

The Coasts of Latin America at the End of the Century

Juan M. Barragán

Ordenación del Espacio Litoral
Facultad de Ciencias del Mar
Universidad de Cádiz (Spain)
Apdo. 40, 11510 Puerto Real,
Cádiz, España
E-mail: juan.barragan@uca.es

ABSTRACT

BARRAGÁN, J.M., 2001. The Coasts of Latin America at the End of the Century. *Journal of Coastal Research*, 17(4), 885-899. West Palm Beach (Florida), ISSN 0749-0208.



A new management model is needed for the Latin American coastal zone and its resources. During the nineties, some very interesting management initiatives were implemented. Nevertheless, in general terms, coastal management is relatively backward in comparison with other regions of the world. There are also very different levels of coastal management within the various Latin American countries themselves. In spite of these differences, the cultural homogeneity of the area could serve to facilitate international cooperation for more integrated management. Such an initiative would not only help to find a specific Latin American management model, but would also contribute to improving the levels of technical training, scientific knowledge, exchange of experiences and South-South co-operation. Also, the effectiveness of the initiatives carried out by countries with more highly developed systems of coastal management could be reduced if the surrounding States do not undertake similar initiatives.

ADDITIONAL INDEX WORDS: *Coastal management, Latin America, coastal zones, national programs.*

INTRODUCTION

The main aim of this work is to offer a panoramic overview of coastal management in Latin America. The rather limited bibliography on the subject reflects the lack of attention paid to coastal management in the Latin American arena. The work by SORENSEN and BRANDANI (1987) and, more recently, by LEMAY (1998) and YAÑEZ-ARANCIBIA (1999) should be mentioned, as well as the interesting publications by the United Nations Economic Commission for Latin America and the Caribbean (ECLAC 1990; 1999a). The work by SULLIVAN and BUSTAMANTE (1999) on the marine ecoregions of Latin America also should be mentioned.

Some authors highlight the differences that exist within the great region of Latin America, and even define it as a "mosaic" of experiences, cultural roots, ecosystems, etc. (YAÑEZ-ARANCIBIA, 1999). We have opted for a different approach by emphasizing the aspects that unite many of these countries. One of the most outstanding of these is the great cultural homogeneity that exists, mainly due to the Spanish and Portuguese colonization of the region. This has had far-reaching effects, such as the importance of the concept of maritime terrestrial public domain, which comes from Roman Law, in the legal systems of almost all the Latin American countries.

As far as coastal management is concerned, however, these countries are united through their contiguous coastlines and the fact that they have similar natural resources or ecosystems. Unfortunately, they also share a low level of social and economic development, limited institutional capacity, inadequate

technical training, strong influences exerted by management models which reinforce the idea of a "mosaic," and so on. The aim of our approach to Latin America is to promote co-operation within the region itself, which does not exclude other types of co-operation.

Analysing the Latin American region as a whole does, of course, mean that some useful local or subregional experiences may be overlooked. On the other hand, a subcontinental approach will provide us with a general idea of what has taken place in a geographical area with a high level of homogeneity. This is seen not as an obstacle but an opportunity for co-operation.

It is also our intention to highlight a series of interesting national experiences which support our original hypothesis. These can be summarised as follows:

- The nineties represent an essential frame of reference to understand the changes that are taking place, and that will soon occur, in the coastal management of this geographical area.
- During the last ten years a considerable number of Latin American countries have progressed, albeit slowly and with great difficulty, toward a more developed model of coastal management. As a result, the current period could be defined, for some countries, as the beginning of or a transition toward a more advanced model.
- Despite this general situation, it should be said that there are different rates of development resulting from extremely varied social, economic and institutional situations.
- Some of the problems derived from the process described could be assisted by a supranational initiative specifically designed for Latin America.

The first step in the chosen methodological framework is to present coastal management within its general context; *i.e.* taking into account the social, economic and institutional reality referred to earlier. We are convinced that this operative framework is fundamental in order to understand coastal management processes in all their complexity. This is because planning and management systems cannot be understood in isolation as an end in themselves. They are, first and foremost, one of the priorities, opportunities and possibilities available to each country in relation to its natural and cultural resources and its stage of development.

Secondly, the situation and evolution of specifically coastal aspects of Latin America are reviewed. An overview of the three sub-systems (physical-natural, socio-economic and legal-administrative) helps to form an approximate idea of the resources available, the human pressures on them, the problems derived from this, *etc.* (Barragán, 1997). The third stage is to offer a summary of the most interesting and significant initiatives on a national scale. Finally, a series of conclusions are proposed which aim to endorse the initial working hypothesis.

A variety of information sources have been used. These include bibliographic sources, statistics from international bodies (the Inter-American Development Bank, Economic Commission for Latin America and the Caribbean, the World Resources Institute, the United Nations Environment Program, the World Bank), national regulations, institutional reports, *etc.* The meetings held with people directly involved with the institutional processes of coastal management in various countries were particularly important. These interviews were always held on two levels: on the one hand, with technical and administrative staff in order to gain information in situ about the work carried out, and on the other hand, with scientists and researchers from various universities, to assess the assistance given and the critical aspects of the process. These meetings were found to be extremely useful since an evaluation of the situation of coastal management on a national scale based solely on the available bibliography would be very difficult. In many cases the publications referred to dealt with the situation in a particular country or with a single sector of coastal activity.

The General Context of the Nineties

Latin America is a group of regions which includes 32 countries and some autonomous territories, making a total of more than 20 million km² and 500 million inhabitants (Table 1). Some of the greatest differences between the regions can be found in the physical and natural environment. There are examples of almost all climates and ecosystems and contrasts such as that between one of the highest and longest mountain ranges in the world (the Andes) and the planet's most important hydrographic basins (Orinoco-Amazon) (CUNILL, 1981), and between the massif forms of the South American subcontinent and a chain of islands structured in an archipelago (the Antilles).

In general terms, it can be said that the socioeconomic profile of the region is that of underdeveloped or, at best, developing countries. The Human Development Index (HDI)

Table 1. *Sociodemographic information on Latin America.*

	Area (thousands km ²)	Population (thousands)	Density (Inhab/ km ²)	Illiteracy (%)
Mexico	1,967.2	95,831	48.7	10
Greater Antilles	221.4	33,893.2	153.1	19.2 (m)
Lesser Antilles	10.7	2,895	271.4	2.3 (m)
Central America	511.2	34,625	67.7	26.5 (m)
South America	17,736.7	335,711	18.9	11 (m)
Latin America	20,447.2	502,955.2	24.6	10.8 (m)

Source: Based on El Estado del Mundo (1999) and BID (2000)

which, as well as the Gross Domestic Product (GDP), includes variables as important as the level of education and life expectancy, places almost all the Latin American countries above the 30th position. Those of the Southern Cone are placed between the 30th and 50th positions. It is worth remembering that some countries are in the group of the most underdeveloped nations in the world: Haiti (159), Nicaragua (123), Honduras (119), Bolivia (116), El Salvador (114). In 1998 there were a total of 176 countries on the United Nations list.

Although the present social and economic situation is worrying, it should be mentioned that the last decade, contrary to the preceding one, has been positive for Latin America in general.

In fact the '90s saw the end of many of the cruel civil wars that devastated Central America. In most of the countries where democracy was lost, it has been recovered with the fall of military dictatorships; the economic recession has eased, inflation has been reduced to bearable levels, the foreign debt, one of the main threats to the economic stability of countries which depend heavily on foreign aid and capital, has been reduced considerably in relation to percentage of the GNP; foreign capital is once again being invested in some Latin American countries, and supranational integration processes, one of the great weaknesses of the region, have been reactivated, albeit slowly (Mercosur, the Central American Common Market, *etc.*). The Average Annual Growth Rate of the GDP per capita was positive between 1989 and 1998 in all the countries except four: Venezuela, Surinam, Nicaragua and Haiti. The growth rate in the Southern Cone countries was also high (5.9% in Chile).

However, this relatively favourable situation contrasts with the social cost of the aforementioned progress. The difference between those who hold the wealth and those who lack the basics is greater. In other words, the economic adjustment and its repercussions (privatisations, disappearance of social policies, increase in unemployment, crisis among the middle classes where they existed, *etc.*) have brought about an increase in social tension. This has reached the stage whereby some Latin American cities and rural areas (in Colombia, for example) have the highest rates of crime and violence in the world. The economy of Latin America also has had its share of ups and downs—one only has to remember the effects of the financial crises in Mexico (the 'Tequila Effect' in 1995) or Brazil (the 'Samba Effect') or the mini-recession in Chile at the end of the '90s caused by the Asian crisis.

Table 2. General information about the Latin American coasts.

	Linear km of Coast	Land Area/coast (km ² /km)	Platform up to 200 m (thousands km ²)	E.E.Z. (thousands km ²)	km ² Platform/ Linear km coast	Km ² E.E.Z./ Linear km Coast
Mexico	9,330	210.8	442.1	2,851.2	47.4	305.6
Greater Antilles	11,518	19.22	154.6	1,848.9	20.3	162.8
Lesser Antilles	1,477	7.2	31.9	291.1	42.6	339.9
Central America	6,603	77.4	229.4	1,117.1	36.9	179.7
South America	30,663	578.4	1,984.9	10,124.8	64.7	330.2
Latin America	59,591	343.1	2,842.9	16,233.1	52.8	280.3

Source: Based on data from the World Resource Institute (1996), El Estado del Mundo (1999) and BID (2000)

Latin America's system of foreign relations also shows the structural weaknesses typical of an underdeveloped region. Generally speaking, there is a notable economic dependence, particularly in terms of technology, commerce and finance. As a result, it is not surprising that the International Monetary Fund or the World Bank take part in the internal decision-making process regarding economic and social policy.

