



E/CEPAL/CDCC/52/Add. 1
19 March 1979

ECONOMIC COMMISSION FOR LATIN AMERICA
Office for the Caribbean

CARIBBEAN DEVELOPMENT AND CO-OPERATION COMMITTEE

Fourth Session
Paramaribo, Suriname
21-27 March 1979

J. COASTAL AREA DEVELOPMENT
DEVELOPMENT AND ENVIRONMENT IN THE CARIBBEAN
COASTAL AND MARINE ASPECTS
(Possible Programmes and Activities)

Prepared by
Ocean Economics and Technology Office
Department of Economic and Social Affairs
United Nations



UNITED NATIONS
ECONOMIC COMMISSION FOR LATIN AMERICA Office for the Caribbean



P R E F A C E

The present paper is a complement to the draft background study, with the same title, prepared by the Ocean Economics and Technology Office of the United Nations. It was prepared with the aim of facilitating the consideration and discussion of the main problem areas and policy issues relating to coastal area development and marine-related activities in the Caribbean.

The first chapter of this paper is an abridged version of the background study referred to above, giving a very general review of the importance of coastal and marine-related activities by sub-regions.

It should be borne in mind that for most activities, such as mining and fishing, it is not possible to make a clear distinction between coastal and non-coastal activity; statistics are not kept for coastal shipping, as distinct from marine shipping, for example. Therefore, to be realistic, the discussion must, sometimes cover the broader context of sectoral activities.

On the basis of the general review, the second chapter outlines some specific programmes which might be undertaken at the regional, sub-regional and national levels, to promote the development of coastal areas and marine-related activities in the Caribbean. The programmes outlined in this chapter should not be construed as "proposals" by the UN. Instead, they are designed to call attention to the interrelated nature of coastal and marine problems requiring the formulation of an interdependent "Programme Package" by means of which the research and technical assistance operations of organizations of the UN family could have the most effective and lasting impact.

J. COASTAL AREA DEVELOPMENT

I. General Review of Coastal and Marine-Related Activities by Sub-Regions 1/

A. Caribbean South American Sub-Region 2/

For the countries of this sub-region, certain parts of the coastal area are intensively used for a variety of activities. Yet, given the large land areas of countries such as Venezuela and Colombia, the importance of the coastal area relative to the totality of national economic activity is not great. Conflicts and management problems will tend to be localized around certain urban, industrial and port centres.

The population in this sub-region is concentrated in coastal settlements, which have absorbed the majority of total demographic growth over the last decade. Venezuela, Guyana and Suriname have extensive unoccupied hinterlands, so that the future growth of coastal settlements could be channelled elsewhere. The same does not hold true for Colombia. As opposed to Caribbean Central America, where there tends to be a single, primary urban centre, the demographic trends in Caribbean South America have led to a multiplication of large, fast-growing urban centres.

The minerals sector in this sub-region is very significant, and for certain minerals, such as petroleum, the industry is significant even in world markets. Venezuela is, for example, one of the world's leading producers of offshore oil; she is the major supplier to refineries on the U.S. East coast, and is estimated to have 700 billion barrels of oil in place in one single deposit, the Orinoco heavy oil belt. Colombia produces a wide range of minerals, and supplies 95 per cent of the world's output of emeralds. Guyana and Suriname are among the world's leading producers of bauxite. The Caribbean aluminium industry accounts for 41 per cent of total world market economy production, 19 per cent of the total alumina production, and a mere

1/ This study includes all countries and territories members and observers of major regional institutions: CARICOM, CACM, ECLA and its CDCC.

2/ Includes: Colombia, Guyana, Suriname, Venezuela.

one-half per cent of the total aluminium production of all market economies. Although the potential contribution of the minerals sector to the Caribbean economies is large, the current contribution is restricted, for the most part, to the mining stages.

Since there are zones of significant upwelling along the northern coast of South America, there is considerable interest in the living resources of this sub-region. Although the countries of this sub-region fish for a variety of species, the crustacean resources are most important, both for their current contribution to export revenues, and for future potential. Since the various unit fisheries for shrimp are distinct, stocks requiring management must be distinguished from those susceptible to development.

