Secretary of State for Environment has power to issue decrees declaring maritime hunting reserves.^{2/}

(d) In Cyprus, a "white zone" may be declared for protecting places, including the coastal area, /of natural beauty or special value.^{3/} Guidelines may also be provided regarding the choice of sites for development and for the promotion of planning control in such areas. Once a "white zone" is declared, existing uses are to remain and any further development must be limited to essential needs (e.g. agriculture, forestry, fishing or archaeology). The order setting up the zone must be accompanied by a map together with a statement of the principles governing any development activities in that zone. Preservation order may also be issued for any particular building, or "any area" of a special soil, architectural, historic or other interest or of natural beauty. No changes are allowed in the preservation area.^{4/} Violators are subject to fines; unauthorized developments are subject to removal.^{5/}

^{1/} Information received from the Government of Sweden, dated 3 March 1976.

^{2/} See G. Tendron, Development of Leisure Areas and Nature Conservation in Coastal Regions and by Lakes and Rivers. Paper submitted to the European Technical Conference on Leisure and Nature Conservation, Hamburg, June 1975. Published by Council of Europe, 1976.

^{3/} See Town and Country Planning Law, 1972, Section 35.

^{4/} Ibid, Section 38.

^{5/} Sections 46-55.

(e) In Republic of Korea, coastal conservation zone may be established wherever it is necessary to prevent damage to the coast. Activities such as stone quarrying, clay and sand pitting, wood cutting, building, remodelling, expansion of any facility, or any geological alteration of land pitting or landfilling are prohibited in such zones.^{1/}

(f) The Marine Reserves Act (1971) of New Zealand provides for the setting up of marine reserves in the sea and foreshore areas >

as the habitat of marine life. Such marine reserves are administered and maintained to ensure that they are preserved as far as possible in their natural state. The emphasis of the Act is to retain areas of sea-bed for their scientific and education value, and it sets out the machinery for the declaration of a marine reserve. Application for a declaration may be made by any university, national parks authority, or any body which has been appointed to administer land having a frontage on the sea coast, or any incorporated society or body engaged in scientific study of marine life or natural history.

A coastal reserves survey was recently completed in New Zealand.^{2/} The purpose was to identify areas which should be preserved for their outstanding natural, historic or scientific features or for their recreational potential. The results of the survey led to the taking of administrative action to safeguard land from conflicting use or to bring it into public ownership or use, and to assessing allocation of responsibility of central, regional or local government. On the basis of this survey, detailed local plans for implementation are being made.

^{1/} Information received from the Government, dated 30 March 1976.

^{2/} See The Coastal Heritage, publication by the Department of Lands and Surveys, New Zealand, 5000/P.82/1975.

(g) National parks have been set up in the coastal areas of Tanzania^{1/}. Efforts to start marine parks have met with considerable difficulties.

National Parks officials have already identified the areas for marine parks..

→ The officials of National Parks have held a number of discussions with the Fisheries Division on how to implement these marine projects; outside agencies have offered financial assistance for the necessary capital development. Dynamiting of the coral reefs has caused considerable damage and is not prohibited under the law at present.^{2/}

(h) Kenya has established three marine parks under the Wildlife (Conservation and Management) Act, 1976^{3/}: the Malindi Marine National Park (covering the waters of the Indian Ocean within Kenya's territorial limits), Watam Marine National Reserve (comprising the Mida Creek), and Kisite-Mpunguti Marine National Park (south of Wasini Island and covering some 21 square kilometres encompassing three off-shore islands). All the marine life in the parks are protected and hunting is prohibited unless licensed.

^{1/} For example, the Mikumi National Park and the Setons Game Park.

^{2/} See Annual Report, Tanzania National Parks, 1975, p. 14.

^{3/} Chapter 376, Law of Kenya.

(i) The Council of Ministers of Venezuela has power to designate a region as a national park.^{1/} The Los Roques achipelago was thus designated in 1972 as a national park. Various keys, gulfs, bays, islands, and lakes in the vicinity of Chichiriviche, Morrocoy, and Tucacas have also been declared national parks. Within this area, no structures or houses may be built over the waters, and existing constructions must be demolished within sixty days. Coral reefs and mangrove trees may not be damaged or destroyed. Untreated waste waters may not be discharged into the region; likewise dredging and underwater fishing are forbidden. The size and speed of boats navigating in the waters are limited. The Ministry of Agriculture and Ranching, in coordination with the Ministries of Interior, Development, Defense and Health, is to enforce the law.

Venezuela created in 1973 a National Parks Institute as an independent agency to administer the parks system.^{2/} Responsible for planning, conservation, and education, the Institute is required to issue rules and regulations for insuring the health and safety of persons in the

^{1/} See A. R. Graefe, et al., Towards Coastal Zone Management in Venezuela, Department of Management, Texas A and M University, Texas, June 1976. Memeographed Chapters 2 and 3 in particular.

^{2/} Law of National Park Institute, 15 October 1973.

park, as well as preserving the natural resources. Certain decisions of the Board of Directors are subject to approval by the Ministry of Public Works. Reserves, refuges and sanctuaries may also be established to protect mammals, birds reptiles and amphibians.^{1/} Hunting is prohibited both in the refuges and sanctuaries; threatened species may be transferred to sanctuaries for special protection to increase their population. Reserves are zones set aside for the orderly development of wild life population and for hunting under controlled conditions. In the coastal zone, Venezuela has used this authority to declare certain keys and islands near the State of Falcon a wild life refuge. This action was taken primarily because a number of migratory birds have their nesting sides in this area.^{2/}

Concerned that ecological changes are threatening coral formations and mangrove trees, Venezuela has forbidden the filling of coral structures or mangrove swamps on the coast of the mainland or on the islands in the Caribbean Sea. Houses may not be built over the water in or near the coast or the islands of that Sea.^{3/} The law also prohibits the cutting or destruction of mangrove trees, as well as the dredging of canals or of marine bottoms in mangrove swamps. Nor can polluted water be discharged into these swamps. Artificial islands may be installed in these waters only with prior permission of the Ministry of Health and Public Welfare and the Ministry of Agriculture and Ranching; these permits are in addition to those already

^{1/} Wild life Protection Law, 11 August 1970.

^{2/} Law 911, 2 June 1972.

^{3/} Decree 110 of 26 May 1974.

required under the Law of Navigation. A recent regulation orders the demolition of "palafitos"^{1/} and other structures built on the waters among the mangrove trees in the Bay of Buche. The Ministries of Interior, of Defense, of Health and Public Welfare, and of Agriculture and Ranching are to coordinate and execute the regulation. Another decree prohibits the construction of houses, cabins, or permanent camp grounds on the shores of Caicaro Lagoon.^{2/} This lagoon is now reserved for sports fishing only and the size of the permissible boats is limited.

Venezuela has established a committee to undertake an evaluation of all the problems confronting the use of/ renewable natural resources in the islands, lagoons and coasts.^{3/} The members are composed of representatives from Ministries of Agriculture and Ranching, of Foreign Affairs, of Defense, and of Health and Public Welfare. The Committee undertook a census of projected development in population and property.

This group is compiling data relating to legal, sociological, sanitary and economic considerations in different areas in order to recommend appropriate action. It also has power to make proposals to the Ministry of Agriculture and Ranching for the creation of specific wildlife reserves and marine parks in the coastal regions.

A 500-metre protective zone has already been drawn around lakes and lagoons. Within this area, no farming or ranching and no destruction of vegetation is permitted without governmental consent. The Director of Renewable Natural Resources is to supervise this scheme.^{4/}

^{1/} Regulation of 18 November 1974. Although the dictionary meaning of "palafitos" covers only "primitive dwellings", in actual fact all illegal structures, including luxurious houses, are to be demolished under this regulation

^{2/} Regulation of Ministry of Agriculture and Ranching, 4 July 1974.

^{3/} Decree 122 of 27 May 1974 and Decree 1,333 of 6 March 1969.

^{4/} Forestry, Soils and Water Law, 25 January 1966.

(j) For many years, Argentina has enjoyed a national park system^{1/}. Provincial authorities may also establish provincial parks.^{2/} The use of this power in the coastal zone is shown by a 1969 decree of the Buenos Aires Province which declared the Martin Garcia Island in the La Plata estuary as provincial park and recreational reserve. Hunting of wild animals in national territory or other territory under national jurisdiction is forbidden.^{3/} Under certain conditions, however, licenses may be issued for sports hunting; permits for commercial hunting are limited to those species specifically designated by the government as suitable for this purpose.

(k) The Barbados Parks and Beaches Commission Act gives the Commission the power to make regulations to establish sanitary conditions, practices to be observed in respect of public parks and beaches, and measures for the preservation of beaches. Under the Act, beaches cover not only the foreshore, but also the first one hundred feet of the landward limit of the foreshore.^{4/}

(l) In the last ten years, legislative acts have been adopted in Yugoslavia for the protection of fauna and flora both by the Federal Government and by the Union Republics.^{5/} Measures taken at the Adriatic coast are examples of harmonizing development (e.g. cultivation of land) and tourism on the one hand and the setting up of green areas and parks to preserve historical settlements and monuments.

1/ Law 12,103, 29 October 1934.

2/ Decree 2,091, 2 May 1969.

3/ Law 13,908, 29 July 1950.

4/ Communication from the Government of Barbados, dated 25 March 1976.

5/ E. g. Slovenian Law on Protection of Nature, 1971.

(m) In Poland, natural reserves may be created by Executive Acts of the Minister for Forestry. In the shore regions, a whole range of reserves has been created. For example the reserve "Kadyński Las" in the Gdańsk voivodship and "Bialogłowa" in the Gdansk voivodship were specifically created for the purposes of research, training and of preserving a valuable part of an old forest. In the reserves, no falling of trees, diverting waters, erecting buildings or structures are permitted.^{1/} Similar reserves can also be established in Romania under the Law on Environment Protection of 1973.^{2/}

(n) In many south Asian countries, coasts are places in which shrines and other architectural structures of archaeological value exist and where ancient treasure may be discovered, especially during development works. There are laws regulating finds, monuments and archaeological sites.^{3/}

^{1/} Regulation of the Minister of Forestry, 23 January 1973.

^{2/} Lois sur protection de l'environnement. Revue Roumaine des Sciences Sociales, 1975, No. 21, p. 59; Decree No. 76 of 1953, Decree No. 43 of 1954.

^{3/} For example, West Bengal Preservation of Historical Monuments and Objects and Excavation of Archaeological Sites Act, 31 of 1957; Orissa Ancient Monuments Preservation Act, 12 of 1956; Andhra Pradesh Ancient and Historical Monuments and Archaeological Sites and Remains Act, 7 of 1960; Madras ditto, 25 of 1966; Kerala Ancient Monuments and Archaeological Sites and Remains Act, 26 of 1969; Mysore Ancient and Historical Monuments and Archaeological Sites and Remains Act, 7 of 1962; and Gujarat Ancient Monuments and Archaeological Sites and Remains Act, 25 of 1965 (the authority has the power to purchase lands and to purchase antiquities.)

2. Protection of Shorelands

(a) Australia has a Coast Protection Board established under the Coast Protection Act, 1972. The purposes of the Board are to protect and restore ^{the/}coast from erosion, to develop any part of the coast for aesthetic improvement or for more appropriate use, and to conduct research on protection, restoration or development of the coast. The Board is preparing a management plan for South Australia's metropolitan beaches. The plan considers land use, land tenure, physical features, public access, foreshore and beach activities and measures to meet the problem of erosion and pollution. The plan takes the view that erosion problems form only one part of the wider management problem of a coastline, and stress that all coastal activities, e.g. harbours, residential, recreation, conservation, industrial or beach reservation, are closely interrelated. The solution of erosion problems might be solved by means other than engineering works and local authorities are advised to consider immediately preventive measures to avoid erosion problems, rather than to wait for engineering solution.^{1/}

Under its Beach Protection Act, beach erosion control districts are established on the coast up to 1,600 metres offshore from low ^{metres/}water mark and up to 400/inland of high water mark. The guidelines established for beach protection suggested that such districts should

^{1/} For the purpose of the plan, a working definition of the coast is given and covers from the hundred metres landward line measured along high water mark to a seaward limit of three nautical miles from the low water mark. At the same time, it is emphasized that ocean outfalls, offshore mining and dredging in that area should also be included.

extend the full 1,600 metres offshore, and the inland boundary should be drawn to include all areas considered to be vulnerable to long-term erosion over a 50-year period. Coastal protection in Australia is further strengthened by the Water and Soil Conservation Act, one of the purposes of which is to promote soil conservation and prevent damage by flood and erosion.

(b) The protection of soil against erosion is one of the most urgent problems in Bulgaria in view of the great quantities of shoreland being washed into the Black Sea. Several statutes are applicable to the protection of shoreland and soil against erosion^{1/}, and come within the competence of the Ministry of Forestry, Ministry of Agriculture and local People's Councils. The relevant laws require the competent authorities, for example, to plant trees as a means to control erosion.

The Law on Protection of Air, Water and Soils against Pollution deals also with sanitary aspects in tourist and health resorts and the use of drinking water. Agriculture land is protected through a system of high tariffs from being unreasonably diverted to non-agricultural uses. The funds obtained are channelled to land improvement, drainage and other purposes aimed at the increase of agricultural production.

(c) In the Soviet Union, the protection of shoreland is of great importance in the Black Sea region^{2/}. For example, the Law on Protection of Beaches on the Black Sea, 1962 prohibits the removal of pebbles from the beaches and feeder streams. The Law on Urgent Measures for Protecting the Black Sea Coast against Destruction and for Rational Utilization of the Resort Territory of the Black Sea Coast, 1969, provided that no new factories or buildings could be built within three kilometres of the coast. ←

^{1/} For example, the Law on Protection of Air, Waters and Soils against Pollution, Law on Protection of Agriculture Areas, the Forest Law.

^{2/} Information received from the Government, dated November 1975.

Fundamental rules on land protection, including shorelands, are contained in the principles of land legislation. Soil erosion is regulated by the Council of Ministers' decision on urgent measures for the protection of soil from wind and water erosion of 20 March 1967 ^{1/} and by legislation within the Republics. A general scheme of ^{an} anti-erosion programme has been instituted in the Ukrainian SSR. ^{2/}

(d) Under the British Coast Protection Act 1949, maritime district councils are designated as coast protection authorities and have powers to carry out works. They have a general responsibility for the protection of the coastline (except certain estuarial waters) against erosion or encroachment by the sea. Schemes for coast protection are submitted to the Secretary of State for approval; loans and grants may be given. Water authorities are responsible for the defence of low-lying land against flooding, whether by inland water or by the sea. Applications for licences for offshore dredging of sand and gravel from the sea-bed are submitted to the Crown Estate Commissioners, who consult with other government departments before any licence is issued.

× (e) India is aware of the need for soil conservation, particularly in areas open to erosion (e.g. Bengal and Kerala). The law is concerned mainly with two problems, the question of land ownership for taxation purposes, and protection against flooding ^{3/}. Some statutes specifically authorize embankments to be built, maintained and protected. The control of such matters has always lain with government. ^{4/} The basic

^{1/} SP SSSR, 1967 No. 9 p. 45.

^{2/} Vedomosti verkhovnoho Soveta SSR, 1960, No. 23, p. 175; SP USSR, 1967, No. 5, p. 47.

^{3/} See for example, the Bengal Alluvion and Diluvion Act; Bengal Alluvial Lands Act, 5 of 1920.

^{4/} E. g. the Sunderbanks Act 4 of 1915.

principles common to this type of legislation are: (i) the identification of a body responsible for detecting where works are needed, and for carrying them out; (ii) the empowering of this body; (iii) conferment of supplementary or ancillary powers; (iv) penalties for interference or infringement. Thus ←

the legislation sets up a legal framework, while the rules promulgated within that framework set up an administrative framework. Of special interest is the Kerala Land Development Act,^{1/} which may well be adapted in regions with similar erosion problems.

P The purpose of the Act is to prepare and execute schemes for conservation and development of soil resources, the control and the prevention of soil erosion and/reclamation of waste lands.

There is a Land Development Board which prepares plans.

The initiative lies with the local politicians, whose constituents or interested parties may press them for improvement or initiating new ideas. The Board conceives plans

and devises schemes so as to free the local politicians from responsibility for detailed work (e.g. feasibility study).

Then there are the District Committees composed of personnel recruited locally on a part-time basis. They are the actual initiating functionaries. The District Committees make recommendations to the Board. The Boards' schemes may provide for such matters as reclamation, prevention of soil erosion, and draining of canals, streams and rivers. The financing of the authorized work is to be

^{1/} Kerala Land Develop Act, 17 of 1964, amended by 16 of 1973.

borne by the owners of the land affected. In this manner, the schemes automatically involve the owners in the work of the District Committees. The taxpayers are partly relieved of the financial burden. To strengthen the system, the government is given the power to reserve the right to carry out work as devised by the Board and to recover the cost from the owner. The Board and its employees have rights to enter, inspect and survey the area involved.

(f) Argentina^{has/} established a Council to develop a plan for soil improvement and cultivation in the federal territories of Tierra del Fuego, Antarctica, and the Islands of the South Atlantic.^{1/} Concerns about soil erosion led Brazil in 1975 to order the Ministry of Agriculture to designate those lands where special protection of the soil is needed.^{2/} The owners of such land must begin the corrective work to prevent soil erosion and must complete such projects within a specified period. No credit for such land may be given by governmental lending institutions for other purposes until the projects have been completed.

^{1/} Decree 8 of 5 January 1970.

^{2/} Law No. 6,225 of 14 July 1975.

Chapter III: Natural Resources Management

Legislation relating to living and mineral resources management in many developing countries deals mostly with ownership, planning, protection, licensing and financing. Generally, such legislation does not distinguish the coastal area from other localities; nor is there special reference to such issues as siting of industries, waste disposal or pollution control in coastal areas. This section contains examples of some legislative approaches used in Africa, Asia and Latin America.

1. Management of Living Resources

A. Protection and Development Policies

Almost all Latin American countries have established some type of licensing requirements for fishing activities in coastal areas. In general, a licence is required for commercial and in most cases, sport fishing by national or non-nationals^{1/} in waters under their jurisdiction. Various rules have been established to exclude non-nationals from fishing activities or to limit them, particularly in certain zones reserved for nationals. The legislation of Brazil Mexico and Peru illustrates this approach.

(a) Brazil permits certain foreign vessels to conduct fishing activities in the outer 100 mile zone of her territorial sea.^{2/} Even within the outer zone, the fishing of crustaceans and "other living resources which are closely dependent on the sea-bed under the territorial sea" (e.g. lobster) is reserved for Brazilian vessels only. In the inner zone, foreign vessels may be permitted only if compensation is paid. The 1972 agreement with the United States provided that the latter agreed to license and control the number of American shrimp boats operating in Brazil's 200 mile zone. The agreement further authorizes Brazilian officials to board and search American vessels in that zone and to seize and detain any vessel reasonably believed to be in violation of that agreement. Proceedings against such ships are reserved to the United States, and Brazil is to hand over the detained vessels for prosecution

^{1/} E.g. Venezuela Fishing Law of 1944 (Article 13); Peru, Decreto Ley 18,810 of 1971, (Articles 6 and 7); Argentine, Buenos Aires, Decree 2,269, 4 May 1965 (Articles 3 and 10) and Law 17,500, 25 October 1967 (Articles 1 and 2); Brazil, Decree 68,459, 1 April 1971.

^{2/} Decreto Ley 1,098, 25 March 1970.

in the United States. Certain payments are to be made to Brazil to cover its share of the cost of enforcing the agreement. A recent Brazilian statute further clarifies this situation by stating that foreign vessels can fish in her territorial waters only with a permit of the Ministry of Agriculture or when authorized to fish pursuant to an international accord.^{1/}

(b) Subject to certain exceptions, commercial fishing by foreign vessels within the 200 mile Mexican economic zone is prohibited.^{2/} The Executive branch is to determine the allowable catches of the living resources in this zone. When the total allowable catch is greater than the hunting and fishing capacity of Mexican vessels, the Executive can grant foreign vessels access to the surplus of the allowable catch. Foreigners wishing to obtain such permits must register and must agree to certain specific conditions: e.g. not to unload their catch within Mexican territory, to make available to Mexican nationals on a gratuitous basis the technology used in the fishing operations and in the processing of authorized catches, ← and to make a cash deposit as a guarantee of compliance. In addition, at least 50 per cent of the crew must be ← Mexican nationals hired in that territory; there must be equal pay for both foreign and Mexican crew. Foreign vessels are not allowed to catch anchoveta or sardines. The basic objective of this law is to reserve future potential development for Mexican

^{1/} Law 6, 276, 1 December 1975.

^{2/} Law on the Exclusive Economic Zones, Decreto oficial, 13 February 1976.

nationals.^{1/}

(c) Peru has special regulations designed to protect national interests in fisheries. Thus, no foreign participation in fishing companies may exceed 49 per cent. No fishing permit can be granted to enterprises with foreign participation the main objective of which is to manufacture fish meal or oil for indirect human consumption. Every private fishing enterprise in Peru is required by law to ensure that the workers will receive twenty per cent of the net profit and that sum should normally be reinvested in the company's own shares. This scheme is designed to give the workers a voice in the management of the firm and ultimately a significant part of the equity ownership of the company. Foreign vessels may be permitted to fish within Peru's 200 mile zone if they are properly registered with and licensed by the Ministry of Fisheries. The registration fee is \$500 per ship and a licence fee by tonnage is imposed.^{2/} Restrictions are placed on the right of such foreign vessels to sell their catches in the Peruvian market.

(d) In view of the importance of fisheries, several Latin American countries have created special agents to deal with fisheries. Venezuela for example, has a National Consultative Council on Fishing Policy, whose members include both representatives from government and research institutes.^{3/} The Council makes recommendations on development and financing of the fishing industry, as well as on the enforcement of

^{1/} It is reported that so far, Mexico has exploited only about 10 per cent of her huge coast. Ninety-eight per cent of the scientific research on resources adjacent to her coast has been carried out by foreign powers without Mexican participation. Enforcement of these new provisions, however, may prove difficult, since as of 1973 Mexico had only 69 units to police her entire coastline.

^{2/} Supreme Decree 011-71-PE-1971.

^{3/} Decree 62 of 10 June 1969.

fishing regulations. Peru has established ~~←~~ a separate Ministry of Fishing.^{1/} Ecuador has established a General Office for Marine Development, which coordinates the activities of the Merchant Marine, the Army Oceanographic Institute and the Naval Transport Company.^{2/}

(e) In Bangladesh, there is a Fisheries Development Corporation Act which provides for the development of fisheries in coastal waters. The Act establishes units for the capture of fish and ^{for the/} survey of fish resources in coastal waters and estuaries. The corporation is to prepare plans and may itself acquire fishing-boats, and establish units for processing, distributing and marketing fish. The Act also provides financial assistance to fishing industries.

(f) In New Zealand, the establishment and development of farming for seafish, shellfish, oysters and marine vegetation are dealt with by the Marine Farming Act (1971). The Act provides for the setting aside of areas suitable for marine farming and assisting applications for leasing or licensing of such areas. Application must be publicly notified with copies sent to the controlling authority, adjoining local authorities and landowners. Procedures are available for ~~←~~ objections.

(g) In India and Pakistan, the question of fisheries is primarily a state concern. Certain methods of catching ^{3/} (e.g. explosives, poisoning water, construction of weirs),

^{1/} Decreto Ley 18,026 of 1969.

^{2/} ^{2/} D. S. 112 of 1973.

^{3/} The India Fisheries Act, 4 of 1897.

are prohibited. The states or provinces enact their own law for fisheries development or control purposes. For example, in the Andhra area, the catch of pearl or chunk fishery is subject to regulation and the catch must be licensed;^{1/} Kerala has a peculiar statute, Kerala Lime Shells (Control) Act (18 of 1958), which controls the acquisition, sale, supply, and distribution of limeshells on account of using shells in cement.^{2/}

Pakistan has an Exclusive Fishery Zone (Regulation of Fishing) Act, (32 of 1975) establishing an exclusive fishery zones for its own nationals.^{3/} All fishing in the zone must be licensed and all craft are subject to navigational regulations. The Federal Government may by notification establish closed seasons, prohibited areas, fish sanctuaries and detailed regulations to govern such matters as permissible catching methods.

(h) In Eastern Europe, the rules related to fishing and conservation of fishery resources are contained in special laws. For example, according to the Polish Law on Maritime Fishing of 21 May 1963, the right to fish within the six-mile fishery zone is granted exclusively to her own fishing vessels. Foreign vessels are not permitted to fish in Polish internal or territorial waters, unless it is so provided ^{for/} in an international agreement to which Poland is a party. Fishing is licensed^{4/} and controlled by the appropriate Maritime Office and by the Ministry of Foreign Trade and Shipping. Protection zones may be established in spawning areas.

