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REPORT ON THE RESULTS OF THE COASTAL AREAS MANAGEMENT PROGRAMME (CAMP) FOR ALBANIA

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1. INTRODUCTION

1.1 PREPARATORY ACTIVITIES

In May 1990, the Government of Albania signed the 1976 Barcelona Convention on the Protection of the Mediterranean Sea against Pollution, together with its four related Protocols existing at the time. Following such signature, a number of activities within the framework of Albania's participation in the Mediterranean Action Plan were commenced. The Albanian Government expressed in 1991 its commitment to the philosophy of the integrated planning and management of the coastal areas of Albania and invited the Coordinating Unit of the Mediterranean Action Plan to take necessary actions in order to initiate the programme.

1.2 FEASIBILITY OF THE DEVELOPMENT OF THE COASTAL AREAS MANAGEMENT PROGRAMME FOR ALBANIA

Following the invitation of the Albanian Government, a multi-disciplinary MAP mission visited Albania in May 1992, and in discussions with representatives of the Albanian Government and specialized institutions, identified priority issues to be included in the programme proposal.

Identification of these issues was made on the basis of the background information, analysis of the situation in Albania, requests by the Albanian authorities and specialists and experience of the Mediterranean Action Plan in the development and implementation of such programmes in other Mediterranean countries.

The Agreement for the development and implementation of the Coastal Areas Management Programme for Albania was signed by the United Nations Environment Programme, in its capacity of Secretariat to the Convention and Protocols, on 8 September 1993, and by the Government of Albania on 22 September 1993.

The strategy of this programme was based on the principles of sustainable development through integrated planning and management of coastal resources. Four components with 13 activities were developed and implemented with the intention to lead to the preparation of management plans integrating all knowledge gained by individual actions. At the same time, the results of all individual actions were included in plans of a more comprehensive nature.

Such a strategy required a selective approach to the identification of areas in which the majority of activities will be carried out. Since the problems of pollution, as well as development resources and potentials, are concentrated in the immediate coastal zone of the region, the programme was focused on that particular area.

The problems of development-environment inter-relations were studied in an integrated way, and the basis was established for future planning activities. However, sectorial actions had to be taken alongside so that implementation plans could be launched sooner, and which could serve as inputs to the preparation of more complex plans.

For the successful implementation of the programme the active involvement of national and local authorities was a very important factor. The knowledge of the local conditions and the precise identification of the environmental problems in Albania were secured by the relevant institutions. In parallel, the coordinating and supervising role of the Committee for Environmental Protection was essential for the determination and methodological approach of the scopes and objectives of each activity.

1.3 OBJECTIVES OF THE PROGRAMME

The objectives of the programme were the following:

- overall, to protect and rationally utilize the coastal resources over a relatively long period of time. The task of such a programme was to determine and recommend appropriate management measures with a view to resolving the existing environmental conflicts and establishing the optimum paths for dynamic development;

- in the long-term, to prepare the base for the development of the coastal area of Albania in harmony with the receptive capacity of the environment and to create conditions for the establishment of a system of integrated planning and management of resources in the region;

- immediately to offer, within the individual activities, solutions to urgent environmental problems which could be implemented immediately.

1.4 GEOGRAPHICAL AREA COVERED

The entire Albanian coastal zone, from the Greek border to the border of former Yugoslavia, as an organic whole consisting of littoral area, coastal strip and its adjacent sea area was covered with this programme (Fig. 1).

The area covered extended seawards as far as necessary to approach the particular problem, and landwards this axis covered, for the same reason, part of the hinterland and the associated aquatic ecosystems and was based upon an ecosystem approach.

Precise boundaries of coverage for each activity were determined in the initial phase of the implementation.

1.5 INSTITUTIONAL FRAMEWORK

The Mediterranean Action Plan and national authorities and institutions participated in the development and implementation of CAMP for Albania.

MAP participated through: the Coordinating Unit for MAP (Athens); the Pollution Monitoring and Research Programme (MED POL); the Blue Plan Regional Activity Centre (BP/RAC); the Priority Actions Programme Regional Activity Centre (PAP/RAC); the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC); the Specially Protected Areas Regional Activity Centre (SPA/RAC); the Regional Activity Centre for Environment Remote Sensing (ERS/RAC); and the Centre for Historic Sites.

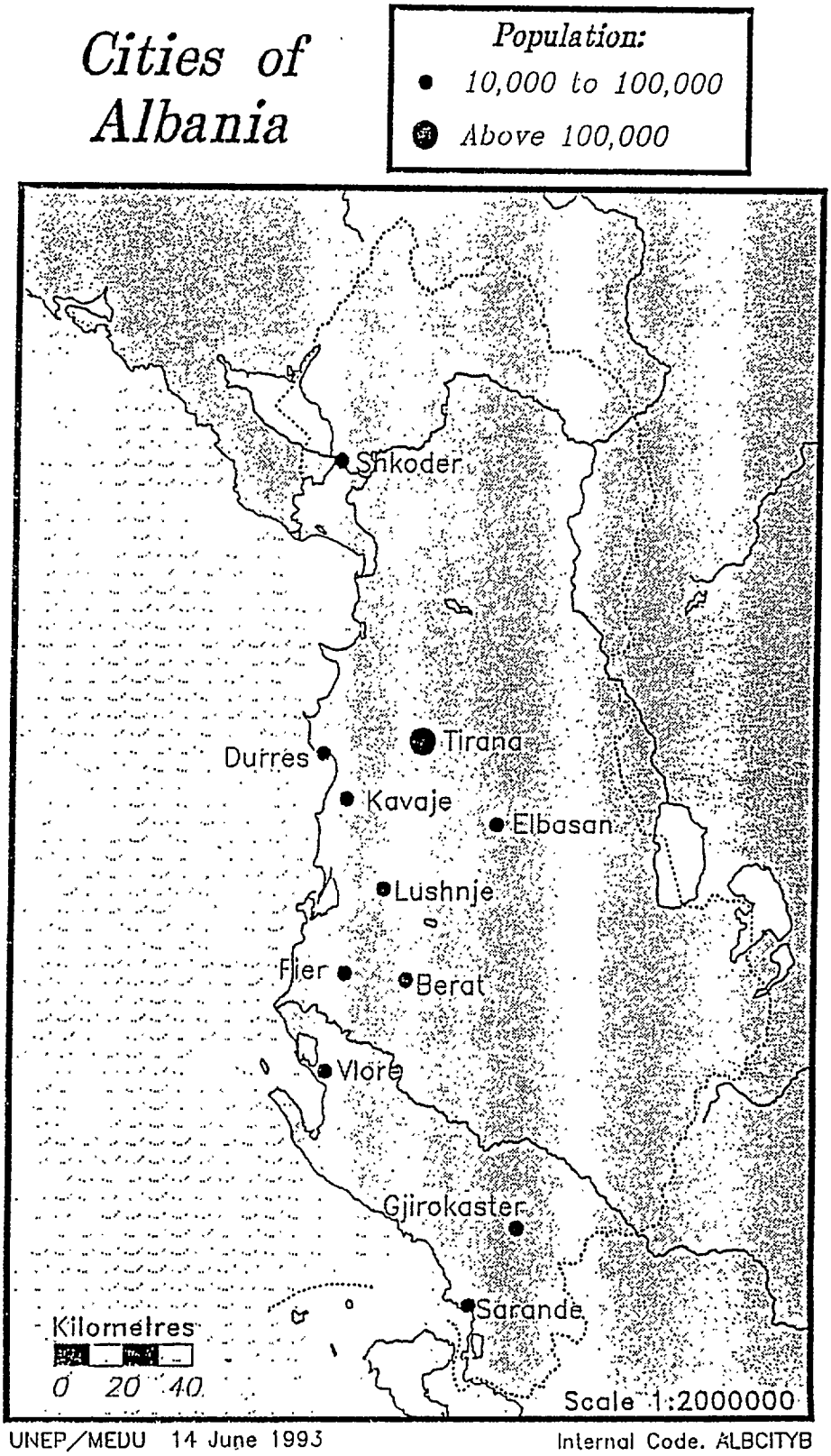

Figure 1 - Albanian coastal cities

The Committee for Environmental Protection (CEP) of Albania was designated by the Albanian government to act as a general national coordinator for national institutions and experts. The CEP coordinated all relevant national institutions (financial, economic, planning, development, industry, energy, tourism, sanitation, transportation, water resources, etc.) and received the necessary scientific, technical, logistical and financial support as envisaged by the agreement and its budget and workplan.

Individual national institutions participated in the formulation, preparation and implementation of the programme as envisaged by the agreement and its budget and workplan.

2. PRESENTATION OF RESULTS BY ACTIVITY

2.1 INVENTORY OF LAND-BASED SOURCES (LBS) OF POLLUTION

2.1.1 Introduction

The programme of activities of the CAMP for Albania included, as a specific activity, the establishment of an inventory of land-based sources of pollution, which would be carried out through an appropriate survey.

The assessment of the total pollution input to the Mediterranean Sea from land-based sources was the major objective of a pilot project (MED X) implemented in 1976/77 within the framework of the Joint Coordinated Mediterranean Pollution Monitoring and Research Programme (MED POL Phase I). At their Fifth Ordinary Meeting (Athens 7 - 11 September 1987), the Contracting Parties to the Barcelona Convention and Protocols approved a calendar of activities towards the implementation of the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources, to be carried out within the framework of the Long-term Programme of Pollution Monitoring and Research in the Mediterranean Sea (MED POL Phase II). This calendar of activities included a new, improved survey of pollutants from land-based sources in the Mediterranean.

The survey was implemented through a new set of questionnaires, which was sent to all National MED POL Coordinators in June 1989. These questionnaires were concerned with the following:

(a) Liquid domestic discharges;

(b) Industrial discharges containing selected substances listed in Annexes I and II to the land-based sources protocol;

(c) Industrial discharges of petroleum hydrocarbons, including sub-questionnaires on discharges from oil refineries and reception facilities respectively.

Where appropriate, the survey work was integrated with ongoing projects being conducted within the framework of the Coastal Areas Management Programme (CAMP). Apart from providing an essential input into the CAMP projects themselves, the experience gained at local level would provide the basis for completion of the questionnaires for the rest of the country. In the case of Albania, such integration was effected, the national survey forming part of both the overall regional survey and the Albanian CAMP programme.

2.1.2 Results of the Survey

Following the provision of expert assistance in 1993, eight questionnaire forms were filled in by the Albanian authorities at the end of 1994, and were received early in 1995. These questionnaires covered four coastal districts: Durres, Lezha, Saranda and Vlora. All are urban areas with industries located therein.

The questionnaires concerning (a) Liquid domestic discharges (MED/X/BIS/1); and (b) Industrial discharges containing selected substances listed in Annexes I and II to the land-based sources protocol (MED/X/BIS/2), were completed for each of the four districts in question. All the questionnaires were only partially completed - in particular, the lack of information on waste constituents was evident. Population data submitted was from the last census, held in 1991; other data was from 1990.

Municipal wastewater production and collection

In all districts reported on, there was an increase in the coastal population during the summer months, increases being 46.6% for Durres, 20.8% for Lezha, 29.2% for Saranda, and 33.3% for Vlora. The total increase, *i.e.* for all the four districts covered, was 37.9%. Normal water consumption figures were

reported as 222 litres per person per day for Durres, 111 litres for Lezha and Saranda, and 133 for Vlora. Actual consumption is probably less due to water being used for non-domestic purposes. In all four areas, water consumption during peak population periods was reported as being the same as for normal periods.

The average values for wastewater production were 175 litres per person per day in Durres, 93.6 litres in Lezha and Saranda, and 105.9 litres in Vlora. The average value for all four districts combined was 134 litres per person per day. These figures include the amount of industrial wastewater discharged into the municipal sewage system. In all four districts, the principal method of municipal wastewater collection is *via* municipal sewage systems, populations so served at peak periods being 95% in Durres, 89.7% in Lezha, 94.8% in Saranda, and 90% in Vlora. (92.6% for all four districts combined). The rest of the populations were reported to be served by other systems. These were not defined, but as they were not reported to be sewage systems, they are probably septic tanks.

Data reported on (a) populations, water consumption and wastewater quantity, and (b) populations served by sewage systems in the four districts are summarised in Tables 1 and 2 respectively. In each case, no details were provided as to the physical, chemical and organic parameters of municipal wastewater effluents, and it is assumed that these were not known at the time.

Municipal wastewater treatment

No treatment of municipal wastewater was reported to be carried out in any of the four districts.

Municipal wastewater disposal

In all four districts, municipal wastewater is not discharged through submarine outfalls, but directly into the sea or a river. As the relevant item in the questionnaire on liquid domestic discharges does not distinguish between these two environmental matrices, no details are available as to the proportion discharged into each. The bulk, however, if not all, appears to be discharged directly into the sea The wastewater not collected through municipal sewage systems (5% in the case of Durres, 10% in the case of Lezha, 5% in the case of Saranda, and 10% in the case of Vlora) was reported to be disposed of into the subsoil. Data on municipal wastewater deposition in the four districts is summarised in Table 3. As the wastewater undergoes no treatment, no sludge is generated, and no re-use of wastewater effected.

Municipal solid wastes

The amount of municipal solid wastes generated was reported as 22 kilotons per year in Durres, 1.8 kilotons in Lezha, 2.9 kilotons in Saranda, and 44 kilotons for Vlora. All are disposed of in sanitary landfills, situated 2 km from the coast in the case of Durres, 8 km from the coast in the case of Lezha, 6 km from the coast in the case of Saranda, and 500 m from the coast in the case of Vlora. In each case, details on the volume of the landfill and the mean moisture content of the waste were not available. The substrate was reported as permeable in the case of Lezha and Vlora, non-permeable in the case of Durres and Saranda. The data reported are summarised in Table 4.

Industrial wastewater

The total domestic wastewater pollution .load from industry is shown in Table 5, classified by type of establishment. Ten types of industrial establishments were reported to exist, covering bakeries (10), breweries, distilleries and pharmaceutical industries (16), tanneries (19), pulp and paper industries (22), acid manufacture (25), naval stores (28), pesticide manufacture (33), plastic and resins (34), rubber (45) and Cement (47). The numbers in brackets refer to the industry classification types listed in the relative questionnaire. The total amount of domestic wastewater generated in all four districts was reported at 8.88 x 10^6 cubic metres per year. No information as to constituents was provided.

Table 6 summarises the types of wastewater generated by industry, and the methods of discharge practised. All domestic wastewater from industries is discharged into the municipal sewage system. The total amount of process wastewater generated was reported as 15.15 x 10^6 cubic metres per year. Of this, 13.05 x 10^6 cubic metres is discharged into the municipal sewage system, 0.9 x 10^6 cubic metres is discharged into rivers, and 1.2 x 10^6 cubic metres is discharged directly into the sea from the shore. The waste is not treated, and no outfall structures were reported to exist. Table 7 summarises the same information for the various districts. As expected, the two larger districts, Durres and Vlora, are the most heavily industrialised.

2.1.3 Situation Analysis

The general situation in all four districts may be described as similar. In all cases, municipal liquid waste is discharged directly into the sea without any treatment. As no outfall submarine structures are reported to exist, discharge takes place off the immediate coastline. The same holds good for industrial wastewater. Again, no treatment is performed, and the bulk of the process wastewater is discharged through the relative municipal sewage systems, with the remainder split roughly evenly between discharge into a river and direct discharge from the shore. Analytical data on the constituents of the wastewater are lacking.

In all four districts, the municipal sewage system carries a mixed effluent in which, from the data reported, the volume of process wastewater forms a significant proportion of the total. Apart from this, there is the discharge of process wastewater directly into a river in Lezha, and directly into the sea from the shoreline in Vlora. An indirect estimate of the components of both wastes, and their approximate amounts, could be reached from data on establishment size and industrial processes utilised. This method was used in the 1976/1977 survey, and the relevant information was specifically requested in the relevant questionnaire of the current survey. No data, however, were provided in any of the questionnaires returned. The annual disposal of 44 kilotons of municipal solid waste (which probably also contains industrial solid waste) in a landfill with a permeable substrate situated only 500 metres from the coast could also pose a further coastal pollution problem in Vlora.

Although the year of reference for most data is given as 1990, the fact that no information was provided regarding submarine outfalls or waste treatment plants indicates that their absence was also true at the time of completion of the questionnaires, *i.e.* at the end of 1994.

2.1.4 Conclusions and Recommendations

In general, the information supplied in the partially-completed questionnaires provides sufficient indication of a coastal problem in all the four districts covered, but makes it impossible to gauge the problem*s gravity and extent. Apart from acquisition of information on the type and quantity of pollutants being discharged at each point, the situation in the immediate coastal zone, particularly in sensitive areas, such as bathing beaches and shellfish grounds, which could be affected by the discharges, must also be investigated. This work is required in order to arrive at a proper, or at least reasonable, assessment of the problem, and thereby enable appropriate remedial action to be taken. No coastal zone management programme can be effected without a knowledge both of the actual situation, and of the likely impact of any projected or planned new development.

It is recommended that in order to obtain essential data on the type and amount of pollution being generated, the following be undertaken in all four areas:

(a) Determination of the constituents of the municipal wastewater and the average amounts of each;

(b) Determination of the constituents of the domestic wastewater and the industrial process wastewater being discharged by each industry into the municipal sewage system; and the amounts of each major pollutant therein;

(c) Determination of the constituents of industrial process wastewater being discharged into the sea or rivers by each industry, also together with the amounts of each major pollutant therein;

(d) A survey of sensitive areas (bathing beaches, shellfish grounds, etc.) in the vicinity of the discharge points and in adjacent areas likely to be affected by the discharges, along with microbiological analysis of the water in the case of bathing beaches, and chemical and microbiological analysis of both water and shellfish in the case of areas where shellfish are either grown or harvested;

In the case of Vlora, the extent to which pollutants are leaching into the sea from the landfill site 500 metres from the coast should also be determined. This should be done by chemical analysis of both the leachate before it reaches the sea, and the seawater in the immediate coastal zone.

The acquisition of the above information will enable determination of the type and extent of the pollution problem in each area. In turn, it will enable proper decisions on appropriate remedial action to be taken. Such action could include the following measures:

(a) The construction of submarine outfall structures to carry the effluent out to sea away from the immediate coastline;

(b) The establishment of municipal sewage treatment plants;

(c) In view of the inability of the orthodox municipal sewage treatment process to remove certain chemical pollutants, the introduction of treatment of industrial wastewater at source, prior to discharge into the municipal sewage system;

(d) The introduction of treatment of industrial wastes prior to direct discharge into the sea or into a river;

(e) In the case of Vlora, relocation or rehabilitation of the landfill site for municipal solid wastes, or the establishment of a new site for wastes containing specific pollutants.

In each area, the particular measures to be taken will depend on the extent of the problem as evidenced by the data acquired. The exercise will also be extremely useful as it will indicate what preventive action will have to be taken when considering new developmental projects.

In assessing the extent of the problem and the remedial measures necessary, the provisions of the Protocol for the Protection of the Mediterranean Sea against Pollution from Land-based Sources, together with all the relevant measures formally adopted by the Contracting Parties under the terms of the Protocol, will have to be taken into account.

TABLE 1

POPULATION, WATER CONSUMPTION AND WASTEWATER QUANTITY

District	Population		Water consumption in m^3 per month		Wastewater		
	Normal	Seasonal increase	Normal	Peak	Production 10^6 m^3 /yr	Discharged into sea or river 10^6 m^3 /yr	%
Durres	75,000	35,000	500.000	500.000	4.80	4.56	95.00
Lezha	12,000	2,500	40,000	40,000	0.41	0.37	90.24
Saranda	12,000	3,500	40,000	40,000	0.41	0.39	95.12
Vlora	75,000	25,000	300,000	300,000	2.90	2.60	89.66
Total	174,000	66,000	880,000	880,000	8.52	7.92	92.96

TABLE 2

POPULATIONS SERVED BY SEWAGE SYSTEMS

District	Population		Estimated population served			Sewage treatment
	Normal	Average seasonal increase	By municipal sewage systems	By other sewage systems	By other systems	
Durres	75,000	35,000	104,500	0	5,500	0
Lezha	12.000	2,500	13,000	0	1,500	0
Saranda	12,000	3,500	14,700	0	800	0
Vlora	75,000	25,000	90,000	0	10,000	0
Total	174,000	66,000	222,200	0	17,800	0

TABLE 3

MUNICIPAL WASTEWATER DEPOSITION

District	Total urban wastewater x 10^6 m^3 /y	Estimated annual discharge in million m^3 per year				Wastewater re-use
		Into sea (municipal sewage system)	On land	In subsoil	Other	
Durres	4.80	4.56	0	0.24	0	0
Lezha	0.41	0.37	0	0.04	0	0
Saranda	0.41	0,39	0	0.02	0	0
Vlora	2.90	2.60	0	0.30	0	0
Total	8.52	7.92	0	0.60	0	0

TABLE 4

PRODUCTION AND DISPOSAL OF MUNICIPAL SOLID WASTES
in Ktons per year

District	Total waste	Incineration	Composting	Landfill
Durres	22.0	0	0	22.0
Lezha	1.8	0	0	1.8
Saranda	2.9	0	0	2.9
Vlora	44.0	0	0	44.0
Total	70.7	0	0	70.7

TABLE 5

DOMESTIC WASTEWATER POLLUTION LOAD FROM INDUSTRY

Type of industry	Total pollution load					
	Total no. of estabs	Total amt of domestic wastewater m^3 per year	Suspended solids Kg per year	BOD Kg per year	COD Kg per year	Oil Kg per year
10	1	390,000	N/A	N/A	N/A	N/A
19,25,34.47	4	3,000,000	N/A	N/A	N/A	N/A
22	1	390,000	N/A	N/A	N/A	N/A
16,28,33,45	4	5,100,000	N/A	N/A	N/A	N/A
Total		8,880,000	N/A	N/A	N/A	N/A

Note: Industry types

10	Bakery
16	Brewery, distillery, pharmaceutical
19	Tannery
22	Pulp and paper
25	Acid
28	Naval stores
33	Pesticides
34	Plastic and resins
45	Rubber
47	Cement

TABLE 6

TYPES OF WASTEWATER FROM INDUSTRY AND METHOD OF DISCHARGE
GLOBAL AMOUNTS FOR WHOLE COASTAL ZONE SURVEYED

	Type of wastewater					
	Process wastewater		Cooling water		Domestic water	
Method of discharge	Untreated m^3 per yr	Treated m^3 per yr	Untreated m^3 per yr	Treated m^3 per yr	Untreated m^3 per yr	Treated m^3 per yr
Municipal system	13,050,000	0	N/A	0	8,880,000	0
River	900,000	0	N/A	0	0	0
On shore	1,200,000	0	N/A	0	0	0
Other	0	0	N/A	0	0	0
Total	15,150,000	0	N/A	0	8,880,000	0

TABLE 7

**TYPES OF WASTEWATER FROM INDUSTRY AND METHOD OF DISCHARGE
AMOUNTS PER DISTRICT SURVEYED**

District	Type of Industry	Total wastewater	Domestic wastewater	Process wastewater discharged into		
		in m^3 per day	municipal system	municipal system	river	on shore
Durres	16,28,33,45	40,000	17,000	23,000	0	0
Lezha	22	7,800	1,300	3,500	3,000	0
Saranda	10	2,300	1,300	1,000	0	0
Vlora	19,25,34,47	30,000	10,000	16,000	0	4,000
Total		80,100	29,600	43,500	3,000	4,000

2.2 DEVELOPMENT OF A NATIONAL SYSTEM FOR PREPAREDNESS AND RESPONSE TO MARINE ACCIDENTAL POLLUTION

2.2.1 Objectives

The long term objective of the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC) activities within CAMP Albania was the setting up of an effective national system for preparedness for, and response to, marine pollution incidents. In order to achieve this main objective several short term objectives were defined as follows: development of the legal and institutional framework for dealing with marine pollution incidents; preparation of national and related local contingency plans; training of pollution response personnel; and assistance in acquisition of essential dedicated pollution response equipment.

