

# COASTAL AREA MANAGEMENT IN CROATIA

REPUBLIC OF CROATIA  
STATE DIRECTORATE FOR THE PROTECTION  
OF NATURE AND ENVIRONMENT

MAY 1998

**Note:** This paper has been prepared upon request of the State Directorate for the Protection of Nature and Environment of the Republic of Croatia, and was written and edited by a group of experts from the State Directorate's Office for the Adriatic, Rijeka, and the Regional Activity Centre of the Priority Actions Programme, Split.

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Printed by: **JAFRA, Split**

ISBN 953-6429-14-4

*For bibliographic purposes this document may be cited as:*

State Directorate for the Protection of Nature and Environment of the Republic of Croatia: Coastal Area Management in Croatia. Zagreb, State Directorate for the Protection of Nature and Environment of the Republic of Croatia. 1998.



REPUBLIC OF CROATIA

THE STATE DIRECTORATE FOR THE PROTECTION  
OF NATURE AND ENVIRONMENT

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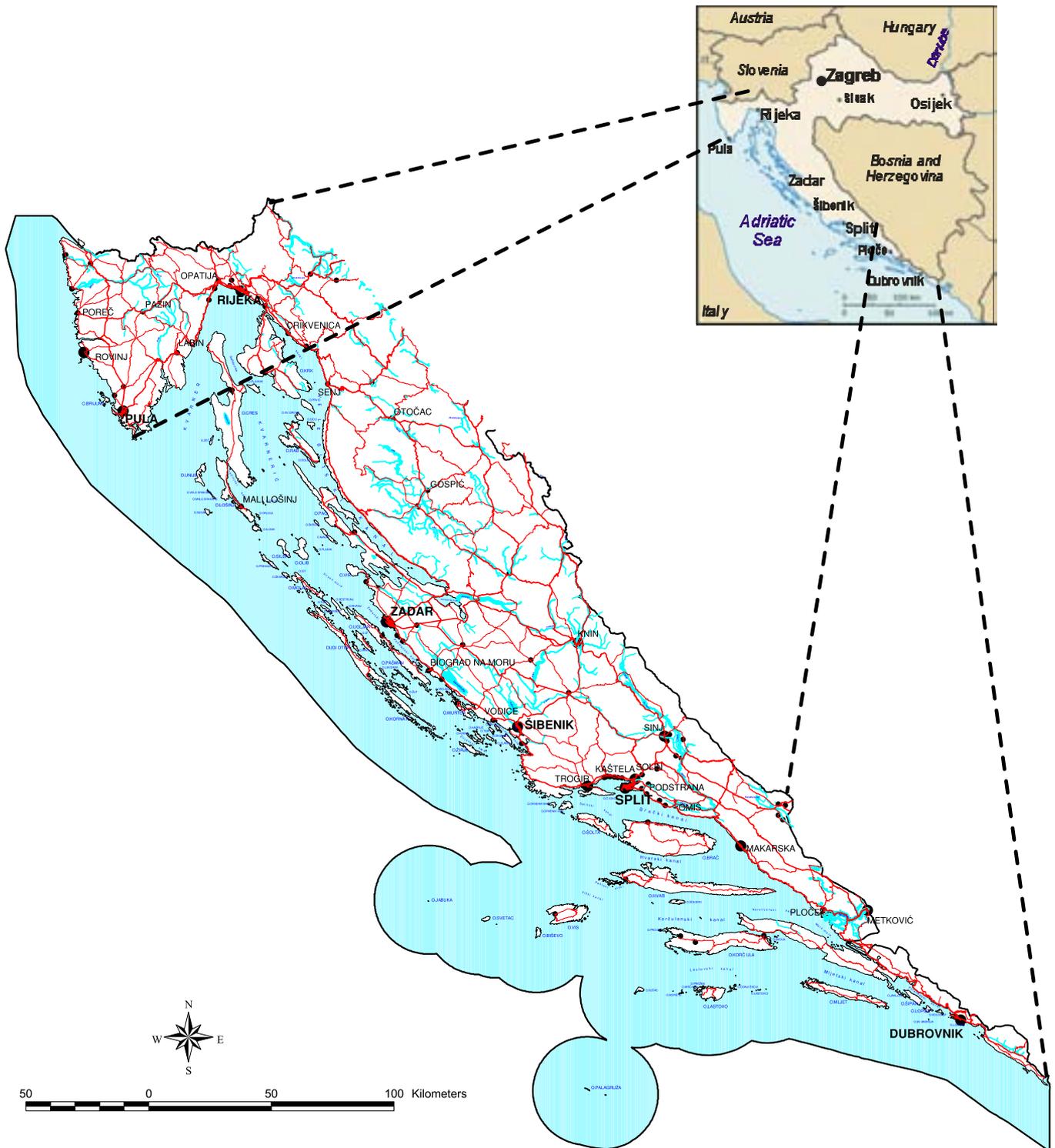
Zagreb, May 1998



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**CONTENTS**

|            |  |           |
|------------|--|-----------|
| <b>I</b>   | <b>INTRODUCTION: TRADITION OF COASTAL MANAGEMENT .....</b>                       | <b>1</b>  |
| I.1        | PURPOSE OF THE REPORT.....   | 1         |
| I.2        | HISTORY AND TRADITION OF COASTAL AREA PLANNING AND<br>MANAGEMENT IN CROATIA..... | 2         |
| <b>II</b>  | <b>COASTAL AREAS AND ISLANDS: POTENTIALS AND CHALLENGES .....</b>                | <b>5</b>  |
| II.1       | COASTAL ENVIRONMENT OF CROATIA .....   | 5         |
|            | Natural characteristics.....   | 5         |
|            | Protection of nature.....  | 7         |
|            | Biological and landscape diversity.....  | 8         |
| II.2       | POPULATION OF THE COASTAL REGION .....   | 10        |
| II.3       | ECONOMIC ACTIVITIES .....  | 12        |
|            | Primary sector .....   | 13        |
|            | Secondary sector.....  | 14        |
|            | Tertiary sector.....   | 14        |
| II.4       | ENVIRONMENTAL IMPACT .....   | 15        |
|            | Water resources .....  | 15        |
|            | Waste waters.....  | 16        |
|            | Solid waste .....  | 16        |
|            | Sea.....   | 16        |
|            | Terrestrial ecology.....   | 17        |
| <b>III</b> | <b>PRACTICE OF COASTAL MANAGEMENT IN CROATIA.....</b>                            | <b>19</b> |
| III.1      | STRATEGY AND POLICIES .....  | 19        |
|            | Legal framework, principal documents and attitudes .....                         | 19        |
|            | Accents and priorities .....   | 21        |
| III.2      | REGULATION OF URBAN DEVELOPMENT.....   | 21        |
|            | Accents and priorities .....   | 23        |
| III.3      | COASTAL MANAGEMENT TOOLS.....  | 23        |
| III.4      | ADMINISTRATIVE AND INSTITUTIONAL STRUCTURE.....                                  | 25        |
|            | General and special institutional frameworks for action .....                    | 25        |
|            | Implementation system.....   | 26        |
|            | Accents and priorities .....   | 26        |
| III.5      | ROLE OF NON-GOVERNMENTAL ORGANISATIONS IN COASTAL AREA<br>MANAGEMENT.....        | 27        |
|            | Access to information on the environment, and public participation.....          | 27        |
| III.6      | ENVIRONMENTAL IMPACT ASSESSMENT.....   | 28        |
| III.7      | IMPLEMENTATION OF MANAGEMENT PLANS.....  | 29        |
| III.8      | INTERNATIONAL CO-OPERATION .....   | 30        |
| III.9      | EXAMPLES OF SUCCESSFUL COASTAL MANAGEMENT PROJECTS.....                          | 32        |
|            | Cres-Lošinj Archipelago.....   | 32        |
|            | Kaštela Bay .....  | 33        |



# I INTRODUCTION: TRADITION OF COASTAL MANAGEMENT

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## I.1 PURPOSE OF THE REPORT

Coastal planning and management has become a well established scientific discipline throughout the world. According to numerous sources, about 60% of the global population currently live in coastal areas, i.e. in a strip reaching 100 km inland from the coastline, and the tendency is of further growth. At the same time, 65% of all cities with more than 1 million inhabitants, and most of economic activities are concentrated in those same areas. It is not surprising, therefore, that we now witness a global boom of a special interdisciplinary and multidisciplinary profession dealing exclusively with that specific part of the national territory: coastal area planning and management. The Republic of Croatia is certainly no exception, and, moreover, has a

long tradition of coastal planning and management, where it has achieved enviable results.

Owing to the long history of coastal planning in the Republic of Croatia, a number of valuable coastal environments have been preserved in spite of great pressures of urbanisation, industrialisation and tourism over the past decades. Croatian experts and institutions have been very active in the international organisations dealing with planning and protection of the sea and coastal areas, both within and outside the United Nations system. Croatian experts were actively involved in the formulation and implementation of the Regional Seas Programme of the United Nations Environment Programme (UNEP), as well as the Barcelona Convention and the



Mediterranean Action Plan (MAP). Shortly after gaining independence, the Republic of Croatia has joined the Barcelona Convention. Finally, Croatia hosts a respected international institution, centre of excellence dealing with coastal planning and management, the Regional Activity Centre of the Priority Actions Programme (PAP/RAC) which operates within the MAP.