It is not our intention to go any further in our analysis of the general context of Latin America. However, there are other problems that have yet to be resolved and that are important to understand this general context, such as the situation of the indigenous population, land ownership in Central America, and the devastating effect of natural disasters.

We would like to conclude this section by emphasizing a few points. The last decade saw, in general terms, a positive change for many Latin American countries and, at the beginning of this new century, this should be used as the basis for a new opportunity to make up for lost time in development. For precisely this reason, it is likely that economic recovery will increase the pressure on natural resources. The Latin American community and the international community as a whole are thereby faced with a challenge: to design together a more ecologically balanced and sustainable development model, especially in coastal zones.

The Latin American Physical and Natural Coastal Subsystem

An analysis of coastal management requires basic knowledge of the characteristics of the coastal zone and its resources. The following is a schematic presentation based on studies of the main coastal subsystems and the problems observed. For a better understanding of this complex coastal situation, the coastal system has been divided into three basic yet interdependent subsystems; physical-natural, socio-economic and legal-administrative.

The first of these presents, among other things, the dimensions of the object of our study: almost 60,000 linear kilometres of coast. The following are some of the characteristics of this subsystem:

a) The coastline is divided fairly evenly between the northern subregion (Central America-Caribbean-Mexico) and the South. In spite of this, half of the total amount of coastline can be found in just five states: Mexico, Brazil, Chile, Argentina and Cuba (Table 2). Another interesting characteristic is that all the Latin American countries ex-

cept two (Paraguay and Bolivia) are coastal. However, there is an obvious geographical contrast between the countries that could be considered 'coastal' or 'insular' in Central America and the Caribbean, and the more 'continental' ones in South America.

This first classification can be observed in the relation between the square kilometres of national territory and the linear kilometres of coastline: the ratio is lower in Central American and Caribbean countries than in South America. This also helps to explain why countries like Brazil, Argentina, Peru or Columbia, which have an enormous maritime and coastal potential, have, paradoxically, never given their coastal and maritime resources the importance they deserve.

b) Other interesting factors which reveal the possibilities for coastal and oceanic management in Latin America are the area of the continental shelf up to the 200 metre depth contour (closely linked to the extraction of resources), more than half of which is in Argentina and Brazil, and the resources of the Exclusive Economic Zone (EEZ), to which Argentina, Brazil, Mexico and Chile have potential access. Figures contrasting length of coast with marine area are also a guide as to what extent each of these countries can be considered coastal or oceanic.

The characteristics of the much shorter east coasts differ from those of the west due to the proximity of the Andes. For the same reason the Quaternary plains and the marine shelf up to the 200 metre depth contour are more extensive in the countries bordering the Atlantic.

c) The bearings of the Latin American coasts with respect to the meridians, 30° latitude north and 55° latitude south, explain the existence of most types of coastal ecosystems, with examples ranging from tropical to cold, including arid and warm: mangrove swamps, wetlands, coral reefs, sea grass meadows and coastal desert ecosystems (MORELLO, 1984; MATTEUCCI, SOLBRIG, MORELLO and HALFFER, 2000). Other natural phenomena such as the Humboldt current provide the Pacific coasts with considerable fishing wealth (Table 3).

d) The importance of some ecosystems, such as the mangrove swamps, is beyond doubt for various reasons, one of which is the services they provide for the human race: genetic bank, coastal defence, food, etc. (Lugo, 1999). It should also be remembered that the Latin American mangrove swamp, which covers an area of approximately 6.8 million

Table 3. *Distribution of some ecosystems and natural resources on the Latin American coasts.*

	Mangrove Swamp* Thousands of has.	Most Important Ecosystems	Existence of Large Fish Stocks	Existence of Energy Resources
Mexico	1,420	Coastal lagoons, coral reefs	No	Yes
Central America	571	Coral reefs, estuaries	No	No
Caribbean America	783	Coral reefs, sea grass meadows	No	No
South America	4,064	Estuaries, costal forests	Yes (Peru, Chile, Argentina)	Yes (Venezuela, Brazil)
Latin America	6,838			

Sources: Based on data from Instituto de Recursos Mundiales (World Resources Institute), (1996)

hectares, is the greatest single area of this ecosystem on the planet. Almost 40% of the more than 17 million hectares of mangrove swamp that exist in the world are found within the area being studied. A major part of this natural wealth is in Brazil, Mexico, Venezuela, Cuba and Columbia.

- e) The natural phenomena that can be observed in the Latin American physical and natural subsystem also should be mentioned. The need for scientific knowledge about these phenomena and their repercussions on the security of people and property justifies their inclusion as a point of interest (ECLAC, 1999b). It is precisely the repercussions on the social and economic subsystem that convert these natural phenomena into natural disasters. The floods caused by El Niño on the Pacific coasts of Peru, Ecuador and Mexico (in the states of Oaxaca and Guerrero) in 1997; hurricane Mitch which devastated Honduras and Nicaragua in 1998; the torrential rains in Venezuela in 1999-2000 which caused tens of thousands of deaths and billions of dollars in material losses, or the droughts which ravaged north-east Brazil and Uruguay are proof of the special attention that natural phenomena in this region require.

The Social and Economic Coastal Subsystem in Latin America

The following are some outstanding aspects of the social and economic subsystem.

- a) The population of Latin America, as a human process of occupation, exploitation and planning, follows an urban and coastal model. In fact, the coastal zone played a vital role in the territorial organisation resulting from the colonization process. It is not by chance that in South America and the Caribbean the population is centred in cities in coastal municipalities. This contrasts strongly with the

population density inland. The figures on population for the last 20 years (1980-2000) published by the World Resources Institute show that there is a progressive tendency towards the concentration of population in coastal zones. This is particularly evident in Brazil, Peru and Ecuador.

In the South American countries, the population living in built-up coastal areas has almost doubled over the last two decades, increasing from 60 to 105 million inhabitants (Table 4). The situation is similar in the Caribbean and Central America, where population has grown from 26 to 43 million in built-up coastal areas. The urban networks and transport systems are also less extensive the further inland one goes, with the exception of Mexico and the Central American countries, which tend to follow a more 'inland' model of occupation.

Port cities were and still are, at least in South America and the Caribbean, the nerve centres of the national population, industry and politics. It is no coincidence that many major Latin American cities share the following characteristics: they are usually a port city, or located 50-100 kilometres from a port, with a large nucleus of population (Buenos Aires, Sao Paulo-Santos, Rio de Janeiro, Santiago-Valparaiso, Lima-Callao, Montevideo, Caracas, Santo Domingo, La Habana, Kingston, Puerto Principe, San Juan de Puerto Rico, *etc.*) and constitute a centre of industrial capacity, foreign trade, political decision-making and so on. While the worldwide network of cities is more continental in character, the urban network in South America is clearly coastal (Table 5).

A considerable part of the total national population (up to 30%) live in some of these large cities. Urban development is frequently rapid, spontaneous and disorganised, leading to uncontrolled growth which often takes the form of marginal habitats (slums, camps, "emergency cities," *etc.*). It is not un-

Table 4. *Population in coastal urban developed areas (1989-2000).*

	1980 (thousands)	2000 (thousands)	Increase %
Mexico	6,529	9,501	45.5
Central America	6,248	12,748	104.0
Caribbean America	12,729	21,004	65.0
South America	59,553	104,628	75.7
Latin America	85,059	147,887	73.9

Source: Based on data from Instituto de Recursos Mundiales (World Resources Institute), (1996)

Table 5. *Location of large cities in 1995.*

Region	Between 500,000 and 1,000,000 Inhabitants		Between 1,000,000 and 10,000,000 Inhabitants	
	Coastal	Noncoastal	Coastal	Noncoastal
Central America	6	9	3	8
South America	17	10	12	10
World	124	214	108	159

Source: World Resources Institute (1996)

usual for these people, who belong to the poorest social strata, to occupy the most unhealthy coastal areas (inter-tidal or marshy) or those with the highest natural risk (marine or fluvial flooding areas). They are often pioneers in the transformation and degradation of natural areas of great ecological value (deltas and estuaries, mangrove swamps, coastal lagoons, *etc.*).

b) The urban development model described above is accompanied by a series of human activities which have a marked effect on coastal zones: the creation of infrastructure, industry, tourism, second homes and so on. It is not only the possible impact of these activities on the natural resources, but also the fact that a large part of the cultural patrimony is to be found in the coastal areas. It should not be forgotten, for example, that the effectiveness of the Spanish and Portuguese colonization model depended to a large extent on a network of fortifications spread along the coast.

These forts or bastions defended the cities and port installations which were the link with the metropolis. This is why the majority of coastal cities in Latin America are home to real jewels of XVI to XVIII century military architecture. Some examples are La Habana (Cuba), Colonia de Sacramento (Uruguay), Natal and Cabedelo (northeast Brazil), Cartagena de Indias (Colombia), and San Juan (Puerto Rico).