^{1/} India Fisheries (Andhra Pradesh (Andhra Area) Amendment Act, Madras Act 2 of 1929.

^{2/} According to the Act, dealers using shells in cement are to be licensed; maximum prices and maximum quantities to be held and sold may be fixed by government. Provisions are made for such matters as restrictions on sale, power of search and seizure. Separate provisions are made for curios and ornaments, and collecting shells and selling them for their edible content.

^{3/} See West Pakistan Fisheries Ordinance, 30 of 1961, amended by 7 of 1972.

^{4/} Order of the Minister of Shipping of 26 November 1963.

(i) The Fishing Law of the German Democratic Republic^{1/} regulates fishing activities in rivers and coastal areas. It deals with fishing seasons, licences, and fishing gear. The Fishing Office is specially empowered to declare, after proper consultations with the permanent fishing commissions of local administrative authorities, waters or part of waters under special protection for reasons of spawning or conservation. In closed areas, not only fishing but also diversion of river beds, removal of aquatic plants, or dredging of sand, clay or stones from the water bed is not permitted.

B. Law Affecting Specific Species of Marine Life

(a) Usually, the government agencies authorized to grant licenses also have power to set fishing seasons for different species, limit the size of fish which may be taken, and prohibit the use of certain kind of gear.^{2/} Generally speaking, harpoons or dredgers, powder explosives, lime, sulphur, acids or other chemicals which may injure aquatic fauna are prohibited. In Venezuela, fishing areas are determined in accordance with sizes of fishing boat (e.g. boats larger than 18 metres are not permitted to fish within 6 miles of the coastline). The purpose is to reserve nearshore fishing for smaller fisherman with simple equipment. The Ministry of Agriculture and Ranching may designate certain species to be used only for fish fertilizer, flour or oil. It is illegal to use other species for these purposes.^{3/}

(b) In some parts of Argentina, a licence is required for extracting rushes or weeds from its waters;^{4/} in other parts, the extraction or harvesting of algae from the beaches or sea in a three-mile zone extending outward from the coastline requires special permission.^{5/} The provincial government is empowered to issue regulations to protect and conserve algae: e.g. seasons and areas for harvesting, as well as companies eligible to collect algae.

^{1/} 20 December 1959.

^{2/} Venezuela, Regulation of Ministry of Agriculture and Ranching, 6 July 1974; Argentina, Decreto Ley 2,269, 4 May 1965; Brazil, Decreto Ley, 454, 5 February 1969.

^{3/} Fishing Law 6 October 1944. Peru established PESCA-PERU, a corporation owned wholly by the Government, to produce fish meal and oil.

^{4/} Decree 2,269 of 4 May 1965, Article 45.

^{5/} Chubut Law 939, 23 July 1972.

(c) There are also laws designed to protect specific species of marine life. For example, Brazil and Venezuela are parties to the 1966 International Convention on the Conservation of Atlantic Tuna,^{1/} which established thereunder an international commission. The commission is empowered to issue recommendations designed to maintain the population of tuna and tuna-like fish. Such recommendations become binding on the member states within sixty days, if no objection is raised. Mexico, as a party to the Convention for the Regulation of Whaling, is bound by Regulations of the International Whaling Commission. This body may, for example, set seasons for whale hunting and designate _____ as protected species.^{2/} A 1973 Mexican regulation established a protected area for whales on the Pacific coast.^{3/}

(d) The taking of turtles or turtle eggs along the coasts or islands of the Orinoco River in Venezuela has been prohibited since 1972 for a five year period.^{4/} To further protect these animals, camping and the embarking or disembarking of boats on certain islands in this river, except in case of emergency, is _____ forbidden. In the Caribbean Sea, a green turtle (*Chelonia mydas*) refuge was declared in 1972, encompassing the Aves Islands, the corresponding continental shelf and the territorial sea.^{5/} The Ministry of Agriculture and Ranching is charged with enforcing these laws. In 1975, Peru suspended cod fishing around the area of Port Haurmey.

^{1/} Text of the Treaty in 673 UNTS p. 63.

^{2/} Text of the Treaty 161 UNTS p.72.

^{3/} Diario Oficial 14 January 1972.

^{4/} Regulation of Ministry of Agriculture and Ranching, 20 May 1972.

^{5/} Decree 1,069, 23 August 1972.

(e) Lobster fishing has been forbidden in Venezuela since 1975. An exception to this prohibition was reserved for the resident fisherman of the Los Roques archipelago.^{1/} Local fishermen in that area must obtain permits from and register each trap with the National Fishing Office. The total number of permits issued in any one season is limited; the commercial sale or transport of lobsters is regulated.

(f) Brazil limits fishing of pink shrimp in the open sea between the 20th and 30th latitude to vessels in excess of five tons. Such vessels must be licensed by the National Fishing Agency. Exceptions are made for shrimp boats under construction or approved for construction prior to its effective date. The avowed purpose of this legislation is to foster increased production of large shrimp boats.

(g) Pearl gathering and oyster fishing in Venezuela are subject to special laws which establish fishing seasons, and prohibit taking oysters under certain sizes.^{2/} Peru makes trading in pearls a government monopoly to be administered by the Peruvian Mineral Bank.^{3/} The capture of ornamental fish is also regulated.

^{1/} Regulation of Ministry of Agriculture and Ranching, 4 July 1975.

^{2/} Regulation of Ministry of Agriculture and Ranching, 4 July 1974.

^{3/} Decreto Ley 18,882 of 1971.

2. Mineral Resource and Industrial Development

(a) In both Kenya and Tanzania, ownership of mines/^{in coastal areas/} is vested in the Government or in the Head of State who holds such ownership in trust for or on behalf of the Government. This state ownership of mineral resources stems from a cardinal principle

that all the country's natural resources are the property of the nation and the Government acting on its behalf should ensure that their exploitation benefits the whole nation.

The powers and functions of the agents and institutions charged with overseeing mining and related activities/^{in coastal areas/} are the same in Kenya and Tanzania. In the former case, for example, the mining industry is governed by the Mining Act which deals primarily with precious metals and stones. The extraction of non-precious minerals (e.g. clay, sand and gravel) is not governed by the Act and remains unregulated to a large extent. Prospecting of minerals requires authorization from the Government and cannot take place in (i) land dedicated or set aside for burial or for public purpose (e.g. parks) (ii) the foreshore between high and low water marks at ordinary spring tides within the boundaries of any municipalities or urban centres or (iii) any area, which is the site of or within a certain distance (e.g. 50 or 100 metres) from any dam, canal, reservoir or building belonging to the Government or a county Council. It is specifically provided

1/ At present, mineral resources development in Kenya and Tanzania is still relatively small. Kaolin is found in the coastal area of Tanzania (the Pugu Hills) and is used in the chemical and ceramic industries of Dar es Salaam. The Uluguru Mountains are the main mica producing area in the country. Copper and manganese deposits are found in the coastal regions near Mobassa (Kenya), at Vitengeni and Mrima Hill. Drilling of oil near the coast inland from Lamu is also taking place. Since large coastal areas in both countries have not yet been surveyed, whether other minerals deposits exist is not known.

in the Tanzanian legislation that mining cannot take place in any national park, forest reserve, or game reserve.

The cutting down of timber or the clearing away of vegetation in coastal areas is permitted for the construction of works and ^{the/} installation of machinery connected with mining.

The cutting and making use of any trees in the course of mining operations are subject to payment of fees or royalties under the law relating to forests. Where mining operations are carried out near bodies of water or may pollute or interfere with the flow of such bodies of water, the Minister of National Resources is empowered to make regulations to protect such bodies of water against activities which may damage the quality or usefulness of such water. ^{1/}

For example, regulation 136(2) provides that no water containing any poisonous or injurious substances be allowed to find its way into any stream, lake, dam or reservoirs without having been first rendered harmless. On abandoning mining operations, the location holder is required to fill in pits, holes and excavations resulting from his mining activities. ^{2/} The regulation does not specify any particular methods for filling in such pits and excavations, the only requirement being that excavations be filled in or otherwise rendered safe to the satisfaction of the Commissioner of Mines and Geology.

^{1/} Legal Notice No. 275 of 1969.

^{2/} According to the Mining Law of the German Democratic Republic, a miner is responsible for reclaiming land for agriculture and forestry purposes after mining has been completed. In this manner, about 2,000 acres of land has been rehabilitated, among which 40 per cent has been used for agriculture and 60 per cent for forestry.

Control over the mining operations is maintained by the Commissioner who ensure that the holder of a location complies with the terms and conditions upon which the location was granted; he also ensures that the holder does not mine any mineral other than the one for which the location was granted. It is also his duty to oversee the restoration of land and to adjudicate any disputes which may arise from the activities. His decree or order is enforceable by the court having the jurisdiction.

In Kenya, the responsibility for survey and mapping of mineral resources and for the control of mining activities is assigned to the Mines and Geological Department of the Ministry of Natural Resources. An Economic Investigation Programme has now been set up under the Department to undertake research and evaluation work on ore minerals, building materials, mineral procession and mineral economics.

Kenya does not allow an oil mining lease more than 1,250 square kilometres. ← While an oil prospecting or oil exploration licence can be granted to any company, an oil mining lease can only be granted to a company incorporated in Kenya or a company incorporated outside but registered in Kenya.

There is no specific reference to protection of environment. The only recourse which may serve as a preventive measure is the ← provision requiring compensation for causing "disturbance" causing / to the owner or occupier of private land or/damage to such land or to any crops, trees, buildings, stock or works thereon. A person who is neither an owner or occupier of the land in question does not seem to have the right to seek compensation for disturbance or damage.

(b) In most Latin American countries, laws in the fields of mineral resource extraction, like those ^{in/}fisheries, are mainly directed towards excluding or limiting exploitation by non-nationals. Mineral deposits are generally designated as property of the State.^{1/} The Mexican Constitution, for example, specifically claims public ownership of the minerals deposits in the 200 miles exclusive economic zone. Concessions may be granted, however, for exploitation. Upon expiration of the time period of ~~mining~~ concession, such property reverts to the State.

Until 1974, the exploration of salt in Venezuela was done by licenses and contracts^{2/}. Since 1974, the National Salt Company (ENSAL) has been authorized to use and to purchase from concessionaires all the installations, equipment and property necessary to continue the mining and processing of salt. The expressed purpose was to ensure the proper iodination and refining of salt for public health reason. Nevertheless, ENSAL may contract with mixed capital companies^{3/} to refine and iodize the salt. A commission was created to oversee the operations of ENSAL. Members of the commission consist of representative of the Ministries of Health and Public Welfare, Treasury,

^{1/} For example, Peru (Decreto Ley 18,880 of 1971, Art. 1) Mexico (Constitution, 1961, Art. 136), Venezuela (Constitution Art. 27). Ecuador also declared the "inalienable interest" of the state in "petroleum exploration and conservation" Decree of 6 June 1972).

^{2/} According to Constitution Art. 136 (10) and Decree 560, 26 November 1974, salt deposits may not be alienated.

^{3/} A mixed capital company means a corporation, part of whose stocks is held by the government and part by private persons or enterprises.

and Development. This commission must approve both the contracts by ENSAL to buy the properties of the former concessionaires and the contracts of ENSAL with other companies to process salt.

(b) Peru has created a wholly owned corporation, the Salt Company, whose capital is furnished by the State; its board of directors consists of representatives from the Ministries of Industry and Commerce, and Energy and Mines, and of the Salt Company's workers.^{1/} Mineral wastes must be disposed of in special dumping grounds where proper safety measures are to be taken to prevent contamination of water and soil. The Ministry of Mining, upon advice of other appropriate agencies, is to establish such special dumping grounds and authorize the installation of mineral compacting plants.

(c) The Yugoslavia Basic Law on Mining Ores of 18 February 1966 also applies to the extraction and exploitation of mineral ores on the sea-bed, underneath it, or outside the coastal sea of Yugoslavia but within its national jurisdiction. In addition, the law of 22 May 1965 made special provisions for exploration and exploitation of the continental shelf. Such activities must not unjustifiably interfere with navigation, fishing, protection of living resources of the sea in general and with fundamental oceanographic or other scientific research.

(d) In South Asia, mining has always been considered a concern of the State. In India and Pakistan, for example, the central government has the sole responsibility for nuclear substances, oilfields and gasfields; other mines are in the hands of the provincial government.^{2/} For any group or class of mines, there is a Mining Board and the development of mines is in general in the hands of corporations set up specifically for that purpose. The government plays an important role in all industrial development both in terms of organization and financing. Prospecting or mining operations are under licence or lease and usually only nationals may hold such licences or leases.

^{1/} Law 17,525 implemented by Decreto Ley 18,923 of 1971 and 18,350 of 1971.

^{2/} E.g., the Mines Act, 35 of 1952 of India as amended by 52 of 1970.

Leases are limited in the first instance to 30 years for coal, iron ore, and 20 years for any other mineral. Mines are ← government controlled,^{1/} and the rules for the grant of prospecting licences and mining leases and for the conservation and development of minerals are also made by the central government. The Geological Survey may be authorized to make surveys.^{2/}

The import, transport, storage, production, refining and blending of petroleum and other inflammable substances are also controlled by the government.^{3/} In India, for example, no one is permitted to produce, refine, or blend petroleum save in accordance with rules made by the Central government. Pipelines must not be laid under residential land, permanent structures, lands close to a dwelling house, or less than one metre from the surface^{4/}. Where pipelines have been laid, no building, excavation or construction of tanks, well or reservoirs can be made without special authorization. In Sri Lanka, the local authorities have powers to license import, transport and storage of oil, and the Minister determines ports of entry.

The development of oilfields is governed by special legislation in India.^{5/} The Central government makes rules for granting leases and for the conservation and development of mineral oils. There is an Oil and Natural Gas Commission whose functions are to plan,

^{1/} See, for example (India) Mines and Minerals (Regulation and Development) Act, 67 of 1957.

^{2/} The amending Act, 56 of 1972.

^{3/} See for example, the India Petroleum Act, 30 of 1934, as amended by 24 of 1970. The Act is also in force in Pakistan and Burma.

^{4/} The (India) Petroleum Pipelines (Acquisition of Right of User of Land) Act, 50 of 1962.

^{5/} The Oilfields (Regulation and Development) Act, 53 of 1948, as amended by 39 of 1969.

promote, organize and implement programmes for development of petroleum resources; it makes surveys and undertakes/ exploration (including drilling), and geological and other investigations. The Commission may set up an industry with the approval of the government. It has power to acquire land for that purpose and to make rules and regulations with the prior approval of the Central government, to discharge its functions and regulate its own procedure, the central government having the power to amend or rescind any regulation. A similar course is taken in Pakistan.^{1/}

In south Asia, coastal regions are favourite location for factories as they are near to sources of power, points of entry and departure. They also provide access to cheap labour forces. There are laws dealing with various aspects of factories: licensing and registration, inspection, health safety, welfare, working hours, employment and young persons, and annual leaves.^{2/} The question of discharges from factories into rivers or the sea/generally/figures/little importance in the legislation.^{of/} Some general guidelines dealing with marine or coastal pollution resulting from land-based sources appear to be needed. ← Legislation exists in Pakistan and Burma pertaining to scientific and industrial research.^{3/} In Sri Lanka, an Institute of Scientific and Industrial Research was set up under the control of a Minister to develop natural resources and industries.^{4/}

^{1/} The (Pakistan) Regulation of Mines and Oilfields and Mineral Development (Government Control) Act, 24 of 1948, as amended by Ordinance 8 of 1971; the Oil and Gas Development Corporation Ordinance, 37 of 1961 as amended by Act 15 of 1966 and 3 of 1971.

^{2/} Some of the examples include: (India) Factories Act 63 of 1948; (Pakistan) Older Factories Act of 25 of 1934, as amended Ordinance 6 of 1966; (Sri Lanka) Cap 128 of the Laws of Ceylon.

^{3/} The Pakistan Science Foundation Act, 3 of 1973, set up a Financing agency; the (Burma) Union of Burma Applied Research Institute Act, 1954, set up an Institute to further research.

^{4/} Cap. 164 (Sri Lanka), as amended by 14 of 1962 and the Law of 1973 (No. 51). There is also the National Science Council of Sri Lanka under Law 36 of 1975.

In south Asia, the government plays an important role in all industrial development both in terms of organization and financing. In India,[✓] for example, the development of any industries requiring finance comes under the State Financial Corporation Act (63 of 1951) whereby a Corporation is set up to guarantee loans from banks and deferred payments to underwrite stocks, and ^{to/}grant loans and subsidies against debentures to "industrial concerns". The Act is applicable to all major industries, including processing of goods, mining, hotels, transport, generation of power or development of any land contiguous to an industry area. This Act, thus, provides a financial framework for the creation of new industries.

The Central government may establish a Development Council for any new industry. Existing industries are registered and new undertakings are licensed by the Central Government. Government has power to investigate industrial projects and may issue directives for undertakings. Direct management and control of industrial undertakings may be assumed by the Central Government, and it may control supply, distribution and prices.

^{1/} The Industries (Development and Regulation) Act, 65 of 1951.

An interesting code is the West Bengal Industrial Infrastructure Development Corporation Act (25 of 1974) which established a Corporation to secure the development of trade, commerce and industries on a well-planned basis. Its functions include reclamation and improvement of land, acquisition of land, sewerage, transport, roads and zoning. The Corporation's powers of acquisition of land are provided in detail. No person may undertake any specific development of land in any industrial estate save with the permission and under conditions laid down by the Corporation. This Act appears to be a typical legal framework in South Asia. It provides for the tight and exhaustive hold over the Corporation by the State Government and the relatively loose and flexible and vaguely-expressed delimitation of the Corporation's own powers vis-à-vis the public and its actual duties. The legal framework is widely drawn to enable the Corporation to equip itself to function multifariously. The Act sets up a framework for action. Whether the action itself takes place depends on the interaction of the designated officials of government and their contacts in the enterprises in question.

In Pakistan^{1/} some industrial development can only take place under the control of the Central Government (arms, nuclear materials, petroleum and mines), while the rest comes under Provincial control. The appropriate government may plan and regulate the setting up of new undertakings and the development of existing undertakings and make rules to carry this out. Industries such as oil, gas and electricity are under federal control and are not governed by the law of companies.^{2/} There is a Board of Industrial Management whose function is to ensure that establishments are managed efficiently and in accordance with sound business principles. The Board/may also give directions to managing directors in the exercise of their powers. There is a plethora of statute law in the provinces of Pakistan, ← dealing with further development of cottage and small industries. Loans/ and/ guarantees may be provided for surveys, and for the establishing facility centres, small industries trading estates and artisan colonies.

^{1/} The (Pakistan) Development of Industries (Government Control) Act, 13 of 1949.

^{2/} The (Pakistan) Development of Industries (Federal Control) Ordinance, 36 of 1972, amended by 37 of 1974.

3. Electricity and Other Sources of Power

(a) Many developing countries have special legislation regarding production of electricity. For example, in Kenya, electricity generating activities are controlled by the Government through a licencing system.^{1/} The applicant for a licence to generate energy must submit an application and make public the application. Any person, company, public or local authority who desires to make representation or objection regarding the application is given an opportunity to do so and his representation or objection must be made by letter addressed to the Minister in charge, with the same procedure being followed where it is desired to have any restrictions to be inserted in the licence. The application, together with any representation or objection made, is considered after the expiry of sixty days and the Minister in charge may then refuse the application or grant it on such terms or conditions as he may impose.

In the event the licensee cannot obtain land on his own for the purposes of constructing a generating station, the Government may facilitate the acquisition of the land by authorizing compulsory acquisition.

Some protection measures for the environment are provided by Section 69(1) of the Electric Power Act which imposes liability on all licensees, operators or owners for nuisance caused or permitted by them. Specific protection is extended to shores, sea beds, canals, creeks, bays and estuaries, whereby no licensee may have the right to take, use or interfere with any portion of such areas.

^{1/} The Electric Power Act, Chapter 314, Laws of Kenya Section 135(1).

In effect, the construction of generating stations on the country's shores, sea bed, creeks and bays is barred since such construction would invariably involve the use of ^{a/}portion(s) of the said shores, sea-bed, creeks and bays.

(b) In Tanzania, one of the main sources of hydro-electricity is the Grand Pangani Falls, about 40 miles from the coast on the Pangani River. Unlike the Kenyan system, it is the President who has the power to grant a licence for the supply of electricity and to expropriate land for that purpose. There is a general ordinance dealing with electricity. The Electricity Ordinance empowers the Minister to appoint electric inspectors who supervise the construction of works and may enter any premises of a licensee to ascertain that the provisions of the Ordinance and the rules made thereunder are being complied with. A licensee is required to submit to the Minister, maps, plans and drawings on a detailed scale when the work involves dams, canals, reservoirs, or tunnels.

The Pangani River Ordinance ~~this Ordinance~~

regulates the use of certain parts of the waters of the River and its tributaries. It restricts the extent of the rights which may be granted by the President or any other authority charged with the duty of controlling or regulating the waters of the River. The Ordinance provides that neither the President nor any such authority may allow the use or obstruction of the waters of the River in such a way as to reduce the flow to less than 450 cubic feet per second.

(c) In India, the State Government controls the supply of electricity; the State Electricity Board acts as the medium between the government and the users. In addition to the powers devolved on the licencees to distribute electricity, the Boards themselves may become heavily involved in water power, which is particularly relevant to the coastal regions. The Board is empowered to take measures to advance the development of water-power in the State (this would include tidal power) and to organise and carry out power and hydrometric survey work necessary for such purposes. It prepares schemes for generating stations. The Central Electricity Authority recommends to the Board any scheme for developing electricity but must ensure that the power-generation will not affect the natural flow of the river and will be consistent with requirements of irrigation, navigation, and flood control.

←————— The State Government alone grants concessions for development of water-power and its use for electrical purposes. The State Government makes rules governing these matters and the Board functions under the State Government's directions on questions of policy. →

The legal framework is similar in Pakistan,^{1/} Burma,^{2/} and Sri Lanka.^{3/}

(d) In Mexico, the / transmission/ transfer or distribution of electricity are functions performed by the State; concessions to non-nationals are forbidden.^{4/}

^{1/} For example, the Act of 1910, as amended in 1949 and 1964, and the Electricity Control Ordinance, 28 of 1965.

^{2/} For example, the Electricity (Control of Undertakings) Act, 63 of 1947

^{3/} For example, Eap. 205 Laws of Ceylon provides the framework whereby the Minister grants licenses to supply electrical energy.

^{4/} Constitution (1917 as amended 1972) Article 27.4.

(e) All activities relating to the application of nuclear energy are generally under the control of the government in most developing countries: e.g. to mine and dispose of uranium, to produce, develop, and use nuclear energy,^{1/} to manufacture, produce and buy radioactive substances. In India and Pakistan, the government is also empowered to declare 'restricted information' and 'prohibited areas'. The production and supply of electricity, the erection of buildings, and the execution of work connected with nuclear energy all fall also within the exclusive competence of the government.^{1/}

(f) In Peru, an exclusive right to explore, exploit and refine radioactive substances is given to the Institute of Nuclear Energy, a government agency.^{2/} Both Brazil and Venezuela assigned this task to specialized agencies. Brazil created a mixed private-public company whose stock must be at least 51 per cent owned by the National Commission on Nuclear Energy.^{3/} The corporation is also to ensure adequate treatment and elimination of nuclear wastes.

^{1/} India, the Atomic Energy Act, 33 of 1962 as amended, Section 3; Pakistan, Atomic Energy Commission Ordinance, 17 of 1965, as amended by Act 13 of 1968 and 16 of 1974.

^{2/} Decreto Ley, 21,297 of 1975, Articles 1 and 2.

^{3/} Law 5,740 of 1 December 1971, Article 1.

Chapter IV: Management of the Marine Environment

Three aspects are dealt with in this Chapter: Water management, marine pollution and oil pollution. Very few specific coastal water management laws are found. Management of coastal waters remains under the general framework of water management of the whole country. The first/ Section provides some examples of how problems of water management in coastal areas have to be tackled.

1. Water Management

(a) In Yugoslavia, the inland waters, the sea and the seacoast are treated as a part of the "commonwealth" and as such are specially protected. They can be used only under conditions prescribed by law in order to ensure their rational exploitation. Jurisdiction over the waters and the coast is essentially in the hands of the republics and autonomous provinces. The federation retains powers concerning the overall management of waters involving two or more republics, international waters, and Yugoslav coastal waters as regards pollution control. The basic management of water courses is governed by a master plan drawn up by mutual agreement among the Republics concerned. The classification of international and inter-Republic waters is established by a federal ordinance which prescribes, inter alia, maximum permissible concentrations of noxious substances in the water. The Republic and provincial water laws lay down the basic principles concerning utilization, uses of watercourses, flood control, water conservation and erosion control. These laws also deal with questions of implementation, supervision and sanctions.