The objective of this publication is to concisely present what has been achieved in Croatia in the field of planning, protection and management of its coastal areas. The wish is to achieve it through a brief presentation of the basic human and natural resources, relevant problems, and possibilities of future development and use of those resources. This publication is neither plan nor study aimed at judging, praising or suggesting what should be done in the coastal area. The basic intention is to present, as objectively as possible, the true situation of coastal planning and management in Croatia and the possibilities of this important scientific discipline, as well as the institutional basis for tackling the problems and challenges that the future has in store. The population's expectations are great, coastal resources are considered among the most important for the prosperity of the country, and the present capacities for their permanent management are not negligible. All this leads to the conclusion that, with certain efforts, the coastal area can be used yet remain preserved, as the generations of Croatians have been doing for more than a thousand years. This publications will be just a small contribution showing what we have and how we can further improve it. The profession of coastal planning and management can provide great help in achieving that aim.

## **1.2 HISTORY AND TRADITION OF COASTAL AREA PLANNING AND MANAGEMENT IN CROATIA**

The coast of the Republic of Croatia makes 51% of the eastern Adriatic coastline. If we add the coastline of the islands, the

Croatian coast accounts for 90% of the total length of coast of the eastern shore of the Adriatic Sea. This illustrates how developed and rich in islands the Croatian coast is, next only to Greece in the Mediterranean.

The Adriatic Sea, deeply cut into the European continent, has always represented an important link between the Middle East and western Europe. Its eastern coast, protected by numerous islands, provided suitable maritime ways from the Mediterranean to the Po Valley and Alpine passes. As a result of those circumstances, the eastern Adriatic coast was inhabited very early, through Greek and Roman colonisation, when the first coastal agglomerations were created.

The eastern Adriatic coast and its hinterland were at the borderline between civilisations and political forces: Illyrian and Greek, Roman and "barbaric", western and eastern parts of the Roman Empire, Rome and Byzantium, eastern and western Christianity, and later between Christianity and Islam. Since the 7<sup>th</sup> century, the eastern Adriatic region has been the field of mutual influences of Croatian, Roman and mid-European cultures.

Under such tumultuous historic conditions, 40-odd larger settlements were formed which, in the early Middle Ages, turned into well organised, fortified and economically stable urban communities, small in the number of inhabitants (2,000-5,000), but very important for their urban, physical and social qualities. These communities based their administration, safety and organisation of everyday life on town statutes, enacted very early, through which they took a particular care of the urban space, soils, forests, water resources, landscapes, and fishery resources.

From the 10<sup>th</sup> to the 20<sup>th</sup> century, those towns, like the entire Croatian part of the Adriatic coast, were under the authority of several different states (Byzantium, Mediaeval Croatian state, Croato-Hungarian state, the Dubrovnik Republic, Venice, Austro-Hungarian Empire). The coastal strip

is separated from the immediate hinterland by a chain of medium-high karstic mountains that spreads almost along its entire length. Traffic connections along the coast were very bad, as there was no coastal road, just as there were no good connections with the hinterland. Thus, only several sites along the coast, where the configuration of the mountains allowed for communication with the hinterland, provided conditions for the development of larger settlements. It was on those sites that larger coastal towns, Pula, Rijeka, Zadar, Šibenik, Split and Dubrovnik were formed. These were centres of their respective regions, market places and important harbours where goods were exchanged between the hinterland and islands, and from where ships went to the opposite coast of the Adriatic, Venice, Ancona and Apulian towns, as well as to other Mediterranean ports. However, all until the second half of the 20<sup>th</sup> century there were no good roads connecting the coast with the hinterland, or the coastal towns between them.

During the 1950s and 60s, the economic growth was much stronger than in the 19<sup>th</sup> and the first half of the 20<sup>th</sup> century, and ever growing numbers of tourists visited the coastal resorts (Dubrovnik, Hvar, Lošinj, Opatija and others). All that required interventions in the maritime and road traffic and infrastructure in order to enable the development of the region as a whole, especially with regard to tourism. Construction was launched of a road to run along the entire coast (the so called "Adriatic motorway"), modernisation started of the road and railroad networks leading to the hinterland, new ports were built, suitable for the use of motor vehicles which had become dominant in the transport of passengers and goods, water supply systems were built, and a number of similar actions were taken.

With regard to the importance of the coastal region for the whole country, the United Nations were asked for assistance in further planning of coastal development. As a result, the entire coastal region was

covered by a series of physical plans prepared over a period of 10 years, which contained a number of elements that correspond to what we call today "sustainable development". Those plans included:

- physical plans of the development of the southern Adriatic region, which covered the coast between the Albanian border and Split (1969-1971 – Adriatic I)
- Co-ordination Physical Plan of the Upper Adriatic Region and its Hinterland, which covered the coast between Split and the Italian border (1971-1973 – Adriatic II)

A large number of national and international experts of various profiles participated in the preparation of those plans, supported by the United Nations Development Programme (UNDP). That enabled for performing thorough studies of the resources of the eastern Adriatic region, and for assessing more precisely development potentials, which in turn helped with making more realistic plans of its economic, social and physical development. Although in the preparation of plans there was the intention to protect and enhance the environment, the stress was primarily on the development component.

In 1973, again in co-operation with UNDP, the project Protection of the Human Environment in the Adriatic Region was launched (Adriatic III), with the basic aim of harmonising to the maximum the development and protection needs. That project is particularly important because it was perhaps the first response to the conclusions of the First World Conference on Environmental Protection held in Stockholm in 1972, and because it covered such a large area (entire eastern coast of the Adriatic with immediate hinterland). The project dealt with a variety of problems, regarding air, water, soils, public health, waste waters, solid waste, noise, sea, ecology, land, vegetation cover, historic heritage, and tourism. Assessment was made of growth limits using conceptual and mathematical models, and of the relations between the human activities and the various

components of the environment. That project, in which 40-odd national scientific and professional institutions participated, as well as some 20 leading international experts engaged by UNDP, gave very precise recommendations which greatly contributed to the fact that the eastern Adriatic region, including the land, islands and the sea, is still one of the best preserved coastal areas of the European part of the Mediterranean. All of the above mentioned plans (Adriatic I, II and III) contained concise recommendations for physical and environmental management (especially Adriatic III), but those were not obeyed to the full, since the then current political system did not allow for it. Therefore, the Adriatic region, even if one of the best preserved in the Mediterranean, suffered a certain amount of damage, due to badly planned and/or uncontrolled tourism construction, urban spreading, and inadequate location of roads in some segments of the coast.

## II COASTAL AREAS AND ISLANDS: POTENTIALS AND CHALLENGES

### II.1 COASTAL ENVIRONMENT OF CROATIA

#### Natural characteristics

##### Relief and soils

By its position, the Republic of Croatia belongs to the central European, Adriatic-Mediterranean and Panonian-Danubian group of countries. It covers an area of 87,677 km<sup>2</sup>, of which 56,610 km<sup>2</sup> are land, and 31,067 km<sup>2</sup> coastal sea, while the surface area of the Adriatic watershed is 22,134 km<sup>2</sup>.

The coastal region of Croatia is an Adriatic area showing all phenomena typical of a large part of the Mediterranean, especially of its European shores. Developed relief with mountain chains in the immediate vicinity of the coastline, sometimes at just 10-odd metres, and numerous islands (1,185), interchanges with flat stretches. Geographically, the islands are classified in 718 proper islands, 389 rocks (top above the water), and 78 ridges (top below the water). There are two large peninsulas, Istria and Pelješac. Generally, the coast is rocky with frequent pebble drifts, while sand beaches are rather less common. The total length of the coastline is 5,835 km, of which 1,777 km belong to the coast of the mainland, and 4,058 km to the island coasts, which makes the Croatian coast the most indented in the Mediterranean.

The principal natural feature is the hilly karstic base. The mountainous coastal belt often keeps the dominant influence of the sea within just several kilometres inland. The karstic base lacks any significant earth layers, and the vegetation cover is relatively scarce, except in some river valleys and karstic fields. The soils are shallow and skeletal (rendzinas, black and eroded brown

soils on limestone and dolomite bases). Deeper soils (red) can be found only locally.

##### Climate and vegetation

The most important climate zones of the region are:

- The zone of moderate tropical climate (Mediterranean or sub-tropical) which covers the coastal and island areas of Dalmatia, as well as the southern parts of the Rab and Lošinj islands.
- The zone of moderately cold climate which covers the entire coast facing the Velebit mountain, the Kvarner region and the peninsula of Istria, including the adjoining islands.