The cultural patrimony of Latin America also can be found in the customs and traditions of the indigenous populations, which are particularly rich and varied on the Caribbean coasts of the Gulf of Mexico, southern Chile and northeastern Brazil. Their ways of life, highly dependent on marine and coastal resources, are a very important part of the overall cultural heritage.

c) Infrastructure, or rather its lack, is another important part of the characterization of Latin American coastal zones. Firstly, shoreline dynamics have been significantly altered by many of the infrastructure created to satisfy the needs of land transport due to the fact that the routes run very close to the coastline. There are many examples of this in the road systems of some Caribbean islands, Chile, Uruguay and Brazil.

Secondly, port installations must also be taken into account. Many Latin American countries export raw materials, and their considerable agricultural, forest, livestock, fishing and mineral production requires the expansion of port facilities. For some countries, building this type of installation is, at present, a priority. Brazil, Chile and Venezuela, for example, need to improve their port systems urgently if they want the present rate of growth in exports to continue.

As far as wastewater treatment is concerned, the lack of facilities has caused degradation of coastal water quality. The rapid growth of large urban centres, the creation of industrial zones with no control of waste disposal, the development of holiday resorts without wastewater treatment plants, the alteration of water channels in mangrove swamps or marshes, and an increase in the use of fertilisers and pesticides in agriculture are all factors which contribute to the pollution of rivers, estuaries, bays, lagoons and coastal waters. For this

reason, the bays of La Habana, San Juan de Puerto Rico, Guanabara, Cartagena de Indias, El Lago Maracaibo and Rio de La Plata are targets of national and international environmental policies.

The economic activities in Latin America which have the greatest impact on the shore and its resources include: mining, fishing, aquaculture, industry and tourism. Most of these activities are related to the export process and are therefore important for obtaining foreign currency.

d) Mining, including oil extraction, is very important for the Latin American coast for two reasons. Firstly, it has a direct impact on the coastal zones where it takes place (coal mining in Brazil, bauxite in Surinam and Guyana, copper in Chile and oil in Venezuela and Mexico, for example) and secondly, as we have already mentioned, it calls for the building of new harbour installations or the expansion of those already in existence.

e) Traditional fishing is one of the main activities of the local coastal population. It is an almost irreplaceable source of food and work. In Central America, for example, WINDEVXHEL *et al.* (1997) indicate that it provides around 200,000 jobs and contributes to the maintenance of local and indigenous communities in the region (250,000 Miskitos, Kunas and Garifunas). The situation is similar in northeast Brazil and the coasts of Chile. The most significant fact related to traditional fishing in Latin America is the reduction in catch size, especially of species with a high added value (shrimps, lobsters, winkles, *etc.*). This reduction is due to the over-exploitation of some species and the pollution of coastal waters.

Deep-sea fishing is also important in some countries in the region, particularly in Peru and Chile. These two countries were third and fourth in the world ranking in 1993 with a total catch of 8.5 and 6 million tonnes respectively (FAO, 1995). This represents 15% of the world's fishing with a fleet that is barely 1% of the number of vessels and 3% of the Gross Tonne Register (GTR).

f) The growth of aquaculture reflects a very negative side of coastal resource management even though the region is not a leader in aquaculture: there are no Latin American countries in the top ten producers in the world, according to the FAO (1995).

The cultivation of tilapia and shrimp, for example, usually takes place in areas of mangrove swamps, which are cleared and transformed into ponds for aquaculture. It is interesting to note that more than 90% of production is exported, which makes it another economic activity that generates foreign currency, and, in this case, quickly: many companies recovered their original investment in only one or two years. And yet in some countries such as Ecuador (COELLO *et al.*, 1995), at least half the shrimp are the result of extensive cultivation and the technology needed for intensive or semi-intensive cultivation is not used.

WINDEVXHEL *et al.* (1997) state that in the mid-1990s nearly 28,000 hectares were given over to the white shrimp (*Penaeus sp.*). Over half the total area for this stock and the total quantity produced is to be found in Honduras. Ecuador

is the most outstanding case in South America. At the beginning of the '90s, nearly 120,000 tonnes of shrimp were produced in an area of 150,000 hectares, almost 10% of which were illegal (COELLO *et al.*, 1995). The effects of the ecological disaster which took place in this country, of even greater proportion than in Honduras or Panama, can be observed in many of the estuaries and lagoons on the coast of Ecuador. OLSEN *et al.* (1995) claim that in just over twenty years (1969–1991) the shrimp ponds were responsible for the loss of 20% of the mangrove swamps and 88% of the salt marshes in Ecuador: a total of nearly 90,000 hectares.

- g) The level of industrialization in Latin America is still relatively low. Despite this, the geographical situation of industry is an important factor in the deterioration of some coastal resources, especially water quality. It has already been mentioned that industrial areas tend to be located in urban regions of the coast. The most important industrial focus in Latin America is to be found in Rio de Janeiro, Sao Paulo, Santos, Curitiba, Porto Alegre and Buenos Aires. Basic industries, particularly chemical and petrochemical, pour a large part of their untreated waste into coastal waters.
- h) Coastal tourism is one of the most dynamic economic activities in Latin America, although the region does not yet attract a large percentage of the world market. The figures are modest even in Cuba, the Dominican Republic, Costa Rica, Brazil and Mexico, the region's leaders in this field with between one and two million foreign tourists a year.

In the nineties, the Caribbean Islands and the Yucatan Peninsula have consolidated their position as international tourist destinations. Large quantities of foreign capital, particularly Spanish and American, have been invested in promoting holiday resorts. The chosen areas all have something in common: they have a high ecological value and at the same time are very fragile. Coastal lagoons, sandy beaches and coral reefs are the vision of paradise offered to the European and American tourist.

Varadero and Cayo Coco in Cuba, Cancún and the Riviera Maya in Mexico, Puerto Plata, Playa Bávaro and La Romana in the Dominican Republic, Isla de Margarita in Venezuela and the Bahamas and Lesser Antilles are common tourist destinations in the Caribbean. In South America the most popular places are Punta del Este in Uruguay, Mar del Plata in Argentina, Valparaiso and Viña del Mar in Chile, Florianópolis and Rio de Janeiro in Brazil, and the Galapagos Islands in Ecuador. With the exception of the final two, these destinations are tourist areas aimed mainly at the regional market.

The majority of governments gave priority to tourism policies, mainly because this type of activity generates a large amount of foreign currency income. This also explains, although it does not justify, why the large multinational companies were allowed access to extremely valuable natural resources, often without even minimum guarantees that the environment would be respected. Other types of coastal tourism also were promoted: sports, diving and underwater photography in coral reefs, marine bird and mammal watching,

etc. Countries such as Costa Rica and Belize are the forerunners in the promotion of this segment of the market. Bahía de Samaná in the Dominican Republic and Peninsula Valdés in Argentina offer observation of the mating rituals of certain types of whale. The government of Chile is making efforts to promote the scenic beauty of Tierra del Fuego, Chiloé, Patagonia and the Atacama desert. Whale watching and coastal desert landscapes are emphasized in northwestern Mexico.

All the above leads us to the conclusion that the pressure exerted on the coastline of Latin America will increase. There are two main reasons for this: firstly, the distribution of the population and the traditional economic activities (fishing, industry, *etc.*); and secondly, the demographic dynamics of coastal zones and the increase in new activities such as aquaculture and tourism, requiring service workers and attracting the underemployed.

The Legal and Administrative Coastal Subsystem of Latin America

Finally, some aspects of the legal and administrative subsystem should be taken into consideration in order to have a basic understanding of the institutional organisation affecting coastal management. Firstly, the policies adopted in the Latin American countries with respect to coastal zones and resources should be mentioned. In fact, the policy of many governments has traditionally been to pay very little attention to marine and coastal matters. On the few occasions when the sea has been brought into the political arena, it has been due to its strategic and defensive importance, rather than for its development potential. It should not be forgotten that a coastal management policy should be part of the general strategy for sustainable development of a country (ARTIGAS, 1997). Generally speaking, these countries have adopted "inland" policies with a "continental outlook". This attitude on behalf of political leaders is understandable if we bear in mind that Latin America is a subcontinent that is still not fully occupied or exploited.

The above is, however, a paradoxical situation: one only needs to recall the territorial structure of the population and economy of Latin America, especially South America, to realize this. It should also be pointed out that a substantial change has taken place during the final decade of the XX century, as is the case in many other parts of the world. Over this period of time, several governments have implemented, or initiated, institutional policies aimed at improving the management of coastal areas and resources. These policies take the form of laws, action programs, the creation of new public institutions, interministerial commissions, *etc.*

This type of development can first be seen in the proposal or passing of specific legislation, such as the examples in Table 6.

- a) It is interesting to note that many of these specific legislative initiatives came about as the result of international cooperation agreements. There has been obvious foreign influence in this process of change, such as the role played by the World Bank in the case of Brazil, the US Agency for International Development in Ecuador and the Spanish Directorate General of Coasts in Cuba.