Water management communities (or ventures) are set up to deal with control and water supply in the country, including coastal region. These communities are formed by citizens and working people, and have a wide range of authority: Planning, execution of plans, maintenance and control

of water regimes, watercourse regulation, training, and development of navigation waters. As for irrigation, drainage, hydro-electric power and industrial water supply, there are specialized communities (or ventures) formed by users and suppliers. The law of the Republics authorizes local government to prescribe conditions under which ventures can be organized. For example, irrigation and drainage ventures are formed by participants from the enterprises maintaining the system, and citizens and enterprises which use the land improved or reclaimed by the system.

Water authorities exist at federal, republic and provincial levels. Their functions are to draw up legislation on all matters concerning water, and to enforce the relevant laws. Every water area is required by law to have a water management master plan to cover a period of 15 to 20 years. The draft is made available for public scrutiny and is submitted to the republic (or provincial assembly for approval. Once it has been approved, it is then incorporated into laws for enforcement.

(b) In Kolobrzeg, a coastal region in Poland, special laws are issued to protect waters needed for medical purposes.^{1/}

^{1/} Order of the Chairman of the Higher Mining Office on Establishment of the Area of Mining Protection of Medicinal Water Springs, Mineral Waters of the Health Resort-Kolobrzeg of February 14, 1963, M. P., 1963, No. 15, Item 91.

Any construction or rebuilding within the defined region is closely controlled and in certain areas near protected waters, any exploitation of clay, gravel or waters for industrial purposes is prohibited.

Systematic sanitary control of coasts and summer resorts or ports on the Baltic sea is carried out by the Inspection Service of the Ministry of Public Health and Welfare. This control covers the total coastal length on a seashore which is usually a few hundred metres. The corresponding measurements and analysis are carried out by the laboratories of the local authorities which are administratively attached to the Central Water Resources Administration. Since 1971, a comprehensive research programme has been carried out for pollution control in the central Baltic and the straits. Certain ecological parameters have been measured. The two main rivers Odra and Vistoula which lead into the Baltic maintain an adequate water quality level in order to satisfy the quality standards established in the country for industrial and irrigation use. Systematic control of water pollution is carried out for rivers with basins larger than 300 km². The frequency of surveys depends on the economic importance and the rate of pollution increase of the rivers under study. However, the intervals should not exceed five year periods. The Odra and Vistoula are examined every year.

(c) In Bulgaria, the use of water and water basin is set out in a well-defined water economic plan which, in turn, is governed by the Water Economy Act. The construction of sewage treatment plants to deal with urban and industrial waste waters is required under national economic plan. Under

its water law of 1969, it is prohibited to undertake activities or to carry out construction work which could harmfully affect the natural condition of water, the run off, the river flow capacity, the quality of water etc., and special penalties are applied against violators. For the protection of the Black Sea against pollutants resulting from inland sources, several technical measures were undertaken in 1970, such as the treatment of sewage and effluents from housing, camping, and industrial sites. The Ministry of Forestry and Protection of the Natural Environment is responsible for the enforcement of these measures. Expenditures are shared among the central authorities and establishments whose activities include the discharge of waste waters.

(d) The Water Law of Romania, 1974, requires preparation of water economy programmes to be based on schemes for the management of water basins. The programmes intended to safeguard rational and complex utilization of water resources in the light of social and economic development and the quality of environment protection. General plans for each water basin are formulated on the basis of development plans. Each scheme contains analysis of surface and ground water potential from the standpoint of quantity and quality of the waters, and their assessment in terms of utilization of waste bilans. Emphasis is given to environment aspects, future needs, hydroelectrical potential, soil, erosion and management method.

(e) Guidelines for future economic and technical policy in the utilization and protection of water resources in the Soviet Union are set out in the General Scheme for the Multipurpose Use and Conservation of Water Resources (1980) which covers the whole territory. This General

Scheme provides for the distribution and development of the productive forces in the country, while taking into account the need for preserving and improving the state of the hydrosphere as one of the elements of the natural environment.

(f) Traditionally, waters in many Latin American countries were subject to appropriation and control by private persons. Since the 1960's, there has been a shift away from the sanctity of private property rights in order to give powers to the state to manage waters and related problems. Hydraulic reserves, water-falls, currents and natural water deposits are now in the public domain.^{1/} The law establishes protected water zones together with the surrounding land necessary to conserve these water resources. Hydraulic works and dams are subject to special regulations: e.g. they must be constructed in a manner so as to avoid affecting the aquatic animal life; dams and dikes have to be built with staircases to permit the passage of fish.

(g) The flow of river water is relevant to the availability of fresh water for drinking, irrigation, and for industrial purposes, and it affects drainage and sewerage, which in turn affects health. The powers and duties of various regulatory bodies are intimately connected with drainage and flood-control. In India, River Boards are established to administer and regulate interstate rivers and river valleys.^{2/} The Boards are charged with advising the government on such matters as conservation, control and utilization of water, promotion and operation of schemes for irrigation,

^{1/} E.g. Venezuela, Decreto Ley 1,333, 6 March 1969. Some trend is also followed in Peru (e.g. General Law of Waters, Diario Oficial 17,752 of 1969) and Ecuador (1972 Supreme decree declared her waters a national asset for public use and consequently outside of commerce).

^{2/} See for example, the River Boards Act, 49 of 1956.

water supply, drainage, hydro-electric power, flood control, navigation, afforestation and control of soil erosion, and the prevention of pollution of waters. Each Board also has power to acquire, hold and dispose of property, to undertake survey and inspection, to collect topographical, meteorological, hydrological and subsoil water data, and to publish statistics. In Kerala, flood control drainage, and paddy-rice growing are the concern of a special officer. In some regions, the government has power to deal with the non-exploitation of lands under the command of the irrigation scheme, and cultivators may be compelled to make use of the scheme.^{1/} In Sri Lanka, the government, has power to reclaim low-lying land in Colombo District for development purposes.^{2/}

(h) The adoption of the Water and Soil Conservation Act in New Zealand in 1967 led to the establishment of a policy for the conservation, allocation, use and quality of water and procedures for its control and management. The policy ensures adequate supply of quality waters for national uses: e.g. primary and secondary industries, drinking water, fisheries, wildlife habitats and recreational uses.

Provision is also made for classification of waters suitable for various public uses. The purpose of the classification is to guide the location of waste discharges so as to minimize conflicts, and to regulate their quality, thus providing a plan for their control. The provisions of this Act also extend the powers of the Soil Conservation and Rivers Control Act to include its operation in maritime areas regarding conservation of soil resources and control of erosion and flooding.

^{1/} E.g. the (Indian) Maharashtra Act, 47 of 1965; East Bengal Embankment and Drainage Act, 1 of 1953.

^{2/} Colombo District (Low-lying areas) Reclamation and Development Board Act.

In recent years, conservation of natural wetlands (e.g. swamps, flood plains) to productive farmland in highly developed regions in New Zealand has left only remnants of formerly large areas of natural wetlands.^{1/} Recognizing such major functions of wetlands as flood and erosion control, nursery area for food and recreational uses, institutions specifically responsible for the conservation of wetlands are concerned and have proposed guidelines aimed at clarifying approaches and actions in managing water and soil.^{2/}

(i) In the Republic of Korea, the Shoreland and Adjacent Water Space Control Law was enacted in 1961 to preserve, use and manage shoreland and adjacent water space.^{3/} It also prohibits disposal of any noxious materials and any activities which may damage the quality of the coastal environment. Any building, dredging or deforestation in coastal areas requires prior permission.

(j) According to the Health Decree 1965 of Greece, sea waters are classified into categories following their uses, and for each use, water quality standards are established. There are also general regulations concerning the quality of waste waters discharged into the sea and the conditions under which discharge is accomplished. According to the same decree, authorization is required to discharge waste water into the sea, and it is granted on the basis of existing standard requirements and supplementary ones depending on the particular case. The competent authority for the implementation of the decree of 1965 is mainly the Ministry of Social Affairs, by means of its central and regional services. As far as

^{1/} Water and Soil Management Guidelines, published by the Ministry of Works and Department for National Water and Soil Conservation Organization, Wellington, 1975, 9 pp.

^{2/} Ibid.

^{3/} Information received from the Government, dated 30 March 1976.

technical and economic measures are concerned, the construction of municipal waste networks, waste treatment plants and new discharging installations are being promoted and they will be financed through loans, government financing or other sources.

2. Marine Pollution

It is generally recognized that pollution in coastal areas has adverse effects directly or indirectly on most economic activities.^{1/} Recently, the problem of pollution of coastal areas has become particularly serious, primarily because of the importance and the function of coastal areas in the whole national economy, and the changing nature of the discharges into the sea themselves, as the intense exploitation of the coastal zones continues. The importance attributed by countries to pollution of coastal waters is reflected in their efforts to prepare suitable legislation ensuring efficient pollution control. Some countries have adopted direct legal measures concerning, for example, the conditions for safe discharge of effluents into the sea and the authorization required. These measures are promulgated either in the form of general regulations, directives to specific users or in court's decisions. As mentioned in the previous section, coastal waters of some countries are classified according to their uses and for each use, water quality standards have been established.

While the accelerated development of coastal areas has led to a change in the nature of discharges into the sea, the pollution of coastal waters does not always originate solely in those areas. A considerable proportion of the pollutants are also carried by rivers.

^{1/} The Pollution of Coastal and Estuarial Waters, published by the Economic Commission for Europe, Committee on Water Problems, ECE/WATER/6 (mimeographed), 8 August 1974, p.3. This document provides a survey of the problems of marine pollution in 22 member countries of the Commission.

The rivers also carry nutrients and pesticides contained in run-off and drainage water from land under cultivation. Because of the unity of the marine environment, the problem of coastal water pollution is linked to that of river pollution.

The present concern in many countries has been focused on heavily polluted rivers and estuaries with the aim of obtaining an acceptable level of pollution. Little attention has been given to management of water resources which remain relatively unpolluted. For most developing countries whose objectives are to create conditions for fast economic growth, there is a real danger that they may soon face the same kind of problems which many industrialized nations now confront.

As pointed out in a UNEP report,^{1/} until only recently, there has been no legislation aimed at the control of marine pollution per se. The prohibition or regulation of discharges of harmful wastes into the coastal waters has been promulgated mostly to prevent the contamination of fishery resources and to protect human health. The oceans having been considered as an infinite receptive tank of undesirable matter produced by man, national legislation concerning the control of wastes into the marine environment has lagged far behind the actual requirements of control.^{2/} Often, such control measures are merely an extension of those established for freshwater pollution, and there are areas where literally no regulation exists, such as land run-off or the atmospheric transport of pollutants.^{3/}

^{1/} Study of Offshore Mining and Drilling Carried Out within the Limits of National Jurisdiction, Working Group of Experts on Environmental Law, Second Session, Geneva 3-14 April 1978, UNEP/WG.14/2, 23 February 1978, p.3.

^{2/} Activities of the United Nations Environment Programme for the Protection and Development of the Mediterranean, UNEP, 1976.

^{3/} See Existing and Proposed International Conventions for the Control of Marine Pollution and Their Relevance to the Mediterranean, published by FAO, Legal Office, Background paper No. 8, Rome 1975, 29 pp.

How big an area is needed for pollution control has been a controversial issue. For the purpose of dealing with marine pollution, various distances have been proposed.^{1/} Some of these proposals are mentioned here. The purpose is not to give any preference but to underline the point that situations vary in different countries and that the area needed to be taken into account varies according to local conditions. With respect to on-shore width, the Federal Republic of Germany proposed the width of the port activities zone; Greece suggested that the width should vary according to the coast: flat land (500 metres), shores and rocks (100 metres); the United States proposed that the width should include the total drainage area of minor streams draining into the estuary and also that part of the drainage area of the major stream where any significant pollution from the stream is transferred into the estuary; Finland, 10 km and United Kingdom, 1.6 km. Norway considered that the width should depend on the degree of development, the density of population and the geological, geomorphological, hydrological and other physical characteristics of the area.

With respect to seaward limit, a wide range was suggested: e.g. Belgium (3 km.) Spain (3.7 km.), Sweden (5 km.) Portugal (55 km.), Bulgaria (500 km.) Several other countries suggested different criteria: Yugoslavia considered that for the north-eastern coast of the Adriatic, the whole bay was necessary; Greece maintained that the limit depends on whether it was for open sea or for a gulf (which would need 5-10 km.); the United States suggested the slope of the continental shelf and its fish yield.

The various administrative structures for coastal pollution control can be classified in two groups. In the first group, the responsibility

^{1/} See The Pollution of Coastal and Estuarial Waters, pp. 10-11.

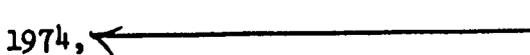
for statutory control of coastal pollution is shared among different central departments and regional and local authorities, depending on their competence, or on the nature of pollution (e.g. Cyprus, Spain, Ukrainian SSR), or on the place of pollution (e.g. Portugal).^{1/} The protection of the coastal as well as of the territorial waters from pollutants coming from the open sea (oil spills) is generally the responsibility of the marine and port authorities. In the second group, the protection of fresh and salt water is the responsibility of a single body which, in most cases, is also responsible for the management of water resources. This body with its scientific units, research institutes, regional and local executive authorities usually has the form of a national water board (e.g. Finland, Romania) with a co-ordinative capacity, or a water ministry (Netherlands, Ukrainian SSR) or with a central water resources administration (Poland).

The recent need for more centralized responsibility on matters of natural resources and environmental protection has resulted (e.g. in Sweden), in the establishment of a "National Environment Protection Board" whose most important long-term project is research on the pollution of the Baltic Sea. In the United States, the Environmental Protection Agency has been established, and in Bulgaria, France and the United Kingdom, Departments of the Environment have been founded to which have been attached the regional authorities responsible for water resources conservation in river basins and estuaries.

The effectiveness of legislative measures largely depends on the administrative machinery for their implementation. As will be seen, where basic legislation is still scanty, responsibility for pollution control

^{1/} The Pollution of Coastal and Estuarial Waters, p. 14.

is shared among a number of departments, a system which does not seem to provide unity of action. In other cases, however, the adoption of overall legislation has led to administrative changes under which all the relevant powers are vested in a single body or under which/ such a body is made responsible for co-ordination of the activities of all departments concerned with any aspect of pollution. It is at this central level that pollution control principles are being developed, the application of these principles being decentralized in most cases at the level of the drainage basin. It should be noted that where such legislative and administrative measures have been taken, financial problems are also on the way to solution. The basic principle is that of sharing expenditure among all those interested in conserving the quality of water in proportion to their responsibility for pollution. Under this system the best solutions for those concerned are also those most conducive to rational management of water quantity and quality.^{1/}

(a) In India, the Water Prevention and Control of Pollution Act, 1974,  established a Central Board, the objectives of which are to promote the cleanliness of streams and wells, to coordinate activities of the State Boards (e.g. planning and training) and to set up a nation-wide programme for prevention, control, or abatement of water pollution. The State Board plans a comprehensive programme, inspects sewage, trade effluents, works and plant, lays down effluent standards, develops methods of treatment of sewage and trade effluents, and evolves methods of disposal of sewage and trade effluents on land. The State government may declare water pollution, prevention and control areas. The special features of the Act are

^{1/} Ibid pp. 33-34.

that it combines research, expert participation with actual enforcement of anti-pollution rules, and that the same body determines policy at a high level and at the same time is responsible for execution at ground level.

(b) New Zealand adopted in July 1974 a Marine Pollution Act which provides for the control, prevention, and discharge of oil or pollutants into New Zealand waters. Powers and means are also provided for implementing the objectives. This Act also gives statutory effect to New Zealand's signing of the Convention on the Prevention of Marine Pollution by Dumping of Wastes or other Matter, 1972. It is an offence to load any material for the purpose of dumping it at sea without obtaining a permit. Procedures have been established whereby permit applications are checked with the Ministry of Agriculture and Fisheries, the Department of Scientific and Industrial Research and the Department of Health.

(c) Several Latin American countries have enacted detailed, sometimes comprehensive, legislation regarding marine pollution. For example,

Mexico's Law on the Exclusive Economic Zone (1976) includes jurisdiction over pollution control and abatement within a 200 mile band. Its Environmental Pollution Law of 1971 forbids the discharge of "waste waters" of certain kinds into the sewers, rivers or territorial seas, if such discharge will contaminate the

quality, interfere with the purification of water, or adversely affect the operation of the water or sewerage systems.^{1/} Likewise, waste waters which contain ← radioactive material or other harmful substances may not be discharged into the nation's waters, nor permitted to seep into its soils. Works or installations may not be constructed if ← contaminated waste waters are not effectively treated. ← The Ministry of Health and Public Welfare and the Department of Water Resources are authorized to establish rules and conditions under which waste waters may be discharged into waterways or permitted to seep into the earth; these two agencies are also empowered to require the installation of purification systems. Detailed regulations to implement the provisions and to define "waste waters" were issued in 1973^{2/}.

^{1/} Law of 11 March 1971; Diario Oficial, 23 March 1971. Ecuador recently enacted a Law Relating to Prevention and Control of Atmosphere and Water Contamination (D.S. 374, 1975).

^{2/} Diario Oficial, 29 March 1973. Mexico's environmental pollution law, however, has a much broader purpose than simply water problems. Directed against any substance which may contaminate or degrade the ecological system, this legislation covers all chemical or biological substances, such as "smoke, power, gases, ashes, bacteria", and "anything else which may be added to or incorporated into the air, water or earth and which can alter its natural characteristics or environment" (Diario oficial, 11 March 1971). The law also includes "thermal pollution, radioactive wastes, and noise levels which can alter the normal state of the air, water or land". Contamination is defined as anything which can harm or annoy the life, health or well being of humans or of flora or fauna. The executive is ordered to control the use of pesticides, fertilizers, defoliants, and radioactive materials, as well as the disposal of garbage, wastes and industrial residues. Substances not subject to organic decomposition, such as plastics and aluminum, are singled out for particular attention. It is illegal to emit into the air substances which can harm human beings, flora or fauna. A decree, issued under this law, describes in detail the volume and composition of gases which may not be discharged into the air (Diario oficial, 8 September and 17 September 1971). The Ministry of Health and Public Welfare, with the aid of the Attorney General, is to enforce these regulations.

3 To carry out the broad mandate contained in the Environmental Pollution Law, the executive is required to undertake a study and to design a plan for pollution abatement. The study should identify, classify, and evaluate the types and sources of pollution, as well as recommend the rule and technology for adoption. The plan is to be implemented by the relevant Ministries (dealing with water resources, agriculture and ranching, Commerce and industry, and health and public welfare,) which are to ensure installation of the appropriate technical equipment, treatment processes and disposal methods. Environmental factors must also be taken into account in executing public works for urban development and national parks. Moreover, the government is to encourage decentralization in its planning. Violations of the Environmental Pollution Law, and the regulations issued thereunder, are punishable by fines; in addition, offending factories or establishments may be shut down, temporarily or permanently.

4 Peru's General Law of Waters empowers the State to declare protective zones, in which any activity that affects water resources may be limited or prohibited. In case of scarcity, excess, or contamination of water, the executive may also declare an emergency water zone, in which necessary protective measures must be taken. This law applies to the waters of the sea up to 200 miles and the waters of gulfs, bays, inlets, estuaries, rivers, and lagoons. Any solid, liquid or gaseous

1/ Regulations of Ministry of Agriculture and Ranching, 20 May 1961.

2/ National Sanitation Law, 21 July 1938.

waste which can endanger human health or the normal development of the flora and fauna is prohibited from ^{being/}dumped in the waters unless;

(i) they have been adequately treated; (ii) the condition of the receiving body of water is such as to permit natural purification; (iii) the seepage of such waste underground will not prejudice the use of such soils for other purposes; and (iv) other applicable regulations have been obeyed.

Peruvian law also forbids the discharge into the public sewer networks of corrosive wastes or other materials which may damage the construction of the sewers or render impossible the reuse of the recipient waters. No wastes whatever may be dumped into the territorial sea without prior approval of the government, and wastes going into the ocean must have been previously treated and must be transported sufficiently far out to sea. Herbicides and pesticides may not be used on vegetation in rivers without government permission. The Peruvian law divides waters into five different categories, based on a variety of criteria. Permissible uses for each category are specified. ^{1/}

^{1/} Class I for potable water after treatment with disinfectants, and for recreational and agricultural purposes without additional treatment; Class II for potable water after sedimentation and filtration and for fish and birds without further treatment; Class III for potable water and for agriculture after coagulation, sedimentation, filtration and disinfection; Class IV for irrigation of high stemmed plants and for industrial uses, provided such waters will not flow into the potable water system; and Class V for industrial use only (and with no connection with the potable water system)

The waters of its ocean/^{areas/}are similarly divided into five classifications, based on various criteria such as colour, or the presence of arsenic, chrome. Class I, seawater, ←————— is designated as the "beach zone" for recreational purposes; Class II waters are destined for conservation of marine life; Class III waters may be used for industrial purposes; Class IV waters are for navigation and ports; and Class V waters may be used for any other purpose. Generally speaking, nothing may be discharged into Class I water which would alter its natural characteristics. Nothing may be discharged into Class II or Class III waters which would alter their natural characteristics or alter their temperatures by more than 2.5° Centigrade. After a study of the individual case, the government may permit discharges into Class IV and Class V waters which may alter their temperatures by more than 2.5° Centigrade. In order to carry out the provisions of this law, the Ministries of Agriculture and Fishing and of Health are to undertake the necessary studies and issue the appropriate regulations. These agencies are also charged with imposing sanctions for violations of the law or regulations issued thereunder.

(d) In Brazil, a Division of Environmental Affairs was created by a Decree in 1973 within the Ministry of Interior to make technical studies and issue necessary regulations for protection of the environment.^{1/} This Division is under the supervision of a nine-man council, whose members are selected by the President. A regulation issued by this Division divided the recreational beach waters into seven categories on the basis

^{1/} Decree 73,030, 30 October 1973.

of such elements as sewage particles and the presence of oils, grease, or other dangerous chemicals.^{1/} The waters characterized as "improper" or "suspect" may be declared unfit for recreational purposes. The municipal, state or federal authorities must issue bulletins and post warnings about the classification of the waters; when considered necessary and proper, recreational activities may be prohibited in these areas.

(e) An Argentine Decree of 1969 prohibits the discharge into its waters of any substances or waste which can harm the aquatic flora or fauna; likewise, it is illegal to interfere with the natural migratory movements of fish.^{2/} A provincial law of Buenos Aires provides that private boat docks and floats may not be placed in the water without permission of the Water Department.^{3/} In Tierra del Fuego and the Islands of the South Atlantic, the construction of dams on private of property must not impede the passage/fish and must permit the preservation of fauna.^{4/} Enforcement of this decree is placed in the Minister of Agriculture and Ranching, he may, however, delegate such authority to the Governor of a particular region.

(f) In Venezuela, once a sea, river, or lagoon has been declared a reserve, it is illegal to discharge into it any petroleum, oils, ashes or waste dangerous to aquatic fauna or prejudicial to fishing activities^{5/}. There is also a general organic law the purpose of which is to conserve, protect and defend the environment, and is applicable to the question of marine pollution in general. A National Environmental Council is established to carry out the objectives of this law.

^{1/} Portaria, 9 December 1974.

^{2/} Decree 1,234, 19 March 1969.

^{3/} Law of Buenos Aires 7,169, 10 December 1965.

^{4/} Decree 1,284, 19 March 1969.

^{5/} Fishing Law, 6 October 1944.

(g) Syria has standing instructions for pollution control measures specifically in ports; ^{they/} were issued in 1973 by the Directorate of Port Affairs of the General Maritime Department.

→ These Instructions deal with: the ascertainment of cases of pollution, including pollution from port installations and undertakings, and the determination of those responsible; the immediate measures to be taken in the event of cases of pollution being confirmed; the subsequent measures to be taken by the port authorities; the responsibility of the manager of a port (after having been informed of a case of pollution originating from an installation or undertaking) to conduct the necessary investigations and to ensure that the case is reported; the tasks and duties of the Primary Commission for Estimating the Damage Caused by Pollution (referred to in Section 9 of the 1972 Law); and the application of procedures for dealing with cases of pollution (the necessary works are undertaken by the Pollution Control Section of the General Maritime Department, in accordance with the directives of the Director-General of Maritime Affairs and under the supervision of the Commission referred to above and the port authorities). The final clauses of the instructions are devoted to the sums to be paid by polluters (in determining the charges to be imposed, account is taken of: (i) damage to public property, including such amenities as tourism; (ii) damage to private property, e.g. cultivated land, fishing nets, and maritime equipment; and (iii) the real costs of eliminating the pollution, including compensation for the work of the various commissions concerned). The

← Government departments, committees, ports, and other agencies having jurisdiction over the control and prevention of pollution are responsible for the enforcement of compliance of the Instructions.