2.2.2 Activities

Preliminary contacts between REMPEC and the Albanian authorities, aimed at assisting Albania in building its accidental marine pollution response capacity, started in 1991/92 through participants in training courses organized by REMPEC.

When the Coastal Areas Management Programme (CAMP) for Albania was launched by MAP, following the MEDU mission to the country in May 1992, REMPEC prepared in July 1992 the first draft proposal of its contribution to the programme.

During the meeting of REMPEC Focal Points (Malta, 22 -26 September 1992) REMPEC reported on the exploratory talks which had taken place with the Albanian Focal Points with a view to initiating actions for providing assistance to the Albanian authorities in developing its “national organization for preparedness and response”. The Albanian delegation at the meeting put forward a request for REMPEC's assistance in this field and the meeting took note of it.

Talks held with the members of the Albanian delegation at the meeting led to identifying the lack of national legislation related to preparedness for, and response to, accidental marine pollution, and consequently the lack of a necessary institutional framework for the implementation of any activities in these fields, as the main obstacle in building the national spill response capacity.

Other questions indicated as those needed to be addressed as priority included: increasing the level of awareness of accidental marine pollution problems (from environmental, economic and organizational point of view) among national authorities; training of spill response personnel (at various levels); and the complete lack of spill response equipment and products in the country.

On the same occasion, the Albanian delegation invited the Director of REMPEC to visit Albania as soon as possible. A written invitation from the Albanian Focal Point was received on 30 October 1992 and the Director of REMPEC visited Albania between 21 and 24 November 1992.

On the basis of talks held with the Albanian authorities and with the Albanian delegation at the Focal Points meeting, REMPEC formulated that part of the draft CAMP document referring to its contribution to the programme.

The revised text, included in the December 1992 version of "CAMP Albania Draft Agreement", concentrated on the setting up of a national system for preparedness and response to accidental marine pollution, comprising the preparation of a National Contingency Plan. Activities leading to achieving this main objective were listed, and included:

- assistance in drafting the legal act establishing the national organization;
- organization of a seminar for decision-makers;
- assistance in the preparation of contingency plans (national, district and local plans);
- preparation of a project to be submitted to donor agencies for the acquisition of equipment;
- conduction of a training course for on-scene commanders;
- conduction of a training course for response personnel; and
- national exercise.

A workplan and tentative timetable were prepared in accordance with these goals.

Since the building of a legal and institutional structure was considered as essential for the undertaking of any other activities and the setting up of a national system, absolute priority was given to the drafting of a legal act concerning preparedness and response to accidental marine pollution.

It was agreed that the first draft would be prepared by Albanian experts on the basis of a document specifically prepared by REMPEC to serve as guidelines: "Development of a National System for Preparedness and Response to Accidental Marine Pollution". REMPEC also provided the Albanian authorities with copies of French and Italian legal acts concerning the establishment of their respective national systems.

The draft document prepared by Albanian experts was submitted to REMPEC at the beginning of March 1993. This draft was thoroughly revised and completed with two annexes during a visit to REMPEC by two Albanian officials between 10 and 13 March 1993. As a result of this working session, REMPEC submitted the completely revised draft text entitled "Decree Concerning the Organization of the Public Authorities for the Preparedness and Response to accidental marine pollution", which included Annex I "The List of Ministries, Governmental Departments and Other Pars of Administration and Industry, Taking Part in the National System for Preparedness and Response and their Respective Roles", and Annex II "The Outline of the National Contingency Plan" in March and April 1993 to the Albanian national focal points.

On 21 July 1993, following the proposal of the Ministry of Health and Environment Protection, the Council of Ministries of the Republic of Albania approved the decision concerning the National Contingency Plan for the protection from pollution of maritime waters and coastal zones (Decision No. 379 of 21 July 1993). The English version of this legal document, which the Centre received on 30 August 1993, was a very slightly modified text prepared by Albanian experts and REMPEC during their mission to Malta in March 1993.

In August and September 1993, REMPEC established a series of informal contacts with the officials of the Italian Ministry of Merchant Marine, which was considered to be the most likely institution which could offer its assistance to the Albanian authorities in completing the National Contingency Plan, and in particular, its operational part and technical annexes.

In October 1993, the Centre was informed by the Coordinating Unit of MAP that the agreement relative to the CAMP for Albania had been signed by the Albanian Government on 23 September 1993.

Simultaneously with the CAMP related activities, REMPEC continued to support the process of

capacity building in Albania, by facilitating the preparatory work carried out by the Albanian authorities in relation to Albanian membership in IMO and in its accession to some of the international conventions for which IMO acts as depositary. In particular it refers to assistance in establishing contacts with the IOPC Fund which led to the subsequent accession of Albania to the CLC and Fund Conventions in 1994.

According to the workplan of activities included in the adopted version of the CAMP Agreement, the next planned activity was the organization of a workshop for decision-makers, aimed at familiarizing key personnel from various governmental institutions and services, as well as from the shipping and oil industry, with the main concepts of accidental marine pollution preparedness and response.

Unfortunately, due to lack of funds, the organization of the planned workshop (seminar) started only in December 1994.

Following the identification and selection of suitable lecturers and the preparation of the necessary written materials and audio-visual aids by REMPEC, the seminar for decision-makers and government officials representing national authorities designated to take part in accidental marine pollution preparedness and response activities was organized in Tirana between 13 and 15 February 1995. Logistic support for the seminar was provided by the staff of the Directorate for Maritime Transport, Ministry of Industry, Transport and Trade, who were also responsible for the invitation of the participants.

The seminar was attended by 27 participants from various ministries, the army, regional agencies of the Committee of Environment Protection, port authorities, the shipping industry and the oil industry.

In order to achieve the main objective of the seminar, which was to familiarize the participants with the basic concepts of accidental marine pollution preparedness and response, particular importance was given to the organizational, administrative and financial aspects of setting up an effective national pollution preparedness and response system, with emphasis on contingency planning. Another objective was to present the existing international regulations and regimes for responding to major pollution incidents, including cooperation at regional and global levels. Although the seminar was not of a technical nature, the third objective was to outline the basic elements of spill response technology.

During the discussion at the end of the seminar, the participants reconfirmed that the principal activities in which REMPEC could assist competent national authorities were those already identified in the CAMP agreement, namely:

- preparation of the operational part of the national contingency plan including risk assessment and defining priorities for protection;

- identification of adequate pollution response equipment and potential sources of financial assistance for its acquisition;

- training of pollution response personnel at different levels; and

- cooperation with neighbouring countries through bilateral or subregional agreements.

In November 1995, REMPEC defined draft terms of reference for the consultant(s) who would assist the national authorities in the preparation of a draft national operational contingency plan and related district local plans.

An expert was identified and is expected to undertake the mission to the country in the first half of 1996 and to prepare a detailed project covering these activities.

Simultaneously, a training course for personnel in charge of command and coordination of response activities (on-scene commanders) is currently under preparation and is expected to take place in Albania (the place is to be identified) in the second half of May 1996. The possibility of using materials developed by IMO for this type of training course is being investigated.

The organization of the planned training course for response personnel who will be directly involved in spill clean-up operations, with an emphasis on various oil spill response techniques, will clearly depend on the availability of funds. However, it is planned to conduct this course, if possible, in 1997.

The identification of specifically designed oil spill combatting equipment and products, considered necessary for initial response to marine pollution incidents, will be carried out as part of the process of preparation of the operational part of the national contingency plan. Since the funds necessary for purchase of such equipment will most likely have to be provided by an external donor agency, REMPEC intends, as soon as the basic requirements have been defined, to assist Albanian authorities in approaching potential donors with a view to obtaining financial assistance for setting up a national stockpile. Preparation of the necessary project documentation for submission to potential donor agencies is expected to be finalized approximately 3-4 months after the submission by the consultant of the project for the completion of the operational part of the national contingency plan and related district and local plans. It is envisaged that the proposal for the acquisition of equipment, together with the necessary technical specification will be ready in 1997.

It is expected that the training activities planned within the framework of setting up the national preparedness and response system under the present CAMP will be completed in 1997, however the planned national exercise could be organized only after the spill response equipment is acquired by the Albanian authorities. At this stage it is not possible to envisage when the exercise could be held.

2.2.3 Conclusions

Building and consolidating an effective national system for preparedness for, and response to, marine pollution incidents is a complex and continuous process. It comprises: setting up the organizational framework for dealing with marine pollution incidents, based on the political decision to do so; preparation of a national contingency plan and related local contingency plans; training personnel designated to respond to pollution incidents; and acquisition of basic pollution response equipment and products.

The analysis of the situation regarding preparedness for response to accidental marine pollution in Albania in 1992, before the start of the project, revealed a complete lack of any of the above listed elements. Accordingly, REMPEC prepared the programme of activities which would address all these issues and lead to the building of a national system as the main objective, while comprising several separate objectives such as: setting up the legal and institutional framework for oil spill response at national and local levels; preparation of a national contingency plan; training of key personnel; and facilitation of the identification and procurement of the necessary equipment.

To date the first of these separate objectives has been achieved in full, while the second and third ones have been realized partially, and are expected to be completed in approximately one year's time.

In particular, in the preparation of the operational part of the national contingency plan (defining priorities for protection from the environmental and economic points of view, risk assessment, forecasting spilled oil movement, fate and behaviour, etc.), REMPEC intends to extensively use the work carried out in the framework of CAMP Albania by other MAP components.

The main objective of current REMPEC activities in Albania, i.e. achieving the desired level of preparedness for facing a major marine pollution incident, will eventually depend on the acquisition of the essential spill response equipment by national authorities. While REMPEC will assist the competent Albanian authorities in identifying the required equipment and products, drawing its technical specifications and in approaching suitable donor agencies, the procurement of this equipment will depend entirely on the availability of external financial responses.

2.3 SPECIALLY PROTECTED AREAS (SPA) AND IMPLEMENTATION OF SPA PROTOCOL

2.3.1 Objectives

The overall, long term objective of the activity was the protection and conservation of the Albanian natural heritage in the coastal area, through an effective implementation of the SPA Protocol and the integration of conservation issues in planning policies for the development of the coastal area.

In the short-term, the activity was aimed at identifying solutions to urgent environmental problems which could be implemented immediately.

To this end, the activity has been mainly directed to:

- the identification of the main threats for the conservation of the natural heritage;
- the analysis and identification of shortcomings at legal and institutional levels;
- the identification of priority sites for conservation and protection; and
- the identification and recommendation of immediate and long-term actions.

2.3.2 Main Actions Undertaken

Following the signing of the CAMP Agreement, a first mission to Albania was carried out by an expert from the Regional Activity Centre for Specially Protected Areas (SPA/RAC), from 6 to 8 December 1993. The main results of the mission were (i) the establishment of a multidisciplinary working team of national experts, and (ii) the definition of a working methodology for the implementation of the activity.

The agreed methodology provided for the implementation of the activity in three distinct phases:

- collection of the available documentation and information;
- specific field studies, aimed at completing the missing information; and
- synthesis and production of the final report.

With the aim of coordinating the activity with the concomitant project for the integrated management of the coastal zone financed under the METAP Programme and concerning the northern and southern sectors of the Albanian coast, action was focused on the central coastal sector (from Cape Rodoni to the Bay of Vlora) in the implementation of the first two phases. Aiming at consistency of the outputs produced, efforts were made towards the involvement of the same experts in the two activities and an agreement concerning the full exchange of information between the respective working teams was promoted.

Coordination was also promoted with some related activities within the CAMP, in particular with the activity “Integrated Coastal Area Management of the Durres-Vlora Region”. To this end, regular exchange of information and documents was undertaken with the Priority Actions Programme/Regional Activity Centre in Split.

The activity of the interdisciplinary team of national experts represented the main counterpart contribution of Albania to this CAMP activity. The following experts were selected as members of the team:

Mr. Leke Gjiknuri	Faculty of Natural Sciences (Team Coordinator)
Mr. Ferdinand Bego	Faculty of Natural Sciences
Mr. Alfred Mullai	Institute of Biological Research
Mr. Arian Gace	Committee of Environmental Protection
Mr. Equerem Kapidani	Institute of Fisheries
Mr. Fatmir Lacaj	Institute of Forestry Research
Ms. Miranda Haxhiu	National Planning Institute
Mr. Sokol Kongoli	Ministry of Tourism

The team participated in all phases of the implementation of the activity. Its work included:

- the collection of available relevant documentation and information;

- field studies of sites of major value for biodiversity conservation in the central coastal sector of the Albanian coast;

- the production of an activity report; and

- the contribution to the preparation of the final report of the activity.

The activity of the team was supported by a mission of international experts to Albania in December 1994. Participating experts were Mr. Marco Barbieri (SPA/RAC expert) and Mr. Tobias Salathé (wetland expert, SPA/RAC consultant). The mission was mainly aimed at considering aspects of wise use and conservation of coastal wetlands in the central coastal sector of Albania. A mission report prepared by Mr. Salathé was the main output of the mission.

The activity is expected to be concluded by the production of a final report, whose preparation is in an advanced stage at the moment of the drawing up of the present report. SPA/RAC and the Committee for Environmental Protection (CEP) agreed that the final report should cover the whole Albanian coast, as provided in the CAMP Agreement. To this end, the final report integrates the various relevant reports and studies produced in the framework of the CAMP and METAP project. The preparation of the final report was entrusted to one of the international experts who also participated in the METAP project, Mr. Alain Jeudy de Grissac. A first mission to Albania was realized by him, and was mainly aimed at discussing the structure and content of the report with the national experts and CEP, and at visiting the sites of the central coastal sector identified in the previous phases. A preliminary version of the report prepared by the consultant and cleared by SPA/RAC was sent for comments to the relevant national authorities and to Albanian experts, and then presented and discussed at a synthesis meeting (Tirana, 21 December 1995) with the concerned Albanian authorities, the national experts and SPA/RAC. A revised version of the report reflecting the conclusions and recommendation of the meeting was prepared by Mr. de Grissac, cleared by SPA/RAC and submitted to the relevant authorities and experts for possible further comments.

Continuous support to the implementation of the activity was granted by the CEP, national coordinator of the CAMP for Albania. It selected the members of the team of national experts, ensured liaison with the concerned Albanian institutions and authorities, and provided technical and logistical support to the work of the experts.

2.3.3 Brief Description of the Main Outputs of the Activity

Three main outputs have been produced in the implementation of the activity:

- Conservation and wise use of lagoons and coastal wetlands - Central coastal sector: from Lalzi Bay to Vlora Bay. This report was prepared by Tobias Salathé following the above-mentioned mission to Albania in December 1994. Four main wetland complexes are identified and considered in the study area, namely:

  - Lalzi Bay with Erzeni Delta;
  - Shkumbrini and Semani Deltas with Karavasta Lagoon;
  - Vjosë Delta and Narta Lagoon; and
  - Pasha-Limani Lagoon.

  These wetland areas are singled out and analysed according to the concept of Environmentally Sensitive Areas (ESAs), the criteria for the identification of an ESA including high ecosystem complexity and functional value, rich biological diversity, important natural resources for consumptive and non-consumptive human uses, and the need for integrated development planning. On the basis of an analysis of main biological values and ecological functions, existing and potential conflicts of human uses, present conservation status and constraints for conservation, the report provides for each area proposals and recommendations concerning the most urgent management and conservation issues. Finally, a preliminary pragmatic planning proposal is provided for the four proposed wetland ESAs in the form of zoning schemes.

- Conservation and protection of coastal sites in Albania - Central coastal sector: from Lalzi Bay to Vlora Bay. This report constitutes the synthesis of the work carried out by the interdisciplinary team of national experts on the central coastal sector. The report includes two section:

  - the first section consists of a synthesis of background information collected by the team, and deals with the following main aspects in relation to the Albanian coastal area: geographical features, geomorphology, geology, pedology, climatology, hydrology, mineral resources and soil, natural ecosystems, human activities and impacts (demography, industry, agriculture, fishery, infrastructure, tourism), legislation and administration;
  - the second section provides for descriptive files of the coastal sites singled out for their conservation interest, namely:
    - Lalzi Bay;
    - Lagjit Cape;
    - Karavasta-Divjaka;
    - Pishe-Poro pine forest, Viosa River mouth and Narta Lagoon; and
    - Orikum Lagoon.

For each site, a description of the main natural and cultural values is given, human uses are analysed, and recommendations are made concerning the protection status, conservation and management of the different areas. Proposals for development planning are made in the form of zoning schemes; and

- Coastal Zone Management Plan for Albania - biodiversity component. (Final report of the activity). As opposed to the previous ones, this report (not yet in its final version at the time of the preparation of the present report) deals with the conservation/ protection of sites of ecological and aesthetical value of the whole coastal area of Albania. To this end, it integrates the results and proposals of reports and studies produced in the framework of the CAMP and the above mentioned METAP project. The report includes: (i) a section on the legal and institutional framework; (ii) a definition of the coastal zone management units; (iii) a definition and description of the sites of interest; (iv) a diagnosis of the main environmental issues and threats affecting these sites; (v) a selection of the national priorities for conservation; and (vi) recommendations for action.

2.3.4 Main Results, Conclusions and Recommendations (as per the final report of the activity)

2.3.4.1 Sites of Interest

In the whole Albanian coastal area, 19 sites have been identified by the different missions as the most interesting due to the association of their biodiversity, landscape and cultural features. They are (from north to south):

1. Velipoja
2. Renci Mountain
3. Kune Vain
4. Fushe Kuge Patok
5. Rodoni Cape
6. Rrushkulli Lagoon
7. Lagji Cape
8. Divjaka-Karavasta
9. Narta Lagoon
10. Vlora Bay
11. Orikumi Lagoon
12. Sazani-Karaburuni
13. Kanali-Llogara
14. Vunoi-Jala
15. Porto Palermo
16. Kakomese Bay
17. Lake Butrinti
18. Ksamil Islands
19. Stillo Island and Cape

A substantial amount of information was collected on the different sites by the various missions, which is synthesized in the site descriptive files included in the final report.

2.3.4.2 Main Problems and threats

At the national level, the main issues related to environment conservation are identified in the inadequacy of the legal, policy and institutional frameworks. The lack of a comprehensive law on nature and biodiversity conservation is the main problem as far as legislation is concerned. Due to the lack of a clear legislation framework, overlapping of competencies in the field of administration frequently occurs. The shortage of trained personnel is another major issue at the institutional level. Other issues related to nature conservation are the lack or incompleteness of national strategies concerning, in particular, the conservation of biodiversity, tourism development, pollution control, exploitation of natural resources, and criteria for land compensation.

At the local level, while the identified sites in most cases turned out to be still in good conditions of conservation, all of them are, however, threatened, and in some cases already heavily affected by a number of threats. The main identified threats at the site level are synthetically illustrated in Table 8.

2.3.4.3 Selection of Priority Sites for Conservation

Among the 19 identified coastal sites, a reduced number of priorities have been identified. This exercise was carried out with the team of national experts during the preparation of the final report, on the basis of the criteria for the selection of areas of intervention for the conservation of biodiversity in the Mediterranean basin, developed in 1990 by a group of experts from Mediterranean countries, SPA/RAC and IUCN.

From north to south, the priority areas identified are:

- Kune-Vaïn Lagoons;
- the association of Divjaka forest and of Karavasta Lagoon;
- Narta Lagoon;
- Vlora Bay; and
- the association of Sazani island and Karaburum peninsula.

2.3.4.4 Recommendations for Action

In order to attain the objective of nature/biodiversity conservation in the coastal area of Albania, a series of actions at the national/regional (district) and at the site levels are recommended. These are synthetically illustrated in Tables 9 and 10 hereafter.