Table 6. *Legislation related to coastal zone management.*

Country	Law or Regulation	Date of Enforcement or Proposal
Brazil	Law 7.661 National Plan for Coastal Management I	1988
Brazil	Resolution 005 National Plan for Coastal Management II	1997
Ecuador	Executive Decree 375: creation of the Program for Coastal Resource Management	1988
Cuba	Coastal Zone Management Bill	Version 19 May 1997
Chile	Supreme Decree 475, National Policy for Use of the Shoreline of the Republic	1994
Argentina	Integrated System of Coastal Management Bill	Presented in the Senate on 19-3-99

Source: Own data

- b) The improvement in general legislation, both environmental and sectorial, has strengthened the possibilities for management of coastal areas and resources. Many of the laws governing fishing, protected natural areas, environmental impact or land use were passed during the '90s in several countries.
- c) One of the main legal instruments, apart from those already mentioned, is that of public property. Most Latin American legal systems are based on Roman law as part of their colonial inheritance. Therefore, the marine, intertidal and land areas up to a given distance from the highest point of high tide are in this category. Although the term used varies slightly, the concept referred to is the same: Public Domain (Argentina), Union Lands (Brazil), Lands for Public Use (Colombia) Lands for National Public Use (Chile), Maritime-Land Federal Zone (Mexico).
- d) Unfortunately, Public Administrations have never been very efficient in the management and conservation of this patrimony, especially during the neo-liberal decade of the '90s when the term 'privatization' was used perhaps too freely. In most cases, it is not simply a question of the sale or loss of public property. In Nicaragua, for example, the ownership of common land has a direct and dramatic effect on the lives of the indigenous communities. In Colombia STEER *et al.* (1997) highlighted natural degradation processes and the social consequences of the misappropriation of beaches or the destruction of swamps and coastal lagoons.
- e) From an institutional point of view, it is interesting to note that the Navy often participates in coastal management initiatives. In some countries, such as Brazil and Chile, the Navy or an associated institution is involved in the early stages of Coastal Management Plans and Programs. The Ministry for the Environment or the Natural Resources Department then takes over the projects. In other cases, for example in the Dominican Republic, the

Table 7. *Marine and coastal protected areas (MPA, CPA).*

Marine Region	Number of MPA	Number of CPA
Caribbean Basin	96	58
South Atlantic	19	98
Southeast Pacific	19	34
Total Latin America	134	190

Source: Kelleher, Bleakey and Wells (1995)

corresponding inter-ministerial commission is presided over by the Navy.

- f) The administrative organization works on two basic levels: national and local. The former, following the colonial model, is more important as far as the management of the coast and its resources is concerned. The latter is oriented toward the planning and management of land use, often with little success. The administrative framework is more complex in countries like Brazil, Mexico or Argentina where there is also an intermediate level: the State in the first two cases and the Province in the case of Argentina. Many environmental responsibilities are controlled at this level. During the '90s, the cost reduction program of the Argentinian Federal State, for example, meant that more responsibilities were transferred to this third level without the necessary accompanying funds.

One of the specific tools for the management of coastal and marine areas and resources is the use of Protected Areas. According to the information gathered by KELLEHER, BLEAKEY and WELLS (1995), there are approximately 134 Protected Marine Areas (PMA) and 190 Protected Coastal Areas (PCA). Protected marine areas are of particular importance in the Caribbean, while in the South Atlantic region, coastal areas predominate (Table 7).

According to the World Resources Institute (1996), however, the protection of marine and coastal areas is greater in South America (almost 25 million hectares) as opposed to Central America and the Caribbean (approximately 2 million hectares). This is due to the policy of two countries, Chile (10 million hectares) and Ecuador (9 million hectares), relating to their fishing grounds.

Although these protected areas are important within the Latin American legal structures, they are not always effective. Very often there is no more than a formal declaration granting a particular administrative status to a specific area. The ecosystems that are supposedly protected are usually critical, extremely fragile habitats of great bio-diversity, or environments threatened by human activity: mangrove swamps, coral reefs, coastal lagoons, salt marshes and submerged environments (sea grass meadows) *etc.*

Problems for Integrated Management of Latin American Coastal Zones

The problems related to coastal areas and resources should not be confused with those directly linked to coastal management itself. Water pollution, the destruction of critical habitats, the use of inappropriate techniques in the exploitation of some natural resources, overfishing, the degradation of the

landscape, the misappropriation of public property, and erosion are just a few examples of the problems of coastal areas. Yet it should not be forgotten that some of them are a direct result of the management models currently employed.

Although the concept of "integrated coastal zone management" has already been dealt with in earlier pieces of work (BARRAGÁN, 1994), we would like to recall that it is a "public process of participative and decentralized administration which aims to preserve the resources of the coastline, while at the same time improving the quality of life of the population." The following is a brief description of the main problems observed in the coastal management of Latin America.

- a) There is not a sufficient level of public awareness of the problems of the shoreline. Only a small minority of people have a real idea of the problems and their significance and, apart from those directly affected, they tend to be connected to universities or research centres and ecological organizations. Proof of this is that only a few countries, such as Cuba, have strategies to alleviate natural disasters (RODRÍGUEZ, 1998, U.N.D.P., 1998).
- b) The above partly explains why many countries have only recently developed a coastal policy. In fact, in some countries such as Peru, Venezuela, Mexico and the Dominican Republic, there is still no institutionalized policy.
- c) Another common problem of integrated management is related to the knowledge of coastal resources and processes. The information provided by scientific organizations is very limited as they have weak research systems. There is often insufficient knowledge of the national coastlines, both in the physical and natural sense and in the social and economic sense. Sometimes the problem is that this information is not transferred to the decision-making bodies.

In spite of this, some countries have institutes or university departments with a tradition of research into marine and coastal resources: INVEMAR in Colombia, Marine Science Faculties or Oceanographic Departments in Chile, Brazil, Costa Rica, Mexico, and so on. However, many of these research centres have very limited resources, which implies that their role in coastal management could be greater.

- d) The training of public officials and technical staff is too sectorial and conventional (biologists, economists, engineers, *etc.*). There is not usually specific training designed for integrated management of coastal zones. The dependence on external training programs can be seen from the fact that nearly all the national coastal management programs initiated in the nineties required the advice of foreign consultants (Canadian or Spanish in Cuba, American in Ecuador, Chile and Brazil, Danish and Dutch in Nicaragua, and so on).

This has a particularly significant effect: the institutions consulted are extremely diverse. Governmental and non-governmental, European and American, linked to international banks (the World Bank, the Inter American Development Bank), Non-Governmental Organizations (IUCN), the United Nations (Program for Development and the Environment, Train Sea Coast Program), national agencies for internation-

al cooperation (Danida; USAID), universities (Rhode Island *etc.*) and so on. On the other hand, access to foreign training is limited due to the fact that the predominant language in the foreign universities specialized in this area is not Spanish or Portuguese.

- e) There is a lack of institutional efficiency in integrated management initiatives. There are various reasons for this, which include the lack of coordination mechanisms between the different Public Administrations. In addition, it is not normal practice to monitor and evaluate projects, and the implementation of innovations in public administration is extremely slow and the continued funding of the majority of coastal management programs is not assured, which means that processes are cut short, technical teams are not consolidated, *etc.* Administrations both nationally and locally are changed completely over set periodic terms with no opportunity for continuity.
- f) The neo-liberal phase which was consolidated in some Latin American countries in the '90s is a negative factor for integrated management. Like other public functions, it disappears when the State's capacity to act is reduced. On the other hand, it becomes easier for companies to exploit natural resources. Thus private profit, a short-term view and a sectorial outlook have the advantage over the common good, a long-term outlook and an inter-related perspective. It should be remembered that the latter are three essential characteristics of the integrated management of coastal zones.
- g) There is enormous pressure on "exportable" resources as a result of the considerable foreign dependence of Latin America in economic terms. It is only in this context of the need to obtain foreign currency rapidly and an overly permissive State that one can understand what has happened with the great shoals of fish, the destruction of the mangrove swamps to install shrimp farms, the degradation of the shoreline in areas where tourist projects have been set up with capital from countries where these same projects have not prospered, and so on.
- h) There are few legal tools or institutions specifically designed for coastal management.
- i) There is no tradition of coordination and cooperation between public institutions and between the public and the private sectors. In general, with a few exceptions, the different institutional agents (political, social, economic and those belonging to the scientific and technical system) usually work separately on the problems and conflicts of the coastal zone.
- j) Society is not well organized either. The accumulation of wealth by a reduced number of people became more pronounced during the 90s. The middle classes, precisely the sector with the greatest level of awareness of certain environmental problems, were the worst affected. Social differences are therefore ever greater. With this general outlook, increased public participation is unlikely.
- k) There are no Latin American networks working toward the improvement of coastal management practices (ECLAC, 1997a & 1999a). This is perfectly understandable in a subcontinent which has never been known for

the success of its regional integration initiatives. South-South cooperation in coastal management is also rare, although some countries cooperate with others outside Latin America (for example, Brazil with the Coastal Management Program in Mozambique).

Projects which go beyond the national scale are of great interest for shoreline regulation. Among others, those sponsored by the United Nations are worth mentioning: "Inter-vention Strategy for the Coastal Waters of the South East Atlantic and Adjacent Coasts" (1980), "Regional Project for the Environmental Management of Bays and Coastal Zones in the Wider Caribbean" (1990), "Land-based Sources of Pollution in the Wider Caribbean Region" (1994). There are also some scientific initiatives such as that of the University of Miami on "The Ecosystem of the Mangrove Swamp in Latin America and the Caribbean Basin: its management and conservation" (SUMAN, 1994), or coastal management projects sponsored by the U.S. Agency for International Development (USAID) which are put into practice by Rhode Island University (together with the WWF and the Nature Conservancy). This last example, called PROARCA-COSTAS, involves very localized cases of coastal management in Belize, Honduras, Nicaragua and Panama. Non-governmental organizations, local training and the spreading of information have a very important role to play here (WINDEVORHEL *et al.*, 1997).