(h) In Spain a number of items of legislation deal specifically with the prevention of coastal pollution. On the administrative side, a Commission for the Prevention of Marine Pollution was set up by a Ministerial Order of 13 June 1962; its terms of reference were to include problems associated with pollution caused by the direct discharge of industrial effluents into the sea. A specialized committee of the Inter-ministerial Commission for the Environment has been set up to deal with the control and prevention of marine pollution.

On 27 May 1967, an Order was made prohibiting the discharge by industrial installations of all kinds of petroleum products, or wastes containing such products, into the sea. This prohibition applies whether the products concerned are persistent or not. Applications for licences to discharge effluents into the sea must be submitted to the Ministry of Public Works, and must indicate the measures that are to be taken to avoid water pollution. The applications must first be approved by the Merchant Marine. An Order of 21 August of the same year specifies the materials and equipment to be kept by petroleum refineries and petrochemical plants having oil terminals on the coast, for the purpose of dealing with any accidental oil spills.

In view of the complexity and fragmentation of the legislation pertaining to coasts and of the fact that some of the provisions were mutually contradictory, a single Law on coasts (No. 28/69 of 26 April 1969) was introduced.^{1/} This Law deals only incidentally with the questions of coastal pollution, item 4 of Section 10 empowering the Ministry of Public Works to grant licences for the discharge of wastes, after prior consultation with the

^{1/} Enciclopedia Jurídica Española, 1970 Appendix, p. 870.

Ministries of Shipping, Trade, and Information and Tourism, as well as the municipalities concerned. If hydrocarbons or industrial wastes are to be discharged, the Ministry of Public Works must obtain the approval of the Ministry of Trade.

Detailed provisions are contained in the Provisional Rules for the design and construction of installations for the treatment and discharge of wastewater into the sea along the Spanish coast, approved by a Resolution of 23 April 1969^{1/} of the Dirección General de Puertos y Señales Marítimas. The first such Rules, which had been drawn up by the latter agency in 1962, were based essentially on the principle of dilution, a principle whose validity was confirmed by the experience acquired over a period of four years. At the same time, however, it was found necessary to incorporate certain bacteriological criteria. The Rules were therefore updated in 1966. Although still only provisional, the preamble to the current Rules emphasizes that they are now obligatory in character.

(i) In Egypt, the basic items of legislation that deal with water pollution control are Law No. 93 of 1962^{1/} on the discharge of liquid wastes and Regulations for its implementation issued in 1967. A Higher Commission on Waters was established by a 1966 Decree; its functions include assisting projects for the discharge of human and industrial wastes and other pollutants, with a view to preventing the pollution of surface waters and groundwater.

(j) France^{2/} has adopted a multi-faceted approach to the problem, the central item of legislation being Law No. 64-1245 of 16 December 1964 concerning the administration and classification of waters and the control

^{1/} "Protection of the Mediterranean Sea against Pollution from Land-Based Sources: A Survey of National Legislation", UNEP and WHO, Geneva (1976), p. 7.

^{2/} Ibid.

of water pollution. The overall policy represents a combination of procedures aimed at (i) prohibiting or, as appropriate, limiting the discharge of pollutants, and (ii) improving the quality of receiving waters. Furthermore, an inventory (subject to regular revision) is made of all surface waters on the basis of specified physical, chemical, biological, and bacteriological criteria. Numerous Ministries are concerned with various aspects of pollution control, but their activities are now coordinated by a specialized Ministry, viz. the Ministry for the Quality of Life. Other major bodies at the national level include the Interministerial Commission on Water and the National Committee on Water. Economic measures to promote pollution control have been taken, notably through the intermediary of the Intervention and Action Fund for Nature and the Environment. The "polluter-pays principle" has been adopted, the amount of the levy payable by polluters being proportional to the quantity of pollutants discharged into the water. As a result of a decision of the Conseil d'Etat, it has become possible for levies to be imposed on undertakings effecting discharges into the sea. However, the system is not solely punitive, since there are financial inducements offered by the State to polluters who undertake appropriate water-treatment projects.

(k) In Turkey,^{1/} the principal current measures for dealing with marine pollution are incorporated in a 1971 Law on water-derived resources and in Regulations for its implementation. However, a draft Law on the prevention of pollution and the protection and inspection of waters was under consideration. It would appear that this Bill is the first in the Mediterranean area to incorporate the "zero-emission" principle, although no timetable has been fixed for attaining this objective.

(l) In Cyprus, under the Foreshore Protection Law, as subsequently amended in 1961 and 1964, the District Officer is empowered to prohibit or impose restrictions and conditions upon the dumping of any rubble, rubbish, sweepings, litter, night-soil, engine-oils, or any other fluid lubrication oil, dry or liquid balast, or other refuse, on any specified part of the foreshore, into the sea within a specified distance from low watermark, or from any pier, wharf, quay, or jetty.

(m) In the United Kingdom / the discharge of deleterious substances into rivers from industry and sewage wastes has to be authorized by the regional water authorities, who control all discharges into waters. The Dumping at Sea Act 1974 prohibits, except by licence, the permanent disposal of any substance or article into / the sea or tidal waters from a vehicle, ship, aircraft, hovercraft or marine structure or from other structures such as a conveyor belt.

(n) The Convention on the Protection of the Rhine against Chloride Pollution has been signed by most of the riparian states. The instrument gives details of how targets for reducing discharges into the Rhine might be achieved. A plan to inject salt and thus cut down pollution from the Alsace potassium mines is to be opened near Mulhouse. Financial contributions to the plan are made by France, Federal Republic

1/ Ibid

of Germany, the Netherlands and Switzerland. Denmark issued a special law to protect the Baltic Sea from marine pollution.^{1/}

(o) In Portugal, the law of 1971 enforces the existing measures for the control of pollution of coastal waters. Decrees have been issued to establish an interministerial committee to study the uses of the sea bed, with fines to be imposed on violators, etc. Furthermore, various regulations and measures established by private organizations aim at formulating an efficient policy for sea water protection. New legislation is on the way for the classification of coastal waters into various categories, the definition of quality standards and the setting up of conditions for waste disposal. The administrative organizations for the protection of coastal areas include: The Interministerial Committee for the Peaceful Uses of the Sea-Bed (Ministry of Foreign Affairs); the National Antipollution Committee (Ministry of Navigation); the General Directorate of Hydraulics (Ministry of Public Works); the General Directorate of Health (Ministry of Health and Public Welfare). Control is practised and fines are imposed by the regional and local organs of the various services, depending on their responsibility (health services, port authorities, hydrological services, police authorities, customs authorities, etc.) Due to the lack of special services for pollution detection and monitoring, this is done by public and private laboratories. The necessary means, e.g. material for chemical and mechanical dispersion of hydrocarbons are provided by the various enterprises. Sharing of the expenses is not obligatory for municipalities or industries, as the costs are covered by the government.

^{1/} Act No. 324, 26 June 1975 on Protection of the Baltic Sea.

(p) Tanzania and Kenya have no specific law on marine pollution. Protection of bodies of water can be effected through regulations for the disposal of sludge and tailings, sludge channels, poisonous or noxious products resulting from mining operations, and for waste waters.

↑
In Kenya, the Port Officer is responsible for the well-being of shipping activities as well as that of the coastal environment.

The Port Ordinance prohibits ←
the casting or throwing of any ballast or rubbish and anything likely to form a bank or shoal into ports or upon any shore from which the same is likely to be washed into a port. The Port Officer and the Marine Superintendent exercise the power of determining whether or not a ship or any other vessel is fit for the transportation of petroleum in bulk.

(q) In an attempt to minimize sea pollution, the Ministry of Public Health of Ethiopia established ←
strict regulations aimed at controlling household waste disposal, and the discharge of industrial wastes comprising oily substances and other dangerous chemicals that may pollute the waters of the sea.^{1/}

The Marine Administration of the Ministry of Transport and Communications issues port regulations which prohibit the discharge of harmful waste materials in the port areas.

(r) In all Eastern European countries efforts are being made to control coastal and sea water pollution.^{2/} The effectiveness of the measures depends on the legislation in force, the availability of funds and the administrative structure of the relevant authorities.

^{1/} Information received from the Government, dated 22 February 1976.

^{2/} The Pollution of Coastal and Estuarial Waters, pp. 25, 28, 29 and 31.

The protection of waters is regarded as an integral part of the general problem of the utilization of water resources. The measures adopted are aimed at preventing further pollution of waters as a result of industrial growth and urbanization, and restoring polluted waters for ~~drinking, household needs,~~ sports and recreation. ^{1/}

In general, the responsibility for the application of water protection measures lies with the organs controlling the factories which discharge waste waters. In the river basin and coastal areas of Yugoslavia, the control of the whole hydrological cycle is given to a single authority in view of the close relationship between fresh and sea waters and of the necessary scientific and research support. Regulation of the conditions and rules governing the discharge of wastes is based on the composition of the water concerned. The degree of purity of water bodies is assessed on the basis of the findings of chemical, bacteriological and biological tests which are different for inland and maritime waters.

Many Eastern European countries classify their inland and maritime waters according to usability; sometimes a special status is given to coastal waters (e.g. in Yugoslavia). The purposes of the classification is to reflect the composition of the water, to show how far waters can be used, to ascertain the causes of pollution, to prepare measures for eliminating pollution, and to establish priorities in the execution of these measures. The indicators for assessing the

^{1/} New legislation in Bulgaria and Yugoslavia requires the maintenance of the marine environment in its natural state. The discharge of sewage and industrial wastes is not allowed if this natural state is affected, e.g. (Yugoslav) Federal Executive Council Act on Inter-Republic and Inter-State Waters, 10 January 1974.

quality of waters, the system of classification and the methods of analysis are not the same in all countries. The Soviet Union has established purity standards for waters used for sanitary and domestic supplies and for fishing.^{1/} Although such standards have been adopted in most Eastern European countries, none of the background studies have been developed on a wide scale.

The enterprises and organizations concerned may be penalized financially for any failure to adopt water protection measures. Fines are used for the development and rehabilitation of the environment. In some cases, it is more economic for plants to pay fines than build installations to meet the requirements. The suspension or closure of enterprise activity as a consequence of violation of protection measures constitutes a grave administrative and legal sanction, which could only be taken in extreme cases. While national councils and individuals have the right in law to claim compensation for damage suffered, or for additional expenses resulting from the pollution and degradation of water, soil, forests and buildings, no serious claims have yet been made.

^{1/} T. Nagibina, Organization of Water Pollution Control Measures in the USSR and Eastern European Countries, WATER POLL./CONF.13, Vol. II, p. 20.

(s) In Finland, according to the act of 1962, industries and communities which have over 200 inhabitants, must have a permit from the Water Court, to discharge waste water into the sea. The procedure for granting the permit involves detailed examination. Pollution consequences are examined by a specialized engineer who is appointed by the National Water Board. The terms for the issue of a permit are stated in the Board's report. If the interested party is dissatisfied with the decision of the court, it has the right to appeal to the Supreme Court. The National Water Board offers its experience to the courts that handle pollution cases, controls the amount and the quality of wastes disposed into the sea, and conducts studies on certain industrial wastes. The Institute of Marine Research is an expert body used by the water courts, the coastal communities and industry for the selection of discharge areas. The opinions of this Institute carry the same weight as those of the National Water Board. The Institute of Marine Research and the National Water Council co-operate in the formulation of a suitable policy for sea protection. Co-operation also exists between the Council of Environmental Protection, the regional planning bodies, the rural community unions and other national and local authorities. In the technical field, it is anticipated that sewer systems which cover 55 per cent of the communities will be expanded to cover 80 per cent during this decade and that biological and chemical treatment of sewage should be completed by 1980. During the same period, the wood-processing industry will complete the change of processes and replace mechanical waste treatment with chemical treatment. It is anticipated that other industries will attain, before 1980, the waste treatment level set for domestic sewage. Investment for the above projects are estimated at one billion Finnish marks.

The part to be allocated to the coastal area cannot be estimated separately because part of the wood-processing industry, a large part of other industries and most communities are located on the coast. In addition, it is expected that the load of solid wastes from the wood-processing industry in the whole country will diminish by 80 per cent.

(t) In Norway, pollution aspects are taken into account at the planning stage so as to reduce damage. Norway ^{has/} established totally integrated natural resource planning procedures with close administrative coordination between water and land use management, and between water management and product control.^{1/} The first major legal change was to require all municipalities to prepare overall physical and economic master plans for the use of all resources so as to coordinate different sector plans within a community or region. Prior to this requirement, ~~permits were~~ issued by different authorities ^{with/} responsibility for small sectors of natural resources or environmental management, ^{and/} there was very little coordination. To rectify this shortcoming, the sectoral authorities were brought into the system of master planning on all levels. In the field of water resources, for example, there was established at the appropriate level a master plan on the future water use and all major uses of the drainage basin that influence the quality of water due to pollution. Permits are given only in conformity with the master plan.

^{1/} For details of this approach, see Instruments for Water Quality Management of Unpolluted and Slightly Polluted Water Resources, E/CONF.70/TP.185, 10 November 1976, a paper submitted by the Government of Norway, Chapter 4 in particular.

The government passed a new water pollution Act in 1970^{1/} requiring that the approval of water supply and sewage disposal systems (and hence the use of water resources for recipient purposes) as part of the municipal or regional resource plan should incorporate a permit for discharge. This law also makes it possible to control pollution through legally binding regulations. Such regulations may be fully self-executing requiring no further administrative action, or they may be combined with permits given on local level, thus decentralizing the permit process. In 1972, a Ministry of Environment was established to have coordinating responsibility for natural resources planning, pollution control and nature conservation^{2/} Under this system, the municipal master plan (general plan) prepared by the community council with public participation is transmitted to the county authorities who make comments and forwards it to the Ministry of Environment. The Ministry approves the plan with appropriate suggestions. Both the municipal master plan and the county master plan are advisory in nature. They formulate the principal features of land use pattern and natural resources use and development. In this way, they guide the local and county authorities in their local plans for development. The plans become binding once by-laws have been adopted.

In preparing the master plan, the following points are taken into account:

^{1/} Act No. 75 of 26 June 1970 relating to Protection against Water Pollution (Water Pollution Act), with amendments of 31 May 1974.

^{2/} See Chapter I, Section 1 (Special Legislative Measures).

a. Securing drinking water catchment basins for the future (10 years) either by adopting by-laws to the master plans that forbid other use of the catchment area or simply by the county authorities' approval of a municipal plan. For small catchment basins this means no dwellings, no industrial activities, no farming, no motorized transport and so on. For larger catchment areas (i.e. the biggest river in Norway), it may imply rather heavy restrictions on new industrial establishments and changes in production of existing industry. The aim is that all people within ^{a/} few decades shall drink water practically free from pollution due to human activities.

b. Areas for residential purposes, industrial development and so on, will be located on the basis of a comprehensive analysis of all important aspects, and great importance will be placed on finding locations where the activities will lead to least harmful environmental effects.

c. Areas for industry will be zoned so that industry with polluted process water will not be located in drainage areas where such use can harm the planned use of the water resources concerned.

d. The master plans will show the main future uses and conservation of water resources (rivers, lakes, ground water, fjords) and these uses can, inter alia, be made legally binding by adopting appropriate by-laws to the plan. (Other more direct methods are also being considered).

The Norwegian government is now in the process of preparing new laws to replace existing planning and pollution laws. The new planning law will stress the coordination of municipal, county, and national master planning of all resources. A new comprehensive pollution act will contain regulations on air, water, solid waste and noise to achieve total integrated pollution control by one administrative body.

As already mentioned, this new Norwegian approach to water resource is part of an overall method for natural resources management. The organizational structure of the authority in charge at the national, county and municipal levels is a very important element. Bad, or the lack of, coordination between the different ministries and between different authorities at the various levels has been recognized as a serious handicap to better management programmes. The Norwegian experience indicates a strong need for coordination. It created one ministry having coordinating responsibility for approving all physical and economic master planning.

In the light of the above survey, it would appear that most countries seem to have a sufficient body of law regarding marine pollution, even though they may differ in approaches and details. Some of the approaches referred to above, particularly the Norwegian laws, seem to suggest a viable and effective way to tackle the problems in countries having similar situations.

3. Oil Pollution

Oil pollution in the coastal area may come from different sources: land-based industrial activities and offshore drilling and vessels (discharge or collision). Very few countries have established complete regulations to deal with these sources. National legislation deals mostly with jurisdictional matters and the issuance of authorization to explore and exploit resources^{1/} Some of them contain general provisions as to the safety of operations. A number of laws embody more specific reference to the need to prevent pollution during the course of exploration and exploitation of mineral resources of the continental shelf, setting out general rules for oil pollution prevention usually as an adjunct to the regulation of safety.^{2/}

Generally speaking, those laws which are more comprehensive usually contain such requirements as technical standards of equipment, specific equipment such as blowout preventers, and regulation of their uses. A number of such laws either prohibit discharges of oil beyond a permissible level (e.g. Bahamas, Continental Shelf Act, 1970; Malta, Continental Shelf Act, 1966). or prohibit pollution of the marine environment arising out of such activities in more general terms (e.g. Thailand, Petroleum Act. March 1971; Ghana. Minerals (offshore) Regulations 1963 as amended).

^{1/} For detailed analysis of sources, effects, protection measures of pollution in European countries, see "The Pollution of Coastal and Estuarine Waters." op. cit.

^{2/} A general review on these questions is contained in "Study of Offshore Mining and Drilling Carried out within the Limits of National Jurisdiction", Working Group of Experts on Environmental Law, Second Session, Geneva 3-12 April 1978, UNEP/WG.14/2. 23 February 1978. 24 pp.

(a) Kuwait has a law^{1/} which declares all areas within 50 miles from the nearest land to be prohibited zones into which no oil may be discharged. ← The law, however, does not deal with accidents involving oil spills. It relies heavily on fines as punishment for any contravention. Iran and Bahrain have inserted in their port regulations provisions dealing with oil pollution situations in general. They are concerned mainly with ships' normal operations; they do not deal with oil spills per se. Environmental legislation was presented to the Iranian Parliament to establish a 50-mile zone outside its coasts to prevent oil pollution. Oman introduced in 1975 a marine pollution control law regulating oil discharge from vessels which appears to be the most comprehensive law in the region.^{2/}

None of the Gulf States has enacted specific legislation covering oil spillage from exploration and exploitation of its continental shelf. There are very general provisions in the offshore oil exploitation agreements. These obligations are usually imposed on operators in the conduct of their activities (e.g. relating to work performance, safety of personnel and equipment, and the obligation to prevent damage as well as prevention of oil pollution of the sea).^{3/} It has been suggested that legal provisions regarding oil pollution should be strengthened and that oil pollution contingency plan be prepared so as to mitigate any possible damage.^{4/}

^{1/} Kuwait Law No. 12 of 1964 concerning the Prevention of Pollution of Navigable Waters by Oil.

^{2/} For example, Oman has a Marine Pollution Control Law (text provided by the Permanent Representative of Oman to the United Nations in a note verbale of 2 December 1974). It deals with primarily discharges from vessels. Israel has an Ordinance to make provision against the discharge or escape of oils into navigable waters.

^{3/} See M. Hardy, Offshore Development and Marine Pollution 1973 Ocean Development and International Law Journal, Vol. 1 No. 3, 1973; B. A. Al-Awadhi, Legal Aspects of Maritime Pollution with Particular Reference to the Arabian (Persian) Gulf, Ph.D. thesis, University of London, 1975.

^{4/} Ibid. A number of basic issues are dealt with in Chapter VII.

(b) Kenya is concerned with oil discharges ←
by tankers passing by from the Middle East. Its Petroleum Act provides that specific regulations may be established regarding loading, storage or transshipment of oil.^{1/} Rule 48(i) prohibits the discharge of petroleum or water mixed with petroleum from bilges or tanks, of water used for flushing out pipes or ←
of sand used to absorb petroleum. → All pipes and connexions on board and on the shore between a ship and a quay must be maintained in an efficient condition and they should be ~~reasonably~~ free from leakage. In addition, a watch must be constantly maintained near the pipes and connexions during the loading or discharge of petroleum in bulk. Failure to observe the ~~above~~ rules relating to the transport of petroleum is an offence punishable by fines. There are however no regulations that are enforceable to tankers passing through the coast.

(c) The Soviet Union adopted in 1953 regulations for the prevention of leakage into reservoirs of oil products, acids and other chemical substances during their transport.^{2/} No leakage is permitted when petroleum products and other liquid cargoes are transported on water or to shore. There must ←

^{1/} Similar provisions are also found in Tanzania, the Petroleum Ordinance, Chapter 225, Laws of Tanzanyika.

^{2/} These regulations were confirmed by Order of the Ministry of the Maritime and River Fleet of 14 September 1953, No. 414.

be sumps or gutters at the junctures of deck or ~~shore~~ oil pipes to collect any substance that might seep through. During loading, unloading or transferring chemicals or liquid cargoes in containers, measures must be taken to prevent such cargoes from leaking into reservoirs. Shipping companies are required to make adequate arrangements for the provision of barges for pumping the residues out of vessels when they are cleaned at ports or wharves. The residue of petroleum products must be pumped into barges or shore storage facilities and brought to the shore and destroyed in places designated by the administration of ^{the/}port in agreement with the competent authorities.

(d) Belgium recently adopted a plan to combat oil pollution.^{1/} The plan applies to oil pollution occurring in the territorial sea and on the beach, and is being implemented under the general direction of ← the Ministry of Internal Affairs. The plan identifies the steps to be taken, defines the respective responsibilities of the various organs involved, and sets out the coordination required.

(e) In Portugal, the most serious problem is pollution from hydrocarbons. The examination, measurement and control of pollution is at present pursued under the supervision and co-ordination of the National Association for Scientific Research and Technology and the National Environment Committee. This Committee has an inter-ministerial character and is responsible for the co-ordination of various public services involved with pollution (e.g. Ministries of Health, Public Works, and ^{the/}Navy).

^{1/} Pollution à la Côte Belge et/ou de la plage par les hydrocarures, le 28 janvier 1976.

(f) Measures to prevent marine pollution by oil and oily mixtures from shore installations have been taken by several Mediterranean countries.^{1/} Some of the relevant texts deal jointly with oil pollution from ships and from pure installations (e.g. the Oil Pollution Regulations in Egypt, the Oil in Navigable Waters Ordinance, 1936, as amended, in Israel, and the Port Regulations, 1966, in Malta), others are based on the protection of the foreshore (as is the case in Cyprus), while ^{still/}others include oils among the substances whose discharge into the sea is prohibited or restricted under regulations dealing with waste discharges in general. Among the most specific texts dealing with this problem are a Syrian Law (No. 10 of 26 March 1972), an Order promulgated in Spain on 27 May 1967 prohibiting the discharge by industrial installations of all kinds of petroleum products (or wastes containing such products) into the sea, and a Swiss Ordinance of 19 June 1972 on the protection of waters against pollution by liquids liable to cause a deterioration in water quality.

(g) The Canadian government has also developed national, regional and local contingency plans, as well as a joint plan with the United States.^{2/} The Government itself is taking a very active role in anti-pollution. The arrangements are not dissimilar to those of the United States.

In the light of the above experience, a number of points may usefully be mentioned in relation to the role of the government in this respect. There should be a designated lead agency or agencies having overall responsibility for preparing and executing plans to combat oil pollution.

^{1/} "The State of Marine Pollution in the Mediterranean and Legislative Controls", FAO, Rome 8 September 1972. (mimeographed).

^{2/} See Chapter VII, Section II, Manual on Oil Pollution, IMCO publication, 1978.

← If this is not feasible, it may be beneficial to designate a coordinating authority; all agencies should be required to co-ordinate their efforts and provide mutual support in preparing for conducting emergency responses.

(h) The Oil in Navigable Waters Act, 1971 of the United Kingdom provides powers for the government to take action against^a damaged ship which threatens pollution to U.K. coasts or waters, comparable to those in provided/the 1969 International Convention Relating to Intervention on the High Seas in Cases of Oil Pollution Casualties. These powers extend to action towards foreign ships outside U.K. Territorial Waters; the primary purpose of this is to remove any doubts about the right under UK domestic law to take on the high seas the action envisaged under the Convention. This Act has since been consolidated into the Prevention of Oil Pollution Act, 1971.