Generally, the climate is characterised by dry and hot summers, and mild and rainy winters, and a high number of sunny and clear days. Such climatic conditions are favourable for vegetation (cooler and rainier areas in the northern Adriatic, and the warmer areas in the south, variety of micro-climates, etc.).



**Table 1: Largest rivers of the Adriatic basin**

|                | RIVER   | LENGTH (km) |            | SURFACE AREA OF RIVER BASIN (km <sup>2</sup> ) |            | EMPTIES INTO |
|----------------|---------|-------------|------------|--|------------|--------------|
|                |         | total       | in Croatia | total  | in Croatia |              |
| ADRIATIC BASIN | Neretva | 225         | 20         | 11,798   | 430        | Adriatic     |
|                | Cetina  | 101         | 101        | 1,468  | 1,468      | Adriatic     |
|                | Krka    | 73          | 73         | 2,088  | 2,088      | Adriatic     |
|                | Zrmanja | 69          | 69         | 907  | 907        | Adriatic     |
|                | Mirna   | 53          | 53         | 458  | 458        | Adriatic     |

The forest cover of the Adriatic region belongs to the Mediterranean type, except for the border zones of the mountainous hinterland, which belong to the Euro-Siberian - North-American forest type. Over the centuries, the vegetation cover has degraded, so that today, about 2/3 of the area are occupied by degraded maqis, garrigues and rocky plains. Along with individual sites covered in autochthonous Black pine there are relatively large areas of Aleppo pine forests within the zone of the Holm oak, mostly in the southern Adriatic. Forests of Holm oak have been preserved only at few locations (on some islands).

#### Hydrography of inland waters

All inland waters of the Adriatic watershed reflect the hydrographic features of karst, with poor surface and rich underground hydrography, which results in a capricious nature of the natural distribution of fresh

waters. Almost all rivers flowing into the Adriatic Sea, as well as other surface (lakes) and ground waters are of such quality that they can be used for water supply, i.e. represent potential sources of drinking water. Surface waters are also used for hydro-energy purposes. Apart from Neretva, all rivers are fast and short, with great variation of flow. Great quantities of rainfall reach deep layers. A part of those waters reappears on the surface in the form of springs in karstic fields only to disappear again under ground through karstic sink holes (the longest of those water courses are the rivers Lika and Gacka). However, most of the ground waters flow under ground directly into the sea, sometimes under the sea surface creating submarine sources. Local ground waters accumulate in a number of islands, but during the dry period, sea water intrusion often occurs due to over-exploitation.

**Table 2: Largest lakes**

|                         | SURFACE AREA (km <sup>2</sup> ) | HEIGHT ABOVE SEA LEVEL (m) | MAXIMUM DEPTH (m) |
|-------------------------|---------------------------------|----------------------------|-------------------|
| <b>NATURAL LAKES</b>    |                                 |                            |                   |
| Vransko (Biograd)       | 30.7                            | 0.1                        | 4                 |
| Prokljansko             | 11.1                            | 0.5                        | 25                |
| Vransko (Cres)          | 5.8                             | 16                         | 74                |
| Mljetska lakes          | 2.01                            | 0                          | 46                |
| Baćinska lakes          | 1.9                             | 5                          | 32                |
| <b>ARTIFICIAL LAKES</b> |                                 |                            |                   |
| Peruča (on Cetina)      | 1.3                             | 360                        | 64                |
| Krušičko                | 3.9                             | 554                        | -                 |
| Butoniga                | 2.5                             | 41                         | 17                |
| Lokvarsko               | 2.1                             | 770                        | 40                |
| Bajersko                | 0.5                             | 730                        | 7                 |

Permanent lakes are not particularly numerous. There are 10 natural and artificial lakes which cover a total surface of 73.51 km<sup>2</sup>. These lakes are of tectonic, karstic, glacier or riverine origins. For the purpose of using the water courses for the production of electricity 5 artificial lakes have been built, as well as a number of smaller retentions for water supply or irrigation purposes. The largest artificial lake, Vransko, near Biograd, which is also a significant ornithological reserve, covers a surface of 30.7 km, but its maximum depth is of 4 m, so it does not contain large quantity of water. Another lake, of the same name but situated in the island of Cres, 74 m deep, is the richest fresh water lake and the largest cryptodepression of Croatia. It is a natural phenomenon with a highly sensitive balance of water courses which prevent sea water intrusion into the lake. The Blue and the Red Lakes near Imotski are unique hydrographic phenomena in karst, and have been declared natural monuments.

### Sea

Along most of the Croatian coast, the coastal sea is separated from the open waters by a series of islands. The Adriatic is a relatively shallow sea, with average depth of 239 m, it is warm and has a high salinity. Even on the places where it is somewhat deeper near the shore it is separated from the open sea by a submarine barrier which does not affect the passage of even the largest ships, but influences the water circulation. Depending on the season, sea currents, winds and vicinity of the shore, the sea temperature varies throughout the year in both horizontal and vertical directions (in winter, in the north-western part near the coast the sea temperature is 8°C, and in the south-eastern 16°C), the average salinity is 38.3‰, slightly growing towards the south. Near shore the salinity is lower due to fresh water inflow from the land. The highest degree of transparency is found in the South-Adriatic Pit (56m), while along the coast the average value is of 20 m, decreasing towards the north. The sea currents arrive from the Ionian Sea and run

along the eastern coast towards north-west. Since the coast is very developed, with numerous bays, islands, sea passages and canals, there are numerous and considerable deviations, as well as local diversions from this general direction. The exchange of waters of the Adriatic Sea is slow.

There are great differences in the primary production of the organic matter: while the southern part is a practically unproductive sea, the northern part of the Adriatic (the bay of Istria-Triest-Venice) has one of the most intensive primary productions of the whole Mediterranean. This results in great differences in the occurrence of pelagic fish. The Croatian part of the Adriatic is poor in fish as compared to other seas, and even with some other parts of the Mediterranean.

### Protection of nature

Parts of the coast and the sea are protected by the Law on the Protection of Nature. Karst makes a specific geomorphologic structure of the coastal strip and its hinterland. The Dinaric karst, registered as a part of the world's natural heritage (*locus typicus*), is a particularly sensitive system requiring special attention with regard to preservation of drinking water resources. In the coastal region, there are 107 protected objects (83 areas, and 24 individual trees, smaller groups of trees, or very small sites), of which 33 objects of nature have been selected and classified in 8 protection categories. The largest part of the protected surface regard the national parks and parks of nature the structure of which illustrates well the wealth and great diversity of the nature in Croatia.

**National parks** (Brijuni, Paklenica, Kornati, Krka, Mljet) are large areas of particular natural, cultural, scientific, educational, aesthetic, tourist and recreational values, encompassing one or more preserved or insignificantly modified eco-systems. In the national parks, no activities are allowed that could threaten the original flora and fauna, or the hydrographic, geomorphologic, geological and scenic values. The only works allowed are those aimed at maintaining or

establishing the natural balance. Three national parks are on islands (Kornati, Brijuni, and Mljet) including the surrounding sea, one illustrates the interesting features of karstic hydrography and morphology (Krka), and one is a typical mountain area with interesting vegetation and relief (Paklenica). In the immediate hinterland there are two more national parks, Plitvice and Risnjak.

**Natural parks** (Velebit, Telašćica, Biokovo) are natural or partly cultivated areas with pronounced ecological, aesthetic, tourist and recreational values, in which only activities that do not threaten their significant characteristics are allowed. Among these parks, two are mountains (Velebit and Biokovo), and one is on an island (Telašćica).

**Strict reservations** (Rožanski and Hajdučki kukovi on the Velebit mountain) are areas with unchanged or insignificantly changed nature, and are intended exclusively for scientific research which does not change bio-diversity or the original state of the nature, and which does not threaten the free course of natural processes.

**Special reservations** are areas in which one or more unchanged components of the nature are particularly pronounced (plant or animal species, relief, waters, etc.), and which are of special scientific significance or purpose. Thirteen land and marine objects have been covered by this form of protection.

**Park-forests** are natural or planted forests of great scenic value, intended for relaxation and recreation, in which only maintenance works are allowed. Two forest complexes on the coast have been protected under this category (Šijana, Marjan).

**Protected landscapes** are natural or cultivated zones of high aesthetic or cultural-historic value, or which are typical of a certain area. The canyon of the Cetina river, Pakleni and Badija islands, Vidova Gora hill, and Saplunara cove have been covered by this form of protection, and no activities are allowed there that could damage their appearance and beauty.

**Monument of nature** is an individual unchanged part or group of parts of the living or non-living nature, of scientific, aesthetic or cultural-historic value. A monument of nature can be geological, geomorphologic, hydrographic, etc., it can be a rare specimen of tree or group of trees, or a small botanical or zoological site. On the monument and its surroundings no activities are allowed that could threaten its features and value. The small islands of Brusnik and Jabuka, as well as the Zlatni rat cape have been protected as monument of nature.