The rapid growth of petroleum and petrochemical production has been the main spur to industrial growth in this sub-region. The expansion of intermediate goods and capital goods industries has been very rapid. Colombia and Venezuela are emphasizing the development of metal-transforming industries, with particular emphasis on iron and steel, oil refining and high-grade fuels. Industrial activity centres around the manufacturing belts and the port-metropolis, such as Cartagena and Barranquilla (Colombia) and the Caracas and Maracaibo regions in Venezuela.

The top priority on transport, in this sub-region, is the linking up of the economies of the Andean Pact members; marine modes are not presently considered a bottleneck to development. The importance of coastal tourism to the economies of the sub-region is marginal, given the wide range of possible high-growth sectors in countries such as Venezuela, Colombia and Guyana. Water resource problems are not yet critical in this sub-region, except for some overpumping along the Caribbean coast of Colombia and some evidence of salt-water intrusion in the vicinity of Lake Maracaibo.

Venezuela and Colombia, along with Mexico, are among the leaders in the Caribbean region in university-level training in the marine sciences, particularly in marine biology.

B. Caribbean Island Sub-Region^{3/}

The problems of coastal area development are most critical for the countries of this sub-region.^{4/}

In the Island States, settlement and industry is concentrated along the coast. In Trinidad and Tobago, for example, 90 per cent of total national employment is found in the coastal area of the Gulf of Paria. In the Insular Caribbean, Trinidad and Tobago is a major producer of crude oil and natural gas. Aruba, Curacao, Trinidad and Tobago and Jamaica are major refiners of petroleum. Jamaica has a very well-developed and modern solid minerals industry, bauxite and alumina production, however, dwarf production of all other mineral commodities. Cuba and the Dominican Republic are important producers of nickel. Jamaica, Mexico and Trinidad and Tobago are undertaking a joint-venture agreement for production of aluminium, with smelters in Mexico and in Trinidad and Tobago using alumina produced in Jamaica from local bauxite. A similar joint-project involving alumina production in Guyana and smelting of aluminium in Trinidad and Tobago is under consideration. Within the sub-region, there is considerable potential for the establishment of similar co-operative ventures for the production of cement; many of the islands also have large amounts of metal-bearing beach sands, which may have development potential.

The countries of the sub-region, with the exception of Cuba, generally restrict their fishing activities to the Caribbean Sea. Although some islands are large exporters of shrimp to industrial countries, as a rule, they must import staple fish for local consumption. Since many of the islands do not have sufficient agricultural land to ensure self-sufficiency in food production, the protein supply from fish is particularly important. International cooperation in fisheries management and development can bring immediate and significant benefits to this sub-division.

^{3/} Includes: Antigua, Bahamas, Barbados, Cuba, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, Montserrat, Netherlands Antilles, St. Kitts-Nevis-Anguilla, St. Lucia, St. Vincent, Trinidad and Tobago.

^{4/} United Nations, Report of the Secretary-General, "Coastal area management and development" (page 12, paragraphs 33-34).

The economic and social impact of tourism is greatest in the Caribbean Island sub-region, as compared to the two other sub-regions considered in this paper. The high density of tourist arrivals creates a certain amount of social stress, and the economic benefits accruing to the national economies are a fraction of the potential benefits. Careful national evaluations of the tourist industry, along with a co-operative approach to the development of the intra-Caribbean market may be fruitful. Since the revenue from tourism is so vital for some of the islands, such as Antigua, action in this sector merits a high priority. As to the environmental effects of tourism, these tend to be manifest in a seasonal overloading of public services, such as sewerage, during the peak visitor months.

Proper management of water resources is also vitally important for the island States, much more so than for the continental countries. Conditions are not homogenous through the whole island group, however. Islands like the Netherlands Antilles have no surface or ground water resources of any importance, while the larger islands, such as Jamaica and Cuba, have relatively abundant ground water in coastal and inland aquifers. Pollution problems, according to the limited knowledge available at the moment, tend to be localized.