Latin American Geography of Integrated Coastal Zone Management

According to a report prepared by the ECLAC in 1990, the situation of coastal management in Latin America was very poor. Few countries apart from Brazil and Costa Rica could claim to have undertaken integrated initiatives on a national scale.

GUBBAY (1996) and CICIN-SAIN and KNECHT (1998), using data from SORENSEN (1993), summarize the situation in Latin America as follows: "at least 8 of the 26 Caribbean countries have institutional initiatives or make an effort at integrated management; 4 of the 7 Central American countries have developed some management tools and of the 11 coastal States in South America only 5 are seen to be working towards integrated management".

This information should be analyzed with caution. The level of coastal management in Brazil and Colombia, for example, is very different. After more than 10 years of work in Brazil, the second generation of the National Program of Coastal Management has begun, while in Colombia, there is still no National Program. Yet both these countries are in the group that "makes an effort at integrated management."

We now proceed to divide the Latin American countries into groups according to their degree of development in coastal management, a task which presents obvious difficulties especially in terms of precision and objectiveness. The scale of work chosen and the difficulty in analyzing the results of the efforts made by each country may call into question the value of the results obtained. However, our approach not only offers a new territorial dimension, but also encourages debate and discussion of the coastal management model in an important part of the world.

The specific criteria that have been used for this first national evaluation include the existence of coastal policies, specific legislation and institutions, the development of plans or programs, internal financial resources, technical training, external consultants, administrative decentralization of coastal management, scientific policies, the creation of sectorial and administrative coordination bodies, the organization of multidisciplinary teams in public institutions, initiative development time, and experiences on a smaller scale than the national level.

The criteria used to place each country in a specific group are the following:

- a) Countries at a "transitional" stage of integrated management. This group includes countries where a significant amount of the specific criteria mentioned above are found. These criteria are applied on a national scale and have been consolidated over a certain period of time. There is, to a certain extent, a complex structure of organization and administration, and a sufficiently consolidated basis for the process of integrated management to develop into maturity. This is the case of Brazil, Costa Rica and Puerto Rico.
- b) Countries at the "initial" stage of integrated management. This group includes those countries in which only some of the specific criteria can be observed, or where interesting initiatives have been undertaken at national or regional levels. These initiatives are not given particular significance on an institutional level, nor have they been functioning for very long. There is no complex structure of organization and administration, but some of the factors are present which are needed in order to develop a more complex process of integrated management. Mexico, Belize, Ecuador, Chile and Colombia are included in this group.
- c) Countries at the "pre-initial" stage of integrated management. This group includes countries where practically none of the specific criteria exist, and where there are no specific initiatives for coastal management of any significance. There may be initiatives within the academic world, or ones that have had little institutional impact. They are often limited to a particular sector of activity or to solving a specific problem. These are the countries that are most in need of support to improve their level of development in coastal management. The countries in this group include Argentina, Venezuela, Peru, Uruguay, Nicaragua, the Dominican Republic, Cuba, Guyana, Surinam, Haiti, and most of the Lesser Antilles.

This classification is by no means static. If the situation in a given country changes, then this will be reflected in its classification. For example, the Ecuadorian crisis at the end of the nineties justifies its inclusion in a group lower down the scale than would have been the case a few years earlier. Conversely, if the situation in a given country has notably improved over the decade being studied, it can be included in the corresponding group.

Countries at a "Transitional" Stage of Integrated Management

Brazil, a country which has been the subject of an earlier piece of work (BARRAGÁN, 2000), is particularly outstanding in this group. The current "National Plan of Coastal Management" (PNGC or GERCO) arose from the creation of the Interministerial Commission for Marine Resources (CIRM) in the mid-1970s. In 1990 the World Bank began a pilot project implementing the PNGC in six coastal states. Two years earlier, the Federal Parliament had passed a specific law for coastal management. That was the beginning of a period of intensive work which has lasted ten years (MORAES, 1995; 1999).

We have been fortunate to gain first hand knowledge of the Brazilian experience. A good understanding of the Brazilian program has been achieved from visiting seven of the 17 coastal States and interviewing technical staff and politicians responsible for the state and federal environmental bodies in Sao Paulo, Rio de Janeiro, Alagoas, Paraiba, Santa Catarina, Natal and Ceara (1995, 1996 and 1999). We also have participated in some of the National Encounters on Coastal Management (ENCOGERCO) when all the States involved explained and evaluated the situation regarding their respective tasks, giving us the opportunity to witness the evolution of the National Plan for Coastal Management (PNGC).

The general conclusion that can be reached is that Brazil has one of the most advanced systems of coastal management in Latin America. This opinion is based on the following factors:

- a) Specific coastal management policies have been developed for almost two decades.
- b) There is specific legislation at the federal level (the Parliaments of some States have also passed legislation for coastal management or are in the process of doing so, as is the case of Sao Paulo and Santa Catarina).
- c) Responsibilities for coastal management are shared by the three administrative levels (Federal, State and Municipal).
- d) Almost all the States have a permanent specific structure for coastal management.
- e) Multidisciplinary teams have been created in each State linked to the National Program.
- f) Meetings are held every two years to evaluate the progress made in each State and the findings are published.
- g) Written material has been prepared relating to methodology, tools and sectorial aspects.

The following are some of the main problems detected in the implementation of the GERCO: 1) the diversity of the methodology employed by some States; 2) the lack of information available; 3) the limited technical and financial resources; 4) the specialist staff a) pronounced differences in quantity, b) need to balance composition and specialization, c) advisability of ensuring the continuity of staff as far as possible, and d) deficiencies in the control and evaluation system of the work done; 5) variable political support or backing in some States; 6) the complex legal structure; 7) the inefficiency of federal coordination; 8) the lack of intersectorial in-

tegration; 9) the differences established between two groups of States: those where the GERCO is being implemented at a steady pace and those which are lagging behind.

Finally, it should be mentioned that the main problems of the National Program for Coastal Management at the moment are economic and financial. In fact, in the period between 1997 and 2000, little has been achieved in spite of the passing of a second version, the PNGC II. This new generation of the GERCO pays particular attention to some specific aspects: 1) redefining the limits of the coastal area; 2) the distribution of responsibilities among the three main administrative levels. Regarding the former, more flexible delimitation criteria are used, thereby increasing the number of coastal municipalities. As far as the latter is concerned, a more precise account is given, which means that each administrative level (federal, state and local) has a more clearly defined frame of reference.

More than twenty years ago, Costa Rica initiated a series of actions designed to protect its coastal zone and resources. Act num.6043 governing the regulation of the maritime and land zone was a milestone in the recent history of the Costa Rican shoreline. The coastal management program aimed to promote integrated management by means of a series of strategies which have been developed over a period of several years: greater knowledge of coastal resources, regulation of land use, the designing of a policy of concessions and the establishment of a series of control measures. The University of San José in Costa Rica coordinates an Alpha network on coastal management. This project, financed by the European Union, is being carried out in conjunction with other Latin American and European universities. LEMAY (1998) also places Costa Rica among the countries with the most developed systems of coastal management.

Puerto Rico, as a territory of the USA, is integrated into the US Federal system of coastal planning and therefore benefits from the Federal Coastal Management Program. In spite of this, the pressure exerted by tourism exceeds the management capacity of the island (SEGUINOT, 1998).

Countries at an "Initial" Stage of Integrated Management

Ecuador is a particularly interesting example. As with other initiatives of the US Agency for International Development (USAID), such as in Sri Lanka or Thailand, Ecuador was chosen to be the subject of a Program for the Integrated Use of Coastal Resources with technical assistance from the University of Rhode Island. An intergovernmental Cooperation Agreement was signed to this effect in 1986, with an initial duration of four years. The Agreement was then extended for another four-year period, until 1994. This means that Ecuador now has over ten years' experience in this type of project. The government of Ecuador then took over responsibility for the project with the support of the Inter-American Development Bank (C.R.C.-U.R.I., 1995).

The details of the organization model proposed by USAID can be found in MALDONADO and ARRIAGA (1993) and OLSEN and ARRIAGA (1995). At first work was done at the national level with the Government and the program was initiated

through Executive Decree N. 3399. This was complemented with local actions; the so-called "double path" structure. We believe that this initiative greatly benefitted Ecuador as it brought about the rapid incorporation of some tools which favour integrated management. We are not aware of the impact that the present crisis in Ecuador has had, but it is important is to verify how many of those improvements are still present in a country that has other priorities.

In 1996 Belize presented an exhaustive report on its Coastal Zone Management Project, based on an earlier report by PRICE, HEINANEN, GIBSON and YOUNG (1992). It was sponsored by the United Nations Development Program (U.N.D.P., 1996). The significance of coastal management in Belize is obvious if one takes into consideration the fact that a large part of the foreign currency that enters the country does so through tourism and the fishing industry. The aforementioned report comprises a summary of the state of coastal management, followed by four main chapters. Each one analyses a basic topic: 1) State of the coastal zone: description of habitats, endangered species and cultural patrimony; 2) Activities in the coastal area; 3) Legislation, and 4) Strategy for the integrated management of coastal zones. As a general conclusion, it could be said that Belize has, at least, carried out a systemic study of the problems and needs of integrated coastal zone management.