**Monument of park architecture** is an artificially formed zone (garden, botanical garden, arboretum, town park, tree alley, a group of trees or an individual tree, or any other form of garden or park formation) with high aesthetic, stylistic, artistic, cultural-historic or scientific value. The Trsteno arboretum is one of larger objects protected by this category.

Apart from the above mentioned objects of nature, the Velebit mountain has been declared biosphere reserve within the project Man and Biosphere, launched by UNESCO in 1978.

According to the law, all spontaneously grown plants and wild animals found in a national park, strict reservation, and special reservation, as well as animals living in caves enjoy protection, even if they do not belong to protected plant and animal species.

The protected objects of nature in the coastal region cover a total area of 2,863 km<sup>2</sup>, or 65% of the area covered by all the protected objects in the Republic of Croatia, which illustrates the great value, as well as sensitivity of the coastal and island areas.

### Biological and landscape diversity

One of the most important features of the coastal and island region is the biological and landscape diversity, reflected in numerous plant and animal species, their communities and habitats, as well as in a high percentage of endemic species that is due to the geographic position, mild

Mediterranean climate, and expressly karstic relief, on predominantly calcareous base. The region hosts some 3,500 plant species, 12 species of amphibia, 34 species of reptiles, about 200 species of nesting birds, 79 species of mammals, 64 species of fresh water fish, while the sea is home to 407 species and sub-species of fish, 660 benthic algae, 4 species of marine meadows, and several species of marine mammals.

In order to protect that wealth of plant and animal species, a list was made of rare and endangered species (The Red Book). The coastal and island flora and fauna are especially rich in endemic species of great interest for natural sciences: Tertiary endemic relicts (*Degenia velebitica*), glacial relicts and neo-endemic species (*Dianthus*, *Leucanthemum*, *Campanula*, *Cantaurea*, ...). A part of the endemic fauna inhabits underground karst habitats (caves and caverns) and distant Adriatic islands. It was in those habitats that numerous endemic species were identified of Invertebrata and Vertebrata, the *Proteus anguineus* being the most interesting.

The ichthyofauna of the rivers of the Adriatic basin is generally considered among the most significant in Europe. There are 64 fish species, of which 40 are Mediterranean endemics, and 11 can only be found in Croatia.

Among the rivers, the Neretva river delta stands out because of its size, as well as because of a great diversity of vegetation, and a wealth of endemic fauna (Invertebrata and fresh water fish), great numbers of insects, especially butterflies, mammals, and particularly numerous birds. Three hundred and ten bird species have been noted there (of which 115 nesting birds, and 35 aquatic birds). Therefore, the ornithofauna of Neretva has been included in the List of Wetlands of International Importance (Ramsar Convention, 1971).

The landscapes of the Croatian part of the eastern Adriatic can be grouped in two general types, coastal and insular. Within those two types we distinguish two types of

coast, steep and rocky, and gently sloping with pebble, and rarely sand beaches. Significantly different from the rest of the coast is only the Neretva river delta, very large and developed, created by the action of the river and occasional flooding. To certain extent, the same applies also to the Cetina river.

The rocky karstic base and sometimes dramatic topography resulted in highly developed coastline of the islands, with numerous bays, coves, rocks and reefs. Unlike the islands, the coastal segments are rather strait with little space between the sea and the mountains behind. Exceptions to that are only several deep bays in the Istrian peninsula, the Kaštela Bay, the area of Cavtat, and the river mouths of Zrmanja, Krka and Ombla. Of the two large peninsulas, the smaller one, Pelješac, topographically and climatically belongs to islands, while the larger one, Istria, makes a separate unit, characterised by a gentle hilly slope, gradually descending from the steep eastern shores to the shallow and gently inclined western coast.

Strong coastal barriers are made of Učka, Velebit, Kozjak, Mosor and Biokovo, mountain chains rising steeply from the coast. Velebit, in the northern Adriatic, rises practically from the sea, leaving minimum conditions for life on the coast. Mosor and Kozjak, in the central Adriatic, border the wide Split-Kaštela plain, rich in water and fertile soils where intensive life dates back to pre-historic times. Biokovo, also in the central Adriatic, with its slopes suitable for growing fruit and olive, with frequent small springs, and beaches formed by erosion, offers ideal conditions for intensive development of tourism.

The western Istria, Ravni kotari (plains between the rivers Zrmanja and Krka), the Split-Kaštela plain and the Neretva river delta are the areas most suitable for agriculture. Here we can also add small segments of coast and the immediate hinterland where the soil brought by storm waters or produced by erosion gathered in terraces made by forest felling and

supported by walls. Those terraces are very suitable for vineyards, which produce high quality wines.

Unlike the mainland, the islands are mostly karstic and hilly, and only rarely do the hills reach higher than 500 m above the sea level. Karstic fields in small valleys and in the bottoms of bays, as well as the terraces created by centuries of hard work, are suitable for vineyards, and make the principal characteristic of the man-made landscape of the islands. By the natural features, the islands can be divided in bare and forested. Generally speaking, the south Adriatic islands are characterised by thick evergreen maquis with sporadic thickets of barberry. However, these areas, as well as abandoned terraces, are increasingly invaded by the Aleppo pine, which has recently settled in the islands. The central Adriatic islands, dominated by the Kornati group, are predominantly bare and rocky, and only in the zones sheltered from strong winds, rare grass sprouting from broken rocks enables breeding of sheep and goats, or shallow soils enable growing of olive, while the highly developed marine landscape abounds in fish. The Kvarner islands, Lošinj, Cres, Krk and Rab, unlike all other islands in the region, have more water, but due to exposition to northern winds, have forests only in protected zones, which contain some typically continental species, and vineyards can also be found in places.

## II.2 POPULATION OF THE COASTAL REGION

The total number of inhabitants in Croatia, according to the 1991 census, is 4,784,265. The administrative and territorial constitution of Croatia is based on counties, municipalities and towns (21 counties, 122 towns and 416 municipalities).

Seven coastal counties, i.e. those that include segments of coast, account for little less than 44% of the total surface area of the country (24,696 km<sup>2</sup>). Heterogeneous by spatial reach and relief, some counties, like the County of Dubrovnik-Neretva, have a markedly coastal-insular character, one is

almost entirely situated on a peninsula (County of Istria), most of them have vast hinterland, while the County of Lika-Senj has a markedly continental character with little developed coast, but is a highly important link between the northern and southern parts of Croatia.

In 1991, the coastal counties had 1,580,213 inhabitants (little more than 33% of the total population of Croatia), living in 58 towns, 153 municipalities and 2,483 settlements, with the overall population density of 64 inhabitants per km<sup>2</sup>, which is below the Croatian average of 85 inhabitants per km<sup>2</sup>. Among the coastal counties the most densely populated are the counties of Split-Dalmatia (105 inhabitants per km<sup>2</sup>) and of Primorje-Gorski kotar (90 inhabitants per km<sup>2</sup>), while the least densely populated is the county of Lika-Senj with 16 inhabitants per km<sup>2</sup>, which makes it also the least densely populated county of Croatia.

Modest natural prerequisites have limited the economic development of the islands. In the time of greatest prosperity of shipping, fishing and vine growing (late 19<sup>th</sup> and early 20<sup>th</sup> centuries) the 66 inhabited islands of the Croatian part of the Adriatic had a total population of 160,000 inhabitants. In the third quarter of the 20<sup>th</sup> century that number dropped to 94,000, which means that the island population was almost halved in less than a century. In the continental part of the coast, the situation was completely different. In the same period, the towns of Pula, Rijeka, Zadar, Šibenik and Split have grown into harbours and industrial centres which have attracted the population of the immediate hinterland and the islands, so that their population has more than triplicated. Dubrovnik, Makarska, and especially the Istrian coastal towns have grown into important tourism centres, while the general trend of population migration from the hinterland to the coast initiated the growth of other coastal settlements as permanent or temporary homes of that new population.

The basic demographic trend, observed over the last several decades, is reflected in a

reduced population growth rate, with depopulation of islands and hinterland, and population growth of the settlements in the narrow coastal strip. The gravitation force of the macro-regional centres, Split and Rijeka, stimulates migrations towards the counties of Split-Dalmatia and of Primorje-Gorski kotar from the surrounding counties. Another result of this trend is the growth of urban and decrease of rural population.

**Table 3: Ten largest towns of the Republic of Croatia\***

| Town           | No. of inhabitants according to 1991 census |
|----------------|---|
| Zagreb         | 867.717                                     |
| Split*         | 200.459                                     |
| Rijeka*        | 167.964                                     |
| Osijek         | 129.792                                     |
| Zadar*         | 80.355                                      |
| Karlovac       | 70.950                                      |
| Pula*          | 62.690                                      |
| Sisak          | 60.884                                      |
| Slavonski Brod | 58.531                                      |
| Šibenik*       | 55.842                                      |

\* Coastal towns in the table are marked by asterix

The population growth rate index for the coastal counties in the period 1971-1991 (112.77) is above the Croatian average (108.09). The fastest growth was recorded in the counties of Split-Dalmatia and of Primorje-Gorski kotar. Of the total population of the coastal counties, urban population accounts for 61.41%, while for the whole country that index is 54.74%. The population of the coastal towns grows considerably faster than the total coastal population.