Under this/^{latter act,/} the Government is responsible for making all necessary arrangements to deal with oil pollution and actually to carry out clean-up. The Government prepares a contingency plan which is based on the probable size of an oil spill and provides the facilities and equipment required according to the plan. In case of a spill, the plan is put into effect and whatever clean-up required is then carried out by the state. The spiller may be requested to assist the state.^{1/} The government is in charge of and executes the plan. The assumption is that the state knows best what should be done and will do whatever is necessary for the best interest of the country. Since there is a plan, any necessary action can be taken quickly and immediately without delay.

^{1/} See P. J. Fallon, "Marine Pollution Control in the United Kingdom" in J. K. Taussig (ed.) Pollution Control in the Marine Industries, 1974, pp. 297-318.

In the United Kingdom arrangements are in force for reporting vessels which are seen discharging oil: civilian and military aircraft, as well as ships of the Royal Navy and Merchant Navy, and fishing and pleasure craft, report such incidents to the Department of Trade via HM Coastguard.^{1/} If the ships concerned are registered with the United Kingdom or the offence occurs in U.K. territorial waters, prosecution is considered if the evidence is sufficient. If not, the reports are referred to the flag government with a request for investigation with a view to prosecution. If the ship is scheduled to put into a British port, the U.K. also exercises its right to inspect her records and draw the attention of the country of registry to any evidence which they provide.

The Department of Trade is responsible for the practical measures to deal with oil at sea when it threatens serious coastal pollution, and for drawing up national and district contingency plans. The organizations primarily involved are the Marine Survey Service and HM Coastguard. For practical purposes, the coastline is divided into nine districts each with its own Marine Survey Office, which is responsible for initiating sea operations to disperse oil spillages. Local authorities are responsible for clearing any oil which comes ashore.

(i) In the United States, the Federal Water Pollution Control Act, as amended in October 1972, is closely related to the issue of oil pollution. The U.S. Coast Guard's programme in this respect deals with prevention, response and enforcement. Subsection 311(j) (1) (c) requires the issuance of regulations "establishing procedures, methods and equipment, and other

^{1/} "Accidents at Sea Causing Oil Pollution Review of Contingency Measures," in op. cit p. 6.

requirements for equipment to prevent discharge of oil from vessels and on-shore facilities and offshore facilities, and to contain such discharges". The regulations were published in December 1972 after an exchange of views with industry and other interested groups, and following public hearings and review of written comments. The regulations address both vessel operations and terminal transfer operations. Their overall objective is to provide substantial improvement in environmental protection without imposing unreasonable burdens or unattainable standards upon industry.

The Coast Guard has been assigned with extensive responsibilities and authority to respond to oil pollution in the coastal area.^{1/} Surveillance and monitoring by ships, aircraft and shore guards form a major part of Coast Guard efforts to detect discharges. When a discharge occurs, the procedures of the National Oil and Hazardous Substances Pollution Contingency Plan are put into operation. The primary responsibility for clean-up rests with the polluter. But the Coast Guard must judge the polluter's capability and efforts and, if they are considered inadequate, must take charge and effect the clean-up^{2/}. The Coast Guard administers a revolving pollution fund to be used to defray clean-up costs, either when the polluter cannot or will not effect clean-up or when the polluter cannot be identified. The polluter, when known, must, with certain exceptions and within a specified limit of liability, reimburse this fund for the actual costs incurred by the U.S. Government.

Under the Federal Water Pollution Control Act, each vessel owner calling in a U.S. Port must provide evidence of financial responsibility, and

^{1/} See M. Pitkin, "The Maritime Administration's Pollution Abatement" and S. Wallace, "Coast Guard Pollution Prevention Programmes" both in J. K. Taussig (ed.), Pollution Control in the Marine Industries, 1974, pp. 371-378 and 165-176 respectively.

^{2/} See Multi-Agency Oil and Hazardous Materials Pollution Contingency Plan: New York, New Jersey, Puerto Rico and Virgin Islands, published by U.S. Coast Guard, 1976. 2 Volumes, Washington, D.C.

establishes a \$35 million Contingency Fund for use by Coast Guard in cleaning up spills in U.S. waters. Practically all oil tanker owners and oil companies have entered into voluntary agreements known as TOVALOP and CRISTAL which provide up to \$30 million for compensation of oil spill costs.

The Coast Guard maintains the National Strike Force, capable of responding to an incident anywhere in the coastal/United States. Each of the three strike teams is composed of personnel specially trained and equipped for identification of polluters, clean-up operations, and coordination of disparate forces, both organized and volunteer. In addition, there are district offices and captains of the port who are charged with similar duties on a local basis.

Highly specialized equipment is being developed through Coast Guard research and development efforts to limit quantities discharged, contain the oil on the water, and recover it from the water. Off-the-shelf equipment is stock-piled in areas where effective cooperative clean-up organizations or company-owned resources do not exist. Wide use is also made of qualified contractors, who are/specialists in the clean-up business.

The Federal Water Pollution Control Act also stipulates penalty provisions. Failure on the part of a polluter to report a discharge can result in a criminal penalty of up to \$10,000 and/or one year in jail. The Coast Guard has authority to assess a civil penalty of up to \$5,000 for each discharge. The Coast Guard has this civil penalty authority both in the coastal region and in the inland region. Violation of regulations such as those earlier described can bring a civil penalty of as much as \$5,000.

Other enforcement tools are also available. The Coast Guard can proceed administratively under Revised Statute 4450 against a licensed or certified seaman with a view toward revoking or suspending his document. The Coast Guard refers cases of appropriate character to the U.S. Attorney for criminal prosecution under the Refuse Act. One or all of these enforcement tools can be brought to bear, depending upon the facts of the case and the record of the violator. The Pollution Control Act also requires administrative action where a discharge occurs and the polluter is identified; a civil penalty must be assessed. Only the factors specified by the statute may be taken into account in determining the amount of the penalty. The Coast Guard does not have the discretion to limit the penalty to a letter of warning. It is not allowed to take into account the actions of the polluter after the discharge occurs; i.e., the promptness and efficiency of the clean-up effort. The purpose is to stress the importance of penalty.

(j) The United States and Canada concluded in 1973 a joint contingency plan to control oil spills. It may be useful to mention some of the main features. Its objectives are to develop preparedness for the discovery and reporting of a pollution incident, and the prompt execution of joint measures to respond to such an incident.^{1/} The plan outlines standard alerting and notification procedures, command structures, clean-up procedures, post-clean-up requirements, and arrangements for assuming the responsibility for the cost of operations. The plan also makes arrangements for the organization of the input of all the responsible agencies and authorities

^{1/} See G. H. Brown, III, "The Joint Canada-United States Marine Pollution Contingency Plan for Spills of Oil and other Noxious Substances", in T. F. P. Sullivan (ed.) 1973 Pollution Control in the Marine Industries. International Association for Pollution Control, 1973, pp. 69-81.

in each country. The on-scene commanders and deputy commanders are designated before hand. They co-ordinate manpower and resources, and control the clean-up activities with the advice and support of the Joint Response Teams, which consist of representatives of directly involved federal, provincial and state agencies of the two countries. One of the most positive features of the plan is the opportunity it affords each party to utilize the full resources of the other for a severe incident confined within its own boundaries.

Under the Plan, the response to an oil pollution incident is separated into four distinct phases:

(i) Discovery and alarm: border communications between all levels of government are recognized as vital to the success of the plan. Any Pollution incident which presents a threat to the other party must be promptly reported to the appropriate agency of that party in accordance with the Plan.

(ii) Evaluation and plan invocation: when a situation falls within the scope of the plan, it is required that designated agencies take advantage of any and all available resources and arrangements provided for in the annexes to the Plan in order to mobilize regional forces. The on-scene commander will issue an initial report to the Joint Response Team. The Chairman of the Team can invoke the plan if the situation warrants it. The Joint Response Team is an administrative and advisory component and is not a field operating force. It makes recommendations to the on-scene commander, handles public information during incidents, keeps authorities at the national level appraised of the situation, and reviews contingency planning from time to time to detect any weaknesses which may

have developed and should be corrected, reporting these to the appropriate authorities.^{1/}

(iii) Containment and Countermeasures: When the Plan is invoked, the on-scene Commander of the control and clean-up activity is to be represented by the country most seriously endangered. If, as containment efforts continue, the severity of the threat shifts, the on-scene commander is changed.

(iv) Clean-up and disposal: The on-scene commander establishes the clean-up strategy and has the final word on the deployment of the available manpower and equipment.

The cost of operations of both parties is to be borne by the party responsible under the plan for the waters in which the pollution occurred. Special arrangements have been made by each country for customs and immigration clearances for response personnel and equipment.

It appears that not many countries have oil pollution contingency plan and that such a plan would be important for coastal protection particularly in those areas where large quantities of oil are involved.

^{1/} The relevant legislation in Canada in this respect include:

LEGISLATIVE, POLICY AND REGULATORY GUIDELINES

Chapter V: Legislative and Policy Guidelines

Coastal management policy or legislation at the national level should be viewed as a means to an end and should thus be consistent with and form an integral part of a country's over-all strategy for the achievement of national goals. This Chapter identifies some of the basic issues that should be considered in connexion with the establishment of such a policy or legislation, namely: objectives, acceptable level of uses, intensity of use, administrative set-up and means of implementation.

1. Establishing Objectives

The first group of issues relates to the establishment of basic objectives. Although management programmes may vary from case to case, the basic objectives usually fall within three categories: development, conservation, or a combination of the ^{two.} The third group seems to cover a broad spectrum of cases since even in an overall development programme, there must be some elements of conservation; conversely, certain building or physical improvements are almost inevitable in a basically conservation-oriented ^{programme.} This is particularly true in dealing with areas involving divergent situations and interests ^{which} often require different treatments. Although basic objectives have to be implemented by specific measures, the establishment of the former determines the latter. Thus, for example, different measures may be taken to promote tourism and recreation on the coast. The appropriate measures depend on the basic objective. The British Countryside Commission, having adopted a conservation policy for coasts of high quality scenery, ^{1/} decided that in seeking to encourage and promote forms of recreation, it was better not to introduce man-made attractions such as amusements and entertainment, or provide large-scale or sophisticated recreation facilities of the kind normally found in a resort. The best measure was to install facilities ^{the} that would enhance the enjoyment of ^{natural} qualities of the coast. Another example is the coast of Scotland where the overall goal is the development of North Sea oil. ^{2/} But this does not exclude the establishment of

2/ See Chapter I, Section 1.

conservation zones in areas of particular national scenic, environmental or ecological importance in which major new oil and gas related developments would in general be inappropriate, and could be justified only in exceptional circumstances

2. Classification of Coasts According to Acceptable Level of Use

In order to accord the proper treatment on the basis of the resource capacity, some rudimentary form of zoning should be considered. A general measure is to classify the coasts according to the acceptable level of use (i.e. natural suitability for development and use) for each part of the coast involved. Three categories may be distinguished: first those parts of the coastal area more appropriate for intensive development; second, those areas not suitable for development; and third, all other parts which fall between those two categories and are suitable for controlled development.

The factors which may be used for the classification of these categories include geological considerations, ecological significance of the area and its tolerance to alteration, soil suitability, water quality, susceptibility to flooding, archaeological and historical significance, environmental features and existing uses.

(a) Areas well-suited for intensive development are those which have elevations, soils, topography, and other physical conditions favourable to development and are not considered to be environmentally fragile. This category may also include lands having some physical limitations but suitable for development with certain modifications such as improvement of drainage or water supply. Control should be exercised in any event over all forms of development with respect to nature of activities, scale, siting, design, noise, waste and disturbance. Whatever form the management of a coastal area may take, it is unlikely to be effective unless it is allied closely to a firm policy of land use and planning in general. Within each specific area, permissible and non-permissible uses should be determined.^{1/}

^{1/} See infra, Section _____.

There seems to exist a problem in some countries that too much coastal land is committed to urban development in a haphazard fashion and ahead of genuine demand.^{1/} One way to deal with this problem is to select a reasonable number of localities along the coasts that should be developed for urban settlement in the next decades on the basis of such criteria as public preferences, economic demands, qualities of the coastline of the region and local expectations. The resulting pattern of urban and rural land use can then be translated into reality by, for instance, district or local planning schemes, backed by and integrated with government programmes for public services.

Special attention should be given to creating urban development of an appropriate pattern. The task is to bring about forms of urban development which make the most of the recreational and aesthetic assets of each site. The standard of road access provided to any coastal area should reflect the function that area is intended to serve. Land use zoning in district schemes could be used in certain circumstances to modify the typical lineal form of coastal subdivisions and encourage development in depth; land use zoning could also be used to keep intensive urban development back from the beach. Land which is generally vulnerable to erosion should be protected by restrictive rural zoning to keep it largely free of subdivision and building. In addition to the use in district schemes of special ordinances tailored to the needs of coastal settlements, local government should also make clear through other means their policies for coastal development in general and for each settlement in particular.

^{1/} See Part Three, New Zealand and Venezuela.

Local government should make^a/deliberate effort to explain their planning proposals to the public, and to stimulate the public to contribute their own ideas.

(b) Areas which have overriding ecological, hydrological, physiographic or historical importance to the public at large should not be committed to development projects which are incompatible with such natural conditions. Examples of these areas are submerged grassy areas essential to the propagation and nourishment of fisheries; low coastal areas covered by grassy, salt-tolerant vegetation subject to tidal ebb and flow during any part of the tidal cycle; selected estuarine beaches suitable for shore recreation with appropriate public access; areas of outstanding historical or archaeological significance. These areas are appropriate for inclusion in nature reserves and parks. There should be strict regulations regarding construction, roads and utilities, which should be limited to the minimum, so as not to generate adverse effects on the environment.

(c) Development activities in areas which fall between the above two categories are those areas of the coastal zone that are not absolutely critical to regional ecological integrity, but because of their physical character, provide "buffer zones" and represent retention of use options for future generations. This category may include aquatic preserves, aquaculture areas, riverflood plains, scenic vistas, marginal lands, forest and game management areas, wildlife refuges. Some of these areas require special precautions when being converted to development in order to avoid undesirable consequences or harmful effects to the public health, safety and welfare. For example, river flood plains and marginal lands (lands and which owing to soil characteristics/, drainage problems require major

alteration in order to be made suitable for urban development) are appropriate for timber management, recreation and wildlife habitat. They are not suitable for housing or location of power generation. In these areas, conservation policy should prevail and schemes should be initiated to improve and enhance the appearance of landscapes by means of restoration, landscaping, tree planting and the removal of disfigurements. In these areas, opportunities for recreation should be explored to permit greater use to be made of the existing resources (such as antiquities, viewing points and other features of interest) without the need for any substantial increase in man-made facilities. This could be achieved by means of information services and a wide variety of language/ interpretation techniques to help visitor of understanding/any features that may be of architectural, archaeological and historic interest.

3. Determination of Intensity of Use

The policy of management and the scale on which facilities are provided in a specific area of the coast should be related directly to the acceptable level of use determined. The concept of the intensity of use should be introduced for specific areas and be measured according to the maximum number of persons, kind of activities, the pattern of access and the scale and provision of supporting facilities that the coast area is able to accommodate without serious damage to its natural carrying capacity. In a conservation programme, for example, the carrying capacity of a resource may be considered in two distinct ways. Firstly, there is the ecological effect on the environment arising from the kind of the activities and the number of people involved. Above a certain level, the habitat will suffer as a result of discharge of wastes, trampling, disturbance to wild life, pollution, erosion of sand dunes. Secondly, there is the visual or environmental effect of people on the landscape; too many visitors will, as a result of excessive noise, overcrowding, and car-parking, destroy the character of the area/to which/ they came to enjoy. Similarly, necessary/ for an industrial project, it is /activities (on the to take into account the location of development/coast or away from the coast with some distance), whether the land and water could absorb the development, existing communications and infrastructure, or the potential for improving them economically, and whether the environment could be rejuvenated, given the intensity of the intended use. Some of these issues are further discussed in the next chapter dealing with industrial siting.^{1/}

^{1/} See Chapter VI.

Access by pedestrians and vehicles in both areas (b) and (c) mentioned earlier^{1/} should be regulated in such a manner as will avoid excessive concentrations of persons and vehicles at points which are most easily damaged, or where the unspoilt or remote character of the coast or its scientific interest and importance is threatened. Road capacities and widths should be related to the acceptable capacities and levels of use of the resources to which they give access. Careful control of vehicular access and the management of traffic are basic to any conservation plan.

Policy with regard to anchorages, jetties and landing planes should ensure that the degree of access which may be possible from the sea is consistent with the management policy for the zone in question. Local authorities would need to consider carefully which means and what type of enactment to adopt in order to achieve effective management. Sometimes by-laws may be desirable to confine direct access to selected points and to specify the type of vessel, permitted noise level etc. For many of these purposes, statutory powers may be needed.

Special attention should be given to certain use activities which are associated with environmental effects. For example, breakwaters may be needed to protect beaches, bluffs, dunes or harbour areas from wave action or for navigational purposes. But most of the solid breakwaters also obstruct the free flow of sand along the coast and starve the downstream beaches. Similarly, bulkheads and seawalls may protect the uplands, they do not protect the adjacent beaches, and in many areas are actually detrimental to the beaches by speeding up the erosion of the sand in front of the structures. It should be ensured that these

^{1/} Section 2, (b) and (c) above.

structures are designed in such a manner as to avoid potentially detrimental effects on the movement of sand and circulation of water.

The removal of sand and gravel from coastal areas is another example and usually results in erosion of land and silting of water.^{1/} These operations can kill living marine resources. The removal of sand from the ocean beach can deplete a limited resource which may not be restored through natural processes. When rock, gravel, sand and minerals are removed from coastal areas, adequate protection against sediment and silt production should be provided.

^{1/} A case study on coastal erosion resulting from natural processes and man-made events may be found in Rapport, Seminaire-Atelier sur les problèmes de l'érosion des Côtes du Togo et de la République Populaire du Benin, organisé conjointement par les Nations Unies et les Gouvernements du Togo et du Benin, Lomé du 29 janvier au 9 février 1979. mimeographed, 55 p.p., particularly Deuxième partie. 2.2.2.2.1 et seq.

4. Application Scope of the Management Area

The seaward and landward limits of the scope of application of a management programme should be clearly defined.

It is extremely difficult to propose specific limits without referring to/^a concrete situation or studying the relevant factors. In this connexion, reference may be made to the experience of the Economic Commission for Europe in 1974 when it conducted a study on pollution of coastal and estuarial waters.^{1/} An attempt was made for that study to propose physical /^{boundaries/} for the purpose of examining the question of coastal pollution. The wide range of limits proposed by^{2/} Member States of the Commission indicated that such an attempt was not really feasible and that each country would have to decide in the light of their own situation. This conclusion seems to be also applicable in the present case. Indeed, the survey in Chapter I has shown that governments have adopted limits of very differing /^{width/} for management purposes on the basis of their physical conditions and perceived needs. Some are broader than the others; some are defined in a functional manner and others are in specific figures: e.g. Cyprus finds it necessary to include/^a seaward area 50 metres from the high water mark ; Mauritius chooses the area from the coral reef to one kilometre of the shoreline from the high water mark ; Sri Lanka, the strip lying between a distance of three metres landward and two kilometres seaward from the mean sea level; Togo, from the high tide within/^a landward area of 100 metres; the United States, from the water limit of its territorial sea landward to the shoreline to the extent necessary to control shorelands, the use of which has a direct and significant impact on the coastal waters; Norway,

^{1/} "The Pollution of Coastal and Estuarial Waters", Economic Commission for Europe, Committee on Water Problems, ECE/WATER/6, 8 August 1974.

^{2/} These proposed limits are mentioned in Chapter V, Section 4.

all land areas where the sea and shoreline retain their importance for the location of vacation and tourist development.^{1/}

The present trend seems to be that a narrow strip of coastal area is preferred. Be that as it may, in order to permit effective management and to take into account any significant impact on the shorelands and waters and on other economic activities in the coastal zone, the management area at the national level should not/be limited to a narrow strip of the shore-land and water particularly in view of the general development in many countries / toward extending broad coastal resource jurisdictions. Perhaps the management area should include the area where resource jurisdiction is to be exercised.

For the purpose of management, it appears that the size of a given management area should take into account such considerations as: nature of activities involved, distance and locality of activities, physical impact of activities on other related activities, and the destination of the resources and materials produced (i.e. whether they are for export or for inland consumption). Thus, for example, the management area needed for oil exploitation on the continental shelf should cover not only the area where exploitation is taking place but also the immediate localities from which manpower and food stuff come in view of possible social and economic consequences. The size of a management area whose principal economic activity is sand mining and gravel/can be, in principle, considerably smaller so long as the and biological physical/impact areas are included.

^{1/} See Chapter I, Section 1.

5. Adequate Administration

The best policy and legislation will fail if the administrative machinery is badly organized or operated. For example, if the administration is entrusted to one group representing only one kind of interest, it is obvious that the legislation would serve only that particular interest. Inefficient implementation of the law on the part of the administration may be due to various factors:^{1/} e.g. lack of co-ordination, the lack of well-defined machinery to ensure a representation/ of different interests, shortage of staff or of sufficiently trained staff, lack of proper equipment, and lack of awareness of the objectives of the legislation.

Proper administration should include: (i) an administrative structure responsible for defining a coastal area policy and controlling the area; (ii) a systematic concept of administration, embracing all the activities with which an administration is concerned; (iii) adoption of ^a defined coastal area as the unit for management programme without prejudice, if possible, to the existence of political and geographical management units (e.g. economic development units); (iv) avoidance of proliferation of new administrative institutions; and (v) interagency and intersectoral coordination and cooperation.

Experience shows that a well-represented policy-making body is most essential. The membership of such a body should consist of representatives of various government agencies (e.g. resource, planning, transport, economy), major interest groups (e.g. developmentalist, conservationist, and policy-makers)

^{1/} Among coastal management programmes in the United States, most states have found the question of appropriate administrative structure difficult to cope with. Further kind of issues existed in the United States and the alternatives used in California, see H. L. Beschken, "Interorganizational Considerations in Coastal Management: the 1976 California Legislative Experience", Coastal Zone Management Journal, vol. 4, Nos. 1 and 2, 1978, pp. 47-64.

and qualified personnel to give technical advice. The danger is that a commission may become too large to work efficiently. To avoid paralysis, the chairman should be given a decisive role, should a deadlock be reached. Weighted voting should be considered in view of the multisectoral interests of the coastal area and the need to weight different interests. Each interest group may be assigned appropriate voting power in accordance with a scale of importance of the interest it represents. In this manner, the decisions are more likely to reflect the harmonization of divergent interests.

It is also desirable for the administrative branch, particularly at the technical level, to be given explicit authority, within a well-defined framework, to translate into regulations the general norms. This system promotes flexibility, facilitates the implementation of legislation and make allowance for regional differences.

The participation of interest groups and ^{the/}general public in the planning and legislative processes, as well as in certain aspects of coastal administration, should be recognized and should be afforded legal guarantee and means of representation. This participation can be accorded both to individuals and to organizations representing a group's interests. The right of participation should enable different groups to put forward their concerns and needs where these are apt to be endangered by the various procedures established by the law in coastal areas. The representation of group interests can be assured by means of public hearings at the policy decision-making stage, or in the administration system, in which case an administrative organ or a tribunal is needed to harmonize conflicting interests.

Public participation requires education and training. If it has not been practised it would have to be cultivated.

6. Legislative Approaches

Although fairly comprehensive legislation on coastal area management already exists in several countries, these laws cannot be transplanted without careful adaptation. Nor should they be applied in isolation of policy objectives since they were based on particular physical and economic conditions.

← The legislation must reflect the perceived need of the region or area concerned. Various approaches may be considered.

The United States Coastal Zone Management Act, for example, is a framework legislation at the national level which leaves ^{it to/} the states concerned to articulate their needs and to define the methods to meet them. Scotland, Israel, Indonesia, Sri Lanka and Spain selected certain critical areas, which vary in sizes, and prescribed the necessary remedy. Other countries such as Venezuela, Mexico, Norway, New Zealand introduced special legislation to deal with certain critical issues (e.g. tourism, beach protection, or wetland management).^{1/} There is no one solution and the need determines the legislative measure.