TABLE 8

MAIN THREATS FOR EACH SITE QUOTED*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Population and land use																			
- immigration	!																		
- emigration																	!		
- land compensation							!		!										
- land reclamation	!			!							!						!		
Pollution																			
- agriculture (pestic., fertil.)	!			!						!	!			!	!	!			
- urban wastes (liquid and solid)	!		!	!				!		!				!	!	!	!	!	
- industrial (chemical, paper, etc.)	!		!							!									
Water																			
- uncontrolled pumping	!		!						!										
- water circulation in lagoons			!						!		!						!		
- sea, river and lagoon pollution	!		!	!				!		!				!	!	!	!	!	
Erosion																			
- coastal erosion	!		!	!				!	!	!				!	!	!			
- sand (gravel, mud) extraction	!			!										!	!	!	!		
Un- or poorly planned infrastructure	!		!			!	!			!	!	!				!	!	!	
- urban, touristic development	!	!	!		!			!		!						!		!	
- coastal roads or harbours																			
Illegal activities																			
- forest degradation (fire, fuelwood)	!	!	!	!	!	!		!	!	!		!	!	!	!	!	!	!	!
- hunting	!		!	!		!			!				!	!	!	!	!	!	!
- fishing (dynamite, diving,	!	!	!	!	!	!				!		!	!	!	!	!		!	!
trawling)	!	!			!							!	!	!	!	!	!	!	!
- looting of archaeological remains	!		!			!	!			!	!	!				!	!	!	
- illegal buildings																			

* For names of sites for numbers 1 to 19 see page 20

TABLE 9

NATIONAL/REGIONAL ACTION REQUIRED FOR BIODIVERSITY CONSERVATION AND VALORISATION

Legislation	Final version of the Law on Environment and adoption (including EIA procedures, pollution control, etc); preparation and adoption of the Nature Conservation Law.
Institutional strengthening	Establish a coordinating body including ministries of health and environment, agriculture construction and tourism, defence and coastal districts for the integrated management of the coastal resources.
Coastal land tenure policy	Keep under government control the biodiversity areas. Define the public maritime domain area and responsible authority.
Land compensation policy	Adopt criteria for land compensation policy.
Coastal water resources policy	Develop a policy for coastal zone water resources evaluation and uses respecting biodiversity areas.
Coastal erosion programme	Prepare and implement a coastal erosion programme including monitoring, conservation and restoration actions (use bunkers).
Tourism policy	Harmonise and orient tourism policy according to other policies, in particular the Coastal Protection Belt.
Marine policy	Create a coordinating unit for coastal planning including defence, fisheries, tourism, etc., for sustainable use of the marine environment.
Forest restoration	Prepare and implement a programme for the restoration and conservation of the coastal forests.
Staffing	Proposal for the number and professional qualification of staff required to implement management policies.
Training	Plan training courses/seminars for project coordination and implementation.
Enforcement	Proposal for staffing, technical equipment and training to implement environmental policy and regulations.
Funding	Identify necessary funds and sources for project planning and implementation.

TABLE 10

DISTRICT SITE ACTION REQUIRED FOR BIODIVERSITY CONSERVATION AND VALORISATION

District Site	Biodiversity protection	Activities, tourism	Infrastructure
Skhodra 1. Velipoja 2. Renci Mountain	1. Nature game and marine reserve 2. Protected landscape	Beach, nautical tourism, bird watching, ecotourism, trekking, fisheries, offshore fishing	Village accommodation, local transport by land or sea, improvement of Shengjin harbour for sailing activities
Lezha 3. Kune-Vain	3. Nature reserve and game reserve	Ecotourism, bird watching, historical remains, fisheries, aquaculture	Village accommodation, local transport
Laci 4. Fushe Kuge Patok	4. Nature reserve and game reserve	Ecotourism, bird watching, fisheries	Village accommodation, local transport
Durres 5. Rodoni Cape	5. Multiple use area or biosphere reserve, marine reserve, protected landscape and seascape	Ecotourism, trekking, cultural heritage, diving, snorkeling, sailing, fishing, agriculture	Support to traditional agriculture, village accommodation, improvement of tracks, transport by 4x4 or boat
Kvaja 6. Rrushkulli Lagoon 7. Lagji Cape	6. Nature reserve and game reserve 7. Multiple use area, biosphere reserve, protected landscape and seascape	Ecotourism, trekking, cultural heritage, diving, snorkeling, sailing, fishing, bird watching, fisheries, agriculture	Support to traditional agriculture, village accommodation, improvement of tracks
Lushinja 8. Divjaka-Karavasta	8. National part	All activities respecting the status of National Park, defined by the board, including sustainable human activities.	Accommodation in small units in the surrounding villages, amelioration of the access network after EIA
Vlora 9. Narta Lagoon 10. Vlora Bay 11. Orikumi Lagoon 12. Sazani-Karaburuni 13. Kanali-Llogara 14. Vunoi-Jala 15. Porto Palermo	9. Nature reserve and multiple use area 10. Marine reserve (and national park) 11. Nature reserve (and national park) 12. National park 13. National park 14. Protected landscape/nature reserve 15. Multiple use area	All activities respecting the status of National Park, to be defined by the board, including sustainable human activities such as agriculture, fisheries. Licence from the board to tourism companies including diving, sailing, trekking activities.	Creation of a management unit at the district level. Improvement of the national and international connections by air (airport), by road and by boat. Amelioration of the touristic facilities in and around Vlora. Sailing facilities in Vlora and Porto Palermo.
Saranda 16. Kakomese Bay - Qefalit 17. Lake Butrinti 18. Ksamil Islands 19. Stillo Island and Cape	16. Protected landscape and seascape 17. Nature reserve, multiple use area 18. Marine reserve, multiple use area 19. Marine reserve, nature reserve	Ecotourism, cultural features, sailing, snorkeling, diving, fisheries, aquaculture and agriculture. Visit of the coast from Saranda.	Better national and international connections (air, maritime and roads). Improve accommodation in Saranda, development of village facilities.

2.4 MONITORING OF MARINE POLLUTION

2.4.1. Background

The Adriatic and the Ionian Albanian coast extends for a length of 429 km. The mean annual input from the whole Albanian hydrographic catchment is calculated at about 1300 m^3/sec. Along the coast there are several lagoons with a total surface of 150 km^2 that together with complex deltaic formations form a highly diverse ecosystem with great natural, economic and tourist values. A proper management of the marine waters asks for a regular monitoring of the water quality and for inventory of pollution sources (industrial and urban discharges, agricultural activities).

The Governement of Albania as Contracting Party to the Convention for the Protection of the Mediterranean Sea against Pollution and its Related Protocols and UNEP, as the Secretariat to the Convention, have an Agrement on the National Monitoring Programme for Albania. The legal obligations of the Contracting Parties to the Convention require the establishment of a pollution monitoring system in the Mediterranean Sea.

Albania has ratified the Barcelona Convention with all its Protocols. In accordance with the obligations of this Convention and in collaboration with the Mediterranean Action Plan, in the framework of the MED POL since 1992 Albania has started a Monitoring Programme for the marine waters.

2.4.2. Objectives

The monitoring network is distributed along the coastline giving information for the water quality of the beaches, harbors, lagoons and river mouths. The monitored parameters include chemical and bacteriological pollutionof the marine waters.

The main parameters selected are heavy metals and halogenated hydrocarbons (in biota and sediments) and faecal coliforms, with a frequency of sampling of twice a year. In the bathing areas, faecal coliforms will be determined seasonally while during the summer season the frequency will increase to twice a month.

The Albanian MED POL National Monitoring Programme includes 73 stations distributed in six areas (districts). These stations cover sources of pollution (9), general coastal and estuarine areas (24), and bathing areas (40).

Six are the institutes selected to participate inthe Monitoring Programme.

2.4.3. Main results

According to the values of the monitored chemical parameters (Table 11), the quality of the coastal marine waters of Albania is not influenced by the discharges of the different communal sources. At the same time, these values show that marine waters are at the lowest trophic level i.e. oligotrophy.

TABLE 11

AVERAGE VALUES FOR SOME CHEMICAL POLLUTANTS
(in mg/l)

Location	Index							
	O_2	NBO	LST	NO_2	NH_4	NO_3	PO_4	P total
Lezha	6.95	0.85	8.4	0.002	none	none	none	none
Durres	7.05	0.39	4.2	none	none	none	none	none
Lushnje	7.30	1.05	6.4	0.001	none	0.002	none	none
Fieri	8.32	0.37	10.0	0.005	none	0.060	none	none
Vlora	8.02	0.50	6.0	0.004	none	0.006	none	none
Saranda	7.40	1.48	1.0	0.001	none	0.092	none	none

As a part of othis monitoring programme the recording of the pollution levels by heavy metals (mercury, cadmium, lead, copper, chromium, zinc, mangan and iron) in sediments and biota is given in Table 12.

TABLE 12

AVERAGE VALUES OF THE HEAVY METALS OF THE MARINE SEDIMENTS
(in mg/kg dry weight)

Location	Index								
	Hg	Cd	Pb	Cu	Cr	Zn	Ni	Mn	Fe
Lezha	0.070	0.136	11.4	255.1	401.1	134.9	310.7	975	61.2
Durres	0.129	0.445	29.3	100.7	263.0	65.9	189.9	614	24.2
Lushnja	0,079	0.251	14.9	63.1	283.0	95.4	376.0	470.0	57.8
Fier	0.053	0.186	14.5	31.6	298.0	122.0	303.0	499.0	44.5
Vlora	0.773	-	-	33.6	314.0	47.6	-	512.0	35.1
Saranda	0.041	0.272	-	47.1	215.0	108.0	216.0	410.0	33.3

Judging on the reported values, it results that the level of heavy metals in t he majority of samplesis comparable with values in other less polluted areas of the Northern and Central Adriatic. Only in some of them the reported values are similar to values of the polluted areas of some ports of the Adriatic Sea.

The study of microbiological pollution of coastal bathing waters is realized carrying out the analysis of sea water samples in areas of the main beaches. Also the sources and causes of microbiological pollution of these areas are identified (Table 13).

TABLE 13

RESULTS OF THE AVERAGE MINIMAL AND MAXIMAL VALUES OF THE FAECAL COLIFORMS FOR SOME OF THE MAIN ALBANIAN BEACHES (FC/100 ml)

Beach area	Faecal pollution indicator	Average maximum values	Average minimal values
Shengjin	FC/100 ml	130	4
Durres	FC/100 ml	1750	123
Vlora	FC/100 ml	4183	430
Dhermiu	FC/100 ml	23	0
Himara	FC/100 ml	155	16
Borshi	FC/100 ml	32	0
Saranda	FC/100 ml	2075	275

In the coastal areas, close to the main urban centers that have a great density of population and tourist activities (Durres, Vlora and Saranda) are recorded hhigh levels of microbiology load. Other areas and beaches (Shengjin, Felipojo, Patok, Divjako, Borsh, Dhermi, Himara, etc.) that are far from the inhabited areas the sea water is very clean and insome areas the levelof pollution can be considered even as zero.

The evaluation of the microbiological pollution is based in the international standards recommended by WHO/UNEP for the year 1985. The recommended values for this parameter range between 100-1000 FC/100 ml.

2.4.4. Conclusions

As previously mentioned the reported values represent the pollution levels of the coastal waters in the Albanian coast close to the main urban centers which represents only a small portion of the Albanian coastline. The rest of it is naturally clean, since the coastal environment is not affected by economical and tourist activities.

Every year, the results of the monitoring programme carried out by the Albanian insitutions involved in this programme are sent to the Coordinating Unit for the Mediterranean Action Plan based in Athens. These results are also represented in three papers by Albanian specialists inthe occasion of the International Conference on Chemistry of the Mediterranean held in Taranto, Italy, between may 23-27, 1995.

2.5 IMPLICATIONS OF CLIMATE CHANGE FOR THE ALBANIAN COAST

The study on the implications of expected climate change for the Albanian coast was undertaken within the framework of the CAMP for Albania. The coastal area of Albania is the most important and economically valuable part of the country from the developmental and environmental standpoint.

For this reason, a Task Team composed of national and international experts was established to analyse existing information and to evaluate the implications of predicted climate change for the Albanian coast.

The following experts were nominated as the members of the Task Team:

National Experts

Ms. Eglantina Demiraj	Hydrometeorological Institute (Team Coordinator)
Ms. Mirela Bicja	Hydrometeorological Institute
Mr. Emil Gjika	Institute of Chemical Technology
Mr. Lekë Gjiknuri	Faculty of Natural Sciences
Ms. Liri Gjoka Muçaj	Hydrometeorological Institute
Mr. Fatos Hoxha	Hydrometeorological Institute
Mr. Përparim Hoxha	Faculty of Geology and Mining
Mr. Spiro Karadumi	Institute of Forestry Research
Mr. Sokol Kongoli	Ministry of Tourism
Mr. Alfred Mullaj	Institute of Biological Research
Mr. Vangjel Mustaqi	Hydrometeorological Institute
Mr. Arjan Palluqi	Ministry of Agriculture and Food
Ms. Elvana Ruli	Physical Planning Institute
Mr. Mustafa Selfo	Ministry of Agriculture and Food
Mr. Agim Shehi	Ministry of Health and Environmental Protection
Mr. Qemal Sino	Ministry of Industry, Transport and Trade

International Experts

Mr. Ljubomir Jeftic	Mediterranean Action Plan, UNEP, Athens
Mr. Stjepan Keckes	Consultant to UNEP, Rovinj, Croatia

The Task Team considered and agreed on the time horizons 2030 and 2100, as well as on the scenarios prepared for the Albanian coastal region by the Climate Research Unit of the University of East Anglia (CRU/UEA). Three meetings of the Task Team were held in Tirana (12-14 July 1994, 21-23 March 1995 and 21-23 November 1995) at which the Team agreed on the content of the study and reviewed the progress of the work.

2.5.1 Objectives

The objectives of this study were:

- to identify and assess the possible implications of expected climate change on the terrestrial, aquatic and marine ecosystems, populations, land-use and sea-use practices, and other human activities;

- to determine the areas, systems and activities that appear to be most vulnerable to the

expected climate change;

- to make recommendations for the planning and management of coastal areas and resources, as well as for the planning and design of major infrastructural and other systems; and

- to provide an input into other projects and developments relevant to the subject of the study.

The area studied covered (based on the official division of 1990) the following districts: Shkodra, Lezha, Kruja, Durres, Tirana, Fier, Lushnja, Vlora and Saranda.

The report of the study (UNEP(OCA)/MED WG.98/2) was issued in March 1996 as the collective effort of a multidisciplinary Task Team and contains the following main chapters: (a) Analysis of the present situation; (b) Potential impacts of expected change on natural systems and socio-economic activities; and (c) Recommendations for action. This paper presents a summary of the report.

The analysis of the present situation was made on the basis of existing statistical information (wherever possible, long-term data series were used to evaluate the trend) and of overall knowledge of each economic section or ecosystem.

2.5.2 Synthesis of Findings

In many cases, the possible impacts are described qualitatively, because of the impossibility of describing them quantitatively. It was also very difficult to distinguish the impact of climate change on the socio-economic structure from the reverse, namely, the effects of human activities on climate change.

According to the scenarios of climate change by 2030, the annual temperature is expected to increase less than the global level from south (0.7-0.9°C per degree of global warming) to north (0.9-1°C) along the coast and towards the interior. The change in annual precipitation is expected to be small and decrease from north to south.

These changes and the sea level rise (+16 cm) are not expected to have any significant impact. There is a possibility that both natural and managed systems will adapt to new conditions.

The difficulties will probably arise from the expected change by 2100, taking into consideration at the same time the influence of other non-climatic factors.

The analysis of the results reveals that drought, i.e. the prolongation of dry periods during the high temperature and low-precipitation summer seasons, may be the most important direct consequence of the predicted climate change. It is expected that the temperature will increase by up to 2.8°C and precipitation decrease by up to -60%. The second most important cause or contributory factor is the predicted sea level rise of +48 cm. Both these factors may lead to, or significantly contribute to, a cascade of secondary impacts rated by the Task Team as potentially harmful, among which the following can be mentioned:

- the increase in the saline water content in aquifers and fresh water resources of the coastal area. This effect, together with the likely decrease in the recharge of aquifers as a result of the reduction in precipitation (especially during summer by 2100), will cause a shortage in drinking water of adequate quality. It is expected to become an acute problem, bearing in mind that the demand for drinking water, as well as the social and economic demands for water, are expected to increase (Blue Plan, 1995). It is possible that these demands will be greater by 2100.

  This effect will be more marked at Fushë Kuqe aquifer (which supplies the northern coastal cities as well as Durres and Kavaja with drinking water) at Durres Plain (the altitude is 0.11 m above sea level), because it became a swamp many years ago. Even after its reclamation, the soil still has a relatively high content of salt. The other zones that will be affected are Velipoja (Zadrima Plain in Shkodra) and Vlora Plain, which are near the sea with altitudes of 1.67 m and 1.83 m above sea level respectively. The same conclusion might be drawn for all parts where salty soils are located.

- the physical soil erosion, especially at the argillite and silt rocks, located mainly in the western part of Albania (Kepi i Rodonit-Durres-Kavaja region, Lushnja-Fier region, etc.).

- change of the coastline because of erosion, and increase in flooded coastal areas (ligatines) because of the sea level rise that may be expected by 2100.

  Such situations are likely to occur to the north and south (Patok) of Mati delta, to the north of Erzeni delta, in the old delta of Seman, in the zone between Seman and Vjosa and to the south of Vjosa. An increase in sea level is also expected in Ceka Lagoon, whereas in the Mati delta the formation of new ligatines is expected. Patoku Lagoon may suffer the destruction of existing barriers and a change from lagoon into sea. Rrushkull to the north of Ishmi River, once a hunting reserve, is expected to be flooded as it is situated below sea level and is separated from the sea by a low dune barrier. Karavasta and Narta Lagoons are expected to have better communications with the sea in the future. An increase in the ligatine surfaces in the zone between the rivers Vjosa and Seman is also expected.

- considerable changes in vegetation and the ecosystem around the lagoons, caused by high temperature and salinity, less dissolved oxygen, etc.

  There will be an increase in halophile-hygrophile or salt marshes and the characteristic vegetation will move towards the interior.

  Changes can be expected even in the composition of plankton and especially in its seasonal dynamics, as well as in the arrival and departure timing of migratory species.

- vegetation shifts might occur.

  The plants of the plain will extend their altitudinal range into the hilly areas and hilly plants will extend to higher altitudes. Thus there will be an extension of the area that is presently under evergreen Mediterranean vegetation at the expense of sub-Mediterranean communities. Evergreen elements of the sub-Mediterranean zone can endure warmer weather, which is beneficial to them, as opposed to sub-Mediterranean deciduous communities that do not thrive on the soil desiccation and the intensified evapotranspiration.

- significant changes in fauna composition are not expected, as animals have a capacity for adaption.

  It can also be assumed that the animal world of the coastal zone will probably expand at the cost of the mesophyllic one.

- changes in some kinds of marine life forms, with a general shift towards more thermophilic species, or their extension to the north, expected by the increase in the temperature and salinity of surface marine waters.

Many of the inhabitants of Albania's coastal zone are involved in agriculture, and thus the climate change may also have a considerable impact on the socio-economic status. The most significant predicted impacts are:

- the reduction of the extent of arable land due to soil erosion and alteration as a result of an expected increase in soil salinity, is likely to be a major problem in the future. It will be followed by an increased need for irrigation of arable land because of expected shortage of water.

  The summer, with expected higher temperatures (an increase of up to 2.8°C) and an overall decrease in precipitation (ranging from -60 to +13%), might cause major problems for agriculture, unless irrigation is properly structured. Crops that have great water demands (i.e. vegetables, olive groves, etc.) will suffer from the consequences of precipitation decrease, hence it might become necessary to plant more xerophilic crops.

- the growth cycles, harvest time and quality of agricultural production may be directly influenced by the salinisation increase, due to the sea level rise and intrusion of the salt water into the soil.

- the distribution of new harmful parasites, as well as the reduction of their evolution periods, might occur as a consequence of a temperature rise of 2-2.5°C.

- problems similar to those facing agriculture might arise for forest species. Those species that resist the high temperature and severe long dry season should adapt, probably in higher flats; those that need moisture (silver fir, etc.) are in danger of becoming limited or disappearing, and others that produce many seeds (Pinus, etc.) are likely to spread at sea level altitude.

- in forests and pastures, fires would be more frequent and much more dangerous. Also, many pests that might appear and grow in hot conditions will be much more dangerous for forest trees (*Cnethocampa pityocampa, Evetria buoliana, Limantria dispar*, etc.).

- impairment of coastal sewerage systems operated by gravitational flows, due to sea level rise, will become especially acute.

  Liquid and solid waste going directly into the sea will destroy sea flora and fauna. Without solving this problem and that of the shortage of drinking water of adequate quality, the impact of climate change would deteriorate the health conditions of the Albanian population, not only those living in the coastal zone.

- being a greater user of water and producer of both liquid and solid wastes, tourism will suffer from water shortage and impairment of sewerage systems.

- tourism will suffer from the effects on agricultural production, which also plays a part in the supply of tourism.

Among the beneficial impacts of expected climate change, the Task Team distinguished:

- decrease in energy demand for heating;

- increased potential for use of solar energy; and

- extension of tourist season into periods of the year that are presently too cold.

2.5.3 Suggestions for Action to Avoid, Mitigate and Adapt to the Predicted Effects

Air pollution is one of the biggest priority problems nowadays because of its direct negative influence on other media. In order to avoid its negative implications the following action is suggested:

- to develop new technologies to decrease CO_2 and other greenhouse gas emission in the atmosphere;

- to control and eliminate high priority pollution emissions;

- to include in the National Energy Programme the use of solar energy and other forms of renewable energies as a pure energy resource; and

- to establish an air quality monitoring system so that the information on possible increase in air contamination can be used for appropriate and timely actions.

In order to evaluate and control the erosion phenomenon, the following are recommended:

- to study the erosion phenomenon and the dynamics of the coastline, especially the Adriatic coast (it is recommended that remote sensing be applied); and

- to compile a detailed map of areas vulnerable to erosion.

It is also recommended that the following immediate engineering measures against coastal erosion be taken:

- afforestation of the Currila (Durres), Vlora, Kryevidh (Kavaja) zones;

- construction of protective step walls or pipes in zones with developed landslides, such as Kryevidh, Kepi i Rodonit, Bishti i Pallës, Shëngjin, etc.;

- setting up of artificial barriers in areas threatened by erosion in order to prevent the negative erosive effects caused by sea level rise, especially near natural protected areas (it is of great importance to preserve the Patoku lagoon);

- setting up of artificial barriers to protect arable land threatened by soil erosion and alteration;

- drainage of surface and ground waters; and

- provision for complex planning of engineering construction activities, together with comprehensive technical, economic and architectonic studies.

In order to protect the coastal area against flooding, the following are recommended:

- mapping of areas vulnerable to flooding;

- rehabilitation of the flood warning system, which is not operational; and

- control of land reclamation for reducing coastal areas susceptible to inundation.

In order to avoid the likely shortage in available drinking water, the following is suggested:

- monitoring of surface and ground water quality, and also water table elevation; and

- control of ground water exploitation to reduce subsidence.

In order to protect the natural ecosystems from the impact of climate change, the following are recommended:

- preparation of a strategy for biodiversity protection of the coastal area that may consist *inter alia* of:

    - protecting and restoring important biological areas and species;

    - preventing ecosystem loss and supporting ecosystems rehabilitation;

    - preventing large-scale tourism development without taking into account the sensitivity of ecosystems;

    - preventing the pollution load of waste water from entering the coastal wetland; and

    - developing educational programmes on protection of the environment, in particular the coastal environment, in order to increase awareness among the general population and decision-makers of the possible impact of expected climate change.