The distribution of towns by size shows the existence of two strong regional centres, Split and Rijeka, and relatively few medium-size towns. Although the Croatian coast of the Adriatic has a long and rich urban tradition, its urbanisation was somewhat belated, due to various historic and political reasons. The recent decades brought a strong litoralisation trend, stimulated especially by the construction of tourist complexes and entire settlements composed

of secondary homes along the coast. That trend slowed down in the period 1991-1997, but its revival can now be expected. Accordingly, we can expect problems relevant to the protection of the environment, especially of its natural and man-made values, as well as problems relevant to urban expansion, and urban and other infrastructure.

The greatest migration pressure, caused by the outbreak of hostilities in Croatia, was absorbed by the large and medium-size towns. It is estimated that, the number of inhabitants of Split has grown in the seven years after 1991 by almost 30,000, of Rijeka by more than 18,000, of Zadar by more than 24,000, of Pula by little under 15,000, and of Dubrovnik by almost 10,000. The negative aspects of war migrations are the increased depopulation of hinterlands, additional pressure of the coastal urban infrastructure, and changes in the cultural identity of towns. The positive aspect is that the towns gained younger population and different reproduction norms which could secure higher growth rates in the future.



According to the Blue Plan Mediterranean scenarios for the period 2000-2005, further urbanisation in the region can be expected (with the growth in proportion of urban population in the total population to 70-80%), as well as a slower growth of active population, which will get gradually older. The possible lack of younger population in labour force should be partly compensated by feminisation of the active population.

### II.3 ECONOMIC ACTIVITIES

Over the last 50 years, the economy of Croatia has gone through transformation from agricultural to industrial, and then from industrial to tertiary economy. Today, the structure of the gross domestic product of Croatia is similar to that of market economies: approximately 25% industry, 10% agriculture, and 65% tertiary sector. Traditional industrial activities played the role of accelerator to the economic growth, and are now giving way to capital-intensive activities. The nominal GDP for 1996 was about 19 billion US\$, and the GDP *per*

*capita* was around US\$ 4,500. It is estimated that the private sector creates more than 50% of the GDP. In the beginning of 1998, the number of persons in paid employment was 1,250,000, while the number of pension beneficiaries was 925,000. The unemployment rate varies between 18% and 19% of the active population.

In the 1990s, the transformation of the Croatian economy was accelerated by the transition from central-planning to market economy, through privatisation and restructuring of the economic sector. A very strong negative impact on the economy was produced by the aggression on Croatia in 1991. In the period 1989-1992, the GDP was almost halved, and in the second half of 1993 the monthly inflation rate reached 30%. However, owing to the stabilisation and privatisation programmes of the Croatian Government, the GDP and industrial production started showing growth in the second half of 1995. A considerable part of economy was privatised, and after 1993, the inflation rate has not exceeded 5% per year.



The level of economic development varies greatly from one coastal county to another. Of the four Croatian counties with above-average domestic product *per capita* in the period 1971-1991, three were on the coast: the county of Istria and the county of Dubrovnik-Neretva, markedly oriented to tourism, with complementary industrial and agricultural production, and the county of Primorje-Gorski kotar in which the tertiary activities account for more than 2/3 of the domestic product. Less developed counties, which have lost a considerable number of working-age and active population, retained activities of lower profitability and efficiency adequate for the structure of the remaining labour force. Among the counties with less developed economies there are primarily those including a large hinterland: the county of Lika-Senj, one of economically least developed in Croatia, the county of Zadar, and the county of Šibenik-Knin. The county of Split-Dalmatia, although a region with strong industrial and tourism sectors, has been lagging behind the average growth rate of the Croatian economy over the last decades.

In the 1990s, the economy of the coastal counties shared with the rest of Croatian economy the transitional processes and activity under war conditions. Traffic and energy supply isolation of a majority of coastal counties additionally aggravated the economic situation. As a consequence, the economic image of the coastal counties has been changed: the number of persons in paid employment dropped from 513,176 in 1990 to 386,602 in 1992, with further decrease of employment over the following years. The share of industry in the domestic product dropped, and the share of trade grew. In the war years, there was no revenue from tourism, threatening the areas oriented exclusively to tourism.

## Primary sector

### Agriculture

Agriculture is characterised by a constant decrease of the share of the rural in the total population: in 1991, that share was

8.56% for the Republic of Croatia, and for the seven coastal counties it was 3.42% (approximately 54,000 persons in agricultural households).

In 1996, the agricultural land covered approximately 55% of the total surface area of the 7 coastal counties, with several areas with high potential agricultural productivity (Ravni Kotari, Neretva river delta). Mild Mediterranean climate is particularly suitable for growing grapes, olives, fruit and vegetables, flowers and typical Mediterranean plants. A diminishing trend has been noted in the cultivation of traditional Mediterranean species (grapes, olives) which give way to other species which are less labour intensive or more profitable.

The trend reflected in a decrease of agricultural population and of the surface of cultivated land in the coastal region is further stimulated by the re-orientation of the land owners to tourism. The use of the agricultural land in the vicinity of urban centres has to a large extent been changed for the needs of secondary or tertiary activities, or turned into secondary home settlements.

### Livestock production

Livestock production is more pronounced in the hinterlands of the coastal counties, owing to its hilly-mountainous orientation (sheep, goats). In 1993, the number of sheep in the coastal counties made more than  $\frac{3}{4}$  of the total number of sheep in Croatia, while the corresponding ratio of cattle was less than 12%, and for pigs less than 3%. Individual sector dominates the livestock production.

### Fisheries

Fishing is a traditional branch of agriculture, which now shows a pronounced trend of decrease in the catches of sea fish, *Mollusca* and *Crustacea* (from 48,822 t in 1987 to 17,347 t in 1996). The largest part of the catches regards the pelagic fish, where the largest share is of pilchard. Alongside fishing, the marine fishery is made of rearing marine organisms (fish and shellfish). In

1995, 25 farms were registered, of which 17 in the islands and 8 on the mainland. These produced 1,600 t of marine fish, 600 t of mussels, and 50,000 oysters.

## Secondary sector

### Industry and mining

After the 2<sup>nd</sup> World War, Croatia had a strong and rather constant industrial growth. However, that growth was often accompanied by wrong decisions regarding the siting of factories, which had particularly harmful effects in the coastal counties. A large number of factories were sited in the narrow coastal strip, disregarding their effects on other economic activities, natural resources and landscape. The process of de-industrialisation of the Croatian economy can be noted since 1987; the overall industrial production volume index was constantly dropping between 1987 and 1995, to show a certain recovery in 1996. The growth of industrial production in 1997 was 6.8%. At the same time, the number of persons employed in industry shows an even faster decrease, so that the chain index of productivity constantly grew in the period 1991-1996. The positive aspect of de-industrialisation is the closing down of dirty industries in the coastal region, and creation of potentials for new economic activities to be harmonised with the requirements of environmental protection.

In 1992, the industry and mining of the coastal counties participated with some 29% in the total value of sale of industrial products in Croatia. From the point of view of industry, the most important coastal county is the county of Primorje-Gorski kotar, followed by the counties of Split-Dalmatia and Istria. In the industry as well, we can note regional concentration; the largest industrial capacities are located around the largest urban centres, Rijeka and Split.

Shipbuilding is a traditional branch of industry in which Croatia plays an important part at the global level. Shipbuilding is evenly distributed in the counties of Split-

Dalmatia, Primorje-Gorski kotar and Istria. Marine transport is also a traditional economic activity of the coastal counties, with markedly fluctuating income during the 1990s. In 1996, six large shipping companies with more than 1,000 employees realised an income of more than US\$ 500,000,000, with the fleet capacity of more than 3.5 million DWT.

## Tertiary sector

The growing re-orientation of economy towards the tertiary sector has been one of the principal processes in the coastal region over the past two decades, and it is highly probable that this trend will be continued in the future. Trade, hotels and restaurants, tourism, transports and other tertiary activities account for an above-average share of the economy of the coastal counties, both in the structure of persons in paid employment, and in its contribution to the domestic product of the Croatian economy. The counties of Dubrovnik-Neretva and of Primorje-Gorski kotar are good examples of tertiarisation of economy: in 1991, of the total number of persons in paid employment, the tertiary sector employed 72.6% and 66.3%, respectively. At the same time, the tertiary sector of those two counties made 71.9% and 65.7% of the total domestic product, respectively.

### Tourism

In the second half of the 1980s, tourism secured between 3.5 and 5.3 billion DEM of tourist consumption, of which 65-70% originated from foreign tourists' consumption. Tourism participated in the total domestic product of Croatia with 10-12%, and provided employment for 180,000 persons, directly and indirectly.