Before any drafting can be done, an inventory should be taken of all the activities concerned, all the legal provisions applicable to the area, and all the related administrative setups. After the inventory, the relevant laws should be classified and evaluated in the light of the basic objectives to be achieved. The examination should establish the adequacy of existing laws and of the administrative setup vis-a-vis the achievement of the basic objectives, and should identify conflicts and gaps which may exist. After this stage, a decision on how to proceed further has to be made. Two basic alternatives are possible: to draw up

^{1/} For details, see Chapter I.

self-contained coastal management legislation which would supersede and replace all existing applicable laws in the area so far as resource management is concerned, or, alternatively, to amend existing laws by filling the gaps, removing conflicts, consolidating laws and co-ordinating administration. The end result of either approach is the same: to provide an adequate and coherent legal basis for the implementation of the objectives. A decision can be made only after weighing all the pros and cons in the light of the existing legal system and of the prevalent physical, economic and social conditions of the area concerned.

At the national level, it might be advisable to establish a general legal framework for coastal management within which the policy-makers, planners and executors must work. The law may determine the type and variety of information to be gathered, the procedures to be followed and the sectors of opinion which should be heard in order to legitimize the making of the policy and its implementation. The law may articulate broad principles, leaving the concrete policies and approaches to be formulated through the well-defined legal framework so as to reflect diverse economic and ecological conditions. While a general legal framework would thus be provided, regional (or state) and local governments/^{would}retain sufficient flexibility to formulate policies, to determine strategies, and to set out steps for implementation in the light of local needs and conditions. The drawback is that neighbouring local governments may come up with objectives conflicting with each other. A further step toward harmonization would therefore be necessary.

Chapter VI: Regulatory Guidelines for Industrial Siting

The question of siting of industry facilities (e.g. power generation, processing plant or factories) is seldom a feature in legislation dealing with industrial development. For many developing countries, the government agencies involved are mainly concerned with fostering industrial development and they may be expected to evidence greater concern with economic goals than with other competing factors or values.

While coastal areas are ideal locations for industrial activities for obvious reasons of access, supply, market and waste disposal into the sea, the special characteristics of coastal environment may constitute drawbacks which must be fully taken into account. Otherwise, disregard of these characteristics could result in the undermining of the very objectives intended to be achieved. Three categories of problems are involved. The first is protection against natural hazards (such as floods, storms, waves and current) which may have a direct impact on a given type of activity in the coast. For example, ignoring the existence of strong and direct wave action may render recreation on the beach extremely dangerous and in turn, would affect tourism and hotels located in that area. Thus, the development of a resort area would require studies of wave and current conditions to analyze their strength, direction and location, as well as their variability in order to identify areas along the beach where recreation is relatively safe. Otherwise, subsequent corrective measures such as the installation of breakwaters or groins not only would be costly but also would probably spoil the natural setting which made the location in question attractive for resort development in the first place.^{1/} Similarly, hotels placed in areas where natural processes

^{1/} Several very interesting examples of this nature are cited in L. Neuman, "Interactions and Conflicts in Coastal Areas" in K. H. Szekielda (ed.) Development and Management of Resources of Coastal Areas, joint publication by German Foundation for International Development and the United Nations, 1977, pp. 447-450. See also papers submitted on Benin and Togo which reported on problems of this kind in those countries. Ibid. pp. 63-80; pp. 235-242.

of erosion take place may in due course endanger the location of the hotels. Construction and building without knowledge of flood-hazard is another example of danger that may lead to destruction.

The second category of problems relates to the complicated interaction of activities in the coastal area.^{1/} For example, in Venezuela, population pressure on certain parts of the coast and the ensuing disposal of untreated waste water and physical encroachment led to the destruction of mangrove swamps with resultant loss of plant and animal life and possible increased erosion of the coast.

Estuaries and lagoons are areas of major conflicts of interest between fisheries and industry. The location and activities of industries may often interfere with the needs of nursery or breeding grounds. Similarly, industrial activities on the coast may also conflict with tourism and recreation, and all these activities increase the problem of waste disposal. Unless adequate means are found and activities are carefully regulated, natural amenities may be reduced.

The third category of problems relates to the nature of certain activities. Nuclear power production, refining and processing and oil storage are activities having significant environmental implications. The siting of these activities onshore or offshore requires a basic knowledge of climate, winds, precipitation, storm frequency, currents, wave heights and directions, sediment transport, topography and land forms and soil types. ←

← In Lomé, Togo, for example, part of Hotel Tropicana has been eroded and the building itself could also be in danger of being eroded, if erosion continues at present rate. ^{2/}

^{1/} Neuman, op. cit. p. 450

^{2/} See Rapport, Seminaire-Atelier sur les problèmes de l'érosion des côtes du Togo et de la République Populaire du Bénin, organisé conjointement par les Nations Unies et les Gouvernements du Togo et du Bénin, 29 janvier au 9 février 1979, Deuxième partie.

Experience shows that proper siting of industrial facilities can often ensure better development, avoid costly alteration and reducing adverse effects on other values (e.g. scenic, water quality, conservation of wetlands).

The purpose of this Chapter is to identify the various issues that should be considered in relation to certain hazardous areas, marinas and offshore structures, and refineries and nuclear power plants. The last section deals with the question of licensing.

1. Siting of Coastal-Dependent Activities

Fishing aquaculture, port facilities, extraction of minerals (e.g. iron ore, salt, tin sands and offshore oil), tanker terminals, shipyards, marinas and certain applications of power generation are coastal-dependent activities in the sense that they must be carried out in or near the ocean to be able to function at all. Such industries, while obviously essential to a state's economy, can have major impacts on the coast, consuming valuable lands, intruding on the visual qualities of the coast, interfering with access and affecting air and water quality. Locations for industry must take into account these effects, as well as safety concerns and growth needs.^{1/}

Legislation dealing with industries should contain a clear statement of policy and criteria. A recommended policy would appear to be one that requires, in cases where the very nature of the development activity requires a coastal site, priority should be given over other development activities on or near the shoreline. Where coastal-dependent industrial, commercial, and recreational development would have a substantial adverse effect on coastal resources, they should be regulated and permitted only if, for example, (i) there is no alternative site; (ii) economic benefits outweigh other considerations (e.g. the need for a port is essential to the region which otherwise possesses no economic resources; (iii) environmental damage is mitigated to the maximum extent technically and economically feasible in the design and execution of the project.

^{1/} The ecology of an island appears to justify special treatment. Some very useful guidelines may be found in J. McEachern and E. L. Towle, Ecological Guidelines for Island Development, published by International Union for Conservation of Nature and Natural Resources, Morges, Switzerland, 1974 (IUCN publications New Series No. 30), 66 pp.

Coastal-dependent activities should be grouped/ spatially, if possible. New developments should be as a rule concentrated in already developed area, unless for other economic, social or safety reasons (e.g. resources allocation or supply), such a concentration would not be desirable. All potentially hazardous industrial activities or other development activities that cannot be allocated or accommodated in already developed areas according to coastal area planning policies should be sited elsewhere and should be kept a/ safe distance away from population centres. All potential industrial sites in such areas should be used to the maximum extent feasible (subject to certain limitations such as safety requirements and economic necessity) prior to the commitment of any new areas. Sewage treatment, water purification, desalination, and power plants should be located when they do not interfere with and are compatible with recreational, residential or other public uses of the water and adjacent land areas. Waste treatment ponds for water-related industry should occupy as little shoreline as possible.

For many developing countries, economic and social values may sometimes attract more attention than environmental considerations; and thus, it is not always practical or economical to exclude non-coastal dependent industrial activities from the coast. For reasons already mentioned, siting regulations should therefore be considered for all major activities to be situated on the coast and likely to have a significant impact upon the environment, and upon/ social and economic conditions.^{1/} Some of

^{1/} R. F. Dasgann, J. P. Milton and P. H. Freeman, Ecological Principles for Economic Development, John Wiley, London and New York 1973, provides a very stimulating discussion on these issues.

the attributes which may require scrutiny include the nature or type of activity, area of land use, location of proposed site, and number of employees. The relevant legislation should establish criteria on the basis of these elements.

Certain types of enterprises might be identified which, by their very nature, are more likely than others to create or result in significant or substantial impacts upon environmental, social, economic or physical conditions. Thus, energy generating and conversion activities, electricity generation, synthetic gas and petroleum production and uranium enrichment are readily identifiable. Other activities such as paper manufacturing, cement production and quarrying, livestock feeding on a large scale, mining and mineral processing, chemical manufacturing, residential subdividing exceeding a specified number of units, and textile milling, and tanning may also require siting regulations.

The area of land to be used in connexion with the proposed activity will often impinge upon environmental and cultural values as well as on social or economic conditions. The utilization of relatively large land areas may have adverse effects upon flora and fauna, scenic and recreational considerations and other natural systems. It is generally true, on the other hand, that the smaller the area is involved, the less the environmental effects will be.

Industrial development in areas exhibiting special cultural, scenic or recreational values, or areas peculiarly suited for wildlife habitats (such as wetlands, marshes, wilderness areas, rivers and streams) require special scrutiny. The number of employees is another useful indicator in view of the necessary implications (e.g. transport, residence, communication, and waste disposal).

Utility services, i.e. electric power, gas, communication, sewage and oil, are essential to coastal area development. The installation of pipes and wires necessarily disturb the landscape, though can usually be planned to have minimal visual and physical effects.^{1/}

← Whenever utilities must be placed in a shoreline area, the location should be chosen so as not to destroy or obstruct the scenic view. If feasible, these facilities should be placed underground, or designed to do minimal damage to the aesthetic qualities of the area. Upon completion of installation or maintenance projects on shorelines, banks should be restored, if possible, to pre-project configuration.

^{1/} Cf. J. C. Sorensen, A Framework for Identification and Control of Resource Degradation and Conflict in the Multiple Use of the Coastal Zone, Department of Landscape Architecture, University of California, Berkeley, California, 1971.

2. Siting in Flood or Geologic Hazard Areas

Certain coastal areas are hazardous for development and this should be taken into account in locating development. Activities in these areas should be specifically regulated by law.

The loss of life and property damage caused by flood is often due in large part to poor planning and use of floodplains. Clearing of vegetation from the surface area can contribute to the intensity of flooding. The cumulative effect of many small structures is to reduce the floodplain's storage capacity. Along with changes in hydrologic characteristics of the watershed, such a reduction may increase velocity of flood waters, thereby diminishing seepage necessary for groundwater recharge. Flooding may destroy valuable habitat areas and kill wildlife. In many developed countries emphasis has been on flood control projects which are very costly. The better policy seems to be to leave undeveloped many floodplains, where costly protection structures are required. Substantial public funds can be saved by early planning.

Legislation can help by requiring careful studies beforehand and serious planning for development in flood-hazard areas to avoid the need for new flood control works and to minimize the risk of interference with natural watershed processes that would adversely affect sand supply and anadromous fisheries. Criteria should be established in the law for any new development in flood-hazard areas. For example, allowable uses should be those which can sustain periodic flooding, and those which do not contribute to the flood hazard, do not aggravate the flood problems, impede floodwater storage capacity or increase pressure of existing flood control devices. Flood-hazard areas should not be used during the flood-prone periods, for instance, for log decks or storage of materials that can be carried downstream by flood waters unless anchoring devices are adequately

← provided. Procedures should also be established to ensure review of proposed developments in inland flood-hazard areas that could adversely affect lives and property in the coastal area.

Earthquakes, seismic sea waves and storm waves, landslides and mudflows, and bluff and shoreline erosion are the four major geologic hazards in coastal areas. Development that interferes with or ignores these nature processes may impose direct or indirect danger and costs on the public, and accelerate or aggravate long-term natural geologic processes of the coast. Of direct concern for shoreline management are shoreline erosion processes. All areas of known geologic hazards should be identified and mapped. All proposed structures for human occupancy and other development/activities that could significantly alter geologic processes or contribute to hazards should be carefully reviewed and regulated.←

Villages within the 100-year seismic sea waves runup zone should include within their safety elements a disaster preparedness plan; which should include evacuation routes and an effective emergency warning system capable of adequately informing all residents and visitors of an impending occurrence. All these elements should be featured in the legislation as requirements before a permit for development is given.

3. Regulations of Marinas and Certain Offshore Structures

Ports and marinas are essential for water-borne traffic and as such have become gravitational points for industrial and manufacturing plants for reasons of access, storage, supplies and services. A coastal zone plan should recognize the regional nature of port services and should not permit development activities that have not been carefully planned. Since industrial piers and required water areas adjacent to ports are usually longer and greater in bulk than those for recreational or residential use, the applicable law must require careful planning to reduce adverse impact of such facilities on other water-dependent uses and shoreline resources.

The location and construction of offshore structures such as piers, jetties, groins, bulkheads or breakwaters should be regulated in view of their physical impact. Floating piers may constitute an impediment to boat traffic and can also alter beach sand movement patterns in areas where tides, longshore currents, and littoral drift are significant. Jetties employed at coastal inlets to maintain a navigation channel may often lead to the impounding of sand at the updrift jetty and to reducing the supply of sand to the shore downdrift from the inlet. The result is erosion.^{1/} Similar effects may also result from groins,^{2/} bulkheads,^{3/} and breakwaters.^{4/} The law should require that they be constructed in such a manner as to minimize alterations of the natural shoreline and not to result in adverse effects on nearby beaches. Sand movement and the effect of these structures

^{1/} The construction of jetties in Lomé, Togo, and Cotonou, Benin, are vivid examples. For a detailed analysis of the causes and possible technical solutions, see Rapport, Séminaire-Atelier sur les Problèmes de l'érosion des côtes du Togo et de la République Populaire du Bénin, 1979, op. cit. Deuxième et Troisième Parties.

^{2/} Groins are barrier type structures extending from the backshore seaward across the beach.

^{3/} Bulkheads are structures erected parallel to and near the high-water mark to protect adjacent upland from the action of waves or currents.

^{4/} Breakwaters are built offshore to protect beaches, bluffs, dunes or harbour areas from wave action.

on sand movement should be particularly considered in reviewing proposals for these structures. Their impact on wildlife propagation and movement, and the extent to which their design might detract from the aesthetic quality of the shore should also be reviewed.

4. Siting of Refineries and Nuclear Power Plants

Coastal areas are ^{the} preferred location for refineries and nuclear power plants primarily because of the free, abundant, and non-depletable waters of the ocean. But because of the very nature of these activities, which require large water supplies for cooling, oil terminals for transshipment and treatment facilities to handle waste, and ^{because of the/} characteristics of coastal areas, special regulations are required. Although there has been a rapid growth of these industries in many parts of the world, a remarkable safety record has been maintained. Adequate planning and siting considerations have contributed to this result. However, better knowledge of those factors deserving consideration is still required.

Refineries are large-scale, and visually could be intrusive. Even the most modern refineries may occasionally emit noise and odors, and they represent significant single sources of air pollutants. Refineries can encourage the nearby construction of petroleum-associated industries (e.g. petrochemical, plastics) which can lead to rapid industrial growth and increased employment. Refineries have a large potential for fire and explosion. Optimal safety considerations require siting refineries away from seismic areas, and separating them from surrounding populations by a buffer zone. Water pollutants emitted by oil refineries [→]

~~should~~ be identified and regulated. Modern water treatment technologies can reduce these emissions, ^{1/} and sometimes they can be eliminated through cooling systems which dilute pollutants to meet discharge standards. Removal of pollutants from the air and from water discharges of refinery systems will result in accumulations of solid or semi-solid waste products, for which proper disposal must be provided.

^{1/} For example, in Sumgait on the Caspian Sea in the USSR, ³ a new purification plant is requested to be able to deal with 200,000m³ per day of effluent from chemical works and oil refineries, yielding polymers and oil residues which can be burnt, providing methane to be fed into the city heating system.

Before permission is given to site on the coast, it should be established that no alternative inland site can be found and that it is economically beneficial to locate the refineries on the coast. It should also be ensured that the project is designed and sited to minimize adverse environmental effects and that there will be a sufficient buffer zone to any impact on/ minimize/surrounding property. The siting of a refinery on a highly scenic area, or in or near environmentally sensitive areas should be avoided, if possible. In principle, refineries should be sited away from areas of substantial seismic risk. The location of offshore moorings, storage terminals, and dockside loading terminals should be very carefully selected to ensure minimal disturbance of environmental values, and the necessary structures/ should be/ equally carefully designed with that end in view. As a general rule, the construction of/ installations should be avoided in areas of high natural biological productivity, such as estuaries, mangroves, coral reefs and oceanic upwells. In other areas, strict operational regulations, inspection and enforcement, coupled with contingency planning should be implemented/ to reduce the risk of oil leaks or spills.

The major concerns related to nuclear power plant siting on the coast include: hazards which are increased because of the sea-land-air interface; effects on to nearshore marine environment due/thermal or chemical discharge from the cooling systems; proximity of nuclear power plant to population centres on the coast, and the adequacy of emergency evacuation planning; the impact of plant and associated structures on scenic natural

areas. The radioactive hazard potential of nuclear power plants requires that the utmost care be exercised to site them away from areas of seismic risk and from population concentration. The principal constraints on inland siting are the availability of adequate water for evaporative cooling towers and the need to dispose of water of high salinity concentrated by evaporation in the cooling tower. If sufficient cooling water is available, inland siting of nuclear power plants is better - at least it could reduce, if not eliminate completely, the possible effects on the sea. Because of the importance of fresh water for agriculture and other uses, inland siting raises other kind of problems.

5. The Granting of Permits

Requiring a permit can be used as an effective method to control siting of industry on coastal zones. Although ^a permit-issuing system exists in most countries, many existing systems do not specifically include siting of industries. Some systems, particularly in industrialized countries, often require either diverse or numerous application and permit proceedings before different/ ^{and} unrelated central, state or local government agencies^{1/}. The procedures are often time-consuming and sometimes may result in omission, confusion or inconsistency. Red tape may also discourage initiatives. It seems that there should be one, coordinated proceeding before a single agency empowered to issue or deny a siting permit covering all aspects that should be considered. This would not only ensure better regulation and control, but also benefit the applicant and other parties having an interest in the probable effects of the proposed facility.

A single or coordinated permit system for siting of industries should include the following elements. First, the licensing procedure should encompass all aspects of the proposed project so that, at its conclusion, the siting agency may issue or deny a single permit, pre-empting the jurisdiction of all regulatory agencies which might otherwise have licensing or approval authority over any aspect of the proposed project, and also binding upon all other interested parties. The final action of this agency should be reviewable, at the instance of any party

^{1/} For example, a large chemical corporation gave up its plan to build a \$500 million petrochemical complex in northern California of the United States because of costs and time required in connexion with obtaining the necessary 65 permits (five from the Federal Government, 40 from the state of California, and 20 from the local counties).

← to the permit proceeding, in a single judicial review. Second, recognizing that the expertise of many governmental agencies may be essential to evaluate various aspects of a proposed project, the single proceeding should combine and coordinate the activities of all governmental agencies with respect to the project in order to avoid overlapping or fragmentary reviews which may be in some respects redundant or in others inadequate. Third, in order to achieve an appropriate balancing of the desirable effects of the project (essentially those involving the benefits of industrial and commercial development) against its undesirable effects (those involving adverse impacts upon existing environmental, social and economic conditions), the single permit agency should be authorized to balance the project's benefits against its possible detriments and, in reaching its permit decision, should be empowered to override decisions or recommendations of other governmental agencies which may retain jurisdiction over only one or a few aspects of the proposed project.

Chapter VII: Regulatory Aspects of Oil Pollution Control

The spill of oil and other noxious substances in coastal areas may have not only harmful effects on the environment, damaging to natural beauty and wildlife but also economic and social consequences on other coastal activities (e.g., tourism) and on peoples who earn their living from the sea. Oil pollution thus represents one of the most serious problems in coastal management.^{1/}

Certain coastal areas and islands conveniently located in relation to high demand markets are likely to experience an increased risk of pollution due to a transformation now under way in the oil transport industry. This stems from the gradual replacement of traditional tankers by very large crude carriers having high draughts (e.g., 90 feet). Islands located near markets and surrounded by deep waters offer obvious advantages for storage or refining before oil is shuttled in smaller tankers where and when required. New and expanded facilities have thus been proposed or scheduled, for example, in the Caribbean areas (e.g., Jamaica, Haiti, Puerto Rico, the Caymana , St. Croix, Turks, the Bahamas and Guadeloupe).^{2/}

Oil pollution hence presents a special problem for these areas. Measures to control oil pollution should accordingly constitute an integral part of a coastal management programme.

^{1/} See Section II, Manual on Oil Pollution contained in IMCO document MEPC IX/9, 17 March 1978. Section II deals with contingency planning. Also see Part IV: Organization Aspects in J. Wardley-Smith (Ed.). The Control of Oil Pollution on the Sea and Inland Waters, pp. 203-223, Graham and Trotman Ltd. Accidents at Sea Causing Oil Pollution, Review of Contingency Measures, London, 1978 published by the United Kingdom, Department of Trade.

^{2/} See J. McEachern and E. Towle, Geological Guidelines for Island Development published by International Union for Conservation of Nature and Natural Resources (IUCN), Morges, Switzerland, 1974. IUCN publications New Series no. 30, 66 p. et p. 50.

The overwhelming majority of oil spills are caused by human error rather than by equipment failure.^{1/} The risk of spills can never be entirely eliminated and there always exists a danger of an accident and oil spill in the neighbourhood of an oil installation and in areas where oil tankers regularly pass along the shoreline. Clean-up may require special equipment which may not be locally available and can be very costly. Moreover, all this cannot be arranged after the threat of pollution is imminent. Unless appropriate contingency arrangements have been made beforehand, serious mistakes and irreparable harm are inevitable.

Some of the basic issues are discussed here, grouped within the following two Sections.

^{1/} Manual on Oil Pollution, op cit. p. 205.

1. Planning Guidelines

Effective oil pollution control must begin with proper planning which should take into account the probable size of a pollution accident, equipment needs, classification of coast line and location of exploration, storage and refining activities.

The risk and the probable size of an oil spill should be reviewed in the light of the following factors:^{1/} the amount of oil being transported into or out of the area and being ^{transported/} close to the shore concerned; past record of the area for oil spills; the size of tankers which most commonly pass through the area; the likelihood of collision between tankers or between tankers and other kinds of vessels; likelihood of grounding; the maximum rate of discharge from a well, a refinery or a terminal if the control devices prove effective; the length of time required before the flow can be checked or stopped altogether; and current and weather conditions. Once the risk and the probable size of a spill are determined, it would be possible to establish a target in relation to which contingency arrangements can be made. When an accident does take place, it can easily be ascertained whether the contingency arrangements alone will be sufficient or ^{whether/} additional help will be needed. In the latter case, steps can be taken to obtain additional assistance.

^{1/} See Chapters 5 to 8 in J. Wardley-Smith (Ed.) The Control of Oil Pollution on the Sea and Inland Waters, Graham, Trotmen, London 1976.

When oil moves ^{landward/} from the sea, equipment will be needed to keep the oil away from the coast (e.g., booms), ^{1/} to disperse the oil at sea before it reaches the coast, and to contain and pick up the oil. It is much easier to disperse oil while it is still at sea and every effort should be made to do this before it washes ashore. Experience shows that it is much easier to deal with oil on the sea than on shore. ^{2/}

Removing oil from the shoreland is seldom an easy matter and no single method or device can be recommended. ^{3/} The situation is complicated by the

^{1/} Oil booms are floating barriers supported by one or more buoyancy units used to prevent the spreading of oil on water and sometimes to thicken the layers of oil by reducing the area into which it has spread. Mechanical devices for the removal of oil from the surface of water are known collectively as "skimmers", which, according to experience, do not, and probably cannot, achieve the intended purpose. Sometimes, other methods such as using absorbents or burning, gelling or sinking may also be considered. The use of dispersants has been the most widely employed and immediately effective method both on the open sea, in estuaries and on beaches. When oil, which is floating on the surface of the sea, is treated with a suitable surface active agent and an agitator is applied, the oil is broken up into particles of different size, some are small and some large. Once the oil has been dispersed, the natural motion of the sea is usually sufficient to distribute the particles over a wide area and prevents their re-forming into a slick. The bacteria naturally present in the sea will then attack the small particles. The normal method of applying the dispersant to the oil is by means of spray booms fitted to ships. Experience shows that dispersants should be used according to the manufacturers' instructions and with suitable and efficient spraying equipment. It is not sufficient simply to have supplies of dispersant and equipment available at the right place at the right time; trained personnel must also be available. For a very useful examination of the various methods and equipment that may be used for the treatment of oil on the water, see J. Wardley-Smith (ed.) Op. cit., particularly Chapters 5-8, pp. 83-159.

^{2/} Ibid Chapter 8.