In order to avoid and mitigate the negative impacts of climate change in agriculture, for which a high rate of growth is planned in coming years, the following recommendations are made:

- development of a modern irrigation system to make rational use of available water in the future climate conditions;

- installation of pumping stations with higher specific discharge to protect arable land threatened by the expected increase in salinity; and

- planning of agricultural production that must adapt to the higher winter and summer temperatures and scarcity of water in summer. Agricultural development should be adapted to enhanced winter production and to species that might adjust to the expected soil and atmospheric conditions (increased temperature and evaporation, scarcity of

precipitation, increased salinity, pests, etc.).

Among the recommendations to avoid, mitigate and adapt to the predicted effects from the forestry point of view, the following recommendations are made:

- proposals for government actions to support the increase and development of mixed forests resistant to the new climate conditions;

- cultivation of big seed forest species, which are likely to occupy other territories, as well as other forest species more resistant to drought, fires, pests, shortage of ground water recharge, increase in salinity, etc.;

- preparation of management plans on the sustainable development of forests in harmonization with the development of other branches of the economy; and

- undertaking of studies on the dynamics of forest fires, on the rehabilitation of existing forests, and on damage that pests might cause in future climatic conditions.

As tourism will be one of Albania's main activities, a more detailed study on the implications of climate change on tourism activities is proposed. The following recommendations are made:

- to develop environmentally sensitive tourism that is not only sensitive to coastal and marine habitats, but which also enhances their quality;

- to take preventive measures to protect existing tourist structures against sea level rise and to design new structures, as well as marinas, taking into account the expected climate conditions; and

- to study (e.g. an appraisal of the negative impacts of mass tourism) and plan the integration of tourism with other activities, because problems created by coastal tourism involve employment, communications, water and food supplies, etc.

It is very important to take the following measures in the health and sanitation field:

- exercise of permanent control of water supply and sewerage systems affected by saltwater corrosion and intrusion;

- improvement of sewerage system in existing and new settlements;

- establishment of treatment systems for urban and industrial wastes; and

- improvement of the awareness of the health culture of the resident population as well as of the tourists, informing them of the possible noxious influence of the environment (e.g. excessive sunbathing), especially on individuals with premorbid conditions or with existing diseases.

To protect the population from the negative impacts of climate it is important to:

- control population movement so that it is far from areas threatened by sea level rise and vulnerable to flooding;

- prepare another scenario to evaluate what is expected to happen with the population's activities possibly orienting them towards fishery, tourism, aquaculture, etc.); and

- prepare better zoning proposals and a land use plan based on this new scenario to be used as basic guidelines for future developments.

2.5.4 Suggestions for Following-up the Present Study

In order to prevent and mitigate the impacts of expected climate change in a timely manner, the Task Team recommends, *inter alia,* a number of activities that ought to be undertaken and should be part of national plans and strategies:

- a strategy for the timely prevention and avoidance of the impact of climate changes, keeping in mind the continuity of the change;

- establishment of a monitoring system to observe the impact of climate change on human activity;

- preparation of local inventories of impacts due to temperature, precipitation change and sea level rise and the effects on water, ecosystems and socio-economic activities. The precise areas that could be affected by climate change will be identified;

- the impact of climate change must be taken into consideration in integrated planning;

- all levels of economic and political decision-makers must be informed of the possible consequences of climate change and the need to take the necessary steps to mitigate them;

- the use of renewable energy, as a resource that does not cause pollution, should have priority; and

- the feasibility of expenditures on mitigation and the vulnerable effects of climate change should be assessed through cost-benefit analysis.

2.6 MONITORING OF COASTLINE CHANGES THROUGH SPACE REMOTE SENSING

In the framework of the CAMP for Albania started in 1994, the Centro di Telerilevamento Mediterraneo - Regional Activity Centre for Environment Remote Sensing (CTM-RAC/ERS), in cooperation with the Institute of Hydraulic Engineering of the University of Palermo, carried out a study on coastal evolution in a central region of Albania - more precisely in the area of the Karavasta Lagoon, between the Shkumbini and Semani rivers. This coastal strip is of paramount importance to Albanian development plans, since tourism growth in that area, along with the build-up of receptive infrastructures and relevant facilities, is considered a priority target for the country (8,9). In the inland part, land resettling will also be planned, devoting specific attention to agricultural practices and reforestation initiatives. Moreover, this area will be concerned with the implementation of a specific management programme in the framework of the RAMSAR Convention (6), in order to preserve its natural resources and reduce the anthropic pressure.

The Institute of Hydrometeorology of Tirana, indicated as the Albanian technical counterpart of CTM-RAC/ERS, has been involved in different phases of the work, and Mr. Nuri, Director of the institute, has been introduced to remote sensing and GIS techniques, while he provided useful information and documents (1,3,5,7) for the good accomplishment of the programme. This paper presents an abstract of the draft document RAC/ERS/AL1, 30 October 1995, presented to Albanian authorities in Tirana, 6-7 November 1995.

2.6.1 Main Objectives

In order to provide the Albanian authorities with an “experimental module” for the analysis of coastal issues, based on the analysis of multi-annual data derived from existing cartography and recent satellite images devoted to supplying useful information for the planning and sustainable management of coastal areas, RAC/ERS' programme was aimed at:

- the implementation of a database, including remotely sensed and cartographic information;

- the support of updated spatial data useful for other present and future programmes and research;

- the interpretations of the observed phenomena through the integration of further available environmental data and Albanian expertise;

- the introduction of remote sensing techniques and their environmental applications to some Albanian experts; and

- the working-out of an effective monitoring tool, through the acquisition of updated satellite data, for effective control of coastal changes due to anthropic and/or natural causes, which could take place in the same region and in the whole Albanian coast.

Furthermore, this study has attempted to stress the potentialities of the effectiveness of satellite remote sensing techniques in the implementation of comparative analysis (2) devoted to the interpretation of complex coastal phenomena, ensuring the continuous monitoring of them.

2.6.2 Material And Methods

In order to assess the evolutionary trends in this area during the last 50 years, the cartography relevant to 1937 at 1:50.000 scale (5 sheets) issued by the Italian Military Institute of Geography, and the most recent official cartography relevant to 1983-84 at 1:25.000 published by the Albanian Military Institute of Topography (9 sheets), which covered the area stretching between the Shkumbini and Semani rivers, were taken into account.

The present data, however, were derived from the analysis of two SPOT panchromatic images, relevant to different periods (15 October 1988 and 30 July 1992). The SPOT satellites are polar sun-synchronous with an altitude of 832 km and a repeating cycle of 26 days. Two kinds of sensors are installed on each platform (HRV with multi spectral mode and panchromatic mode; DORIS for the determination of precise orbits). The SPOT panchromatic images, with a spatial resolution of 10 m, appear to be one of the most appropriate tools to provide information useful for multi temporal analysis of coastal changes and to attempt to estimate variations in speed.

All the operations for acquisition, transformation and integration of cartographic elements have been performed through the GIS Arc-Info. The basic cartographic elements extracted from the cartographical materials were relevant to:

- coastline, hydrography, lagoons from the 1937 cartography;

- coastline, rivers, reservoirs, lagoons, main roads, villages, contour lines (each 10 m) from the 1983/84 cartography.

The operations for the processing of satellite images (geo-referencing, rectification, enhancement) have been performed by a specific image processing package: ERDAS.

All vector and raster data were geo-referred according to the characteristics of the Gauss-Kruger projection (Krasovsky ellipsoid) (4) - official cartographic reference in Albania - and integrated in a similar database using the Arc-Info facilities.

2.6.3 Main Results

The analysis and evaluation of coastal evolution between 1937-92 were made by comparing the trends of coastline, rivers and the Karavasta Lagoon (Fig. 2) in different periods (1937-1983/84; 1983/84-1988; 1988-1992). Figure 3 shows the SPOT image relevant to the year 1992, overlapped upon the 1937 coastline and lagoon. This representation allows the global location of all changes which occurred in the studied area.

The Semani outlet has drastically changed in relation to its canalisation, and in fact has moved towards the south (almost 12 km southward). Indeed, the abandoning of the ancient mouth and the subsequent decrease in the quantity of solid sediments input seemed to give rise to a process of disintegration mainly in the river mouth and neighbouring beaches. Thus the formation of a big sandbar in front of the Karavasta Lagoon and the creation of a new lagoon - the Godula Lagoon - could be correlated to these phenomena. The “migration” to the south of the Semani river is a slow process, and it is possible to identify in the 1983/84 cartography other Semani beds, which today have become drainage channels.

The modifications in the bed of the Shkumbini river are marked at its mouth by a southward migration and the creation of a little coastal lagoon (Kular Lagoon) (1).

The coastal evolution which occurred between 1983/84 and 1988, is marked by the continuous southward movement of the Shkumbini mouth underlined by the transformation of the sandbar in front of the Kular Lagoon. The erosion of the ancient mouths of the Semani is on-going, and consequently, the littoral at the south reveals a real accretion trend marked also by the closing of some little lagoons which were open to the sea on the 1983 cartography. As a consequence, the littoral in 1988 shows a more rectilinear and regular shape. The accretion trend is also found southward of the Semani river where little lagoons which opened in 1983 are now totally closed by a sandbar (1).

The most dramatic changes were recorded in the first observation period (1937-1983/84) during which the disappearance of the southern part of the Karavasta Lagoon was registered, which underwent drainage and reclamations works started in 1953, as to the northern part of the lagoon and in 1974 for the southern part.

In the same period, highly remarkable changes were attested for the Semani and Shkumbini rivers.

The changes recorded between 1988 and 1992 - observed through the comparison of the two images - appear relatively few as a whole; nevertheless some areas are showing modifications which stress, and seem to confirm, some trends defined in the previous period (1983/84-1988). In particular, the present direction of the Semani mouth was subject to a northward rotation marked by an accretion of the northern beach in a north-east direction (around 200 m, in a fraction of the littoral which is 900 m long), while in the south the littoral shows a slight decrease.

The southward movement of the Shkumbini delta is still evident and the sandbar which partially closes the Kular Lagoon is continuously modifying itself.

The modifications of the sandbar which closes the Godula Lagoon is evident and in particular, new accumulation of sediments in front of one communication channel of the Karavasta Lagoon has been found (3).

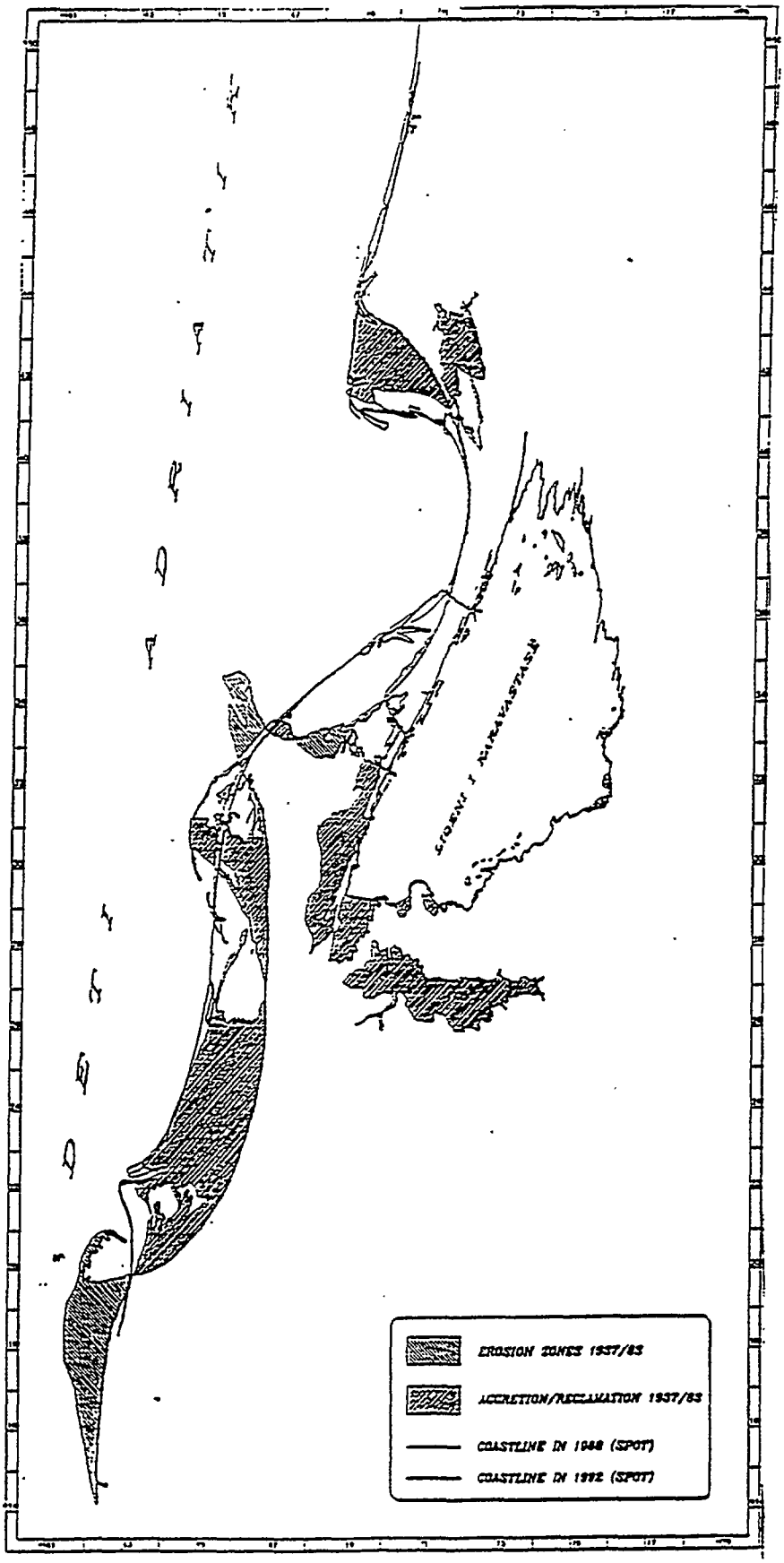

Figure 2 - Progressive coastline changing from 1937-1992.

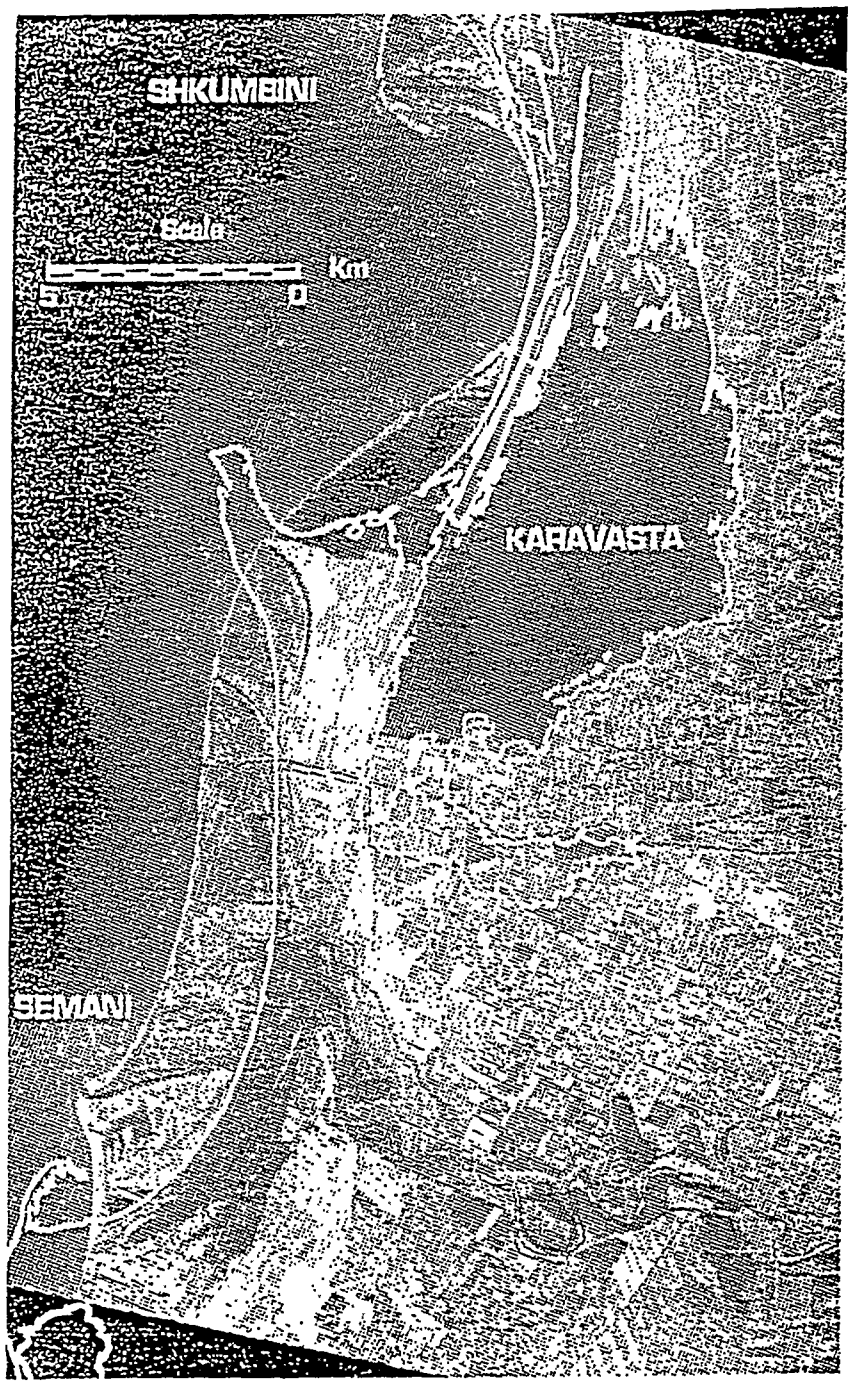

Figure 3 - Overlapping of 1937 cartography to the SPOT 92 image.

2.6.4 Conclusions And Recommendations

The comparison among the cartographic data and the two SPOT images relevant to the area between the Shkumbini and Semani rivers, in four different years (1937, 1983, 1988, 1992), has clearly shown and attested the big changes that this area is subject to.

The extent of the modifications recorded in the last 50 years is, no doubt, remarkable, and although the transformations should be mainly related to the impact of anthropic activities (1,8) which took place before the 1980s, it seems apparent today that the equilibrium condition in such an area is still fragile. As a matter of fact, the comparison made in the last period (1988-1992) put into evidence the presence of small changes (erosion, accretion) in some areas along the coastline. This implies the need for continuous monitoring of the concerned area, but above all, a greater effort in the perception of those phenomena which determine its equilibrium.

From a methodological point of view, the significant role played by high resolution satellite remotely sensed data in the monitoring of present changing of sandy shores must be stressed, along with the usefulness of their integration with cartographical data for a careful assessment of multi-annual coastal changes. In particular, the availability of precise information relevant to 1988 and 1992 - derived from SPOT images - allowed the cartographical updating of coastline, waterways, small lagoons and coastal marshes in the examined area. Moreover, the information quality derived from the processing and comparison of high-resolution satellite images has proven that remote sensing is an accurate and cost-effective means to continuously monitor and update the changes occurring on the coastline and in the whole coastal area.

In view of sound coastal management and planning, the RAC/ERS study, providing updated spatial data at a significant scale (1:25.000) and information on the present situation of the littoral and its recent evolution, is particularly useful in avoiding improper decisions.

Furthermore, the availability of a reliable and updated set of data could be considered by the Albanian authorities as a first step for the build up of a monitoring system which could be integrated with other database implemented in the framework of the CAMP and could be further developed through new monitoring activities and studies.

The hope is that the carried-out project would encourage the Albanian authorities to promote the extension of experienced monitoring to all the national coast as well as the continuation of the use of the applied method in order to periodically control, in the future, the coastline changes and the interactions between land and sea.

Moreover, the expectation is that Mediterranean countries could rely on, and avail themselves of, the experienced techniques and methods in all those areas affected by rapid transformations.

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2.7 WATER RESOURCES MANAGEMENT STUDY FOR THE ERZENI AND ISHMI RIVERS

2.7.1 Background Information

The state of water resources in Albania is a limiting factor of a successful development. It is, therefore, necessary to make a General Water Resources Master Plan which will present all water resources characteristics, serve as the basis for defining the optimal system of exploitation and protection of the resources in accordance with the present and future demands of the region, and contribute to a sound and efficient management of water and other natural resources.

Objectives

The long-term objectives of the plan are:

- to contribute to the protection and rational use of water resources of Albania's coastal zones; and
- to create appropriate conditions for the development of tourism and other activities in the country.

The immediate objectives are:

- to assess the availability of water resources and their quality;
- to propose measures for the prevention of pollution;
- to analyse the existing water resources management system; and
- to recommend a system of monitoring and sanitary control.

The plan will also present the water balance of the existing and future needs for water, and recommend a feasible approach to the planning and implementation of development projects.

Institutional Framework

PAP/RAC will draft the workplan, organize one expert mission, provide consultants, and secure participation of a relevant Albanian institution which will cooperate with PAP/RAC.

The relevant Ministries (Ministry of Agriculture, Ministry of Construction) will act as national coordinators and secure the participation of line institutions and authorities at national and local levels.

2.7.2 Development of the Project

Preparations for this project started with a mission envoyed to Albania in December 1992 with the task to review the existing documentation and institutional capacities, and to determine the basic characteristics of the project. It was agreed that the project cover the watershed of the Erzeni and Ishmi rivers for which a General Water Resources Master Plan (WRMP) would be prepared.

This has been considered highly important for Albania's National Council for Water, since it is actually a pilot project for activities to be carried out on the national level, i.e., for the whole country in the next period. Besides, the area under study is very interesting from the aspect of water resources management because the environmental protection problems and conflicts among different users are most severe in this area. Therefore, the project is expected to provide a good basis for further study and large-scale development which will take place in the area. Mention should be made that the cities of Tirana and Durres are situated in this area.

After the mission, it was recommended that the local experts start immediately with some activities necessary to carry out the project. In consequence, the consultants started preparing a document which would contain an assessment of water resources of the Erzeni and Ishmi rivers.

Another mission was conducted on 11-18 August 1994 in order to see the progress of work of the Albanian group of experts, to draw up relevant guidelines for the completion of the project, and to propose a workplan for the follow up.