The foundations of a national coastal management program in Chile were laid by the Supreme Decree 475, whose title is also significant: "National Policy for the use of the shoreline of the Republic and creation of the National Commission" (Ministry of Defense, 1995). The intention in Chile to design a new policy for the coastline can clearly be seen in this decree. Since this specific legislation was passed, various national seminars on integrated management of the shoreline have been held. In addition, between 1996 and 1999, Regional Coastline Commissions have been set up (a significant fact when in Chile the most important administrative levels are national and municipal) and a whole range of legal instruments created which favour the conservation of the coastal zone, dealing with maritime concessions, the access and movement of vehicles on the beaches, the "coves" used by traditional fishermen, Coastal Protection Zones in the General Town Planning Bylaws, the distance from the shoreline of the new coastal route, etc. There are also some very interesting proposals for integrated coastal zone management on a national scale (PATILLO, 1997; ALVIAL, 1997, *etc.*).

Regional programs also exist, such as the Biobio in Central Chile, which provide enriching experiences for use on a national level (GALLARDO, PARRA and CID, 1993), and there are innovative initiatives for the preparation of physiographic maps applied to coastal zone management (ANDRADE and CASTRO, 1989).

Since 1995, various initiatives to implement a National Plan or Program for Coastal Management have been developed in Colombia. The Institute for Marine and Coastal Research (INVEMAR) has had an important role to play in many of these proposals. For example, in 1997 the "Draft document for the preparation of a National Policy for the Integrated Regulation of the Colombian Coastal Zones" (STEER *et al.* 1997) was presented; the following year the "National

Seminar on Marine Science and Technology" was organized; in 1999 a Methodological Guide to the Integrated Management of the Coastal Zone (INVEMAR, 1999) was drawn up; and in 2000, efforts are being made to establish a joint project with the European Union called Environmental Alliance.

ARIAS-IZAZA *et al.* (1998) suggest four main strategies for the future Colombian coastal zone management program: 1) institutional reinforcement; 2) intergovernmental coordination (creation of an Interministerial Committee for Coastal Management, a Coasts and Seas Policy Unit and a National Council for Coastal Policy); 3) decentralization of management levels and 4) regional strategic planning. There appears to be a clear political intention to create a suitable framework for the integrated management of the Colombian coasts.

At the end of the year 2000, the National Environmental Council, dependent on the Presidency of the Republic, passed the National Policy for Coastal Zones. The Ministry of the Environment also has created an Office for Wetlands and Coastal Zones. INVEMAR continues to organize courses in coastal management for the staff of institutions in coastal regions. The training received by the Naval Academy staff will include a master's degree in coastal management.

Mexico is somewhere between the "initial" and "pre-initial" stages. There are reasons to justify placing it in the "pre-initial" group, such as the fact that there are no specific laws or programs for coastal management and no official policy except for marine protected areas. Management is carried out in a very traditional way, and coastal matters are dealt with in a sectorial way, like any other sector of the administration. In the nineties, however, certain changes have taken place which bode well for the future.

According to ZARATE *et al.* (1999), at the beginning of the nineties the National Property Law was passed, which directly affected the Federal Maritime Terrestrial Zone (FMTZ). These authors also state that the Secretariat of the Environment, Natural Resources and Fishing (SEMARNAP) recently developed a special program for the sustainable management of beaches and the FMTZ. The methodology of the program is very similar to that of the Brazilian GERCO, although for a more limited geographical area.

Furthermore, in 1996 the environmental legal structure began to decentralize and provide for state control of coastal zone management. In addition, there have been some academic initiatives that have had a degree of influence on public institutions, such as in the State of Campeche (YANEZ-ARANCIBIA *et al.*, 1999), and coastal management programs in some Mexican universities (*e.g.* Autonomous University of Baja California, Autonomous University of Baja California Sur) (FERMAN *et al.*, 1993). There has also been an explicit call for a coastal law and a coastal management program (ZARATE *et al.*, 1999; INE, 2000).

The next few years will be crucial for the development of coastal management in Mexico. The new National Development Plan (2001-2005) will set the pattern for a more or less integrated model for coastal management; it will depend on the limits set for the economic sectors (principally oil and tourism) which have traditionally prevented more sustainable development of coastal zones.

Countries at a "Pre-initial" Stage of Integrated Management

The countries included in this group are those in which no initiatives for integrated coastal zone management have been found on a national scale. There are, at most, legislative initiatives without parliamentary backing or isolated regional projects financed by foreign capital but with no institutional support.

It is the most numerous group of countries. In the Caribbean region, Cuba and the Dominican Republic are interesting examples. Although the Dominican Republic does not have special legislation or a specific coastal management program, there is a Technical Council for Coastal-Marine Protection. During a meeting of this council, we were able to witness how the problems affecting the Dominican coasts were dealt with and discussed. The various institutions affected by the development and environmental protection of the coast are represented on the Council. These include the State Department of Tourism, the National Planning Office, the Forestry Department, the Navy, the Central Bank, Santo Domingo Autonomous University (UASD) and tourist companies. In spite of this, the Council has had limited effect.

There is an obvious need to establish additional measures to guarantee an integrated national system of coastal management. This is not only because such measures would be more effective but also because the problems affecting the Dominican coasts are so serious that a new model of regulation is required. The World Bank has recently invited tenders for certain projects linked to coastal zone management and the training of technical staff in this discipline.

With regard to Cuba, one of the most outstanding aspects is the creation of the "Coastal Zone Management Bill." The draft which we were provided with by the Department of Environmental Policy of the Ministry of Science, Technology and the Environment (CITMA) proposes a much clearer distribution of administrative responsibilities, extends the geographical limit of the coastal zone almost to its maximum possibilities, regulates economic activities and protected areas, and pays special attention to the more fragile ecosystems of the coastal zone and protected areas (beaches, mangroves, coral reefs, cays and peninsulas).

This initiative is complemented by the so-called "Strategy for integrated coastal and marine management." This document is still somewhat generic and not very well defined (this was the situation during our visit in May 2000), but it is at least categorized in the National Environment Strategy of the CITMA. In 1999, the Global Environmental Fund initiated a project for the integrated management of the cays of the Sabana-Camaguey Archipelago. This project is interesting not only because of the 800 km of coral reef it covers, but also because of the enormous pressure exerted on the northern reefs by Spanish and Italian investments in hotels. We should bear in mind that this economic activity generates foreign currency that is vital for covering the cost of the Cuban economic deficit.

In Central America, Nicaragua began to develop the first stages of its Program for the Integrated Management of Coastal Zones, MAIZCO (M.A.RE.NA., 1996) with the help of

Danish and Dutch technical experts. The Information Bulletins about the aforementioned program provide details of the progress being made. One of the most outstanding achievements of the Program is that "MAIZCO has managed to become an official Department within the structure of the Ministry of the Environment and Natural Resources (MARENA) which will afford institutional sustainability to the policies and strategies proposed. . . ." At present the Program is at a decisive stage as the next objective is a ministerial agreement approving the proposed actions agreed on by the State institutions involved and civil society.

In South America the case of Argentina is particularly significant. In spite of the fact that a large part of the population and the consequent environmental impact are concentrated in the Rio de la Plata area, there are hardly any initiatives for the integrated management of this stretch of coast (Barragán, 1996). Between 1993 and 1996, however, the first phase of the "Integrated Management Plan for the Patagonian Coastline" was carried out. This regional project came about as a result of the agreement reached between the Argentinian Government, the Global Environmental Fund and the United Nations Development Fund. It has served to strengthen institutions, train staff, obtain information, etc. (YORIO, 1999), but is not well integrated into Argentinian public institutions.

During President Menem's last mandate, a very interesting federal initiative was begun. It was a bill creating an "Integrated System of Coastal Management." The bill entered the Senate in June 1997 but was not published in the Official Gazette until March 1999. The elections which took place in October 1999 changed the political scenario, and this initiative will probably be forgotten.

In Peru, Jamaica or Surinam, for example, the basic conditions for starting a plan or program for the integrated management of coastal zones are still not present. Also, there is probably very limited institutional awareness of the need for integrated management. Thus only a few projects exist which do not go beyond the sectorial or regional level, sponsored by the World Bank, the Inter American Development Bank or the United Nations.

GENERAL CONCLUSIONS

As in many other parts of the world, the decade of the nineties marked new tendencies in Latin American coastal zone management. During this period of time, some countries started to move toward a more integrated management model. Others, a minority perhaps, have consolidated the work begun in the eighties. There is still, however, a considerable number of countries that have no specific instruments for the management of their national coasts. One of the first conclusions that can be drawn, then, is that this period, while generally positive, has reinforced the existing inequality.

The process of change has perhaps been too slow if we bear in mind the urgent need for improved management of some coastal resources. In addition, the continuity and effectiveness of some National Plans and Programs are threatened by the difficulties they face. The problems caused by the very limited degree of public and institutional awareness, the

shortage of funds, the lack of scientific information, inadequate training, and so on indicate that greater effort is needed at the national level and that international aid must continue.

Foreign assistance has been present in almost all the initiatives, with all types of institutions contributing to the implementation of integrated management plans and programs. It is precisely this diversity in the origin of the help received along with the traditional lack of regional cooperation that has brought about a total absence of the Latin American perspective. For this reason, European or American coastal management models are often copied and just as often lead to failure.