Summary

In the Caribbean region as a whole, there is a wide range of uses of coastal space and marine resources. There is, however, considerable variation between States and within national coastal areas. Attempts at regional co-operation which fail to recognize the fundamental differences within sub-regions may not have the maximum effectiveness.

II. Possible Programmes for International Action

Coastal area management and development in the Caribbean is, at one and the same time, both a national and a regional issue. It is one facet of environmental management, which, in turn, is one component of development planning.^{5/} As such, it is fundamentally a national

^{5/} Resolutions 1802 (LV) and 1970(LIX) of the Economic and Social Council of the United Nations recognized that coastal area management and development is an integral part of overall national development planning.

responsibility, except for certain problems which clearly transcend national boundaries, such as marine pollution.

Why then is coastal area management and development in the Caribbean discussed at the sub-regional and regional levels? There are several reasons for this apparent paradox:

1. There is a long history of sub-regional and regional co-operation in the Caribbean.
2. There is an unusually high degree of interdependence among the economies in the region, particularly among the island States and the members of the Central American Common Market.
3. Within the context of coastal area management and development, certain problems require resources in an amount well beyond the capability of individual States or territories.
4. The broadly similar conditions in the various parts of the region have caused most international technical assistance programmes to be provided on a regional basis.^{6/}

Therefore, the political and economic nature of the Caribbean is such that certain priority areas are amenable to international co-operation at the outset although it is recognized that coastal area management and development is ultimately a national responsibility.

The programmes of agencies and organizations of the United Nations system can be formulated and implemented at the regional, sub-regional and national levels. In terms of coastal area development and the use of marine resources, there are nevertheless a few areas in which truly regional programmes suggest themselves. For the Caribbean truly regional programmes may be feasible in:

- 1) training and education, particularly of scientists, where curricula can be standardized according to internationally accepted criteria;
- 2) monitoring of marine pollution and establishment of emergency procedures to combat accidental oil spills; and

^{6/} Statement by the UNDP Representative at the Meeting of Experts on Coastal Area Development (United Nations Headquarters, 11-15 November 1974).

- 3) protection from natural hazards;
- 4) possible legal framework to be established.^{7/}

The economic and environmental problems treated in the study and detailed in the technical annex are essentially oriented to sub-regional action. There are several reasons for this:

1. The economic, social, political and environmental conditions within the sub-region are so diverse that a universal, regional grouping may not be found which would spread the costs and benefits in an equitable manner;
2. Where national and sub-regional institutions are evolving, the creation of regional ones would render some of these ineffective;
3. The countries differ greatly in the priority each attaches to particular coastal problems, and offshore activities.

For the agencies and organizations of the United Nations system, there is an argument for organizing their resources and manpower on a regional basis, in the sense that it is administratively easier to manage. Co-ordination of programmes is also somewhat simpler. However, at the level of implementation and project delivery, sub-regional or national action may prove most effective in the Caribbean context.

While it might not always be possible to determine the optimum scope of a programme, i.e., whether regional, sub-regional, bi-lateral or national, a preliminary classification of possible programmes of action is suggested below.

A. Regional Programmes

1. Training, Research and Supporting Services

Consideration could be given to the following possible course of action:

- (a) The training infrastructure could be planned according to specific regional and sub-regional requirements using existing institutions in the area. Local expertise can provide the

^{7/} This element is only mentioned for the record as its consideration and elaboration is outside the scope of the present study.

nucleus of skilled personnel to work with foreign experts to train local personnel;

- (b) A complete re-evaluation of career programmes in marine science and technology could be undertaken;
- (c) Research infrastructure could be reinforced in order to cover some areas which up to now have not received appropriate attention. Due to the relatively small size of most Caribbean countries and their limited economic resources, integrated efforts towards the improvement of services and research may prove the most economical way to accelerate development of coastal and marine activities;
- (d) Coastal and marine services could be encouraged in order to give immediate support to research institutions and regional marine centres, like the Mexican Data Sorting Center. Tide prediction, equipment needs, instrumentation services, etc., are example of possible fields of mutual cooperation between the countries of the region.