On the basis of obtained information, and having in mind the finances available for this project which appeared to be insufficient, it was decided that the General Water Resources Master Plan for the Erzeni and Ishmi rivers cannot be carried out without additional financial sources. Since these failed to be secured, it was finally decided that a Water Resources Management Study for the Erzeni and Ishmi rivers be prepared instead of the Master Plan.

The objectives and contents of the study will be identical to those of the WRMP, but as the preparation and elaboration of workable projects is expensive, time consuming and thus rather costly, the study will not go into all relevant details, and will not seek the most appropriate solution to the existing problems and the future development of the system. In consequence, there will be some modifications of the workplan.

2.7.3 Contents of the Study

1. Hydroclimatological factors

1.1. Sunny, cloudy and radiation
1.2. Temperature
1.3. Precipitation
1.4. Humidity and pressure
1.5. Wind
1.6. Evaporation and evapotranspiration

2. Regime and quality of the surface water

2.1. General characteristics of catchment area
2.2. Data and previous study
2.3. Discharges
2.4. Water levels
2.5. Sediment regime
2.6. Droughts
2.7. Floods
2.8. Temperature
2.9. Water quality

3. Hydrogeology, regime and quality of ground water

3.1. Ground water regime
3.2. Data collection
3.3. Water transfer in non saturated media
3.4. Water flow in saturated media
3.5. Ground water discharges
3.6. Land use impact on watershed
3.7. Water extraction
3.8. Identification of pollution sources
3.9. Description of aquifer system

4. Natural factors of the catchment areas

4.1. Soil
4.2. Erosion and torrents
4.3. Mineral deposit
4.4. Natural ecosystem (terrestrial, freshwater and brackish water)
4.5. Specially protected areas`

5. Man-made water related physical system of the catchment areas

5.1. Water supply and extraction
5.2. Sanitation, sewerage, waste water treatment plant
5.3. Irrigation and drainage
5.4. Water power
5.5. Navigation
5.6. Fish ponds
5.7. Water related recreation facilities
5.8. Coastal development
5.9. Power control
5.10. Flood control
5.11. Navigation control
5.12. Pollution control
5.13. Water authorities and organizations

6. Hydrological cycle and water balance of the catchment areas

6.1. Natural hydrological cycle
6.2. Natural, theoretical, technical, economical capacity of water resources
6.3. Man-made water cycle
6.4. Summary assessment of available water resources
6.5. Classification of surface water and groundwater resources

7. Socio-economic system of the catchment areas

7.1. Population, settlements, consumption, way of life
7.2. Industry and production
7.3. Mining
7.4. Agriculture and production
7.5. Fisheries and fishing farms
7.6. Forestry
7.7. Energy
7.8. Traffic
7.9. River Navigation
7.10. Tourism, sport and recreation
7.11. Administrative authorities
7.12. Summary of existing and planed development

8. Water demand assessment (water use by principles category) of the catchment areas

8.1 Infrastructure (drinking, domestic use, public use in settlements, navigation, waste disposal, relaxation, aesthetic enjoyment, etc.)
8.2 Agriculture, forestry and aquaculture (rain-fed agriculture, livestock, fish and wildlife and ecosystem maintenance, forestry, irrigation, swamp and wetland habitat, waste disposal, utilization of estuaries, fish farming, soil conservation, etc.)
8.3 Industry (hydropower, steam power, mining, cooling, processing, hydraulic transport, waste disposal, etc.)

9. General plan of development of water resources of the catchment areas

9.1. Storage
9.2. Protection from water
9.3. Sewerage system
9.4. Protection of water resources
9.5. Water exploitation (water supply in settlements, industry, agriculture, hydro-energy, navigation, tourism, etc.)
9.6 Synthesis of economical characteristics of the proposed projects

10. Water resources development and management of the catchment areas

10.1. Organization and management of water resources
10.2. Legislation and other administrative measures
10.3. Water conservation program
10.4. Proposal for monitoring
10.5. Proposal for future study
10.6. Proposal for the future projects
10.7. Cost estimation of the water works development

11. Synthesis report of the study

11.1. Water resources assessment
11.2. Socio-economic system
11.3. Water demand assessment
11.4. Water resources planning and management

2.7.4 Organization of the Project, Assigned Consultants and their Job Description

The project has been divided into a series of sub-projects each entrusted to a team of experts and institutions:

(a) Sub-project: Coordination of the project and editing of the Study.
Job description: overall coordination of work and preparation of the final version of the Water Resources Management Study.
Consultant: Mr. Jure Margeta

(b) Sub-project: Continuous scientific monitoring of the project implementation, and the drafting of the Water Resources Management Study.
Job description: Continuous scientific monitoring of the project implementation, day-to-day consultations with all institutions and experts involved, preparation of a synthesis report on water resources characteristics and of the Water Resources Management Study in draft form.
Consultant: Mr. Romeo Eftimi

(c) Sub-project: Assessment of water resources and evaluation of their availability.
Job description: Preparation of reports on: (a) hydroclimatic factors; (b) regime and quality of surface water; and (c) hydrology, regime, and quality of ground water.
Consultants: Ms. Eglantina Demiraj, Mr. Vangjel Mustaqi, Mr. Liri Muco, Mr. Miron Nuri, Mr. Tofik Jegeni (Tirana Hydrometeorological Institute), Mr. Romeo Eftimi and Mr. Ibrahim Tafilaj (private consultants)

(d) Sub-project: Natural factors.
Job description: Preparation of the report "Natural factors in the catchment areas".
Consultant: Mr. Nasip Mecaj, Centre of Geographic Studies

(e) Sub-project: Water-related physical system.
Job description: Preparation of the report "Man-made water-related physical system of the catchment areas".
Consultant: Mr. Kastriot Shehu

(f) Sub-project: Water balance.
Job description: Preparation of the report "Hydrological cycle and water balance of the catchment areas.
Consultant: Hydrometeorological Institute, Mr. Miron Nuri

(g) Sub-project: Socioeconomic system.
Job description: Preparation of the report "Socioeconomic system in the catchment areas".
Consultant: Centre of Geographic Studies, Mr. Andon Berxholi

(h) Sub-project: Assessment of water demand.
Job description: Preparation of the report "Water demand assessment of the catchment areas".
Consultant: Tirana Waterworks, Mr. Faruk Toro

(i) Sub-project: Water resources development plan.
Job description: Preparation of the report "General plan for the development of water resources of the catchment areas".
Consultant: Institute of Irrigation, Mr. Kristo Goga

(j) Sub-project: Water resources management.
Job description: Preparation of the report "Water resources development and management of the catchment areas".
Consultant: National Water Council, Mr. Franko Sara

2.7.5 Status of Implementation

Sub-project (c): Assessment of water resources.

1. Hydro-climatological factors
2. Regime and quality of surface water
3. Hydrogeology, regime and quality of groundwater

Reports in preparation:

4. Natural factors of the catchment areas
5. Man-made water related physical system of the catchment areas
6. Hydrological cycle and water balance of the catchment areas
7. Socio-economic system of the catchment areas
8. Water demand assessment (water use by principles category) of the catchment areas
9. General plan of development of water resources of the catchment areas
10. Water resources development and management of the catchment areas
11. Synthesis report of the study

Time Table

1996													
Sub-projects		J	F	M	A	M	J	J	A	S	O	N	D
1.	Hydro-climatological factors	*											
2	Regime and quality of surface water	*											
3.	Hydrogeology, regime and quality of groundwater	*											
4.	Natural factors of the catchment areas	-	-	*									
5.	man-made water related physical system	-	-	-	*								
6.	Hydrological cycle and water balance	-	-	-	*								
7.	Socio-economic system of the catchment areas	-	-	-	*								
8.	Water demand assessment	-	-	-	-	*							
9.	General plan of development of water resources	-	-	-	-	-	-	*					
10.	Water resources development and management	-	-	-	-	-	-	-	*				
11.	Synthesis report of the study	-	-	-	-	-	-	-	-	*			

Expected End of the Remaining Activities

Draft of the Water Resources Management Study, August 1996.

Final version of the Water Resources Management Study, September 1996.

2.7.6 Follow up

Using the Study as the basis, it would be advisable to start realizing the Water Resources Master Plan for the Erzeni and Ishmi rivers, as originally planned. The Study would enable a detailed programme of WRMP to be defined, and with that programme, the needed funds could be sought for the Plan preparation. Since we are here dealing with complex problems which need to be resolved to enable a harmonious development of this sensitive part of Albania, the preparation of the Water Resources Master Plan should be given absolute priority.

2.8 TRAINING PROGRAMME ON GEOGRAPHICAL INFORMATION SYSTEMS (GIS)

2.8.1 Background Information

In the period 1989-1992, the Priority Actions Programme/Regional Activity Centre (PAP/RAC), jointly with UNEP/GRID (Global Resources Information Database - Nairobi), and UNITAR (United Nations Institute for Training And Research - Geneva), prepared and implemented the action "Application of GIS in the Process of Integrated Planning and Management of Coastal Zones" as a part of the MAP Coastal Area Management Programme (CAMP) "Kastela Bay" - Croatia. Based on this experience, PAP implemented in the period that followed (1993-1995) the training programme on GIS within the MAP (CAMP) "The Albanian Coastal Region".

In accordance with MOU signed between UNEP-GRID and the PAP/RAC, UNEP-GRID donated the hardware configuration for the needs of the Albania CAMP. PAP/RAC also donated the PC ARC/INFO (to be used on non-commercial basis), the ArcView 1.0 and the IDRISI softwares.

2.8.2 Objectives of the Training Programme

Having in mind the working conditions found at the very beginning of the programme, as well as the role of the GIS in the CAMP as a whole, the objectives of the training programme were the following:

- to determine local institutions which could/should take part in GIS activities within the CAMP;

- to determine experts from these institutions which could take part in the training programme as the members of the local GIS team;

- to prepare and perform the basic training course on personal computers for the above experts;

- to form the local GIS team consisting of the most successful participants of the training course;

- to establish the GIS lab, with the appropriate hardware/software configuration;

- to perform the training on GIS and PC ARC/INFO for the members of the local GIS team;

- to establish a GIS data base for the needs of the ICAM activities within both the MAP CAMP and the World Bank Project; and

- to determine possible GIS support to other activities and projects, whether within or outside the CAMP.

2.8.3 Performed Activities

The activities of the PAP GIS team were carried out in the following phases:

- preparatory activities for the forming of the local GIS team;

- establishment of the hardware/software configuration;

- the basic training course on GIS and PC ARC/INFO for the members of the local GIS team;

- advanced training course on PC ARC/INFO for the members of the local GIS team;

- preparation of the GIS data base for the needs of ICAM activities; and

- training course on basics of remote sensing, IDRISI and ArcView 2.1 software.

2.8.3.1 Preparatory Activities for the Forming of the Local GIS Team

As the first step in this phase of the training programme, in order to determine the conditions for the GIS training programme, a mission was carried out on 14-20 June 1993. During this mission, the candidates for the local GIS team were interviewed (primarily regarding their knowledge in computers and foreign languages, and their professional references).

Contrary to the experiences gained through the GIS training programme performed in other CAMPs, the conditions found in the relevant local institutions required intensive preparatory activities before the forming of the local GIS team and the beginning of the training on GIS. Namely, most of the candidates for the local GIS team had very modest or no experience in the use of personal computers. For this reason, it was decided to perform the basic training course on PCs for all of the candidates for the local GIS team.

The basic training course was held from August 30 to September 9, 1993, in the premises of the Institute of Informatics and Applied Mathematics (INIMA) in Tirana. The course was attended by 20 participants from several institutions in Tirana.

In order to evaluate the training course, to examine the participants in the basic training course, and to prepare a proposal of the list of the members of the local GIS team, a mission was carried out on 9-12 September 1993. Based on the results of this mission, the list of 15 members of the local GIS team was defined.

2.8.3.2 Establishment of the Hardware/Software Configuration

One of the findings of the preparatory missions was that there was no appropriate and available hardware in any of the local institutions involved in the training programme. For this reason, and in accordance with MOU between the UNEP-GRID Nairobi and the PAP/RAC, UNEP-GRID donated the following hardware configuration for the needs of the CAMP:

- Intersys 80486 PC-compatible computer;
  80486 processor, 66MHz speed;
  8 Mb RAM;
  240 Mb hard disk;
  3.5" and 5.25" floppy disks;
  SVGA graphic card;
  Genius mouse;
  Keyboard.
- Intersys/Tatung color monitor 14";
- Summagraphics digitizer Summasketch professional A3 format; and
- Back-UPS (Uninterruptible Power Source Unit) model 400.

At the beginning of 1995, one Hewlett-Packard LaserJet 4L laser printer (A4 paper format, 300 dpi, 4 pages per minute) was acquired.

The PC ARC/INFO version 3.4.D+, the ArcView and the IDRISI (version 4) softwares were installed.

The hardware was located in the GIS lab, which was established in the premises of the National Planning Institute (Urbanistika) in Tirana.

2.8.3.3 The Basic Training Course on GIS and PC ARC/INFO for the Members of the Local GIS Team

The basic training course was carried out between January 31 to February 12, 1994 in the premises of the National Planing Institute in Tirana. The course was attended by ten participants from several local institutions.

The following topics were covered during the course:

- an introduction to GIS and PC ARC/INFO;
- STARTER KIT module of PC ARC/INFO;
- spatial data input and editing (ARCEDIT);
- building topology;
- correcting topological errors;
- assigning descriptive attributes to spatial data (TABLES); and
- creating graphical (screen and plotter) outputs (ARCPLOT).

For almost all of the participants, the course was their first experience with a GIS software. They also had no experience in preparation of the data for the input in GIS, or other relevant topics (data sources in different scales, date or cartographic projections, etc.). Therefore, it was important to cover these topics in a great detail. During the course, beside the test data, several data layers covering the study area were digitized. The follow-up activities were defined, with the emphasis on exercising the use of the software and the data preparation and input of data sets in the GIS data base. The participants showed enthusiasm and interest in the subject, and worked very hard during the course.

2.8.3.4 Advanced Training Course on PC ARC/INFO for the Members of the Local GIS Team

The next mission was conducted from 19 June until 2 July, 1994 with the objective to perform the second (advanced) part of the training course on PC ARC/INFO. Also, in order to begin the establishment of the GIS data base for the needs of the ICAM project, it was planned to use the data sets which should have been prepared by the local GIS team in the period between two missions. Finally, since in May 1994, the World Bank appointed PAP to prepare, jointly with Dobbin Milus International (DMI), Washington, the "Albania Coastal Zone Management Study" covering three sections of Albania's coast, one of the tasks of the mission was to coordinate GIS activities within the CAMP with those performed within the World Bank one.

The following topics were covered during the course:

- exercises: data input and editing, transforming coordinate systems;
- exercises: establishment of topology, assignment of attributes;
- advanced techniques of digitizing and correcting errors;
- exercises: data display using ARCPLOT;
- PC OVERLAY;
- exercises: GIS suitability model;
- ArcView 1.0 - basic concepts; and
- data documentation.

2.8.3.5 Preparation of the GIS Data Base for the Needs of ICAM Activities

Despite some difficulties encountered during the implementation of the GIS training programme, the GIS data base has been established for the needs of the ICAM activities within the MAP CAMP and the World Bank project. Basic layers for the data base (for example, roads, settlements, rivers, lagoons, coastline) were prepared (Maps 1 and 2) using the topographic maps (mostly 1:200,000 scale). The "official" hydrogeological map (1:200,000 scale) was used for hydrogeological data. For climatological data, the 1:500,000, scale maps were used. Other layers were prepared using thematic maps prepared by local experts.

The contents, quality and usability of the established GIS data base are determined by these facts:

- **Inconsistency of the official data sources.** There are several reasons for this problem: significant morphodynamics (particularly coastal), inconsistency in names of map features (particularly settlements), printing errors (colour overlapping, for example), inconsistent (and sometimes confusing) categorization of map features, etc. For these reasons it was very difficult to combine 1:200,000 and 1:100,000 maps;
- **Most of the thematic maps are based on expert assessments.** Generally, this approach affects the precision and reliability of the maps. However, since the maps were prepared by the best experts in the relevant fields, and drawn on 1:100,000 topographic maps, they can be used as a reliable data source;
- **The data base prepared within the CAMP and WB projects is, to our knowledge, the first GIS data base prepared with the participation of local experts.** The establishment of the data base was for most of the experts involved in the preparation of data sets their first experience with GIS.

Although it needs additional data sets for the future use, the data base can be taken as the starting point for the future use at the regional level (applications where precision of 1:200,000 map scale is sufficient). The "educational part" of the establishment of the data base - experience which local experts gained through map preparation and establishment of the data base - is also very important and useful for the future GIS activities.

2.8.3.6 Final Training Course on PC ARC/INFO for the Members of the Local GIS Team

As the final part of the GIS training programme, three members of the local GIS team were invited to Split for the final training course, final work on the document of the ICAM project, and consultations for the future PAP activities (carrying capacity for tourism, water resources management, and environmental impact assessment).

The training course was performed from January 22 to 26, 1996 in the premises of the PAP/RAC in Split. The course had the following objectives:

- to refresh the knowledge in PC ARC/INFO and ArcView 1.0, through exercises performed using the demo data;
- to perform the basic training course on remote sensing;
- to perform the basic training course on ArcView 2.1; and
- to review the GIS data base prepared for the needs of the GIS support to the ICAM project.

The following topics were covered during the course:

- An introduction to remote sensing;

- Image processing and correction;

- Exercises: performing the classification procedure;

- Exercises: PC ARC/INFO data input and editing;

- Exercises: PC ARC/INFO establishment of topology;

- Exercises: PC OVERLAY;

- Exercises: ArcView 1.0 - creating a view, creating a layout;

- An introduction to ArcView 2.1; and

- Exercises: ArcView 2.1 - creating a project, creating a layout, creating a chart, working with tables.

2.8.4 Conclusions and Recommendations for Follow-up Activities

The GIS training programme resulted with the following conclusions:

- A GIS lab is established within the premises of National Planning Institute in Tirana, (PC, laser printer, digitizer and UPS unit).

- The GIS data base developed during the training programme is a good starting point for the future GIS projects at the regional scale (especially having in mind the conditions in which the programme started, and the fact that the experts involved had no previous GIS experience).

- Most of the candidates for the local GIS team expressed their enthusiasm and interest to take part in the training programme. Unfortunately, during the programme some of

them left the country for various reasons. This could indeed endanger the future GIS activities (after the completion of the CAMP).

The following **recommendations** can be given for the follow-up activities:

- The ArcView 2.1 software should be acquired. It is an integrated GIS software, running under Windows environment. The use of ArcView 2.1. is an important improvement in GIS projects, whether at regional or urban scale.

- The PC in the GIS lab should be upgraded with another 8 Mb of RAM, so that the ArcView 2.1 software can be used.

- Within the CAMP activities, the future GIS activities will be related to the carrying capacity for tourism assessment project for the area of Lalzi Bay, and the water resources management project for the Ishmi end Erzeni watersheds.

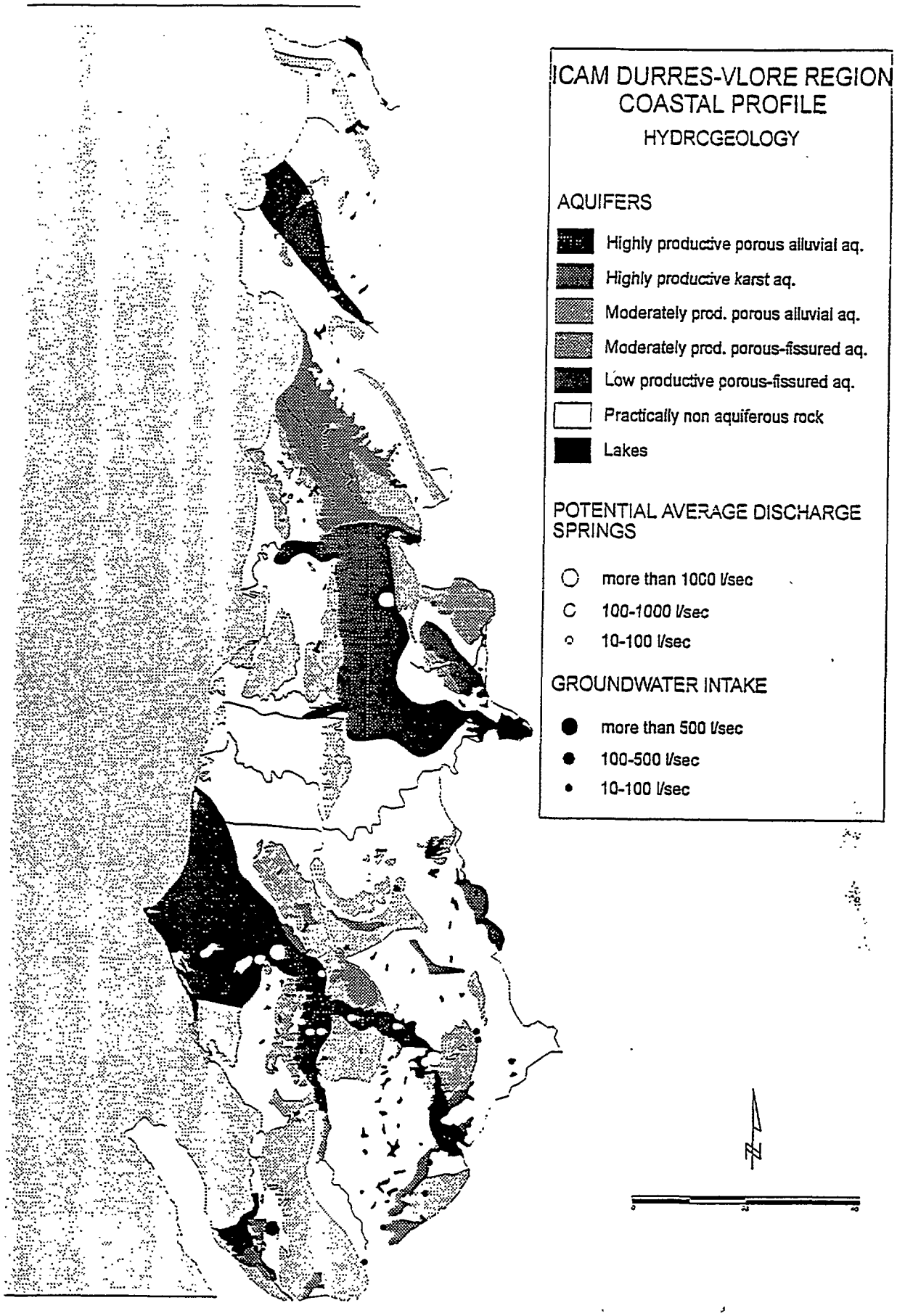
- The local authorities should decide which institution will have the key role in the future (post-CAMP) GIS activities. Also, it is necessary to clearly define institutions which are interested for the continuation of GIS activities, whether at the regional level or at the urban level.