The total accommodation capacity of Croatia in 1990 amounted to 862,653 beds, of which 830,981 belonged to the coastal counties. Of the total number of tourist beds in the coastal counties, 287,502 were in camping sites, 129,673 in hotels, 68,785 in company vacation facilities, 57,537 in tourist settlements, 262,626 in private

accommodation facilities, and 24,858 in other forms of accommodation facilities. In 1992, the total number of tourist beds in the coastal counties dropped to 537,418, i.e. to approximately 2/3 of the capacity recorded in 1990. The most notable drop was noted in the company vacation facilities, where the number recorded in 1992 amounted to just 11.5% of the number in 1990, and in the private accommodation sector (20%).

The number of tourist overnight stays in the coastal counties dropped from about 49 million in 1990 to little more than 9 million in 1992. All the coastal counties recorded in 1992 1-3% of the number of overnight stays in 1990, except the Primorje-Gorski kotar and the Istria counties, where that percentage amounted to 22% and 36% respectively. Since the year 1993, the number of tourist overnight stays has been showing a gradual and stable growth.

The tourism sector of Croatia has a comparatively large tourism superstructure, but considerable capital investment will be required for its modernisation. Along with the transformation of ownership structure, it is necessary to create a new identity for the tourism sector. The generous, ecologically valuable environment is the one strategic resource of Croatia that should contribute to a long-term growth of tourism.



## Transport and communications

The total length of roads in the coastal counties amounted, in the year 1992, to 10,879 km, of which 9,258 with asphalt paving. The density of the road network, especially of modern motorways, is still insufficient. Croatia is planning to build 1,600 km of four-lane motorways, mostly in the next decade, which should overcome the bad connections between the northern and southern Croatia.

Of 9 airports in Croatia, 7 are in the coastal region (Split, Dubrovnik, Zadar, Pula, Rijeka, Brač and Mali Lošinj). Sea ports, both passenger and cargo, are located in a continuous succession along the entire Adriatic coast. The most important cargo ports are those of Rijeka and Ploče. The traffic in Croatian ports dropped from 29,042,000 tons in 1987 to 13,875,000 tons in 1996. The traffic of 10 million passengers was recorded in 1996, and shows tendency for growing.

The telecommunication network of Croatia is one of the best among the countries in transition (29 telephone lines per 100 inhabitants).

## II.4 ENVIRONMENTAL IMPACT

The coastal-insular region is among the most important potentials of Croatia. Apart from the traditional fishing, agriculture and navigation, tourism and industry are also well developed in the region, using its comparative advantages, but sometimes with negative environmental effects. In the summer months, the population of the coastal region multiplies several times, which can not remain without impact on that particularly sensitive ecological system.

### Water resources

The rivers flowing into the Adriatic Sea, as well as other surface waters (lakes) are of such quality that they can be used for water supply. All these waters are limpid, and can only occasionally get turbid. The water courses are very clean in their upper parts, while

moderate to high pollution appears in their lower parts, i.e. where they flow into the sea.

Groundwaters in some urban areas are polluted by households and industries, while elsewhere there is slight pollution by agriculture. The dominant source of pollution are the solid and liquid wastes, from economic activities or any other source, such as washing of dirty surfaces and road network, erosion and washing away of the soil, use of pesticides and fertilisers in agriculture, ill organised dump yards for urban waste, sludge, etc., as well as accidental pollution due to lack of attention or care.

### **Waste waters**

The main recipient of waste waters is the sea. However, before discharging, the waste waters are treated in a number of smaller communal treatment plants which usually apply preliminary treatment, and only rarely a complete mechanical treatment with long submarine outfalls. Tourist facilities (hotels, villages, camping sites) have their own plants for biological treatment of their waste waters. For industrial plants there are only individual treatment plants. The largest quantities of waste waters in the Adriatic basin originate from the areas of Split, Zadar, Pula, Rijeka and Šibenik. Disposal of household waste waters into inappropriate septic tanks, or into porous karstic underground creates great problems for settlements without a sewerage network. Over the several few years, great efforts have been made to resolve the problem of waste water disposal, and we can already note considerable results.

### **Solid waste**

In the entire coastal region there is not one acceptable dumping site that would enable controlled disposal or modern treatment of solid waste. Accumulation of solid waste is not related only to urban areas and tourist facilities. It appears on excursion sites, organised and wild camping sites and bays. The age of the dumping sites is between 20 and 40 years, and, in general, their location was selected without any professional

background or documentation, and is mostly in abandoned mining sites (quarries, bauxite mines, etc.), in karstic holes near forests and inhabited areas, as well as on the rocks by the sea. Very often, the wastes are burned without sufficient control, sometimes causing forest fires, and the discarded waste threatens, both directly and indirectly, the environment (air, waters, sea, soil), human health, and living conditions of plants and animals. In the recent times, measures have been taken to establish regional dumping sites.

### **Sea**

The quality of the largest part of the Adriatic Sea (over 95%) is exceptionally well preserved. A continuous monitoring of the sea water quality on more than 800 beaches shows more than satisfactory results and meet the strictest standards. Only the aquatoriums of the principal harbours and a part of large urban agglomerations with inadequate sewerage outfalls are threatened.

Several sites in the Adriatic have been exposed to strong pollution due to illogical disposition of dirty industries (parts of the Rijeka and Kaštela bays, and the Šibenik bay), as well as due to spilling at oil terminals, discharges of oily waters from ships, discharges of waste waters from the operative surfaces in large harbours (Rijeka, Split-Solin, Ploče), and disposal of used oils and fuels from smaller vessels.

A threatened part of the Adriatic Sea of international importance is the northern Adriatic area, i.e. the shallow bay of Istria-Triest-Venice. Due to a relatively small volume of sea water and great inflow of highly polluted north-Italian rivers, as well as to a high concentration of economic activities on the coast, the natural cycle of some biogenic elements has been greatly disturbed. Aware of the importance of its most valuable resource, the sea, the Republic of Croatia makes great efforts, both organisational and financial, aimed at preserving its quality. Within the State Directorate for the Protection of Nature and Environment there is a separate Office for the Adriatic which co-ordinates the activities

on the protection of the Adriatic. Croatia was one of the first Mediterranean countries to enforce a national contingency plan in cases of accidental sea pollution. Two operations centres have been established (Rijeka and Split) and equipped not only for cases of emergency, but also for everyday care for the coastal sea.

### Terrestrial ecology

Forest cover is the most important element of stability of the land eco-systems, crucial for the dynamics of the global climate and for the bio-geochemical cycle. Loss of biodiversity in some forest eco-systems diminishes their resistibility, and is caused by disappearance, fragmentation and degradation of all forest types. The size of forest habitats diminishes as a consequence of human activities: urbanisation, construction of roads, electric lines, and, especially in the last years, frequent forest fires in the summer months, caused by irresponsible behaviour. That phenomenon almost surpasses the positive effects of natural and artificial reforestation. The fires reduce the

soil fertility (decrease in organic matter content, interruption of the biological cycle of elements, etc.), and increase its erodibility. The share of wood cut because of the action of insects and diseases in the total mass of the cut wood is much smaller than the share of human activity. However, an important project to rehabilitate coastal forests is being implemented now with the support of the World Bank.

### Landscape

The exceptionally valuable and significant natural landscape of the Adriatic region is threatened by quarries, bauxite mine holes, etc. which represent considerable landscape degradation. The same applies for numerous industrial plants, infrastructure objects, permanent and tourist settlements built in urban and suburban zones. New parts of towns with all accompanying infrastructure (in the immediate coastal strip) well harmonised with the macro-landscape are a true rarity.

Regardless of protection, some parts of the nature are exposed to negative influences,



such as illegal housing and expansion of construction areas, wastewaters from households, industries and agriculture, felling and burning of the existing vegetation, hunting and uncontrolled mountain climbing, problems relative to the preservation of submarine habitats, conflicts between economic activities, and a general negative impact of human activities.

### **Biological and landscape diversity**

In the recent times, some anthropochores and new animal species have been introduced to the region, deliberately or involuntarily, such as *Caulerpa taxifolia* alga found in the aquatories of the islands of Hvar, Krk and Rab, the Californian trout, mongoose, elk, mouflon, etc. However, those can not replace the extinct autochthonous species, and the adjustment of some species to new habitats is uncertain. The experience teaches about their hostility aimed at conquering new life space leading to gradual impoverishment of the autochthonous flora and fauna.

Due to the economic activities of men, some biotopes, vegetal and animal communities have disappeared from this region, some parts of which now belong to alarmingly threatened habitats, such as some grazing fields, meadows, aquatic and wetland habitats, and habitats bordering the sea (coastal rocks, reefs, sand and pebble beaches).

Of the 407 species and sub-species of fish living in the Adriatic Sea (18 protected), 64 are threatened by fishing and disappearance of habitats.

As a consequence of sea pollution, accelerated eutrophication sometimes occurs, especially in the eastern part of the Kaštela bay and in the northern Adriatic, which is accompanied by changes in the contents of the plankton community, blooming of some phytoplankton organisms, hypoxia and anoxia, and mortality of marine organisms. At the same time, the number of species is diminished, as well as the number of the members of individual species, and the contents of benthic communities changes.