2. Protection from Natural Hazards

- (a) Within each country, it could be recommended that national preparedness be evaluated in terms of the adequacy of the following systems:

warning systems, which are closely associated with day-to-day activities of meteorological, hydrological, and telecommunications services;

protective systems, such as dikes, dams, levees, sea walls and breakwaters;

legal and financial systems, such as performance or specification standards for construction, zoning and insurance;

evacuation, relief and rehabilitation systems;

land-use management systems.

- (b) Within the WMO Regional Association, it could be recommended that the following items be considered on the future agenda for regional action:

regional meteorological synoptic observation network;

radar observing network;

data processing system;

regional meteorological telecommunication network;

training requirements;

regional working group on Tropical Matters;

a regional Hurricane Committee.

3. Marine Pollution

In view of one pollution expert, "The tasks of monitoring and identifying harmful marine pollutants, policing around a country's territorial waters and the high seas to detect, and where necessary interrupt polluting vessels, are beyond the resources of Barbados and I believe most developing countries."^{8/}

- (a) Given the potential damage to living resources and tourism from a massive oil spill, particularly in the vicinity of the Caribbean islands, it could be recommended that IMCO and UNEP, together with other interested UN agencies and organizations, give immediate attention to the formulation of an oil spill contingency plan for the Caribbean. Details of the technology

^{8/} Archer, A.B., 1975. "Marine Pollution off Barbados' Coasts". Paper presented at the IMCO Symposium on Prevention of Pollution from Ships, SYMP II/2, page 17.

(booms, dispersants), personnel requirements and financing should be specified.

(b) A region-wide reporting system could be developed for recording PHC pollution from tanker accidents, dumping and refinery wastes. The United States Coast Guard has developed a computerized coding system for recording pollution incidents.^{9/} IOCARIB, under programme area 7 of the Meeting of Oceanographic Experts, may wish to consider the implementation of such a reporting system.

(c) The question of training requirements for Caribbean technicians, in the field of marine pollution monitoring and control, could be reviewed by IOC/TEMA, along with the other interested agencies and organizations of the UN system. The feasibility of regional pollution monitoring schemes, such as the one proposed for IOCARIB, will rest on the availability of personnel and financial resources.

(d) Most discussions of marine pollution in international fora omit any discussion of the economic aspects of pollution. No government can afford to devote unlimited resources to pollution monitoring and control; the resources devoted to this purpose must be in proportion to the identifiable economic and social losses from pollution, relative to the value placed on a clean environment. The general principles of optimal resource allocation apply in the

^{9/} This system already contains data on pollution incidents recorded in the vicinity of Puerto Rico and the Bahamas.

case of pollution as they do to other economic and social phenomena, yet they are rarely applied in case studies.

Therefore, Recommendations TEMA'CARIB-I. 13(i),

"... any new marine science curriculum developed in the Caribbean region include courses in the ecological and politico-social-economic aspects here pertaining to the multiple uses of the coastal zone..."

might be implemented with the assistance of UN.

B. Sub-Regional Programmes

1. Marine Transport

In view of the importance of developments in ocean transport for the Caribbean Islands and particularly for the Caribbean Community, it could be recommended that consideration be given to:

- (a) Strengthening the ECLA Office in the Caribbean so that the work undertaken by the Regional Advisers in Shipping and Ports can be continued.
- (b) The question of improving the services of the schooner fleet could be considered, particularly regarding the question of adding refrigeration facilities which may make possible the transport of perishables between Community members.
- (c) Rationalization of WISCO's rate structure, particularly in light of its proposed investment programme, could be considered. Particular attention could be paid to the specifications of the feeder and container vessels being considered for purchase. In this respect, the services of transport advisers from IMCO and UN would be most useful.

- (d) In view of the possibilities for increased regional exports of bauxite and alumina, the vessel and port requirements for such a trade could be studied, along with the environmental impact of increased loadings of these materials.
- (e) The economic costs and benefits of establishing a regional merchant marine are worth studying. To this end, the following issues should be considered:
 - i) Factors relating to choice of vessels and trade routes, management and safety regulations and insurance;
 - ii) The impact of technological development on shipping costs;
 - iii) Port pricing, port congestion, freight surcharges and overall efficiency;
 - iv) Adequacy of ship survey and repair facilities;
 - v) Requirements for training of new personnel and periodic re-training.