- It is very important to continue with capacity building in two directions: education of GIS-makers (persons directly involved in the data preparation for and the establishment of GIS); and education of GIS-users (management level).

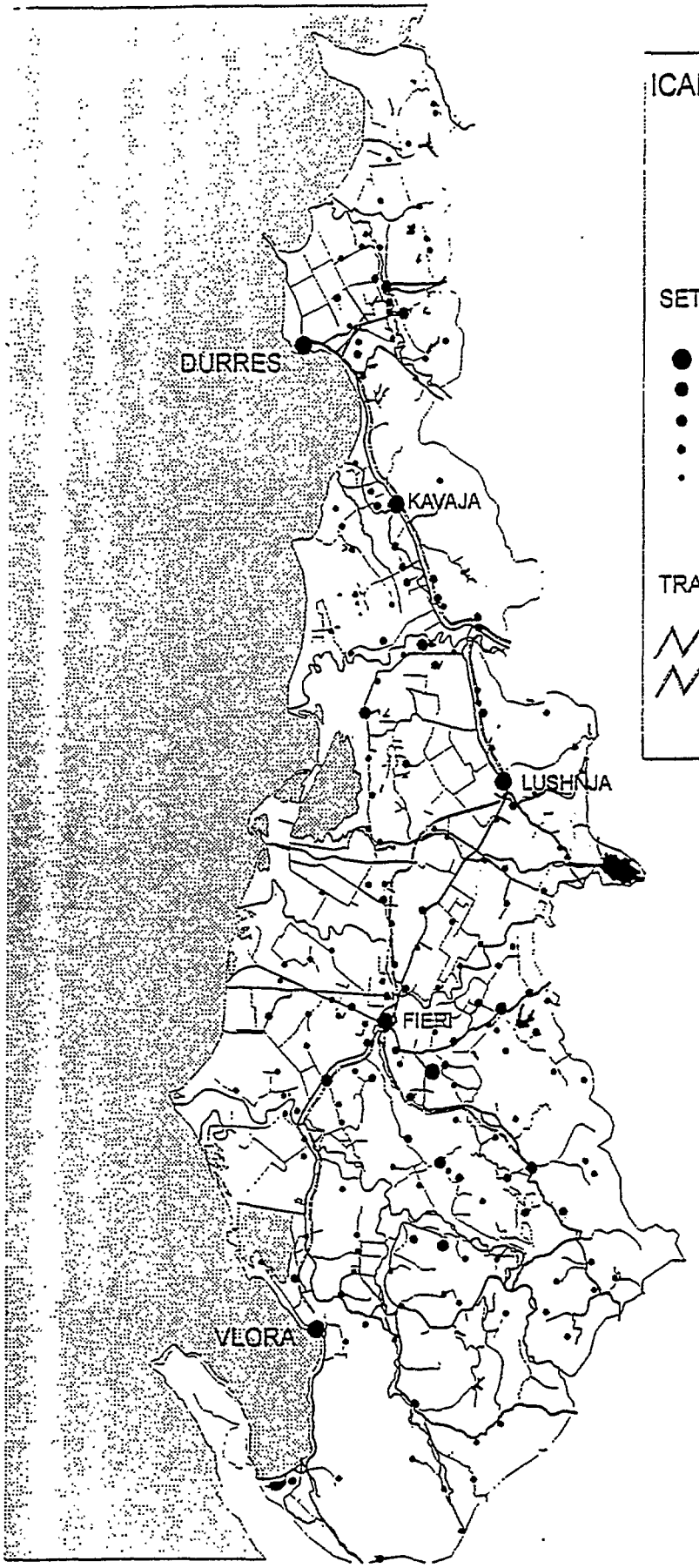
List of Participants in the GIS Training Programme

	PC-TC	M1	M2	GIS-TC
National Planning Institute				
1. Ms. Alma Bako	+	+	+	+
2. Ms. Anila Ballvora	+	+	+	-
3. Ms. Laura Bejko	+	-	-	-
4. Ms. Rajmonda Daja	+	-	-	-
5. Ms. Miranda Haxhiu	+	+	-	-
6. Ms. Mimoza Hoxha	+	+	+	+
7. Ms. Zana Husha	+	-	-	-
8. Ms. Adriana Janina	+	-	-	-
9. Mr. Arben Kamberi	+	-	-	-
10. Ms. Suela Koskia	+	-	-	-
11. Ms. Fatlinda Murthi	+	+	-	-
12. Ms. Diana Progri	+	-	-	-
13. Ms. Elvana Ruli	+	+	+	+
14. Mr. Agim Shehu	+	-	-	-
15. Mr. Astrit Tartari	+	-	-	-
16. Ms. Leonora Zaloshnja	+	+	-	-
Institute for Hydrometeorology				
17. Ms. Daniela Bali	+	-	-	-
18. Ms. Miriam Bogdani	+	+	-	-
19. Mr. Agim Selenica	+	-	-	-
Geographic Study Centre				
20. Mr. Renato Cumani	+	+	-	-
21. Mr. Moisi Sherifi	+	+	-	-
Institute for Informatics and Applied Mathematics (INIMA)				
22. Fotaq Nano	+	-	-	-
23. Arjan Vllahu	+	-	-	-

Note:
PC-TC Training Course on PC and MS-DOS
M1 Basic Training Course on GIS and PC ARC/INFO
M2 Advanced Training Course on GIS and PC ARC/INFO
GIS-TC Final Training Course on GIS


ICAM DURRES-VLORE REGION
COASTAL PROFILE
HYDRCGEOLOGY
AQUIFERS
Highly productive porous alluvial aq.
Highly productive karst aq.
Moderately prod. porous alluvial aq.
Moderately prod. porous-fissured aq.
Low productive porous-fissured aq.
Practically non aquiferous rock
Lakes
POTENTIAL AVERAGE DISCHARGE SPRINGS
more than 1000 l/sec
100-1000 l/sec
10-100 l/sec
GROUNDWATER INTAKE
more than 500 l/sec
100-500 l/sec
10-100 l/sec

Map 1



ICAM DURRES-VLORE REGION COASTAL PROFILE

SETTLEMENTS AND TRANSPORTATION

SETTLEMENTS:

- > 20,000 inhabitants
- 10,000-20,000 inhabitants
- 4,000-10,000 inhabitants
- 2,000-4,000 inhabitants
- 1,000-2,000 inhabitants

TRANSPORTATION:

- roads
- railroads

Map 2

2.9.1 Background Information

The Carrying Capacity Assessment Study of the Lalzi Bay is one of the activities of Integrated Management of Coastal and Marine Areas of the Durres-Vlora Region initiated through "Coastal Areas Management Programme" (CAMP) for Albania. The work is being carried out by the Priority Actions Programme/Regional Activity Centre (PAP/RAC) of MAP. The national counterpart institution ensuring contacts and cooperation with various other governmental agencies is the Committee of Environmental Protection (CEP) of Albania.

2.9.2 The Concept of Carrying Capacity for Lalzi Bay

The concept of carrying capacity for tourism may be easily defined as the maximum number of persons (tourists) visiting a site simultaneously without critically disturbing the physical, economic and socio-cultural environment or diminishing the quality of visitors' experience. This concept can be applied at different tourism development levels (regions, zones, project areas).

In defining the carrying capacity, several elements should be taken into account; especially:

- type, size and sensitivity of the elements of tourist offer;
- national and regional requirements, tourism and environmental policy;
- type of tourism and level of tourism development in the regional context;
- all interrelations between the region and the site; and
- political, cultural and economic preferences of the resident population.

The carrying capacity study will take into account all relevant environmental elements of the selected area, a zone of the "take-off" stage of tourism development. Benefiting from the methodology of carrying capacity assessment, this study will result in a final report which will serve as the practical basis for long-term tourism development reconciled with the environment.

2.9.3 Objectives of the Study

The objective of this study is to prepare the carrying capacity assessment of a selected area of the Albanian coast in the Durres-Vlora region. The study will focus on all relevant interrelations between tourism development and the environmental constrains.

The immediate objectives of the study are as follows:

- to define the carrying capacity of the selected area as a useful planning and management tool for the development of tourism harmonized with the environment;
- to train local (national) experts and professionals in producing the carrying capacity analysis and in implementing it; and
- to prepare a pilot document on the carrying capacity assessment of the area, and thus contribute to the creation of appropriate conditions for environmentally sound development of tourism in the Albanian coast.

The expected benefit of the study is to provide the national and local authorities, tourism promoters and professionals, as well as environmentalists and relevant regional and governmental bodies with a detailed insight into the tourism carrying capacity of the area under study, and thereby assist in the correct decision-making process for the future development of tourism in the area.

2.9.4 Characteristics and Management Proposals for Rodoni Peninsula - Lalzi Bay

The selected area of Lalzi Bay including Rodoni Cape make up the northern part of the Durres-Vlora region. Therefore, the basic principles of environmental protection and tourism development of that area have been set within the framework of the Coastal Zone Management Plan prepared for the Durres-Vlora region. The main characteristics of Rodoni Cape - Lalzi Bay area and management proposals which also include the preparation of a carrying capacity assessment of that area are the following:

- The Rodoni Cape unit, including its extension inland towards the hilly area, is a sparsely populated area difficult to access. Remains of indigenous forest can be found there, and only small areas of the peninsula are cultivated. The northern coast of the peninsula (about 10.5 km in length) is a gentle slope intersected by narrow valleys and a series of sandy beaches (3-8 m). Cliffs and very narrow pebble beaches (up to 3 m) make the southern coast (about 8.0 km long). In addition to forests, a special value of this area is the biodiversity of its marine environment, including potential archaeological sites (ancient ship wreckage) along the southern coast. The rugged landscape on the tip of the peninsula enhances its dramatic effect.

- The Lalzi Bay unit (about 24.0 km of coastline) is an environmentally sensitive area, particularly the wetlands formed by the Erzeni river in the southern and middle part of the bay. A large sandy beach (nearly 100 m wide) stretches along the entire bay encompassed by the shallow but clear sea water. An approximately 250 m wide belt of pine forest forms its back set area. Deeper inland, a range of hills encompasses the irrigated agricultural land of the coastal plain.

  Due to the use of Bishti Pallës Peninsula for military purposes, the access to it is limited. The southwestern shores of this narrow peninsula are steep, while the narrow belt of salt marshes makes up its southwestern shores. In spite of some interventions, the visual values of the peninsula have not been disturbed.

Planning proposals

- The preserved natural and cultural values of the Rodoni Cape should be protected and cherished. The entire peninsula should be established as the protected Landscape/Seascape Area (IUCN V category). Agriculture should be confined to areas already used for that purpose. Indigenous oak forest should be strictly protected from uncontrolled felling.

- The Rushkulli Hunting Reserve should be extended and transformed into a Managed Resource Protected Area (terrestrial and marine, IUCN category VI) which would cover the central and southern part of Lalzi Bay, Bishti Pallës Cape and Porto Romano. In addition to the pine forest, the special value of this protected area lies in its narrow belt of salt marshes, mud flats and sand bars in the environs of the Erzeni river mouth, as well as in the landscape of Bishti Pallës Cape.

- A part of the northern coast of Rodoni peninsula can sustain a tourist zone of less concentrated accommodation establishments (leisure homes) which would, according to its function, belong to the North Coastal Region being thus suitable to accommodate visitors of the neighbouring area of the Drini-Mati-Ishmi wetlands and lagoons.

- The least sensitive environmentally, is the northern part of Lalzi Bay (about 6.0 km of coastline). The sandy beach encircled by pine trees and agricultural land of lower fertility is highly suitable for the location of a concentrated type of tourist accommodation capacities. While constructing the wastewater treatment plant, the possibility should be examined of using the system of constructed wetlands, since there is enough space for it.

- The rural villages of Hamallaj and Rushkulli should be preferably integrated as service centres into the area's tourist supply. It implies visual improvement of these settlements and their linking to the future infrastructure network. At a later stage of tourism development in this area, the artificial lake located in the forested hinterland of Lalzi Bay could be considered for recreation activities.

- The north-eastern corner of the Lalzi Bay is the only site within the area which is suitable for development of a small marina.

2.9.5 Work Completed

The activities completed during the first mission of PAP/RAC experts for CCA of the Lalzi Bay tourist development (March 27 to April 2, 1996) are the following:

- Programme and time table of activities were prepared and a team of PAP/RAC and Albanian experts (representatives of the Ministry of Construction and Tourism, and from National Physical Planning Institute) was set up.

- Basic information needed for the study preparation were identified and some data collected.

- Methodology of work which bases itself on PAP/RAC Guidelines for Carrying Capacity Assessment for Tourism in Mediterranean Coastal Areas was presented, and the time scope for the study preparation was determined.

2.9.6 Expected Proposals of the CCA Study

The Carrying Capacity Assessment of Lalzi Bay will contain, among others, the following:

1. Data Synthesis

- Deteriorating resource supply and issues of management and protection

- Tourism demand and development - choices relative to domestic and international markets
- Synthesis of the new situation and possible alternative approaches to tourism development for the Lalzi Bay area.
- Land-use planning policy and development implications.

2. Tourism Development Options

- Semi-spontaneous development option.
- The option of free transfer to commercial interests for overall development.
- Alternative tourism option.
- Sustainable tourism development option.

3. Tourism Carrying Capacity Assessment of the Lalzi Bay Area

- Requirements necessary to achieve the sustainable tourism development scenario.
- Physical distribution of tourism development.
- Tourist accommodation capacities and their structure.
- Tourism services and support activities.
- Tourism development programme proposal in space and time.

4. Implementation guidelines

The workplan envisages that data analysis and preliminary tourism development options will be drafted by the end of May 1996. During the second mission planned for mid-June, the joint team will select and elaborate an outline of the sustainable tourism development option, as well as implementation guidelines. The study will be completed in draft by the beginning of September 1996.

2.10 ENVIRONMENTAL IMPACT ASSESSMENT (EIA) STUDY FOR THE KSAMILI PENINSULA PROJECT

2.10.1 Background

Following the decision to "apply the Environmental Impact Assessment as an important tool to ensure proper development activities" adopted by the Contracting Parties to the Convention for the Protection of the Mediterranean Sea against Pollution, PAP/RAC, together with OCA/PAC, and in cooperation with MEDU and WHO/EURO, developed a practical procedure for the application of EIA, as well as guidelines for five selected activities (tourist accommodation establishment, marina construction, sewage treatment plant for a city with between 100,000 and 1,000,000 inhabitants, submarine outfall of a city of up to 100,000 inhabitants, and sewage treatment plant for a city with between 10,000 and 100,000 inhabitants. The practical procedure fully complies with the relevant directives of the EC.

The application of EIA as an important instrument in making development decisions in harmony with the environment is one of the targets of the Genoa declaration, the Nicosia Charter and the Agenda 21 on sustainable development. A training of national experts in the application of EIA as well as one pilot EIA of project selected by the Albanian Authority (the tourist establishment at Ksamili, Saranda-Butrinti region) has, therefore, been envisaged within the framework of the CAMP for Albania.

The EIA studies will help the decision-makers perform their task by providing, at an early stage of the decision-making process, a description and evaluation of the environmental effects of the proposed projects. The EIA will support efforts aimed at preventing or reducing environmental damage in both the short and long term.

2.10.2 Objectives

The objectives of the proposed activity are:

- to introduce the EIA procedure;

- to train national and local experts on the application and preparation of EIA in development activities;

- to prepare specific guidelines for EIA of a selected tourist establishment;

- to identify and assess the anticipated or forecasted negative and positive effects on environmental quality and environmental health as a result of the implementation of the project, in order to take measures for eliminating, minimizing or mitigating the adverse impacts, formulate proposals for the mitigation of negative impacts and for monitoring and re-evaluation of the project; and

- to prepare an EIA document for the selected tourist development.

Also, the long-term objective is to familiarize the local capacities (authorities, scientific institutions) with the philosophy of EIA aiming at the incorporation of relevant procedures in similar projects.

2.10.3 Main achievements

A one-expert mission was organized with the aim:

- to assist Albanian authorities to select one development project for Environmental Impact Assessment among the proposed touristic complexes;

- to assist the national authorities in establishing a team of expert for the preparation of EIA document;

- to draft Guidelines for the preparation of EIA document: and

- to initiate activities of the team of experts for the preparation of EIA document.

The Albanian authorities proposed several tourist complexes located in the Saranda-Butrinti region (one planned in the Ksamili Peninsula, one in the Ksamili Bay, and one at the mouth of the Pavllo River) as a case study for the preparation of an EIA.

The project planned for the Ksamili Peninsula, which was submitted by two Italian developers joined in the Societa Turistica Saranda, envisages the construction of a large tourist village (2,500 beds) which will have many small villas, tennis courts, swimming pools, restaurants, and an amphitheater for performing arts. The project includes a marina to be located in the lagoons around Butrinti Channel. A golf course and a 200-bed hotel are to be located on the hill slopes southeast of Lake Butrinti, visually separated from Ksamili.

The Ksamili Bay project is proposed by a joint Albanian-Macedonian (ALB-MAC) developer. It envisages the construction of a tourist village consisting of small villas, restaurants and souvenir shops. Some of the development is planned on the islands in the Bay.

A Maltese developer proposes a large-scale tourism development project (25,000 beds were originally planned) at the mouth of the Pavllo River and in Mursia Plain. It includes the construction of hotels, a tourist village, commercial centres, tennis courts, a golf course and a marina.

So far, the Ministry of Tourism has only approved the Ksamili Peninsula project proposed by the Societa Turistica Saranda. The proponent has to prepare technical documentation necessary for the construction to start.

During the mission in Albania a PAP expert, together with a representative of the Committee of Environmental Protection, visited the proposed project sites.

After the visit, discussions with the representatives of the Promotion of Tourism Investments Department (Ministry of Tourism), and evaluation of the project documentation and available environmental reports, it came out that the Ksamili Peninsula project was developed to the extent suitable for Environmental Impact Assessment. Construction is planned on a less sensitive area, which is very important in assessing possible impacts where environmental data are lacking. The other two projects are in an early stage of planning. On the other hand, the Maltese project entails severe alterations affecting the coastline, wetlands, marine and brackish ecosystems.

Having evaluated the received information, the Chairmen of the Committee of Environmental Protection decided that an Environmental Impact Assessment be prepared of the Ksamili Peninsula project disregarding the planned golf course and the belonging accommodation establishment.

At a meeting held in the Committee of Environmental Protection some technical issues regarding the establishing, leading and work of the national team of experts entrusted with the preparation of the EIA document for the selected project were discussed, and agreed upon. The national team of experts will include five experts, specialists in biology, hydrology, environmental chemistry, tourism, and physical planning.

Specific guidelines for the preparation of an Environmental Impact Assessment document for the selected developed project were prepared and discussed among the team members.

An initial training of the EIA team members was organized. The lecture was focused on the significance and role of EIA in the planning and decision-making process, EIA implementation procedure, and methods of assessing impacts on the environment.

2.10.4 Conclusions

The following conclusion have been arrived at:

- the selected tourist project has been developed up to the stage which allows an environmental impact assessment to be made;

- the site of the proposed development is not environmentally sensitive and, regardless of the lacking environmental data, it is possible to assess impacts with a reasonable degree of certainty; and

- the established team of experts will be able, under the guidance of a PAP expert, to prepare the EIA document within the scheduled time.

2.10.5 Follow up

The team of national experts will prepare the EIA document in accordance with the Specific Guidelines and the agreed timetable:

- Collection of data on the project and the environment . . . . . 15 March
- First draft of the chapters of the EIA document describing the project and the environment . . . . . 31 March
- First draft of the chapter on environmental impact assessment . . . . . 15 April
- Expert mission to evaluate the completed chapters of the EIA document . . . 30 April
- First draft of the chapter on proposed measures to avoid, reduce and mitigate negative impacts . . . . . 15 May
- First draft of the whole EIA document . . . . . 30 May

After the report has been finalized, there will be a training course on EIA organized for national experts. The course is planned for June this year.

2.11 COASTAL ZONE MANAGEMENT PLAN OF THE DURRES-VLORA REGION

This Coastal Zone Management Plan is one of the outputs of Integrated Management of Coastal and Marine Areas of the Durres-Vlora Region initiated through "Coastal Areas Management Programme" (CAMP) for Albania which is based on the agreement co-signed by the Albanian Government and UNEP-Mediterranean Action Plan (MAP). The work is being carried out by the Priority Actions Programme/Regional Activity Centre (PAP/RAC) of MAP. The national counterpart institution ensuring contacts and cooperation with various other governmental agencies is the Committee of Environmental Protection (CEP) of Albania.

The Coastal Zone Management Plan of Durres-Vlora Region covers the central part of Albania's coast which stretches between Ishmi River (north of Rodoni Peninsula) and Orikum Lagoon (root of Vlora Bay). The inland depth of the coastal zone varies in dependence of the issues that are being focused on and studied on the basis of administrative, ecological, landscape, management, and other criteria adopted in determining the area boundaries.

A certain number of issues actually triggered the launching of the process of coastal zone management in Albania. In addition to issues and related tasks defined in the Environmental Strategy Study and National Environmental Action Plan, the following major ones can be identified: coastal and marine pollution, inadequate water and waste management, over-exploitation of natural resources, improper siting of structures and settlements, inadequate protection of and research on the archaeological heritage, inadequate protection of biodiversity assets, incomplete strategy for tourism development, inadequate protection of architectural resources, incomplete legislation, unsatisfactory institutional framework for Integrated Coastal Area Management (ICAM), and inadequately trained personnel/staff to manage, guide, and control the proposed private and public developments/investments.