^{3/} Id. Chapter 2.

different physical characteristics of the oils (e.g., light, heavy, gasoline, or diesel) and the many different types of shoreline which can be anything between soft mud and hard rock.^{1/} Various equipment may be needed : earth moving equipment to remove dirty beach material, oil pick-up equipment, hand-held and other types of dispersant equipment, sea water hoses etc. Stocks of expendable material must be purchased and stored. The most obvious approach to beach cleaning is physically to remove the oil. This is far from easy on many beaches as the oil gets mixed with, and coats, the beach material. Sometimes, it might be necessary to burn the oil, cover it up with an absorbent powder or to wash it away using a dispersant chemical. Each of these methods could be of value in particular circumstances.^{2/}

The decision to clean or remove oil on the shore is conditioned on two important considerations: whether the cleaning or removal is necessary and / ^{whether /} _{will} the cleaning process/damage the environment. On the other hand, the presence of oily effluents, / ^{or} _(tar-balls) lumps of tar/is unpleasant for tourists and from the amenity point of view. But the

cleaning process often causes as much concern among biologists as the oil pollutants themselves, and in some cases cleaning may increase damage

^{1/} See below regarding the types of shoreline and their vulnerability.

^{2/} See for example, Ottway, S. and Knight, M., Review of World Oil Spillages. Marine Ecology and Oil Pollution Applied Science Publishers, 1975. There is considerable published material concerning the effects of oils and dispersants on the plants and animals of the shore. The relevant factors which appear to be important in determining the extent of damage include those which are related to the oil and cleaning treatment (e.g., type of oil, type of cleaning treatment) and to biological and other natural circumstances (e.g., topography, hydrography and the climate of the affected area.)

to shore life.^{1/} Accordingly, a clean-up policy should be developed to give guidance on when and how to deal with spills, and/ what ^{under} circumstances they should be left to disperse and degrade by natural means.

Many issues should be considered/ ⁱⁿ making a decision on the correct control and treatment of shore oil pollution: for example, the short and long-term effects of a particular type of oil; the efficiency of different cleaning methods and the ^{their use causes/} damage/to shore life; plans for discharge ballast water or effluent from a terminal or refinery. Moreover, it should also be noted that the distribution and persistence of spilled oil may be influenced by a complex interaction of various factors,^{2/} e.g., wind stress, water currents, beach activity and/ ^{sand} grain size, wave energy and oil quantity and composition. An effective control programme must not ignore the interaction of these and other factors.

If possible the entire coastline, or at least those parts of the coastline where oil might pollute, should be examined in detail by personnel familiar with the district and qualified in wildlife, oceanography and related fields to determine, in collaboration with those organizations dealing with conservation and/or tourism, which coastline must be cleaned and which need not. All this should be done as part of the planning processes. This task cannot be left until the oil is on the

^{1/} It has been observed that in many instances, there is much merit in doing nothing to the oil at all, and other instances, cleaning is called for. If, for example, the oil threatens amenities, the oil should be removed. But if the oil spill occurs in winter, on a fairly remote coastal area largely used by holiday makers in summer, then, providing it will have been taken away by natural causes before the start of the holiday season, perhaps clean-up should not be carried out.

^{2/} E.R. Gundlach and M.O. Hayes, "Vulnerability of Coastal Environments to Oil Spill Impacts", Marine Technology Society Journal, in press. By the same authors, "Some Guidelines for Oil-spill Control in Coastal Environments; based on Field Studies of Four Oil Spills". Paper presented to ASTM Symposium on Chemical Dispersant for the Control of Oil Spills, Williamsburg, Virginia, November 1977.

shore. For areas where cleaning is required, the precise type of cleaning permitted and the extent of the operation, must also be decided in advance and included in maps prepared for that purpose.

It may readily be seen that a shore classification according to physical characteristics (sand, gravel, mangrove, etc.) and economic activity (tourism, industry, archaeology, etc.) can be very useful for achieving the tasks mentioned above. The technique used for parts of the Spanish coast illustrates this point.^{1/} It has also been pointed out in a study that according to physical processes and shoreline characteristics, as well as biological effects and long-term oil persistence, different types of coasts may be identified in terms of their vulnerability to oil spill damage.^{2/} Thus, the a shore classification can also help/determination of vulnerability.

On the basis of oil movements, the whole coastline or those parts which might be polluted should be divided into administrative units for purpose of oil pollution control. In each area, there should be one person designated as the controller who should be accessible at all times and is responsible for making necessary decisions. If the district has been classified as suggested and plans have been made in the event of an oil spill, the controller's task is to ensure the application of the appropriate

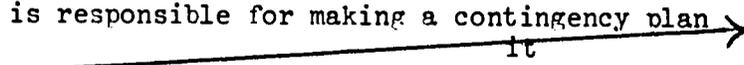
^{1/} See Chapter I, Section 1 regarding coastal planning in Spain.

^{2/} Gundlach *et al.* *op cit.* The following types of coasts are listed in order of their increasing degree of vulnerability: (i) Exposed, steeply-dipping or cliffed rocky headlands; (ii) eroding wave-cut platforms; (iii) flat, fine-grained beaches; (iv) steeper, medium- to coarse-grained beaches; (v) exposed, compacted tidal flats; (vi) mixed sand and gravel beaches; (vii) gravel beaches; (viii) sheltered rocky coasts; (ix) sheltered estuarine tidal flats; (x) sheltered estuarine salt marshes and mangrove coasts. (Coral reefs was tentatively placed at (vii)-(viii)).

plan according to a given situation. All oil spills at sea should be reported and channeled to the controller in the area. Equipment for spraying dispersant should be available throughout the coast. Prior arrangements should be made in every area so that in the event of a spill, ocean-going tugs from home ports can be fitted with equipment to go out and deal with the oil. The tug crews should be trained, and / contingency / drills should be carried out on a regular basis. Provision should also be made by the local government to deal with oil on the beach and shore.

2. The Role of the Government and Administrative Requirements

In view of the potential harmful effects of oil pollution on environment and the scale of arrangements that may be required, it appears that the government should play a leading role to ensure that plans and resources, whether of their own or of other organizations, exist to cover all areas of activity from which oil pollution may arise. The government must ensure that individual plans interlock to form a viable, effective and compatible whole, each agency being aware of the existence and sphere of responsibilities of the other.

As already mentioned,^{1/} in the case of the United Kingdom, the Government is responsible for making a contingency plan  to deal with oil pollution and ^{it} actually carries out cleaning up. The United States, on the other hand, is responsible for the preparation of a central contingency plan and plays a supervising and supporting role. The law sets out guidelines for what is required and requires the spiller to be responsible for the clean-up. When an incident occurs and when a federal agency is informed, the procedures of the National Oil and Hazardous Substances Pollution Contingency Plan are put into operation.^{2/} An On-Scene Commander comes to active duty. The Commander's task is to oversee that a satisfactory job has been done in accordance with what is required by law. The Government intervenes only when the spiller is unable to assume the task. The Government then undertakes the work either directly or by employing a contractor. The United States approach is very much related to

^{1/} See Chapter IV, Section 3 above.

the fact that there has/ ^{existed/} for some time commercial firms or oil spill co-operatives (over 100) specializing/ ⁱⁿ oil spill clean-up. In practice, most, if not all, of the clean-up operations are executed by those companies.

It appears that either of these approaches can serve as a model for contingency planning.

The main policy issue is the role and responsibility of the government and of the owner of a refinery, terminal, barge or tanker causing an oil spill. So far as clean-up is concerned, the responsibility depends very much on the policy that the government has chosen. If the government is to require the spiller to carry out clean-up, the law must clearly stipulate: what is expected from the owner; how clean-up is to be done and in what manner; who is to oversee and to be responsible for implementation; what kind of supplementary measures may be needed and should be equipped by the government itself if the spiller is unable or fails to carry out the task. It is a very difficult task to ensure that the owner will be adequately equipped or will have access to adequate clean-up facilities. If the government itself is to carry out clean-up, the law must require the owner to carry adequate financial liability in order to reimburse the state in the event of an oil spill. To set the financial liability at the appropriate level is a difficult question. If it is too high, the result could mean higher costs for transportation of oil. If it is too low, the amount may not be sufficient to cover the clean-up.

The legislation may also need to deal with the supply of equipment, organization, and communication, and to enlist support from the local government, the public and the relevant government agencies dealing with transport, trade, security, ^{the} /coastguard ^{the} and/ environment. The law should be prepared consistent with the maritime jurisdiction of the state.

In congested areas (e.g., straits) or areas of enclosed sea where neighbouring states may be involved, co-ordination would be necessary for effective implementation. In these and other cases, a regional approach might be desirable. The joint programme between Canada and the United States may serve as a model.^{1/}

There should exist appropriate arrangements for consultations by all anti-pollution agencies with organizations representing fisheries and wildlife interests, both during/planning and at the operational stages. Arrangements should exist for training in the relevant techniques for combating pollution, and the personnel concerned/^{should/} take advantage of these facilities. It may be mentioned that advantage should/^{also/} be taken of the various industry and government courses which already exist in some countries, e.g., in the United States, Canada and the United Kingdom, for training those responsible for the handling of pollution incidents. These courses not only include guidance on types and location of potential spills and the various methods available for dealing with them, but also give practical instruction in the handling and maintenance of equipment.

A recent IMCO publication entitled Manual on Oil Pollution^{1/} can usefully serve as a guide to making detailed arrangements for oil pollution control.

^{1/} See Chapter IV, Section 3 above.

^{2/} Manual on Oil Pollution, particularly Section IV. IMCO publication, December 1978.

PART III

COUNTRY EXAMPLES OF CRITICAL ISSUES IN COASTAL AREAS

Ethiopia ^{1/}

The coastal area of Ethiopia, situated in the northern part of the country, comprises a large sandy plain having a width of 10 to 70 km and extending for a total coastal length of about 1,000 km. For water resource studies and eventual development purposes, the coastal area, known as the Red Sea catchment area, constitutes one of the fourteen drainage basins of the country and ranks eleventh in area with about 44,000 sq. km. The two Ethiopian ports of Massawa and Assab are located along this coastline.

With the exception of these two ports, most of the other parts of the coastal area are sparsely populated mainly with nomads and semi-nomads who depend for their living on cattle, goat and camel raising. Along some river courses there are settlements that depend on irrigation by flooding augmented by ground-water. Some farmers in these localities annually produce two crops of vegetables, melons and field crops by taking advantage of the summer floods originating in the adjacent highlands and winter rains of the coastal plains. Besides moistening the soil, the floods deposit silt that greatly improves the soil's fertility and texture.

So far no systematic investigations of the resources of the coastal area have been undertaken with the exception of off-shore and limited shoreland explorations for petroleum, potash exploration in the Danakil Depression located just to the south of the coastal area and geothermal

^{1/} Information contained herein is based on materials supplied by the Government, dated 22 January 1976.

investigations in the Rift Valley area and around the port of Massawa. These efforts will need to be supplemented by further studies before definite development plans can be drawn up.

The land and water resources of the coastal area can support sound agricultural development as evidenced by some of the ongoing irrigation schemes in the area. There are a number of torrential rivers flowing down the escarpments of the southern and western highlands. Huge fresh ground-water/resources are/ also believed to exist. However, more data and information need to be compiled and carefully analysed prior to any meaningful development.

At present, the National Water Resources Agency of the Ethiopian Government has plans to set up hydro-meteorological stations and carry out general surveys to enable proper assessment of the land and water resources potential and to lay down a sound basis for future development opportunities in the coastal area.

By and large, there is lack of/an adequate/ information base and the various natural resources are at different stages of investigation and development. For systematic development of the coastal area, more comprehensive planning is required; the present piece-meal and ad hoc approach to development will need to be carefully analysed and regulated so as not to hamper future profitable investment opportunities.

In some of the developed localities of the coastal area, such as the ports of Assab and Massawa and the village of Tiho, a chronic shortage of fresh water has been observed. Ground and surface water developments can play an important role in relieving this shortage provided systematic studies are carried out. It would appear that ground-water exploitation close to the coast may carry the risk of salinity.

The torrential rivers of the coastal area flow during the summer months of July, August and September, which constitute the rainy season of the adjacent highlands. Regulation of the resulting floods has proved profitable for agricultural development in some places. Uncontrolled, however, these floods have been the cause of hazards in some other places. These torrential rivers have, over the years, seriously eroded the highlands, which now direly in need of an afforestation programme to arrest further erosion, but they also have carried large/ volumes of silt which are deposited further downstream. This silt has greatly improved the soil's fertility and texture in the lower lands where profitable agricultural development is possible. On the other hand, the few dams that have already been constructed, such as those at Zula and Ghinda, have experienced serious sediment encroachment upon their reservoir capacities. As a result of this, the Zula dam is now no longer/ operational as its reservoir has practically been filled with silt. Hence, there is a need for proper watershed management and careful measurement of sedimentation prior to development.

The ports of Massawa and Assab are the only places where significant industrial and commercial activities exist. Both of them have their own municipalities and town master plans. The town of Massawa, with a population of about 25,000, is well planned, and has a cement factory, salt processing works, fisheries, several small

industries and work-shops and a modest commercial centre provided with good town facilities and amenities. The town of Assab, having a population of some 20,000 has, among other things, an oil refinery ← salt processing works and fisheries. These two ports do not as yet have any port development master plans. Although, at present, port facilities and equipment appear to be adequate to handle the existing volume of traffic, there is a felt need for a comprehensive port development master plan covering a period of about 25 years into the future. In fact, with this in view, basic statistical data and pertinent information have been compiled and analysed and detailed terms of reference prepared to enable the carrying out of the necessary master plan, ^{study/} for both ports. It is foreseen that this ← study will give serious attention to the need for coordinating port development plans with town planning and with the inland transport approaches to the ports.

At present, due to the small size of the port towns coupled with the underdeveloped resources of the coastal area, sea pollution does not pose a serious problem and as such may not appear to merit urgent attention. However low the level of sea pollution may be, the main sources of pollution have been identified as including household and industrial wastes and waste materials discharged by tankers and ships berthing at the Ethiopian ports. Proper provision for the carrying out of studies related to sea pollution will need to be made in order to assure that appropriate rules and regulations are introduced in time to protect the much needed sea resources and assist in the development of tourism. In fact, at present, there are some pertinent regulations already in force in this area, ^{but they/} require substantial revision.

In Ethiopia, several government ministries and agencies are involved in the various development aspects of the coastal area:^{1/}

<u>Agency/Ministry</u>	<u>Tasks</u>
(i) National Water Resources Agency, Ministry of Mines, Energy and Water Resources	(i) Water resources studies and development.
(ii) Ministry of Mines, Energy and Water Resources	(ii) Geological exploration, and mineral and geothermal investigation.
(iii) Mining Corporation, Ministry of National Resources	(iii) Mineral development
(iv) Marine Administration Ministry of Transport and Communications	(iv) Development of ports and regulation of related activities (e.g. discharge of waste and hazardous materials by tankers and ships.
(v) Ministry of Public Health	(v) Control of waste disposal into the sea from settlements and industries.
(vi) Tourism and Hotel Investment Corporation, Ministry of National Resources.	(vi) Development of tourism.

It is apparent that a number of government ministries and agencies have responsibilities over the development of the coastal area. In the absence of proper coordination, it is likely that duplication of efforts and waste of resources would occur. ^{Also,} /in the absence of any comprehensive study on the economic use of the available resources such as land, water minerals and fish, it is possible that development ← of these resources could be in conflict with each other and hence impede their optimal utilization. An integrated approach seems to be called for and some guidelines would be useful. For rational development planning, an inventory of all technical data and information should first be / undertaken / and analysed. On the basis of proper analysis, projects could be preliminarily identified and carefully studied for their comparative advantages and priority ranking.

Finland ^{1/}

Information concerning the coastal areas of Finland is not separately available because those areas have not been treated separately in planning, the compilation of /statistics or environmental protection. Population density, degree of industrialization and economic development vary significantly in these areas. Large parts of the archipelago belong to the less developed areas of the country whereas some coastal areas in southern Finland belong to the most industrialized regions.

The need for planning applies ^{to} /all regions of Finland and ^{emphasis} is laid on land use planning. The Division for Planning and Building in the Ministry of Interior is authorized to co-ordinate land use planning on national, regional and local levels. Three detailed plans for recreation and environmental protection have already been prepared for coastal areas, and the rest of the country will be covered by similar plans by 1 July 1977. The density of vacation housing has been studied in order to define the need for land use plans on shorelands.

The need to integrate the different economic and social functions in the coastal areas is considerable. It is particularly important to integrate planning for industry, environmental concerns and recreation functions. A special law on the archipelago has been proposed as a general measure of regulation. Some of the problems are due to accelerated industrialization and migration to cities which affects the economic balance of the area and brings about unemployment, thus creating the need for over-all regulation.

^{1/} Information contained herein is based on materials supplied by the Government, dated 3 May 1976.

Until recently, there have been no sweet water basins in the coastal area. Some basins have now been built for the use of industry.

Soil elevation creates difficulties in the development of port facilities especially on the Ostrobothnian coast.

Although pollution has until now been limited to areas near major rivers and industrial communities, vacation housing affects all coastal areas thus damaging the quality of the environment and hampering land use for other recreation purposes.

The principal problems of port development are the shallowness of the approaches to ports and the difficulties created by ice conditions in wintertime.

Industrial siting puts increasing demands on the development of coastal areas. The most difficult problems are created by large industrial plants that require coastal siting, such as oil refineries, nuclear power plants and large shipyards. Their siting demands thorough investigation of other forms of land use. The regulation of industrial siting can be carried out primarily according to legislation on the protection of waters, regional planning and government subventions related to regional planning policies.

The State Committee for National Parks is investigating possibilities to create a network of national parks in coastal areas, aiming at the preservation of characteristic natural features in these areas and in the archipelago.

The most essential problem of regional planning in the coastal areas is the high concentration of population, primarily on the coast of southern and south-western Finland. Population density there is not very high in comparison with many other European countries, but the speed of migration has caused a number of problems. Due to the concentration of industries, there has been a shortage of labour in these areas whereas continuous unemployment has prevailed in other parts of the country. In the archipelago, on the other hand, both employment opportunities and population have been on the decrease for several years.

For the purpose of applying various economic support measures to the less developed regions, these regions have been divided into two zones according to their degree of economic development. The law permits the formation of limited zones which can receive supplementary support. The island municipalities of south-western Finland and the Aland Islands belong to such a supplementary support zone. In these areas increased governmental subsidies can be paid to support manufacturing, tourism, fur production, fisheries and fish breeding, horticulture, market gardening and peat production.

Laws concerning environmental protection especially in the coastal areas have not been passed so far. The general regulations included in the Planning and Building Act (1958), Water Act (1961), Public Health Act (1965) and the Protection of Nature Act (1971) form the legislative basis also for coastal development. Regulations on the protection of waters are furthermore included in the Act on the Prevention of Pollution of the Sea (1965) as well as in the Act on the Control of Oil Damage Caused by Ships (1972). These acts may be amended when relevant international conventions, such as the Convention on the Protection of the Marine Environment of the Baltic Sea Area, have entered into force.

German Democratic Republic^{1/}

The German Democratic Republic's coastal area (i.e. the Rostock district) includes off-shore islands, peninsulas, shallow bays and a relatively narrow coastal strip (17 to 60 km.) along the Baltic Sea. The coastal line is composed of 341 km. of outer coast and 1050 km. of bay coast. In 1975, 870,000 inhabitants lived on a territory of 7,100 square kms, making the coastal area one of the most densely populated economic regions (123 persons per square km.) in the North of the country. The coastal area comprises 6.5 per cent of the territory and 5.1 per cent of the total population.

Priority uses in the coastal area are: shipbuilding, including ancillary industry; maritime traffic and harbour industry; fishery and fish processing; agriculture; recreation and tourism. 3.2 per cent of the gross industrial production is produced in the coastal area. 7.8 per cent of the arable land is situated in this area. Fallow land, which exists only on a small scale, is being reduced by recultivation measures. There exist only minor mineral resources (pyrites, sands and chalk).

In 1975, 2.5 million domestic and foreign tourists spent their holidays in the seaside resorts. This number will increase, as planned new capacity becomes operational.

The settlement structure in the coastal area is relatively balanced. Four cities with more than 50,000 inhabitants (Rostock, Wismar, Stralsund and Greifswald) and 38 townships and municipal communities with more than 2,000 inhabitants form a regular pattern of human settlement over the territory of the coastal area. Seventy per cent of the industrial output of the Rostock district is produced in the aforementioned four big cities of the coastal area.

^{1/} Information contained herein is based on materials supplied by the Government, dated 8 October 1976.

Agricultural production was traditionally predominant in the coastal area. Since late 1940's, limited shipbuilding, maritime traffic and harbour industries have been transformed into a rapidly growing sea-oriented industry including shipbuilding, maritime traffic, harbour industry, fisheries, fish processing and ancillary industry for shipbuilding. At the same time, agricultural production has been intensified. Recreation facilities have also been considerably expanded. This dynamic development implies rapidly growing requirements with regard to technological and social infrastructure, manpower and its specialized training. Development of industry, agriculture, recreation centres, towns and communities is taking place in the area as a whole and is relying on all natural and economic resources. For the area concerned, this does not necessarily mean more rational utilization; possibly multiple use could result in conflicts.

Erosion is caused by wind, sea waves and littoral phenomena, short-term storm wave effects on biological and physical protective systems and ice pressure during long winter months. The necessary means are made available through Government's financial assistance and the necessary capacities exist in the Rostock district. System of protection is in use, for example, new and supplementary dikes have been installed in areas endangered by over-flow for high-tide protection and defence; artificial shore stabilization with sediments are being provided for endangered low coast areas. Scientific and technological measures are also used to control sea waves by using off-shore structures in flat and steep coast areas. Investigation has been undertaken to identify factors influencing the coast within the 5m-depth line, the surf area and beaches, through testing mathematical models of natural processes. Adaptable and highly resistant construction material has been introduced to protect structures and measures have been taken to improve high-tide and weather forecasts.

Ports and harbour facilities at Wismar and Stralsund have been reconstructed and modernized. A new transatlantic harbour was constructed in Rostock. All three ports are used throughout the year and the navigable channel is frequently dredged. Both the Government and the Administrative Council of the Rostock district use all means available to minimize pollution of coastal waters and the Baltic Sea caused by waste waters from harbours, industrial plants and communities. These means include a system of waste-water purification plants, and certain specific research projects: e.g. research on problems of vertical and horizontal mixture in waste product effluents resulting from currents and coastal reliefs; installation of control systems by using computer simulation of aquatic ecological systems on the basis of light, temperature, nutritive substances and other parameters.

A complex planning approach exists for the whole of the Rostock district. For their management and planning activities, the competent authorities of the coastal area use data and information from scientific institutions (e.g. Institute of Oceanography, Board of Economics of Water Supply and Distribution, and others), central national economic plans, and regulations concerning general and special environment protection.

Mauritius^{1/}

Little coordination exists at present between different Government sectors concerned with the different aspects of coastal development e.g. hotel development, industrial development, aquaculture etc.

Cyclone and flood damage are major constraints to the development of aquaculture, due either to physical damage to/enclosure etc. or to rapid salinity fluctuations which kill fish. Beach erosion is a problem requiring constant attention in regions with strong coastal currents; dredging should be regulated, and the construction of jetties, which affect the current patterns and cause erosion, require careful study.

Marine pollution is not yet an acute problem in Mauritius, but stringent regulation of industrial development/should be effected/ to prevent any increase in pollution. It has been found that even fresh water if released in substantial quantities can affect coral growth and fish nursery areas.

Mauritius has/^ahigh population density and/^{high}unemployment. Although this condition does not cause any significant degradation of the coastal area from the fisheries point of view, it results in a large number of subsistence fishermen entering the lagoon fisheries, with consequent overexploitation of fish stocks.

Biological primary productivity is low around Mauritius. The result of this is that fish production is low and/^{the}possibility of aquaculture development limited. Conversely, the extremely clear waters form a major asset for the tourist industry.

^{1/} The information contained herein is based on materials supplied by the Government, dated 25 May 1976.

The major problems which are unique to the coastal area are:

- (i) The restricted area of good beach in relation to the total population of Mauritius, particularly in the light of a vigorous programme of tourism development;
- (ii) Ribbon development along the coast as a result of lack of proper planning control in the past.
- (iii) Until recently, uncontrolled subdivision of land for residential purposes within a strip of land immediately behind the coast;
- (iv) overfishing of lagoons;
- (v) damage to shell and bird life as a result of over collecting and vandalism.

New Zealand^{1/}

General problems in the coastal area stem from the area being a fixed resource which is subject to an increasing range and intensity of demands. These are a product of an increasing population, continued economic growth and social changes and consequent higher real incomes and increasing leisure time. These demands include pressure from land based activities in rural, industrial and urban development, roading, waste disposal and outdoor recreation, together with their consequent impact ← on adjacent water areas and on the water.