The future of integrated management of coastal zones in Latin America lies in the following strategies. These include a) the search for Latin America's own model, b) more homogeneous progress among the different countries of the Latin American community, c) consolidation of the achievements gained from the experiences initiated during the eighties, d) taking advantage of the lessons learned by these countries, e) evaluation of the effectiveness of the actions carried out and f) making the most of cultural homogeneity.

Most of the above strategies are directed toward a supranational area of co-operation. This is because coastal management should take advantage of the combination of certain opportunities in Latin America: a continuous coastline, an almost continental scale of work, linguistic uniformity (both Spanish and Portuguese can be used with no great difficulties to train technical staff, publicize the lessons learned and organize international events), homogeneous legal culture (based on Roman law, resulting in specific protection measures for the coast), existence of some countries with experience in coastal management (allowing for South-South co-operation), reactivation of supranational integration processes, *etc.*

The viability of the aforementioned measures could be studied in a Latin American Program for the Integrated Management of Coastal Zones, which could establish possible work methods, strategies, instruments, mechanisms, *etc.*, all specifically designed for this remarkable part of the world. This Program should be headed by an inter-American organization or by the United Nations (ECLAC, for example), and should be based on the principle of international co-operation and the freedom of choice to participate on the part of each nation. Little reference is made to such a proposal in the scientific and academic literature, whereas various ECLAC reports mention the possibility of and the need for a regional (1997a; b, 1999a; c) or sub-regional (ECLAC, 1995) initiative.

ACKNOWLEDGEMENTS

Our thanks go to the technical staff of the various coastal administrations (both civil and naval) and university colleagues from Brazil, Puerto Rico, Argentina, Chile, the Dominican Republic and Colombia whom we have had the honour of working with over the last ten years and whose comments and help have been invaluable. We would also like to mention that a substantial part of the cost of our visits to these countries was financed by the Directorate General of

Universities and Research of the Andalusian Regional Government (Spain) and by various Universities and Ministries for the Environment in the above-mentioned countries. Special thanks are due to David Fischer, Associate Editor for CZM at JCR for his support and advice.

Principal Interviews

United Nations Economic Commission for Latin America (ECLAC): Carmen Rivas (Legal Officer)

Brasil

Oneida Divina da Silva Freire (National Coordinator of the National Coastal Management Program, PNGC, Ministry of the Environment); Antonio Carlos Moraes (Sao Paulo University, Main Consultant for the PNGC); Moacyr Madruga (Federal University of Paraiba); Osvaldo Viégas (Federal University of Alagoas, PNGC Consultant); Antonio Eduardo Poleti (Technical Coordinator of the Sao Paulo State Program); Luis Cruz Lima (State University of Ceará); Victor Philippi (Technical Coordinator of the Santa Catarina State Coastal Management Program); Eduardo Sierra (Federal University of Santa Catarina); Eduardo Trani (General Coordinator of the Sao Paulo State Coastal Management Program); Joao Batista Dias (Technician, Rio de Janeiro State Coastal Management Program).

Argentina

Jorge Morello (University of Buenos Aires); Elsa Laurelli (Centre for Urban and Regional Studies); Claudia Natenzon (University of Buenos Aires); Oscar Alfredo Forastieri (Argentinian Naval Command); Patricia Kandus (University of Buenos Aires); Vicente Finale (President of the Argentinian Association of Naval Surveyors); José Dadón (University of Buenos Aires); Marcelo Ferrero (Argentinian Geological and Mining Service).

Chile

Enrique Fernández Pérez-Cotapos (Head of the Shoreline Office); Consuelo Castro (Subdirector of the Geography Institute of the Catholic University of Chile); Jaime Itrurriaga (National Commission for the Environment); Patricio Inostroza (Technician of the Shoreline Office); Edgardo Fuster (Head of the Territorial Studies Department of the Ministry of National Property); Humberto Rivas (Head of the Planning Department of the National Tourism Service).

Colombia

Pedro Arenas (Environmental Studies Institute of the National University of Colombia); Francisco Arias (Consultant for the National Policy for Coastal Zones and Director of the Institute for Marine and Coastal Research, INVEMAR); Paula Cristina Sierra (Coordinator of the Coastal Areas Group of INVEMAR); Ernesto Guhl (Director of the Institute for Sustainable Development); Rafael Steers and Amparo Rivas (Consultants for the National Policy for Coastal Zones).

Puerto Rico

José Seguinot Barbosa (University of Puerto Rico); Damaris Delgado (Coastal Director of the Department of Environmental and Natural Resources); Marelisa T. Rivera (Fishing and Wildlife Service); Ernesto L. Diaz (Department of Environmental and Natural Resources).

Cuba

Odalys Bouza and José L. Batista (Tropical Geography Institute, Ministry of Science, Technology and the Environment); Augusto Martínez (National Centre for Protected Areas); Carlos Rodríguez Otero (Physical Planning Institute); Elías Ramírez Cruz (Environmental Policy Department); Rodolfo Claro Madruga (Institute of Oceanology); Leandro Peñalver Hernández (Institute of Geology).

Dominican Republic

Venecia Alvarez and Valentin Ribas (Directors of the Marine Biology Research Centre of the Autonomous University of Santo Domingo); Idelisa Bonnelly de Calventi (Director of the Dominican Foundation of Marine Studies); Radhamés Lora Salcedo (Secretary of the Technical Board for Coastal and Marine Protection); Zoila González de Gutiérrez (Director of the Environmental Planning Department); Bolívar Troncoso Morales (Environmental Advisor to the State Tourist Board).

LITERATURE CITED

- ALCOLADO, P.; GARCÍA, E., AND ESPINOSA, N., 1999. *Protección de la Biodiversidad y Desarrollo Sostenible en el Ecosistema Sabana-Camañey*, GEF/PNUD Sabana-Camañey CUB/92/631, 145p.
- ALVIAL, A., 1997. Hacia el establecimiento de un Plan Integrado de Manejo de la Zona Costera de Chile, *Seminario sobre Gestión Integrada del Borde Costero*, Santiago de Chile, 22p.
- ANDRADE, B. and CASTRO, C., 1989. La carta fisiográfica aplicada al manejo de la zona costera, *Rev. Geográfica de Chile Terra Australis*, 31, 87–96.
- ARIAS-ISAZA, F. et al, 1998. Institucionalización del manejo integrado de las zonas costeras en Colombia, *Seminario Nacional de Ciencia y Tecnología del Mar*, Bogotá.
- ARTIGAS, C., 1997. El desarrollo sostenible de las zonas costeras y marinas en la reciente realidad internacional, *Seminario sobre Gestión Integrada del Borde Costero*, Santiago de Chile, 8p.
- BARRAGÁN MUÑOZ, J.M., 1994. *Ordenación, planificación y gestión del espacio litoral*, Barcelona, Oikos-Tau, 300p.
- BARRAGÁN MUÑOZ, J.M., 1996. Planificación y gestión en las regiones litorales latinoamericanas: el conurbano bonaerense, *Revista de Estudios Regionales*, 45, 111–127.
- BARRAGÁN MUÑOZ, J.M., 1997. *Medio ambiente y desarrollo en las áreas litorales. Guía práctica para la planificación y gestión integradas*, Barcelona, Oikos-Tau, 160p.
- BARRAGÁN MUÑOZ, J.M., 2000. The Brazilian National Plan for Coastal Management, *Coastal Management (Submitted)*.
- BID (BANCO INTERAMERICANO DE DESARROLLO). <http://www.iadb.org:80/int/sta/SPANISH/staweb/>
- CICIN-SAIN, B. and KNECHT, R., 1998. *Integrated Coastal and Ocean Management: Concepts and Practices*, UNESCO-Island Press, 517p.
- C.R.C.-U.R.I. (COASTAL RESOURCES CENTER, UNIVERSITY OF RHODE ISLAND), 1995. *Manejo costero integrado en Ecuador. Programa de Manejo de Recursos Costeros*, Guayaquil, University of Rhode Island, 417p.
- COELLO, S. and OLSEN, S., 1995. El manejo de la maricultura del camarón en el Ecuador, *Manejo Costero Integrado en Ecuador*, 389–417.
- CUNILL, P., *La América Andina*, Barcelona, Ed. Ariel, 290p.
- ECLAC (COMISIÓN ECONÓMICA PARA AMÉRICA LATINA Y EL CARIBE), 1990. *Informe de la reunión de expertos en planificación de los usos del mar y administración de las zonas costeras en América Latina y el Caribe*. LC/G.1595, Santiago de Chile, 27p.
- ECLAC (COMISIÓN ECONÓMICA PARA AMÉRICA LATINA Y EL CARIBE), 1995. *Informe de la reunión subregional sobre manejo costero en áreas marinas y costeras de alta biodiversidad en el Atlántico*, LC/G.1856, Tamandaré, Brasil, 38p.
- ECLAC (COMISIÓN ECONÓMICA PARA AMÉRICA LATINA Y EL CARIBE), 1997 a. *Informe del taller sobre áreas costeras y marinas protegidas del Primer Congreso Latinoamericano sobre Parques Nacionales y otras áreas Protegidas*. LC/R.1770, Santa Marta Colombia, 51p.
- ECLAC (COMISIÓN ECONÓMICA PARA AMÉRICA LATINA Y EL CARIBE), 1997 b. *Una contribución latinoamericana a la aplicación del Convenio sobre la diversidad biológica a los ecosistemas costeros y marinos*, LC/R.1755, 78p.
- ECLAC (COMISIÓN ECONÓMICA PARA AMÉRICA LATINA Y EL CARIBE), 1999 a. *Una visión regional del desarrollo del capítulo 17 del Programa 21 en América Latina y el Caribe: 1992-1998*, LC/R.1881, Informe preparado por Jairo Escobar, 63p.
- ECLAC (COMISIÓN ECONÓMICA PARA AMÉRICA LATINA Y EL CARIBE), 1999 b. *Fenómenos climáticos y vulnerabilidad: La ecuación determinante de los desastres. El caso de los pequeños estados insulares en desarrollo*, LC/R.1935, Informe preparado por Jairo Escobar, 42p.
- ECLAC (COMISIÓN ECONÓMICA PARA AMÉRICA LATINA Y EL CARIBE), 1999 c. *Informe de la reunión regional sobre la contribución de los océanos al desarrollo sostenible de la región*, LC/R.1899, Santiago de Chile, 44 pp.
- F.A.O., 1995. *La situación mondiale des peches et de l'aquaculture*, Roma, 57p.
- FERMAN, J.L.; GOMEZ-MORIN, L., and FISCHER, D.W., 1993. Coastal Management in Mexico: The Baja California Experience. New York: American Society of Civil Engineers Series on Coastlines of the World. 167p.
- GALLARDO, V.; PARRA, O., and CID, G., 1993. *Progress in the development of an integrated CZM. Program for the Biobio Region in Central Chile*, World Coast Conference, Noordwijk, Proceedings (vol. II), 723–731.
- GUBBAY, S., 1996. "Coastal zone management an international context", Conferencia Internacional. El litoral, pág. 121–125.
- INE, (INSTITUTO NACIONAL DE ECOLOGIA), 2000. Estrategia ambiental para la gestión integrada de la zona costera de Mexico: Propuesta Mexico, 40p.
- INSTITUTO DE RECURSOS MUNDIALES, 1996. *Población y Medio Ambiente*, Madrid, EcoEspaña, 424p.
- INVEMAR (INSTITUTO DE INVESTIGACIONES MARINAS Y COSTERAS), 1999. *Manejo integrado de zona costera. Conceptos y guía metodológica*, Santa Marta (Colombia), INVEMAR, 60p.
- KELLEHER, G.; BLEAKLEY, C., and WELLS, S., 1995. *A global representative system of Marine Protected Areas*, Washington, Great barrier Reef Marine Park Authority, World Bank and IUCN, Vol. II, 93p.
- LEMAY, M., 1998. *The Inter-American Development Bank Support for Integrated Coastal Area Management and Marine Sciences in Latin American and the Caribbean*, Conferencia Taller Pluridisciplinario TEMA sobre Redes del Gran Caribe en Gestión Integrada de áreas Costeras, Cartagena de Indias, Colombia.
- LUGO, A., 1997. El manglar: un ecosistema al servicio del ser humano, *Biodiversidad y uso de la tierra. Conceptos y ejemplos de Latinoamérica*, EUDEBA-UNESCO, 361–382.
- MALDONADO, J.V. and ARRIAGA, L., 1993. Coastal zone management: The Ecuador case, *World Coast Conference*, Noordwijk, Proceedings (Vol. II), 595–600.
- MARENA, (MINISTERIO DEL AMBIENTE Y RECURSOS NATURALES), (1996). *Manejo integral de zonas costeras de Nicaragua*, Managua, Boletín Informativo 1, 2, y 3.
- MATTEUCCI, S.; SOLBRIG, O.; MORELLO, J., y HALFFER, G., 2000.