2. Fisheries

Within the programmes of WECAFC and IOCARIB, it could be recommended that efforts be concentrated on:

(a) Management of valuable stocks which may now be close to the limits of their potential, e.g. spiny lobster. Management can also serve to choose fishing technology which will maximize the overall use of interrelated stocks in certain areas, e.g. Guianas-Brazil shelf;

(b) Development of local fisheries for species which can be used for local food needs, e.g. blackfin tuna, sardines and thread

herrings (clupeids). More detailed scientific investigations of the region and better statistics on catches will serve to make efforts at management and development more effective;

(c) Detailed investigations of the potential for aquaculture in the Caribbean be carried out along the lines of that executed in the Indo-Pacific region;

(d) The feasibility of co-operative projects in fisheries be investigated. For the Caribbean nations, this is the area which can result in the highest overall benefits. It has been mentioned that many of the facilities in the region, which are currently geared to export, could be more fully utilized if they were also employed in bi-lateral and sub-regional projects. The most outstanding examples are the fishing harbours and support services in Cuba and in Trinidad and Tobago; these facilities could be used to increase the efficiency of the island fishery operations.

(e) Fish meals and fish protein concentrate (FPC) are extremely useful as nutritional supplements and as reserves in cases of natural disasters and resultant food shortages. Stocks of anchovy and thread herring in the Caribbean, which were identified as having a significant margin for resource expansion, could be used for production of FPC.^{10/} An FPC plant might be considered as part of an integrated operation consisting of production of frozen fish or canned fish.^{11/} The major problems in producing FPC in the Caribbean would be to ensure an adequate supply of feedstock on a 300 day/yr. basis. The feasibility of establishing a pilot plant in the Caribbean could be investigated.

3. Tourism

(a) Fuller evaluation of tourism and tourist projects. Given the fact that the social benefits of Caribbean tourism may

^{10/} Protein-Calorie Advisory Group of the United Nations, 1971. "The Potential of FPC for Developing Countries", PAG Statement No.16", p. 13.

^{11/} Liston, J. and Pigott, G.M., 1970. "Fish Protein Concentrate". Paper presented at Third International Congress of Food Science and Technology, 9-14 August, Washington D.C.

be, in some cases, lower than the private benefits, it could be recommended that ECLA begin applying methods of social cost-benefit analysis to this problem, with the assistance of UN and UNIDO.

(b) Re-orientation of investment in physical facilities.

It could be recommended that consideration be given to moving away from heavy capitalization per tourist bed required by high-rise glass and steel hotels. Construction of smaller, guest-house type accommodation, using local and regional building materials, could be considered.

(c) Stimulation of the regional market.

The government tourist corporations and boards within the Caribbean region could meet, under the auspices of ECLA, to formulate a cooperative programme for intra-Caribbean tourist development.

(d) Evaluation and extension of economic incentives.

It could be recommended that certain practices be evaluated on a case-by-case basis. These include: treatment of profits and dividends; granting of tax holidays, and waiver of import duties on capital construction goods. It could be further recommended that extension of fiscal incentives should also be made to Caribbean nationals who wish to invest in tourism.

(e) Environmental protection.

It could be recommended that a management programme be developed for protecting coral reefs of the Caribbean.

For the Caribbean Islands where the majority of the States will not be able to sustain independently, self-sufficient mineral industries, it could be recommended that:

(a) An investigation be undertaken to determine the viability of a cement industry for the sub-region or for groups of the islands. This may be effected by initially proving the existence of the requisite raw materials and determining the optimum location for a plant to manufacture the cement.

(b) Along the same lines as above, known occurrences of metal bearing beach sands could be evaluated with the same perspective for pooling resources to support a beach sands mineral operation.

For Caribbean South America, particularly Guyana, Suriname and French Guyana there is an urgent need to diversify mineral production. A first step in doing this will be in increased exploration activities to obtain a better inventory of mineral resources.