The coast is highly valued for recreation and retirement purposes. With an increasing population together with changing demands, the basic problem is how to accommodate these together with other demands without destroying the natural resource. The impact of these demands is concentrated on particularly attractive areas, those with greatest ease of access and those near to population centres. Specific problems such as pollution and erosion are not wide-spread throughout the country but are concentrated in particular locations. The following problems are significant within the New Zealand context, although the magnitude of these is small when compared with some other countries.

One of the most critical problems has been the pressure on coastal resources from residential development, particularly for holiday purposes. In many cases too much coastal land has been committed ahead of genuine needs for urban development without consideration of real needs. The number of sections subdivided is greater than the number being actually used for building and this has led to haphazard development which is scattered and untidy and which leads to high costs of servicing.

^{1/} Information contained herein is based on materials supplied by the Government, dated 2 January 1976.

In many localities single unit residential development has been permitted at most beaches which are accessible by vehicular traffic. This reduces the variety of experience in the coastal area that people can enjoy, and it only caters to a small proportion of demands from a growing holiday population. Often little attention has been paid to siting buildings in relation to the surroundings, often destroying visual amenities. Beach development has also been permitted in areas which are susceptible to erosion or they have been permitted with little thought to providing adequate sewerage facilities, or suitable public access for public recreation. The pressure to subdivide land for residential development and the consequent inflation in land values (see paragraph 4) leads to high costs and makes purchasing desirable land for public reserves more difficult.

Better planning is required for coastal areas. In respect of water, for example, there is a lack of overall co-ordination for controlling uses of coastal waters and ^{the} seabed, which is spread amongst a range of government departments, harbour boards, regional water boards, catchment authorities and territorial local authorities. Further there is a need to ensure that this is recognized and taken into account when planning for coastal areas because of the inter-relationship between land and water uses. Control of coastal land is primarily the responsibility of territorial local authorities. Their ^{in planning/} performance varies considerably. In some key areas considerable progress has been made in adopting and implementing objectives and policies which recognize the importance of the coastal areas, with the introduction of techniques such as appropriate zoning, reserve requirements, and set-back lines.

However, there are still many issues that point to the need for better planning. There is a need to incorporate objectives and policies which recognize the importance of coastal resource, within both the local and the regional contexts and to implement suitable planning controls to meet and direct varying demands. Often the administration tends only to recognize "local" and immediate interests, to the detriment of wider considerations and the national interest. With demands often being generated from outside local authority boundaries, there is a need to plan the development of a resource from a regional point of view within the context of a national framework. However, often there is little or no co-ordination between local authorities responsible for coastal planning. Further, regional planning is weak in New Zealand because of inadequate provision in the Town and Country Planning Act and because of the fragmented nature of local government. Also the present planning legislation is oriented towards district planning and makes little reference to planning at a national level.

Another problem is the inadequate provision of qualified staff to advise on planning issues and the possible means of contending with them. In some areas, technical support is good, in others weak or spasmodic. In general there is a shortage of qualified and experienced staff covering a range of technical fields at all levels of government.

Implementing better planning for land and water use alone will not necessarily contribute to better use of the resource. The general question of finance is a problem which pervades many of the issues in coastal planning and is manifest in a number of ways; unless this is solved,

it is unrealistic to expect that "better planning" will contribute to solving problems. There are financial pressures on local authorities and landowners which tend to force development. For example, /because of inadequate income, local authorities look to residential subdivisions as a means of increasing revenue and they become reluctant to adopt policies which direct and/or restrict residential subdivisions.

An unsatisfied market for recreation accommodation by way of second houses, hotels, motels, camps and camping sites and associated uses, increases the value of land deemed by the market to be suitable for these purposes, considerably above that pertaining to its traditional use. This places pressure on local authorities to provide these uses in accordance with the expressed demand and to approve undesirable subdivisions. Landowners can find existing uses of their land increasingly uneconomic relative to the enhanced land value. This is because the rates are too high in relation to the income derived from the land. Rates provide the major source of local body finance and the rates structure is related to the valuation of the land. The opportunity for landowners to realize profits on their assets by sale or subdivision becomes increasingly difficult to resist.

The situation gives rise to a high level of speculative activity and contributes to making any acquisition of land for reserves unrealistically expensive; a lack of adequate finance at all levels of government for the acquisition and development of reserves, exacerbates the difficulty of purchasing The / land for public recreation. /central government has provided a fund of \$1 million for five years, although with increasing land values this is completely inadequate.

In many areas where beaches for recreation are a prime element in the panoply of coastal resources, the only restraint on subdivisional pressures is inaccessibility. The improving or upgrading of road access have put pressure on areas to be developed. There is a need to ensure that land use in coastal areas and the degree and type of access (roading, walkway, water) are planned together. Too often, this factor has not been recognized in many of the important areas where all the beaches with road access show some degree of adverse development.

Ports and harbours are foci for a number of particular problems and demands which all modify the harbour in some way. There are demands for reclamation to provide port facilities and marinas; conflicts between recreation uses and commercial development, and between different recreation uses. Water-related industries and waste disposal are in many cases located in estuaries and the importance of these sensitive areas is only now being recognized. Often these water conflicts are accentuated by the lack of overall planning of harbours as a whole and failure to consider all the factors involved and to provide a framework within which different demands could be assessed. Many of the demands are only considered on an ad hoc basis and not within the context of an overall plan for a particular harbour. Reclamation in order to accommodate container facilities needs to be assessed within the context of requirements for port facilities around the country as a whole and of likely national trade and economic requirements. Some of these issues are compounded by local authorities not taking a positive role in the planning of ports and integrating their use with other planning policies. Some of the shortcomings in the present system are referred to below.

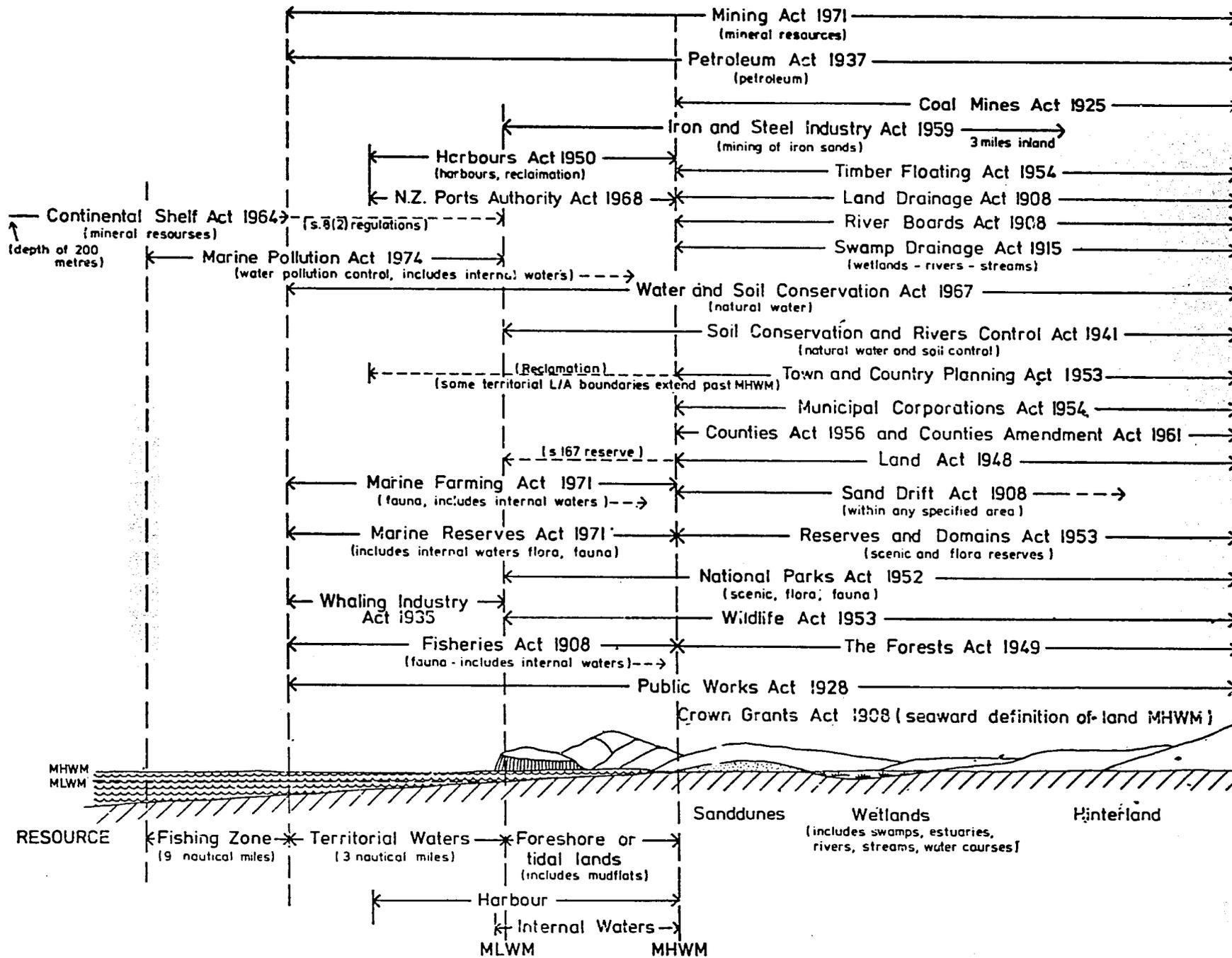
In general there is a considerable amount of information available on many facets of coastal planning covering land based activities, although it is dispersed over a wide range of agencies and various sources, and needs to be drawn together and collated. Also the data that is available may not be directly applicable to coastal areas.

A recent study covering the management of coastal waters and the seabed concluded that there has been a serious lack of knowledge of the nature, quality and quantity of resources available to New Zealand in its coastal waters and seabed. For example, little is known of the importance and specific functioning/ⁱⁿ various sectors of coastal water areas of life cycles of sea vegetation and animals. What research has been done has been applied to specific problems and limited areas.

Information is available on a range of activities affecting foreshores and coastal waters and these include records of ownership and control, grants for all approved structures for foreshore and seabed, reclamations and licences for removal of material from these areas (sand and gravel); also data on tides and information on marine pollution are available.

also/
There is/a considerable amount of data available on land use at all levels of government, though this does not apply specifically to coastal areas. Land use information is contained in local or regional schemes (see Section B1). There is also wide range of information provided by government departments. This includes statistical data on topics such as demography and social characteristics, transport and communication, production and finance./
Further,
there is a considerable amount of physical land resource information available in the form of land resource inventories from which land use capability assessments can be made.

The following chart illustrates the complicated legislative administration of the coastal area in New Zealand and shows the various laws that come into play in the coastal area and their interrelationships, from the continental shelf to hinterland.



LEGISLATIVE ADMINISTRATION OF THE COASTAL ENVIRONMENT

The major tasks of the principal government agencies in New Zealand involved in coastal area activities (excluding fishing, and oil and gas exploitation) may be summarized as follows:

The Ministry of Transport (marine division) is responsible for approving plans of all works in, on, over, through or across tidal lands or the bed of the sea, or the bed or bottom of any harbour, navigable lake or navigable river. Control of harbours, navigation and marine pollution. These provisions are under the Harbours Act, 1950.

The Department of Lands and Survey is responsible for the administration of Crown lands and different types of reserves -- scenic, historic, flora and fauna. This includes national parks; administration and management in maritime parks is formed by the linking of seashore and island reserves. The Department is also responsible for carrying out on a national basis a coastal reserves survey. This identifies areas which, because of their inherent qualities, should be protected. It can make recommendations for administrative action, either to ensure the protection of the land or to bring it into public use.

The Ministry of Foreign Affairs in relation to coastal planning, is responsible for administration of the Continental Shelf Act 1964 and the Territorial Sea and Fishing Zone Act 1965.

The Ministry of Works and Development is responsible for the administration of the (1) Town and Country Planning Act providing for comprehensive land use planning and control; and the (2) Water and Soil Conservation Act and Soil Conservation and Rivers Control Act.

The Commission for the Environment is responsible for the administration of environmental impact reporting policy applicable to all government works as well as to local authorities and private works requiring government finance or approval.

The Nature Conservation Council and Environmental Council are government-appointed independent advisory bodies free to make recommendations to government on environmental issues and to publish their views.

The New Zealand Ports Authority is responsible for fostering an efficient and integrated ports system for New Zealand and planning for the development of ports and harbours.

Local territorial authorities are responsible at ^{the} local level for land use, planning and control.

Harbour boards are responsible for administration and management of harbours.

Catchment authorities (regional water boards, catchment boards and commissions) are responsible at ^{the} regional level for administering the Water and Soil Conservation Act and the Soil Conservation and Rivers Control Act.

The Philippines^{1/}

The first critical problem is the lack of sufficient understanding of coastal processes and behavior such as estuarine circulation, erosion and deposition, effect of waves and surges, ecological interaction of living organisms and environmental and other problems. This lack of adequate understanding results in inadequate planning of the development of coastal areas. There is also a need for effective governmental regulation in the uses and management of the coastal zone.

Although there are at present no serious problems of a fresh water shortage, the country may encounter this problem in the future. A Water Resources Council has recently been created for the express purpose of ensuring adequate supply of water in the years to come. The problems of flooding, erosion and seasonal storm damage are particularly of great concern. Annual losses to the economy in millions of pesos are caused by these natural hazards. Marine pollution is also becoming a critical problem in coastal areas principally because of land based sources, mining activities, and industrial development, and is aggravated by ^{the} densities/ ~~high population/~~ found mostly in coastal areas. All these problems contribute to the need for an integrated approach to coastal area management and development.

Regulations on the use of marshes and shore land areas are issued by the Bureau of Fisheries and Aquatic Resources especially in the establishment of fishpond areas. Zoning laws exist mostly in chartered cities and populated districts. There are no regulations on beach access. The National Pollution Control Commission is required by law

^{1/} Information contained herein is based on materials supplied by the Government, dated 5 December 1975.

consulted in the siting of power plants and in the establishment of industrial factories and complexes. The Bureau of Public Works is entrusted with the dredging of coastal areas especially in ports and habours, while the Bureau of Mines issues, enforces/ regulations on the extraction of sand and gravel for building purposes.

The National Pollution Control Commission is entrusted with environmental protection in coastal areas, while the Philippine Coast Guard, in a recent Presidential Decree, has been given the task of the prevention of oil pollution from vessels, and its monitoring.

14. Singapore^{1/}

In Singapore the interaction between the sea which surrounds the country and the interior of the country is recognized to be very intimate. Therefore coastal area planning has always been an important cornerstone of National Planning. Increasing pressure on meagre land resources has forced national planners to look to the coastal area to obtain new areas by massive reclamation. The reconciliation of the varied and sometime conflicting requirements of important coastal activities such as Port Development, Recreation, Fisheries and the Preservation of the ecological balance is thus one of the challenges faced by the Government.

The important areas of development /activity/ in the coastal zones of Singapore are:

(i) Port Development: Singapore is the fourth busiest port in the world with throughput of 61,268,900 and 60,420,300 tons of cargo in 1973 and 1974 respectively. Port Development has already covered the bulk of the southwest and southeast coastline of the island as well as part of its northeast coastline. Future major port development is expected to be located at the north end of its eastern coastline. Some of the offshore islands, particularly those on which major oil refineries are located, also have their own ship-terminals. In addition offshore terminals have been created to cater for the very large tankers.

(ii) Land Reclamation : Major reclamation has been carried out or is in progress or is planned for the development not only of port works but/ also/ of such other activities as airports, major coastal highways, industrial sites, large housing colonies, parks, marinas and other recreational facilities. Reclamation has not been confined only to the main island but has also been carried out around offshore islands and reefs.

Information contained herein is based on materials supplied by the Government, dated 8 and 12 December 1975.

(iii) Recreation: Inland recreational areas are rapidly becoming inadequate due to increasing demand generated by not only the rising population but also greater affluence. Due to other priority users, some of the coastal recreational areas have also become unavailable to the public. The Government is therefore developing offshore islands for this purpose and creating the communication facilities to enable the public to reach them quickly and cheaply.

Oil pollution is the most serious problem. There are five major oil refineries in Singapore, three of which are located on offshore islands and the rest in the foreshore areas. All of them have tanker berths in close proximity. From two of them, there are potential sources of oil pollution; however, strict control and constant vigilance have so far prevented any hazard. Other sources of oil pollution are the hundreds of ships in the port, especially when bunkering, and also some 35,000 ships which pass through the Singapore Straits which are contiguous to the Singapore Port Limits. However, the greatest threat of oil pollution arises from accidents - collisions and groundings involving loaded tankers/VLCCs in the Malacca-Singapore Straits as well as within Port Limits. In order to reduce, if not totally eliminate, pollution arising from accident, it is therefore imperative that a traffic separation scheme and other safety measures should be drawn up for that narrow stretch of water. In co-operation with neighbouring countries, these navigational safety requirements are being considered.

Risks of other types of pollution due to disposal of industrial and human wastes are not serious so far, but may become so in the years to come. Various means to deal with such risks are under study.

In order to combat pollution and attendant damage to the marine ecology, continuous monitoring of atmospheric and oceanographic quality is necessary. Such monitoring presents certain unresolved practical and theoretical problems such as laying down realistic standards for acceptable levels of water quality, the behaviour of oil on water, the effect on oil of natural processes such as evaporation, solution, oxidation and biodegradation, the spreading of oil in a still sea, the effect of winds, currents and waves, and the deployment of a suitable apparatus for measurement and monitoring, etc. This calls for increasing the information base by means of observations, experiments and research on local conditions.

The coastal areas of Singapore cannot be treated as a separate planning entity; rather, they constitute a very important and integral part of the totality of national planning. This is because Singapore being an island of small dimensions, its coastal areas are critical. If the coastal areas are taken to mean a strip 2 miles wide along the foreshore (excluding all rivers) that strip occupies more than 50 per cent of the main island and all the offshore islands.

Sri Lanka ^{1/}

Several square miles of the country's coast have been lost because of erosion especially in the thickly populated south-west coast and this destructive phenomenon has now become a threat to life, property and communications. Coastal erosion in Sri Lanka has been aggravated by sand and coral mining and uncontrolled coastal activities (e.g. building drainage outlets, etc.) It was obviously futile to permit such operations to continue and then spend large sums of money to protect the coast. While existing legislation for sea-shore protection was weak, a solution should be found for those engaged in the illegal mining of sand and coral for a livelihood.

The causes of coastal erosion in Sri Lanka can be classified in three categories: natural erosion, man-made erosion and biological erosion. Part of the natural erosion is of geological and long range origin and is associated with a tilting of the island and a rise of the mean sea level. It has affected both the East coast and the West coast of the island. The effects demonstrate themselves in a predominantly headland type coastal configuration which is dominant on the South West coast and along part of the East coast. Another aspect of the natural erosion is the development of shorelines adjacent to tidal inlets. The most serious cause of erosion is man-made; it is related to the construction of outlets for drainage purposes, and most important, to the removal of sand from river mouths and the sea shore depleting the natural balance of sand of the coastal regime. The mining of coral along the South West coast is particularly serious because it not only takes away materials which could become available as beach nourishment, but it also destroys the coral reef that breaks down the high waves before they reach the shore line. Another man-made cause that affects stability of

^{1/} The information contained herein is based on materials supplied by the Government, dated 2 January 1976.

the coast line indirectly is the pollution of coastal waters by human and other waste. This degrades water quality and adversely effects (or kills) the growth of natural reefs. These reefs are present along the South West Coast especially in the Hikkaduwa area section where eroding tendencies are high, and along the middle part of the East Coast, between Trincomalee and Batticaloa. Coastal areas subject to erosion comes under coastal defences established by the Government on the basis of priorities formulated within the existing policy of coastal protection.

Biological erosion occurs from coral-eating star fish, which are found in abundance in the Trincomalee area. A programme to eliminate this danger to the coast is presently under execution.

The development of the Tourist Industry in Sri Lanka in the last decade has resulted in the demand for more beach recreational facilities especially from the many beach-oriented tourist hotels springing up along the coast between Negombo and Tangalle on the west and between Batticaloa and Trincomalee on the East. Thus in addition to the need to develop new beaches and to preserve existing beaches, the necessity to evolve measures to combat pollution of beaches, at least in the areas of tourist development, cannot be over-emphasized.

The problem of conflicting interests in the coastal zone requires a broad overall view of the situation. The Coastal Engineering Research Centre of Sri Lanka has been proposed to co-ordinate research activities and to provide research services to all agencies that request them. Action has been taken to introduce new legislation for conservation of the coastal zone and a new division under the Ministry of Shipping Aviation and Tourism responsible for the management of the coastal zone is being organized for the planning and development of the coastal area and the effective implementation of the proposed legislation. The preservation,

restoration and environmental control of the beaches and above all, an effective management of the coastal zone has high priority in the country's development plans.

Priority uses in the coastal area could be classified as harbours, recreation and tourism, shore protection, and waste disposal. Mineral resources development (ilmenite) on the North East coast, some commercial activities, residential development mainly on the South West Coast and the North Coast, and historical and archaeological sites at some of the towns are the next important uses in the coastal area.

Mineral exploitation in the coastal area is at present confined to the mining of ilmenite, sand and coral. Large amounts of ilmenite are present along a stretch of coast approximately 8 kilometres long at Pulmodai on the North East of the island. The sparse population in this area and the undeveloped character of the coast facilitated the legal mining of this mineral on a commercial basis by a Government Corporation. This activity, which commenced over a decade ago, is today a flourishing foreign exchange earner for the country, and it has been estimated that adequate reserves are available for the next quarter of a century. With respect to mining of sand, the present planning guidelines confine such mining to river mouths and lagoon entrances; it is carried out on the basis of permits issued by the Government District Authorities. As regards coral mining, existing laws prohibit such activity within the foreshore and the bed of the sea in specified areas.

The fishing industry is located at several points round the island, and the planning for fishing operations has been based on harbour and shore facilities, fishing grounds in the vicinity, and traditional areas of

fishing. In the development of the coastal area, preference has been given by the Government to fishermen for the use of the foreshore in certain traditional areas for net fishing and beaching boats, and the erection of temporary shelters. A few other industries are located in the vicinity of the harbours of Colombo, Galle and Trincomalee and Kankasanturai, to accommodate their dependence on raw material imports and to facilitate exports of the finished products.

The tourist industry developed in the last decade is located at several points along the coast. Resort areas managed and controlled by the Ceylon Tourist Board have been set up at Negombo and Bentota on the West Coast and Kalkudah on the East Coast. Hotel development in these areas conforms to requirements set out by the Tourist Board.

Land fill and land reclamation in the country are only carried out at harbour development sites by state organizations. No offshore sand and gravel extraction is at present being carried out round the island's coast, whilst dredging in the coastal area is confined to the dredging of harbours by state organizations. The dredged spoil is sometimes deposited a few miles off-shore at selected sites.

Ports of significance in the country are Colombo, Galle, Trincomalee and Kankasanturai (in the North). The development of these ports is undertaken on the basis of priorities determined by economic needs. No marinas exist at present in the country.

Excavation or removal of material from the foreshore or the bed of the sea is prohibited in specified areas by existing laws. The effective control and management of the coastal zone, which includes beaches and dunes, coastal reefs, scenic vistas, recreation areas etc., would form part of the responsibilities of the new Coast Conservation Division. The zoning of the coastal area would also be one of its functions.

Togo^{1/}

Better planning is required in order to remedy the result of unplanned development on the coast. An overall management plan of the coastal area is envisaged in the third five-year plan. All aspects of development will be taken into account, including, the inter-state highway linking the coastal states, the erosion of the road between Lomé-Aného, problems resulting from oil refineries, tourism facilities, and the preservation of forests.

In the control areas of Lomé and Aného, there is a shortage of fresh water partly because of the density of the population and partly because of limited supply - only the top layer of the water is unsalted.

Flooding is quite frequent in the coastal areas particularly during the rainy months when the rivers, lakes and lagoons overflow. The lagoons near Lomé and Aného are being treated, but are not completely immune from the danger of flooding. There is serious shoreline erosion near Lomé, Baguida and Agbodrafo.

Marine pollution is still moderate but will worsen as new oil refineries are constructed.

An industrial zone of 600 hectares has been established for Togonese industries and for the use of the neighbouring states of Niger and Upper-Volta

The coastal areas are difficult to gain access to from the hinterland because of the existence of lakes and lagoons. A better transport system is needed.

^{1/} Information contained herein is based on materials supplied by the Government, dated 26 December 1975.