# III PRACTICE OF COASTAL MANAGEMENT IN CROATIA

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## III.1 STRATEGY AND POLICIES

### Legal framework, principal documents and attitudes

The recognition of the global and specific importance of the coastal region has a continuity in the Croatian politics at all levels: state, sectoral and local. In spite of that, there are no special legal forms regarding the management of the coastal region as a whole. Some basic provisions on protection and restrictions are contained in the **Law on the Protection of the Environment, Law on the Protection of the Nature, and the Law on the Protection of Cultural Monuments**, and some specific provisions are provided by sectoral laws, such as the **Maritime Code**. The totality of the natural and man-made physical structure has been defined most comprehensively by the **Law on Land-Use Management** which regulates physical planning and defines the obligation of making regulations on the protection and management of the coastal region as an area of special interest for the State (this regulation, however, has not yet been made).

Physical plans comprise the development of settlements and infrastructure, conditions for land use, and environmental protection measures. The coastal region of the Croatian Adriatic is covered by physical plans based on a rich experience in regional planning and a strong professional and scientific basis<sup>1</sup>. Those plans contain development

objectives with the principles of and guidelines for the protection of coastal resources, including the borders of the protected coastline belt. However, the plans are accompanied by general regulations with insufficient obligations and without sufficiently strong instruments of management and implementation.

After the Republic of Croatia gained independence, the Parliament of Croatia adopted several strategic documents which contain regulations relevant to the coastal areas. Those are:

1. **Declaration on the Protection of the Environment of the Republic of Croatia (1992)**. This was the first synthesis document adopted in Croatia as independent state, prepared on the basis of the *National Report on Environment and Development*, which advocates preparation of special programmes and taking immediate measures aimed at the protection of the Adriatic coastal and marine areas, and preservation of the values and attractiveness of the Adriatic landscapes.
2. **Tourism Development Strategy (1993)**. The Ministry of Tourism aimed its priorities to a better exploitation of the available potentials with improved quality of services and richer tourist offer in the coastal and hinterland areas. It advocates a thorough transformation of the sector.
3. **National Programme of the Development of Islands (1997)**. The principal reasons behind and purpose of this programme are to maintain life on

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<sup>1</sup> Large regional plans of the Adriatic areas from the 1960s, the Physical Plan of Croatia, physical plans of the national parks, physical plans of the municipalities that were 30 in the coastal region, and urban plans. Those plans are replaced by new documents defined by the new territorial and

administrative constitution of Croatia and the Law on Territorial Constitution. Those are: Strategy and Programme of the Territorial Constitution of the State, physical plans of the counties (of which 7 are coastal), physical plans of municipalities and towns (113 coastal), and urban plans of urban centres.

the islands, to stimulate demographic recovery and economic development, and to preserve the harmony of natural values through small-scale, but well organised and long-term investments.

4. **Land-Use Strategy of the Republic of Croatia (1997)**. This is the fundamental document for land-use planning, which unifies sectoral strategies and programmes, synthesises them, and thus represents the only document that tackles all aspects of land use. It defines the Croatian Adriatic region as a physically large unit of preserved biosphere and special values. Among the large number of directives it gives, the following are important for the coastal region:

- the obligation to use the land rationally, to stop the urban spreading to the most valuable coastal stretches, to carefully select locations for marinas, to assess the carrying capacity of the environment,
- the need to transform the economy in order to harmonise it with the specific features of the coastal environment, to preserve the value of the agricultural land, and to rehabilitate traditional activities,
- the increase of the areas of protected nature from 7.5% to 15% of the total surface area of the country, where a large portion belongs to the coastal region.

The document orders further research and envisages the preparation of an integrated plan for the management of the coastal region as a whole (respecting the already adopted programme for the islands).

Apart from the above mentioned, other documents have been prepared that, among others, deal with the development and protection of coastal areas: **Development Strategy of Croatian Agriculture, Traffic Strategy, National Programme of Protection of the Cultural Heritage, Programme of Development and Organisation of the Croatian Energy Sector**. The latest **Report on the State of**

**the Environment in the Republic of Croatia (1998)** gives an accurate and well organised review of the state and processes with relevant directives.

The Government of the Republic of Croatia has launched the preparation of the **Strategy of Future Development of the Republic of Croatia**. Also in course is the preparation of the **Strategy of Environmental Protection**.

At the local/county level, activities have been intensified on the preparation of the physical plans of the counties and other documents dealing with coastal areas (Development Strategies have been completed for the counties of Primorje-Gorski kotar, and of Split-Dalmatia).

A comprehensive approach to the coastal structure and the Croatian marine orientation has been greatly aided by various professional/scientific studies and the published results of a number of professional/scientific symposiums dealing with the valuation of the Croatian part of the Mediterranean region, especially the national parks and the islands.

A great contribution to the promotion of the idea of the integrated coastal area management, and to the establishment of its theoretic and practical frameworks was provided by the Priority Actions Programme, Regional Activity Centre, through its various activities and publications. A training course organised in February 1998 re-confirmed the importance of physical planning in coastal areas, but also pointed at the under-developed management institutions and mechanisms.

Of particular importance is the methodological approach to the valuation of coastal resources applied in the projects (some implemented in international co-operation) for the Kvarner and Kaštela bays, the Cres-Lošinj islands, and the rehabilitation programme for the Bakar bay (after the closing down of the coke plant), as well as in the preparation of the documents "Protection of the marine and coastal strip of the County of Primorje-Gorski kotar" and "Management of the

Public Marine Property of the County of Split-Dalmatia". The main purpose of those activities is the recognition of the natural and man-made structure, and the classification and evaluation of the coastal areas according to various criteria.

All the documents and activities point out the well preserved, multifarious and high-quality natural environment of the Croatian coast of the Adriatic which enables it to meet various recreational, scientific, research, and similar interests. At the same time, it is an area of ever growing concentration of population and economic activities (especially tourism). Therefore, the development concepts and policies are oriented towards consolidation of the spatial development of the coastal region. Best suited for that purpose is a poli-centric development model and a balanced distribution of development capacities on the coast and in the hinterland. At that, it is necessary to protect the valuable agricultural land, natural coastal forests (threatened by fires), and secure coastal space for recreational components of tourism and activities functionally related to the sea.

### Accents and priorities

The state intervention aimed at qualitative changes in the economy, and at rehabilitation of devastated parts of the coastal region brought considerable results, such as: improved traffic connections of the coast and the islands with other parts of Croatia and the rest of Europe, as well as improved water-supply and sewerage infrastructure; closing down of harmful industries in the Bakar bay and Šibenik; improved management of the national parks and preparations for physical plans of the natural parks; reconstruction of settlements and removal of other consequences of war destruction suffered during the year 1991, which particularly regards the towns and cultural heritage of the southern part of the Croatian coast (the most outstanding example is Dubrovnik with surroundings, where apart from war damages, earthquake also struck).

The general policy of improvement of environmental quality is implemented also through activities of the Tourism Association of Croatia, and by joining a European project of protection of the environment and the sea promoted by the Foundation for Environmental Education Europe (FEEE), and the Blue Flag programme which monitors the quality of the sea for bathing, and the level of equipment of beaches and marinas.

Increased interest in making good use of the comparative advantages of the coastal region brings about several issues:

- regulation of the sea use for aquaculture and construction of marinas;
- prevention of urban spreading along the coastline, directing the new construction to the existing urban zones, and infrastructure equipment of the region;
- protection of the immediate coastal strip from building and securing public access;
- achieving optimum size of plots as opposed to the trend of making the lots with the motivation of a higher exploitation of the coastal zones;
- prevention of environmental pollution;
- blocking all degradation processes in the landscape, and
- prevention of illegal housing and mitigation of the effects of the one that already occurred.

## III.2 REGULATION OF URBAN DEVELOPMENT

### Processes and features of coastal urban structure

The litoralisation process of the Croatian coastal region has not burdened the coast excessively, and the population concentrations are below the Mediterranean average. The majority of coastal population lives on the mainland part of the coast, while the islands are far less populated.

The largest part of the engaged coast belongs to the strong urban agglomerations of the Kvarner bay and central Dalmatia

where the effects are best visible of population immigration and concentration of economic activities, primarily shipbuilding and harbour capacities. The Kaštela and Bakar bays, and the town of Šibenik are drastic examples of industrialisation by polluting industries. Outside those areas, there is an almost continuous succession of settlements and smaller towns, interrupted only by stretches of steep coast (such as the coasts under the mountains of Velebit and Biokovo), with a tendency of further spreading along the coast.

The urban structure and planning indicators of the coastal towns were analysed in each generation of urban plans, and it has been done systematically for a majority of Croatian towns, including the coastal ones.