2.11.1 Integrated Coastal Area Management in Albania

Traditionally, the resources of Albania's coast, as in most places, have been developed in a sectoral manner with little regard to the integrated nature of coastal and marine ecosystems. Coastal areas have been usually managed only around political/ administrative boundaries rather than environmental units, which often results in overlapping jurisdictions and responsibilities. Finally, sectoral approaches often target on short-term rewards without taking into account the long-term costs of resource depletion and the negative impacts that the development of one sector may have on other sectors. Should Albania maintain a *status quo* or, in other words, *ad hoc* and sectoral environmental management and investment strategies, the result will be a further decline in environmental quality and functioning, increase in conflicts among users of the coastal zone, and diminishing of natural and cultural resources available to those users. There are numerous reasons why Albania needs ICAM today, the most important ones being:

- Compared with other parts of the country, the coastal region of Albania is the most important and economically most valuable space, from both development and environmental points of view.
- The economic and social liberalization of Albania will cause many people to migrate towards the coast further burdening the coastal resources.

- Initiation of a permanent ICAM process and preparation of the CZM Plan for the coastal region are powerful tools for securing rational use of natural resources, protection of biodiversity and creation of an institutional foundation for the implementation of appropriate development strategies based on the concept of sustainable development.
- Albania, as a signatory of a large number of international conventions, contracts and other legal documents (such as RAMSAR, Barcelona, Biodiversity Convention, and Law of the Sea), is obliged to implement an effective system of coastal management, not only in order to resolve the problems of its own coastal zones, but also to implement its responsibilities under these international agreements.

The most important overall goals of the CZM Plan are the following:

- to preserve ecological integrity through establishing ecologically sustainable limits for resource use, that is:
- to renew or rehabilitate damaged resources;
- to ensure that natural resources are equitable between generations;
- to encourage complementary rather than competitive activities;
- to preserve and promote social equity and introduce the participatory approach; and
- to provide a mechanism for capacity building and planning.

The strategic objectives of the Plan are:

- to promote conservation of Albania's coastal biodiversity, including marine, freshwater, and intertidal habitats;
- to promote conservation of Albania's coastal cultural heritage, including historical, cultural, architectural and archaeological sites of interest;
- to promote the expansion of Albania's coastal and marine-related tourism and ecotourism industry, other activities, and investment opportunities;
- to enhance employment creation opportunities and maximize benefits to people living in coastal areas;
- to enhance the institutional capacity to manage and implement recommended actions and projects; and
- to recommend a series of investment projects that will help "kick-start" the coastal economy in an incremental way while providing a vision of the overall ICAM programme in a "step by step" implementation program.

Basic principles adopted in the Plan preparation were determined so as to make sure that the ICAM will facilitate integration of sectoral interests, productive coordination of responsible institutions, resource use compatibility, and equity of values among different users. All proposals in the Plan were evaluated through the following criteria:

- *Biodiversity and Environmental Protection.* Given the important role of the coastal and

marine habitats, biodiversity and environmental components should be considered first. Only then, it should be determined what level of development an area can withstand. It is essential that upstream impacts as well as impacts of adjacent activities are accounted for. Criteria for the establishment of "Environmentally Sensitive Areas" (ESAs) should be determined first. Allocation of different levels of protection for different areas is the next step.

- *Tourism, Conservation and Cultural Heritage.* Tourism is increasingly recognized as an important source of foreign currency. Given the present collapse of industrial activities, and the still good health of the remaining natural environments, an environmentally-based tourism that is not only sensitive to coastal and marine habitats but which also enhances their quality, is the most compatible development option. Linking tourism with nature conservation, through the establishment of protected areas, not only provides an incentive for introducing environmental standards for tourist facilities but also ensures that large areas of nature are protected.

- *Institutional Capacity Building.* The ICAM process and planning in its initial stages will require much time and energy to be employed in assessing which level and type of organizational responsibility, coordination and implementation is most suitable to particular places and activities.

Depending on their importance, proposals /plans/ projects will be developed at one of the three spatial levels in each region: zone, area, or site. For management purposes, three interlocking zones running parallel to the coastline are identified: the coastal strip; the coastal plain; and the hilly hinterland.

A similar plan, sponsored by the WB, is being implemented by PAP/DMI for the North and South Coastal Regions. This report provides an overall framework for and identifies links among North, Central (Durres-Vlora) and South Coastal Regions.

2.11.2 Albanian Coastal Zone

The Adriatic coastal zone, which is characterized by the alluvial coastal plain stretching along low-lying sandy shores, is similar in the North and Central Coastal Regions. This calls for a similar approach to be adopted in dealing with the coastal zone management issues for both regions.

The wetlands of the North and Central Coastal Regions are rich in biodiversity, particularly the areas of Drini-Mati-Ishmi in the North Region and Shkumbini-Semani-Vjosa in the Central Region. These coastal wetlands have almost identical genesis, and their biological and physical characteristics are very similar. What these areas also have in common is the threat by the increasing human activities. In the future, it can be expected that the economies of the three regions will merge, e.g. through the development of tourism in the South Region and thereby stimulate import of agricultural produce from the other two. Primary directions of future population migrations will be from the continental parts of the country and from the coastal hinterlands towards the urban centres of the coastal regions, while migration from one coastal region to another will be negligible.

The resources for the development of tourism in the North Coastal Region are rather limited, suitable primarily for ecotourism and local tourism. In the Central Coastal Region, the long beaches bordered by a strip of pine woods and spacious beach setback enable the concentration of considerable tourist capacities for international, national and local recreational use. The South Coastal (or Ionian) Region, the most diverse of all, offers first class natural environments for the development of a broad spectrum of international tourism.

2.11.3 Durres-Vlora Region

The Durres-Vlora coastal region, is generally characterized by coastal lowlands (alluvial plains) intersected by rivers, and flanked by hills along its upland boundary. The coast is made up of long sandy beaches, deltaic river mouths and lagoons. Four large rivers drain into the region, starting with Ishmi and Erzeni in the north, followed by the Shkumbini, Semani and Vjosa towards south. The drainage basins of these rivers have led to the formation of diverse and productive wetland complexes at the interface of the Adriatic Sea and the landward flood plains. These wetlands include coastal lakes and lagoons (including the two biggest Albanian lagoons: Karavasta and Narta), maritime forests, barrier dune and insular systems, and mountains that support rich and globally significant diversity of habitats and species.

Administratively, the area has been subdivided into five coastal districts: Durres, Kavaja, Lushnja, Fieri and Vlora. Only the southern part of the Vlora district, which by its geographic features belongs to the Ionian coastal area, is not included in the project. The Durres-Vlora region (including the southern part of the Vlora district) covers an area of 4,344 sq kilometres, or about 15% of the national territory, and has the population of 820,699 which is more than 25% of the country's total (1990). Excluding the lagoons, its 207 kilometres of the coastline make up 48.3 % of the total length of Albania's coast.

The major threats to the Durres-Vlora coastal region actually derive from human activities that do not respect its dynamic and sensitive character, e.g., shoreline accumulation and erosion patterns and the ecological and biological significance of its wetland complexes. Potential threats are urban, infrastructure, industrial, and agriculture activities in the water basin areas of Tirana, Elbasani, Kavaja, Lushnja, and Fieri. Effluents from these cities affect the quality and quantity of water entering the coastal and marine ecosystems, which is additionally polluted by waste waters from the coastal towns Durres and Vlora.

2.11.3.1 Natural Resources and Physical Environment

Environmentally Sensitive Areas (ESAs) have been selected according to both management and scientific criteria. In the Durres-Vlora region, four main wetland areas can be singled out as ESAs: (1) Lalzi Bay with the Erzeni River mouth; (2) The Shkumbini and Semani deltas with Karavasta Lagoon; (3) The Vjosa River delta and Narta Lagoon; and (4) Orikum Lagoon. These wetlands are characterised by the following:

1. The area of Lalzi Bay and the Erzeni river mouth is a narrow, reclaimed part of the coastal plain. There are still some natural habitats left along the coastline, such as a belt of pine trees, temporary marshes, reed beds and salt marshes. In addition to the loss of large wetland parts by land reclamation, the quality of natural environment of that area continues to deteriorate due to the input of the polluted Erzeni river (contaminated mainly by sewage disposed upstream), excessive felling of trees for fuel, and uncontrolled hunting.

2. The most diverse mosaics of natural coastal habitats in Albania can be found between

the Shkumbini and Semani river mouths, with Karavasta Lagoon located in the middle of this still preserved natural segment of the coastal strip. There is a number of combined aspects which distinguish the Karavasta Lagoon and Shkumbini and Semani zone as an internationally important wetland: the quality and peculiarity of flora and fauna which add a genetic and ecological diversity to the area; the wetland community typical of its bio-geographical region; the presence of 5% of the world's population of pelicans making the lagoon one of the five most important sites in the world; the presence of 1% of the European total number of several species of nesting birds; the presence of 1% of the European total number of some species of wintering birds. In February of 1993, over 26,000 wintering water birds were counted in Karavasta and the neighbouring lagoons. As regards conservation, the most important species are the nesting colonies of pelicans (*Pelecanus crispus,* 30-50 nests), which are endangered worldwide.

3. The Vjosa River mouth is characterized by sand banks, mud flats, salt marshes, reed beds, small lagoons and temporary marshes. On either side of the river mouth which meanders through the drained coastal plain, lies a protected area of pine forests: Pishe-Zeze to the north and Pishe-Poro to the south.

   Of all the lagoons in Albania, Narta, the second largest, experienced the most radical transformation, when more than a third of its area was turned into a salt pan, while the northeastern part of the lagoon has been recently turned into a fish farm. By another intervention, its southern tip was partitioned off as a retention pond for liquid waste of the soda factory. Eutrophication is a serious threat to the lagoon since water exchange through the only canal which links the lagoon with the open sea is very poor. Regardless of this situation, the lagoon is still a habitat of many species of birds, mostly waterfowl (pelicans).

4. Only about 130 ha of the formerly larger Orikumi Lagoon remained at the southern end of the Vlora bay. Inflow of fresh water into the lagoon has been reduced, as well as the water exchange between the lagoon and the sea.

2.11.3.2 Socio-economic Context

According to the 1995 estimates, the population of the region is 796,402, of which 264,304 live in district centres. The percentage of urban population was 39% in 1989. The overall population density is estimated at 190 inhabitants per 1 sq kilometre. The future population trend estimates are as follows:

- Taken as a whole, the region's population will grow at a rate higher than that of the natural growth owing to migrations from Albania's interior areas;

- A marked mechanical influx of population may be expected in Durres and Vlora, and to a lesser degree in other district centres. Among smaller settlements, those located along important transportation routes (e.g. the Durres-Tirana corridor), and along the main coastal transportation axis of Durres-Vlora are likely to grow quicker;

- At a later stage, smaller settlements in the vicinity of the future tourist zones, particularly those near the cities, will also grow; and

- Population drain will continue from the hilly areas and, to a lesser degree, from the rural areas of the coastal plain. A rather high percentage of the population will abandon the hilly areas of the Vlora District.

The planned economic system of Albania which prevailed until 1991 took little account of the coastal strip and the attractive coastal and marine environment. Industrial and agricultural production constituted the backbone of the employment sources. The coastal plain functioned as a distribution centre, which was facilitated by the country's main communication route linking Tirana with Durres and Vlora. The region as a whole possesses a number of attributes which may stimulate development opportunities based on the area's comparative advantages over the rest of the country. There are several major advantages which should play a positive role in the future:

1. The region's location along the main communication axis gives it a potential economic role as a market/distribution backbone for a great part of the country, which is most likely to stimulate the development of services, manufacturing and agriculture.

2. With the increasing demand, the region's productive agricultural land may become an important area of high-value crops (vegetables and fruits) for food processing as well as direct consumption by the growing district population and visitors.

3. The settlement pattern of the region is dominated by the growing urban centres strategically located along the "corridor", at the interface between the coastal plain and the lateral valleys which are the most dynamic parts of the hinterland zone. Nearly 300,000 people or 39% of the region's population is concentrated in these urban centres, providing a future labour pool for the re-activation of industries.

4. The region has a unique biodiversity accentuated by two country's largest lagoons, coastal forests, and long, unspoiled sandy beaches extending from Rodoni Peninsula to Vlora Bay, offering excellent conditions for recreation, domestic and international tourism.

The most dynamic area of the region will continue to be the coastal transportation axis which links all the important settlements in the region and attracts population not only from the region's highlands but also from other mountainous parts of the country. Of course, the concentration of coast-dependent activities such as sea transportation, fisheries, tourism and services are the additional factors which will stimulate the development and growth of the cities of Durres and Vlora. Furthermore, with the construction of tourist establishments and adequate infrastructure on attractive but presently isolated parts of the coast, it is realistic to expect that some settlements of strictly rural character will develop too.

2.11.4 Coastal Zone Management Strategy

The coastal management plan provides a framework for the spatial organization of people, activities and infrastructure. It is based on the principles of sustainable development, which means that the priority is given to ensuring ecological sustainability of economic development. Specifically, the plan offers a system of guidelines, policy directives and measures guiding public and private actions for the development of economy and the protection of environmental resources. The plan is not an attempt at "total regulation". It rather focuses on the identification of initiatives and, through selective actions, on the management of coastal resources.

The future strategic development framework (Map 3) will be marked by the following spatial elements:

- the coastal plain with fertile agricultural lands, the value of which will increase after the irrigation network has been reconstructed;

- the coastal transportation corridor is the main development axis in the region, and the proposals for its improvement avoid any possible negative impact on the coastal environmental and natural assets;

- the coastal cities of Durres and Vlora are the gravity poles of development in the region because of the coast-dependent activities concentrated there. Better economic connections with the outer world (harbour activities), and with the use of their hitherto neglected resources (tourism), the role of Durres and Vlora as regional centres of industry and services will be further strengthened.

- areas of natural value along the coast, especially wetlands, with Karavasta and Narta Lagoons being the most important, are the physical entities whose natural diversity should be protected and promoted through the process of future sound coastal development. It is of special importance to ensure the protection of biodiversity in parallel with the development of coastal tourism which should aim to include these environmentally sensitive areas in its specific tourist supply, and take them into account when deciding on the layout of tourist accommodation projects.

- tourist areas are new spatial and functional entities. In the case of the Durres-Vlora region, this means that any larger tourist accommodation establishment should be avoided in environmentally sensitive areas which are the most valuable parts of the region.

The general goals and principles of coastal management in Albania, as outlined before, have identified three broad axes of intervention: (1) biodiversity conservation and restoration (Maps 4 to 6); (2) tourism and infrastructure development; and (3) institutional strengthening. Given the important role of the coastal habitats, *biodiversity and environmental considerations* should come first and from there determine what level of development an area can withstand. It is essential in this region that impacts of upstream and adjacent activities are accounted for. Criteria for the establishment of "environmentally sensitive areas" (ESAs) are conducted first and from this an allocation of different ranges of protected areas. It is important to link *tourism* with nature conservation through the establishment, not only of environmental standards for facilities but also ensuring that large areas of nature are protected.

Protected areas (proposed on the basis of IUCN classification), are focal points that can attract people and therefore funds to both local communities and national treasuries. Before designating protected areas, it is important to consider the concept of carrying capacity. This is usually defined as the level of visitors' use a site can withstand and still retain a high level of visitors' satisfaction.

The emphasis of this ICAM should lie on *capacity building* of human resources. This requires considerable *institutional strengthening* through relevant stakeholders, and especially in the government agencies presently responsible for environmental management. Without considerable focus on capacity building and planning at this initial stage of ICAM, investments are likely to follow a short-term, profit-driven agenda that benefits only the few.

2.11.5 Coastal Zone Management Plan

For planning purposes, the coastline has been divided into three planning zones: the North, the Central and the South Zone, each containing marine, wetland, and terrestrial environments with great potential for biodiversity protection, nature conservation, and tourism development. Each planning zone has been further divided into planning areas to enable a more detailed strategy to be developed for biodiversity protection, tourism, and infrastructure. Ten (10) planning areas have been identified in the Durres-Vlora Region, most of them containing a combination of marine, wetland, terrestrial and urban environments.

On the basis of planning components (biodiversity, tourism and institutional strengthening) and the applied principles of environmental and spatial planning, three key management planning projects - Master Plans - are identified which spatially correspond to the North, Central and South Planning Zones. Within each of these two key projects, several specific projects - Integrated Management Plans - spatially correspond to the Planning Areas. An outline of management proposals and brief recommendations for each of these plans are given below.

1. Master Plan of the North Coastal Zone covers a geographically heterogeneous zone marked by three peninsulas (Rodoni, Bishti Pallës i Lagji) which encircle Lalzi i Durres Bays. The entire area is under the functional influence of the cities of Durres and Tirana. This suggests a future dynamic development and justifies the need for a single strategy of sustainable development to be designed for the entire area. The basis of this strategy lies in: a) protection, restoration and evaluation, in view of tourism, of the remaining areas of natural value in the north and south of the zone, primarily of Rodoni Peninsula, mouth of Erzeni River, Bishti Pallës and Lagji Cape; b) development of significant tourist accommodation capacities on the northern part of Lalzi Bay and Golemi Beach, as well as various tourist-recreation facilities within the area of Durres Beach, and some of these facilities on Capes Rodoni and Lagji; and c) development and improvement of housing, industry and infrastructure in the Durres urban area, focusing on transportation and service functions as a priority.

   (a) **Integrated Management Plan for the Rodoni Cape - Lalzi Bay Area** incorporates the generally preserved Rodoni Peninsula, the wetlands, and the beaches of Lalzi Bay. The preserved natural and cultural values of Rodoni Cape should be established as the protected Landscape/Seascape Area. The central and southern part of Lalzi Bay, Bishti Pallës Cape and Porto Romano, including a narrow belt of salt marshes, mud flats and sand bars in the environs of the Erzeni river mouth, should be established as Managed Resource Protected Area (terrestrial and marine).

   Tourism development should take place at the less environmentally sensitive northern part of Lalzi Bay as a concentrated type of tourist accommodation capacities (type A). A part of the northern coast of Rodoni Peninsula can sustain a tourist zone of less concentrated accommodation establishments (type B) which would, according to its function, belong to the North Coastal Region being thus suitable to accommodate visitors of the neighbouring area of the Drini-Mati-Ishmi wetlands and lagoons.

(b) **Integrated Management Plan for the Durres Urban Area** should provide management proposals for this town of rich cultural heritage, and its coastal resources, such as the present transportation infrastructure (harbour, railway, coastal road), beaches and the environment of Durres Bay, one of the most attractive areas for development in Albania. North and east of the urban area, there are sufficient spatial possibilities for the city growth and appropriate zoning of housing, industrial, service and recreation functions. The flat and infertile part of the reclaimed wetlands can take the work zones, but account must be taken of the fact that harbour activities will need larger warehouse and operational areas.

The entire stretch of Durres Beach and its immediate hinterland (up to the railway line) should be reserved for recreation. This recreation area and the centre of Durres containing ancient and other monuments of culture call for large interventions to improve its appearance. Construction of the waste water treatment plant at Porto Romano is one of the prerequisites of tourism and recreation development in the entire bay area.

(c) **Integrated Management Plan for the Golemi Beach - Kavaja Area.** Golemi Beach, with its as much as 500 ha of available space, is a site which has large potential for the development of the concentrated type of tourist accommodation establishments (type A). The root of Lagji Cape, between the flat and the steep coast (in the length of about 2.0 km), is suitable for the accommodation of a less concentrated type of tourist development (type B), including primarily the rest homes, small hotels and pensions.

The entire Lagji Peninsula should be established as the protected Landscape/Seascape Area (IUCN category V). The genuine visual and natural values of the area has to be restored by intensive reforestation.

2. **Master Plan of the Central Coastal Zone** covers the area between Lagji Cape in the north and the Vjosa river mouth in the south, which is the central part of the alluvial coastal plain created by three rivers: Shkumbini, Semani and Vjosa. These rivers also created various types and forms of wetlands (river mouths, salt marshes, sand bars, mud flats, etc.) along the coast, the largest being Karavasta Lagoon. These still preserved natural environments, particularly their most valuable parts which can be found in the narrow coastal belt, must be protected or they will be lost to agriculture and other uses. Also, where conditions so permit, such areas should be restored (e.g., areas of unsuccessful land reclamation). Rehabilitation of the irrigation and drainage network should include an environmental impact assessment of the entire area of the coastal plain.

Tourist accommodation establishments should be located on environmentally less sensitive parts of the coastal strip, while alternative forms of tourism should be organized in protected areas, focusing on eco-tourism, excursions and recreation activities.

(d) **Integrated Management Plan for the Lagji Cape - Spilea Beach Area** covers the least environmentally sensitive area of the Central Zone. The 7.0 km long Spilea Beach (about 700 ha) is one of Albania's most attractive coastal areas for the development of a concentrated type of tourist accommodation capacities (type A). The great advantage of the area is its close proximity to Karavasta Lagoon southward, and a series of pebbled beaches stretching northward.

(e) **Integrated Management Plan for the Shkumbini River - Karavasta Lagoon - Semani River Area** covers the environmentally most valuable part of Albania's coast - a 35.0 km long stretch of wetlands, sandy beaches on the seaward side and a pine forest on the landward side. The whole coastal strip (land and marine environment), which includes the western slopes of Divjaka Hill, and the agricultural land around Karavasta Lagoon should be established as a Managed Resource Protected Area (Terrestrial and Marine). The coastal strip and the immediate area of Karavasta Lagoon should be established as a Habitat/Species Management Area (Category IV), while Divjaka Forest should remain a National Park, the status it has now.

The riverine environment along the course of the Shkumbini and Semani rivers should be preserved and enhanced. Wetlands and salt marshes should be restored on abandoned agricultural areas. Tourism development in the Shkumbini River - Karavasta Lagoon - Semani River area should, as planned, be oriented primarily to daily excursionists. The accommodation establishments (type D) should be restricted to lodges, camps and similar facilities located outside the protected Category IV area. Settlements (close to 20,000 inhabitants in 1989) located in the protected zone or along its edges, could be used to accommodate a limited number of tourists. Lagoonar and inshore fisheries should be controlled and organized on a sustainable basis.

(f) **Integrated Management Plan for the Hoxhara Beach Area** should favour the development of "type A" tourism (concentrated accommodation) on two neighbouring sites of almost 500 ha on a 8.0 km long coastal section. As the existing belt of pine forest is considerably wide, the future tourist settlement should be located on less forested areas. Apolonia archaeological site (at a distance of about 10 km) needs additional protection, and further excavations must be conducted on the basis of a long-term research and conservation programme.

(g) **Integrated Management Plan for the Coastal Plain** should primarily consider the rehabilitation of the irrigation system, and particularly the assessment of its impact upon the coastal environment. Discharge of water used in agriculture into the area of wetlands, particularly in the watershed of Karavasta Lagoon, should be avoided, urban and industrial waste waters of Lushnja and Fieri treated, vulnerable ground water aquifers protected, and upstream pollution sources eliminated.