- Biodiversidad y uso de la tierra. Conceptos y ejemplos de Latinoamérica*, Buenos Aires, EUDEBA-UNESCO, 580p.
- MINISTERIO DE DEFENSA NACIONAL, SUBSECRETARÍA DE MARINA, 1995. *Decreto Supremo 475, Política Nacional de uso del borde costero del litoral de la República de Chile y crea la Comisión Nacional que se indica*, Santiago de Chile, 8p.
- MORAES, A.C., 1995. *The environmental management of the coastal zone in Brazil: A case study*, Brasilia, Ministry of the Environment, 14p.
- MORAES, A.C., 1999. *Contribuições para gestão da zona costeira do Brasil*, Sao Paulo, Hucitec, 229 p.
- MORELLO, J., 1984. Perfil ecológico de Sudamérica, *Características estructurales de Sudamérica y su relación con espacios semejantes del planeta*, Vol. 1, Barcelona, Ed. Cultura Hispánica.
- OLSEN, S. and ARRIAGA, M., 1995. Principios relevantes para la construcción del Plan de Manejo Integrado de Recursos Costeros en Ecuador, *Manejo Costero Integrado en Ecuador*, C.R.C.-U.R.I., 3–25.
- PATILLO, B., 1997. Política Nacional de Uso del borde costero, *Seminario sobre gestión integrada del borde costero*, (sin paginar)
- PNUD (PROGRAMA DE NACIONES UNIDAS PARA EL DESARROLLO), 1998. *Desarrollo de las técnicas de predicción de las inundaciones costeras, prevención y reducción de su acción destructiva*, La Habana, I.P.F., CU/94/003, 172p.
- PRICE, A.; HEINANEN, A.; GIBSON, J., and YOUNG, E., 1992. *Guidelines for developing a Coastal Zone Management Plan for Belize*, Gland, I.U.C.N., 37p.
- RODRÍGUEZ OTERO, C., 1998. *El ordenamiento territorial en la mitigación de las inundaciones costeras*, La Habana, Facultad de Geografía de la Universidad de La Habana, Tesis de Maestría, 87p.
- SÁNCHEZ, H.; ÁLVAREZ, R.; GUEVARA, O., y ULLOA, G., 2000. *Lineamientos estratégicos para la conservación y uso sostenible de los manglares de Colombia*, Bogotá, Ministerio del Medio Ambiente, 81p.
- SEGUINOT BARBOSA, J., 1998. Gestión ambiental del litoral en Puerto Rico, *Comisión de Sistemas Costaneros de la Unión Geográfica Internacional*, San Juan de Puerto Rico.
- SORENSEN, J.C., 1993. The international proliferation on integrated coastal zone management efforts, *Ocean & Coastal Management* 21, (1–3), 45–80.
- SORENSEN, J. and BRANDANI, A., 1987. An overview of coastal management in Latin America, *Coastal Management* 15, 1–25.
- STEER, R.; ARIAS-ISAZA, F.; RAMOS, A.; SIERRA-CORREA, P.; ALONSO, D., and ACAMPO, P., 1997. *Documento base para la elaboración de la "Política Nacional de Ordenamiento Integrado de las Zonas Costeras Colombianas"*, Documento de Consultoría para el Ministerio de Medio Ambiente.
- SULLIVAN SEALEY, K. and BUSTAMANTE, G., 1999. *Setting geographic priorities for marine conservation in Latin America and the Caribbean*, The Nature Conservancy, Arlington, Virginia, 125p.
- SUMAN, D.O., 1994. El ecosistema de manglar en América Latina y la cuenca del Caribe: su manejo y conservación, D.O. Suman Editor, Rosentiel School of Marine and Atmospheric Science, University of Miami and The Tinker Foundation, New York, 263p.
- TENKATE, A., 1999. Desarrollo industrial y el medio ambiente en México, *Economía del Medio Ambiente en América Latina*, Alfaomega, 87–120.
- U.N.D.P. (UNITED NATIONS DEVELOPMENT PROGRAM), 1996. *State of the Coastal Zone Report. Belize Coastal Zone Management Project*, Belize, U.N.D.P., 255p.
- VV.AA., 1999, *El Estado del Mundo*, Akal, Madrid.
- WINDEVoxel, N.; RODRÍGUEZ, J., y LAHMANN, E., 1997. *Situación del Manejo Integrado de Zonas Costeras en Centroamérica: Experiencias del Programa de Conservación de Humedales y Zonas Costeras de UICN para la región*, (ejemplar mecanografiado), 31p.
- YÁÑEZ-ARANCIBIA, A., 1999. Terms of reference towards coastal management and sustainable development in Latin America: introduction to Special issue on progress and experiences, *Ocean & Coastal Management* 42, 77–104.
- YÁÑEZ-ARANCIBIA, A.; LARA-DOMÍNGUEZ, A.L.; ROJAS GALAVÍZ, J.L.; ZÁRATE LOMELI, D.J.; VILLALOBOS ZAPATA, G.J., and SÁNCHEZ-GIL, P., 1999. Integrating science and management on coastal marine protected areas in the Southern Gulf of Mexico, *Ocean and Coastal Management* 42, 319–344.
- YORIO, P., 1999. Zona Costera Patagónica, *Los humedales de la Argentina*, Wetlands International, Pub. 46, 137–167.
- ZÁRATE LOMELI, D.; SAAVEDRA VÁZQUEZ, T.; ROJAS GALAVÍZ, J.L.; YÁÑEZ ARANCIBIA, A., and RIVERA ARRIAGA, E., 1999. Terms of reference towards an integrated management policy in the coastal zone of the Gulf of Mexico and the Caribbean, *Ocean and Coastal Management*, 42, 345–368.