Taken as a whole, the transportation corridor is suitably laid across the area, and it only needs some improvement, while the main urban centres (Fieri and Lushnja) require a thorough revision of the existing Master Plans, if the sprawl of haphazard development in the outskirts of the two towns are to be avoided.

3. **Master Plan of the South Coastal Zone** should propose better transportation lines to

link this area with the rest of Albania, primarily for the development of tourism. This includes the (re)construction of roads, and the construction of an appropriate ferry port in the new harbour of Vlora, as well as an international airport on a well chosen location. The biodiversity protection, for Narta and Orikum Lagoon, in particular, should incorporate an integrated programme of rehabilitation and conservation including elimination of existing industrial plants and other sources of pollution, as well as measures for the restoration and enhancement of the area's natural and cultural environment.

The large potential of this zone for the development of tourism should be prudently used, by locating accommodation establishments in less sensitive areas. Development of recreation, tourism, and transportation facilities (harbor) in the coastal strip should be a priority of the Vlora urban area.

(h) **Integrated Management Plan for the Vjosa River - Narta Lagoon Area** should take into consideration the fact that of all Albanian lagoons Narta experienced the most radical transformation. Nonetheless, it is still a habitat of many bird species. On the other hand, the fish catch has dropped considerably. The already disturbed natural balance of Narta Lagoon should be restored by appropriate interventions undertaken on the basis of carefully set strategy and scientifically-based research, programmes and projects of rehabilitation of the lagoon's natural environment. To achieve this, the entire coastal strip should be declared a Managed Resource Protected Area (Terrestrial and Marine). Within this, the uninhabited and preserved environment of the coastal strip, which includes the either bank of the Vjosa river mouth and Pishe Poro reserve, should be established as a Habitat/Species Management Area.

A 2.5 km long stretch of the coast (a total of about 100 ha) along the Treporti site, together with the Zvernec fishermen's village, could be developed into a small tourist resort with Type B (less concentrated) accommodation. The possibility should be examined for turning the soda factory retention pool into constructed wetlands with the function of a sewage treatment plant for the future tourist site.

(i) **Integrated Management Plan for the Vlora Urban Area** covers an industrial and residential coastal strip which is located right along the line of contact between the Adriatic alluvial coastal plain and the steep and rocky coast characteristic for the Ionic Albania. The area needed for the growth of the city, primarily for its service zone with enough harbour handling space, is possible to organize on the flatland area northwest of the city which is not very favourable for agriculture. Soda and PVC factory should be removed and its location used for the accommodation of agencies to serve the new harbor.

Future housing neighbourhoods should be planned adjacent to the existing urban structure and on the slopes of the hills. The beaches south and north of the city should continue to be the recreation zones including the belt of protective pine forest, while the city harbour should be reserved for small passenger liners, and a yacht marina.

(j) **Integrated Management Plan for the Vlora Bay** covers an approximately 15.0 km long, steep and partly rocky coast with pebbled beaches of the eastern side of Vlora Bay and small Orikum Lagoon at the root of the bay. The area of Orikum Lagoon and the mouth of Izvori rivulet should be established as a Managed Resource Protected Area (Terrestrial and Marine) including the archaeological site of the old town of Orikumi. A programme of research, protection and presentation of the archaeological site should make part of the overall management programme for this area.

The eastern coast of Vlora Bay south of Ujet e Ftohte is favourable for the development of less-concentrated tourist accommodation capacities (type B), while especially favourable for Type A tourism development (zones of concentrated accommodation capacities) is the entire southeast part of Vlora Bay between Cape Virojt and Orikumi. This type of tourism to be developed at the foot of the hills behind the semi-enclosed Vlora Bay requires: (1) construction of an efficient wastewater treatment and disposal system; (2) construction of a road along the eastern coast of the Bay which should be laid much farther from it than the existing road.

2.11.6 Institutional Strengthening

The implementation component of this project contains: (a) suggestions for the improvement of the legal framework; (b) proposals for institutional strengthening and integrated management; and (c) proposals for capacity building. A need has been recognized for the elaboration of a specific ***Legal, Institutional and Capacity Building Project*** which will enable the implementation of the sustainable development strategy.

While developing a completely new, democratic legislation, Albania has an exceptional chance to build the principles of Integrated Coastal Area Management (ICAM) into its legal and institutional system in a well-organized and composite manner. What is needed to meet this objective is to incorporate the principles of ICAM in "sectoral" laws which refer to the country as a whole (e.g., Forestry Law), but also to develop and adopt specific regulations and by-laws which will refer to the coastal zone alone, or to different parts of the coastal systems (land and sea) and their different activity sectors (fishing, agriculture, tourism, oil and gas exploitation, nature conservation, etc.). Priorities in preparation and adoption of laws are identified, such as to establish the requirements, standards and procedures for the Environmental Impact Assessment, to adopt the nature and biodiversity conservation and management regulations related to the protection of coastal and marine ecosystems, and to establish specially protected areas on the basis of IUCN classification.

The high attraction of the coast for all forms of development on the one hand, and its environmental sensitivity on the other, call for the establishment of a fully integrated coastal zone management based on this CZM Plan, as well as other relevant integrated policies to follow in the future. Until these policies are developed in full, it is necessary to establish a transitional institutional form of management between the present generally coordinated form and the future fully integrated and coast-oriented management. This could be achieved by setting up at the beginning a permanent coordinating body which will be assigned the following tasks: (a) to build up the integrated coastal zone management policy consisting of relevant planning documents, legal framework and institutional structure; (b) to monitor, at the same time, the ongoing development processes in the coastal zone; and (c) to take prompt measures to protect the coastal resources whenever needed. Integrated management of coastal wetlands, which covers a whole range of protection aspects for these extremely sensitive coastal ecosystems, requires

special bodies or Commissions to be organized as sub-components of the main coordinating body. Furthermore, to ensure efficiency and competence of action, it is desirable to establish temporary or permanent coordinating bodies similar in structure to the main coordinating body with the task of implementing specific projects (e.g., coastal investment projects).

The education and training of professionals should be extended to include all parties in the coastal zone management process. The following forms of capacity building are recommended:

- seminars on the coastal zone management process for decision makers and professionals on the national, regional and local levels;

- workshops and training courses in the country and abroad addressed to the experts working at all levels in administrative, scientific and professional institutions; and

- on-the-job training, one of the most efficient forms of education on concrete tasks and activities related to sectoral and integrated components of coastal zone management.

Special effort should be made to train the experts in implementing the sustainable development concept in the sphere of tourism, which includes training in the techniques of Environmental Impact Assessment (EIA) and Carrying Capacity Assessment (CCA), as well as drafting of "bankable" investment programmes.

For the follow-up, the first priority is accorded to the preparation of Master and Integrated Management Plans which cover the zones and areas where the most dynamic development processes are expected, or where environmental issues call for immediate interventions. This, however, does not prevent the second-priority plans to be launched before, if there is an interested investor or donor.

Working Team

Albanian Working Team:

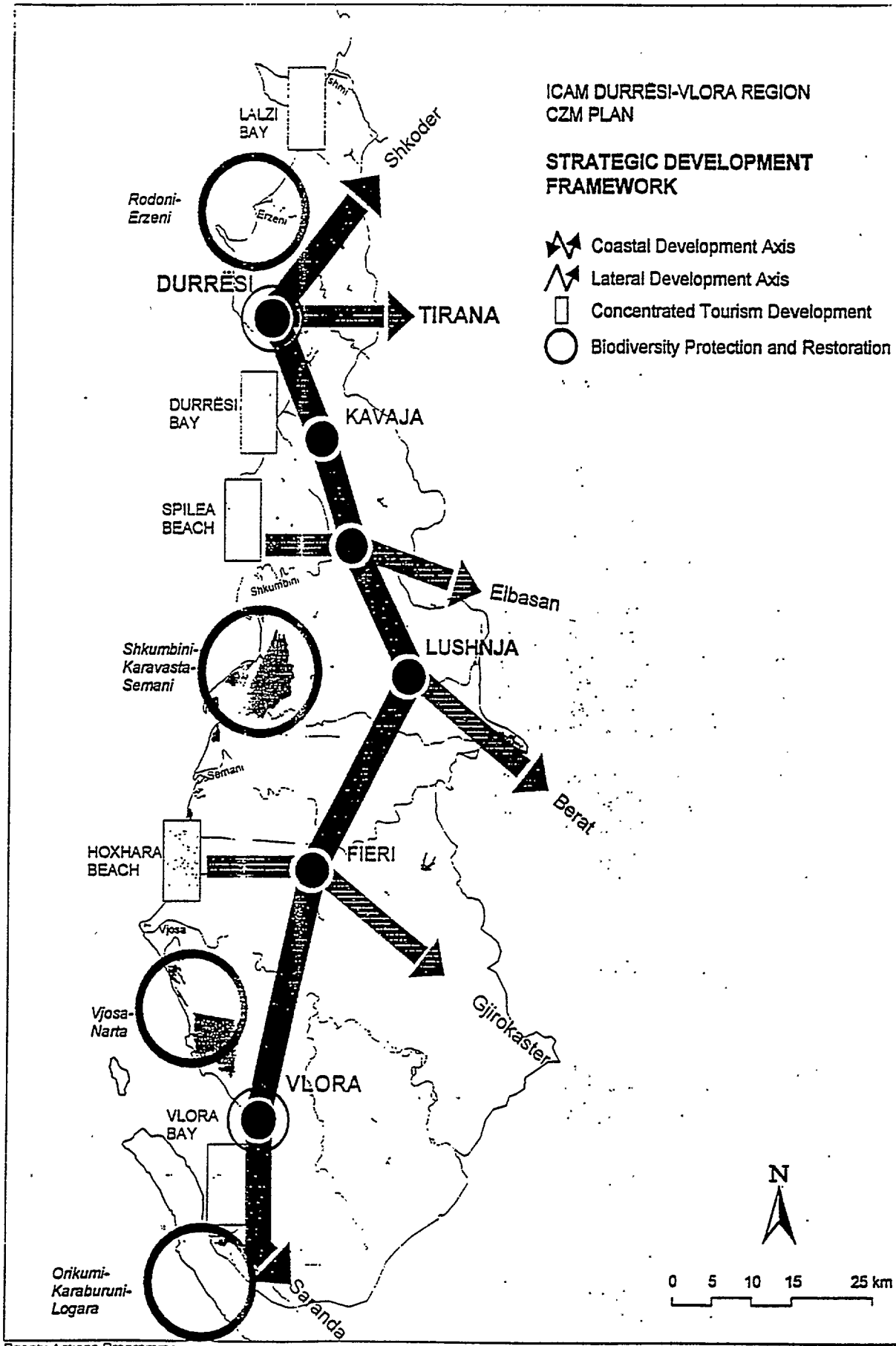
Ms. Alma Bako	Architect-Planner
Mr. Agim Shehu	Civil Engineer-Planner
Ms. Miranda Haxhiu	Architect-Planner
Ms. Elvana Ruli	Architect-Planner
Ms. Diana Progri	Architect-Planner
Ms. Rajmonda Daja	Architect-Planner
Mr. Sotir Dhamo	Architect-Planner
Mr. Arqile Berxoli	Demographer
Mr. Nasip Mecaj	Geographer

Albanian Consultants:

Mr. Romeo Eftimi	Hydrogeologist
Mr. Rezar Shehu	Hydrologist
Mr. Skender Cocoli	Civil Engineer
Ms. Flutra Rreli	Civil Engineer
Mr. Skender Dishnica	Dendrologist
Mr. Ndoc Rrakaj	Ichthyologist
Mr. Aleksandar Flloko	Fishery officer
Mr. Reshat Gega	Architect Archaeologist
Ms. Shpresa Prifti	Architect Archaeologist
Mr. Spiro Karaduni	Forestry Engineer
Mr. Vilson Kulla	Civil Engineer
Ms. Fioreta Luli	Geologist
Mr. Bardhyl Shushku	Engineer
Mr. Gani Sina	Civil Engineer
Mr. Adrian Vaso	Biologist

International Working Team:

Mr. Ivica Trumbic	Director, PAP/RAC
Mr. Srdjan Truta	Regional Planner/Team Leader
Mr. Danilo Demi	Environmental Planner
Mr. Slobodan Pavasovic	GIS consultant
Mr. Gojko Berlengi	Regional Planner
Mr. Gabriele Zanetto	Economist
Ms. Kasja Tulic	Senior Assistant to PAP Projects



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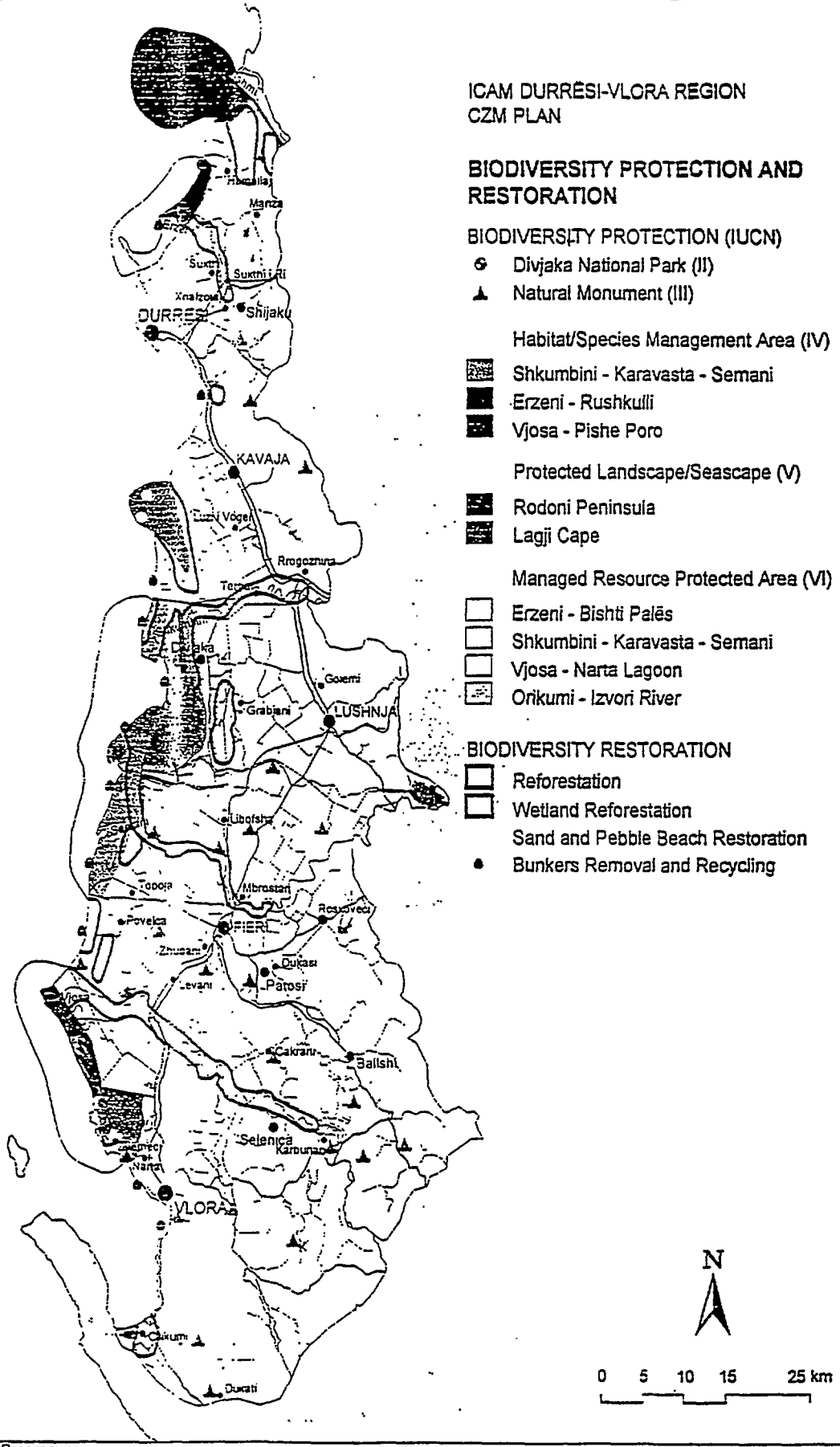
Map 3



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Map 4

ICAM DURRËSI-VLORA REGION
CZM PLAN

STRATEGY FOR BIODIVERSITY PROTECTION, URBAN AND TOURISM DEVELOPMENT

FOREST

- Natural Forest Protection and Reforestation
- Pine Forest Protection and Reforestation
- Reforestation to Limitate Soil Erosion

WETLANDS

- Lagoons, Rivers and Reservoirs
- Wetlands and Restored Wetlands
- Restored Riverine Environment
- Preserved and Restored Saltmarshes-Saltponds
- Intertidal Mudflats
- Intertidal Channels Dredging
- Saltpan

SHORELINE PRESERVATION

- Beach
- Dunes Preservation
- Sand and Pebble Beach Restoration
- Bunker Removal and Recycling

AGRICULTURAL AREAS

- Olive Groves
- Aquaculture

TOURISM DEVELOPMENT

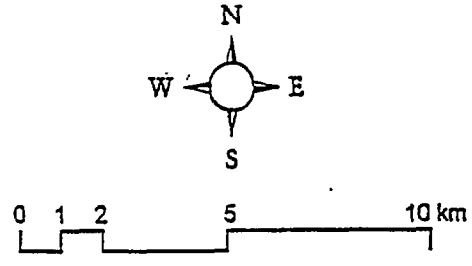
- Zones of Concentrated Accommodation - Type A
- Less Concentrated Accommodation - Type B
- Recreation - Type C
- Recreation and Eco-Tourism - Type D
- Potential Marinas
- Recreation on Artificial Lakes
- Use of Existing Structures for Tourism

URBAN DEVELOPMENT AND INFRASTRUCTURE

- Town and Village Improvement and Expansion Areas
- Harbor Construction and Improvement
- New and Improved Main and Secondary Roads
- Scenic Road or Trail Improvement
- Sewage Treatment Plant / Constructed Wetland
- Factory to be Removed
- Removal of Buildings and Structures in Discrepancy with the Environment

BIODIVERSITY AND CULTURAL HERITAGE PROTECTION

- National Park (II)
- Natural Monument (III)
- Habitat/Species Management Area (IV)
- Protected Landscape/Seascape (V)
- Managed Resource Protected Area (Terrestrial/Marine) (VI)
- Monuments and Archaeological Sites
- Archaeological Areas
- Landscape of Scenic Value
- Sites of National Significance



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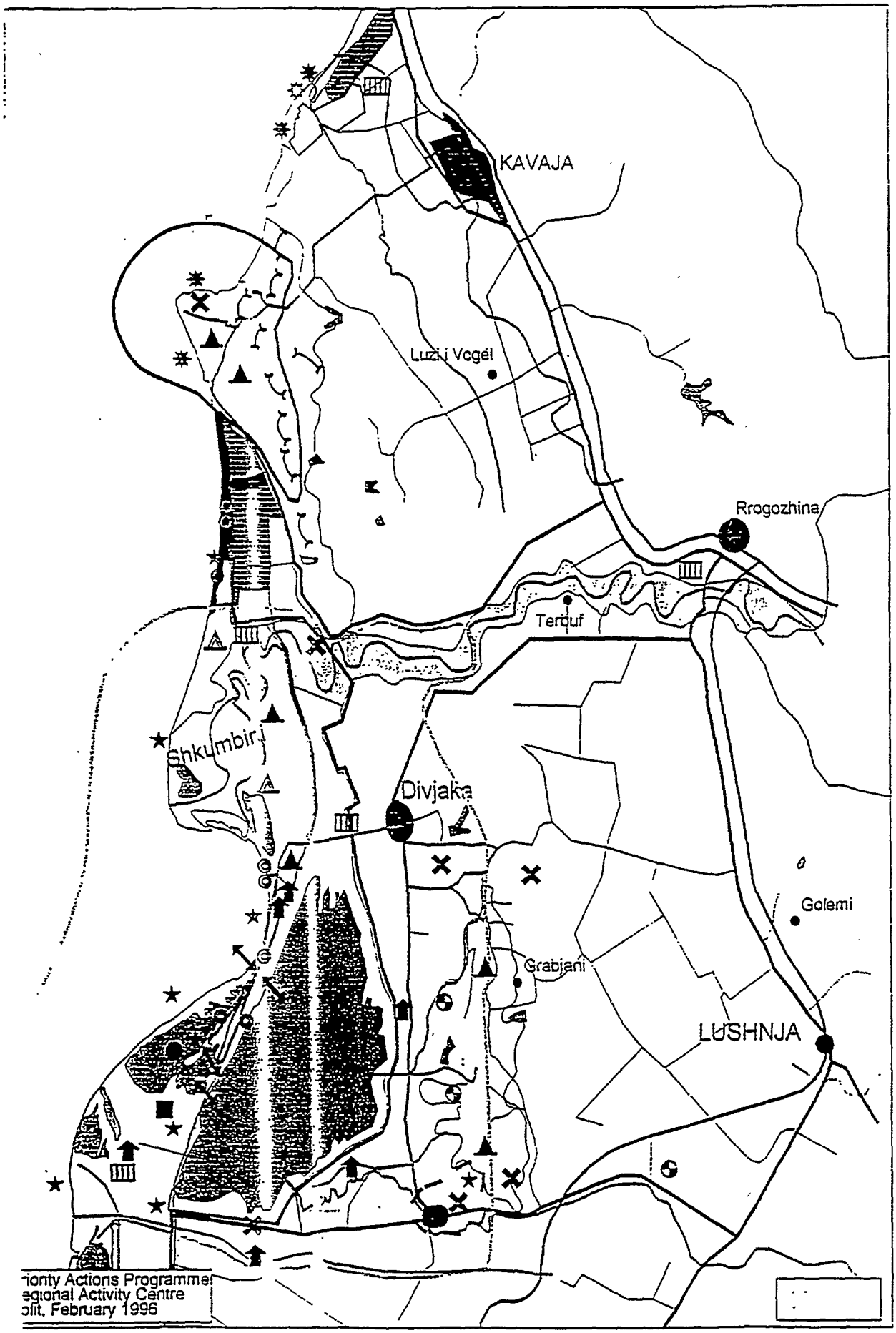
Map 5


KAVAJA
Luzi i Vogël
Rrogozhina
Terdufi
Shkumbin
Divjaka
Golemi
Grabjani
LUSHNJA
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Map 6