The statements and conclusions are particularly relevant for smaller and medium-size towns. The structure is dominated by housing and isolated tourist zones which participate in the total urban area with up to 50%, and, as a rule, contribute to the high percentage of green and recreation

areas. The density varies between 20 and 50 inhabitants per ha, with the value growing with the size of the town. The historic cores are mostly well preserved, as well as the coastal stretches in their vicinity. New parts of towns, with primarily housing and business purposes, are directed away from the sea, and the large tourist (hotel) and recreational complexes are isolated from the typical Mediterranean urban context. Individual building, motivated by the family tourism aspirations, follows the coastline, and when all the space is used up it spreads to the coastal hinterland. The business zones and harbours in larger towns share the coast with the town centres, while industry found itself surrounded by the urban body, often at the very coastline, only to be relocated to the outskirts at later stages.

Development visions from the earlier urban plans have been realised only in fragments and in a spatial discontinuity. That caused great difficulties in equipping the areas with urban infrastructure and services. But it



produced some positive effects as well. A lot of free space remained, while a relatively loose urban structure was formed, unburdened and adapted to the morphology, with considerable portion of green areas. Owing to the state ownership over the land in the previous system, the urban space was not burdened by urban rent interests and was thus mostly saved from over-exploitation through new building. Private initiative was primarily oriented to the zones where it was possible to buy land. Large areas of former state-owned agricultural land, particularly numerous in Istria, hindered settlement spreading. However, the attractiveness of the small towns situated in the immediate hinterland has not yet been exploited and represents a barely recognised potential.

In spite of all the negative impacts of fast urbanisation and growing irregular building activities it can be said that the towns of the Croatian coast have preserved their typical environmental features. Today, that is both advantage and challenge.

#### Accents and priorities

The time of tourism stagnation due to the 1991 war was used in the towns for reconstruction of infrastructure, especially the sewerage systems, which resulted in considerable improvement of the sea water quality in harbours and at the beaches, as well as in a general improvement of environmental quality. The results are even more impressive when we consider the overall economic difficulties and lack of funds. With regard to the conservation of historic areas, the dominant activity has been the systematic work on the valuation, documentation, restoration and recovery of the built heritage of the towns damaged during the war (Šibenik, Zadar, and especially Dubrovnik).

The coastal towns are now living the processes of re-urbanisation, closing of non-efficient and highly polluting industries, property transformation of the principal tourist capacities, making up for the deficient urban infrastructure, improvement of traffic connection, both via the sea and

with the hinterland, and a continuous improvement of historic cores, where the largest part regards the rehabilitation of the cultural monuments. Fortunately, the Croatian coastal towns, especially the small ones, have preserved sufficient traditional elements to provide guarantees that their environmental identity will be maintained and improved.

### III.3 COASTAL MANAGEMENT TOOLS

Traditionally, physical plans were the most powerful tool of coastal area management in Croatia. Although their implementation did not always succeed in achieving the planning goals, and sometimes those goals were not in the function of optimal protection and development of coastal areas, the physical plans have the greatest merit for the fact that large parts of the coastal region have remained well preserved.

On the other hand, absence of a comprehensive set of implementation tools, which, apart from physical plans, includes other possibilities of regulating construction on the coast, resulted in the occurrence of illegal construction. That phenomenon is particularly pronounced in large urban agglomerations along the coast, where it regards primarily the houses of urban immigrants, and at less populated stretches outside the urban agglomerations where settlements of leisure houses prevail. The greatest problem is represented by the absence of integration of implementation instruments of planned construction. Thus, for example, a house built without a building permit can, as a rule, get connections to the electricity, water-supply, sewerage and telephone networks. Inspection services do not always show high efficiency in solving these problems. A result is that some of the most valuable areas along the coast are now highly threatened, and their value for some future purposes considerably reduced.

Land-use reports for the coastal counties are prepared at regular intervals, always pointing at the problem of illegal housing

and suggesting measures for its solution. However, those measures are not always applied, and when so, not consequently. One of the reasons for such situation lies in the fact that a radical solution would cause serious social problems, especially in urban agglomerations. On the other hand, the coastal administration does not always apply efficient rehabilitation measures that would enable the inclusion of the illegal housing into the physical plans, giving the possibility of legalising the houses.

The protection of the coastal belt is regulated by instruments at several levels. First, there is the protection of the public marine property (a 6 m wide strip) where strict limitations are applied and which is entirely treated as state property. Building is allowed only exceptionally. Public marine property can only be used on the basis of a concession granted for a limited period of time. Although the implementation of the regulations on the public marine property started only recently, it has already provoked controversy. The earlier law on the land-use planning included the obligation of defining a protected coastal strip 500 m wide. That instrument was used in the preparation of detailed plans which were compulsory for each construction within that strip. Since many plans have remained in force, the provision on the protected coastal belt has remained in force in many areas.

Integration of the environmental component into sectoral policies is still not widespread. Thus, for example, even if Croatia is a tourist country, its tourism strategy still doesn't include the definition of areas for more or less intensive tourism building. Accordingly, there is no policy of economic stimulation of tourism building in some zones aimed at improving tourism activities in hitherto undeveloped areas. The situation is similar in other economic sectors. The only exception is the stimulation of building in the areas that have to be reconstructed after war destruction, but there are very few such areas in the coastal region.

The use of economic instruments in the development of coastal areas has been rather limited. Mostly, the traditional instruments are used, such as fees and charges for certain resources. There is also the possibility of giving fines for environmental pollution, but these are not always accompanied by adequate inspection service. The use of sophisticated instruments is still in its beginnings. Certain efforts are made in order to define appropriate levels of urban rent, but everything is still at the theoretical level. The application of the polluter-pays principle is also in its beginnings.

Spreading information on the state, quality and value of the environment has started only recently. At that, an important role is played by NGOs. Unfortunately, their activity has a campaign character, and the general public notes it only in conflicting situations. An important role in public awareness raising is played by the State Directorate for the Protection of Nature and Environment, which implements a large number of activities.

At the planning level, a certain lagging is noted in the development of the planning profession and introduction of modern tools



and techniques of coastal planning. That situation can be attributed to the transition processes in the society that encompassed planning as well. Most of the large planning institutions which had important roles in the coastal planning between the 1960s and 80s, have disappeared. Most of the planners are employed today in small companies that see their primary interest in surviving and remaining on the market, while small possibilities are left for the development of planning and management tools and techniques. The situation is slowly stabilising now, and significant improvements are expected in the immediate future. Somewhat better results can be observed in the use of GIS for the needs of coastal planning and management. Most of the municipalities, and the state enterprises managing the infrastructure, have digitised their databases. There is, however, the problem of integration of those databases.

The application of EIA in assessing the environmental effects of individual projects is obligatory. There is a large number of companies and consultants specialised in applying this tool, using the latest methods. The use of EIA has been regulated by the law on land-use planning and a special set of regulations. However, these make no difference between the projects in the coastal region and the others, which would require special consideration. The application of the Strategic Environmental Assessment in the coastal area management has not yet been taken into consideration.

### III.4 ADMINISTRATIVE AND INSTITUTIONAL STRUCTURE

#### General and special institutional frameworks for action

In the Republic of Croatia there are no special organisational or legal forms of integrated management of coastal areas. Specific tasks of coastal resources protection and development orientation are performed within the State organisations and sectoral and other institutions. Protection of the nature and the environment, and land-use

planning are separated institutionally<sup>2</sup>. It can, therefore, be said that the regulation authority, development planning and environmental protection authority are dispersed to several places and a large number of institutions, which creates problems of co-ordination, and overlapping of activities, and calls for simplification of the procedures.

With regard to activity in the coastal region, the following ministries and State organisations are important:

- **Ministry of Physical Planning, Building and Housing** for the tasks of monitoring the processes going on in the environment, physical planning and implementation of plans, as well as urban-planning and building inspections.
- **State Directorate for the Protection of Nature and Environment** acts in the domain of protection of various segments of the environment, including inspection and co-ordination of monitoring. The Directorate has a detached department situated in Rijeka, the Office for the Adriatic.
- **Ministry of Development and Reconstruction** prepares and manages the State development programmes and restoration processes. It is constituted of various directorates, among which there are the Directorate for Regional Development, and the Centre for the Islands.
- **Ministry of Maritime Affairs, Transport and Communications** performs, among others, the tasks relevant to the management of the marine property.
- **Ministry of Culture – Directorate for the Protection of Cultural Heritage** acts in the domains of research, categorisation and protection measures. It has departments

<sup>2</sup> Physical planning as an integrated approach to development and environmental protection has been legally regulated in Croatia since 1973, immediately after the Stockholm Conference. Since 1994, the environmental protection has been separated into a special domain with the relevant law.

in Rijeka, Zadar and Šibenik, and is also in charge of the town conservation institutions in Dubrovnik and Split.

Within their mandates, other ministries also act in the coastal region: **Ministry of Agriculture and Forestry**, **Ministry of Economy** (comprises two important sectors: energy production and ship building), **Ministry of Tourism**, **State Hydro-meteorological Institute**, **State Hydrographic Institute** in Split, and various public enterprises operating within the sectors of waters, forests, roads, etc.

**The State Assembly of Croatia** (the Parliament), as the highest representative body in the country, has boards for land-use planning and environmental protection, tourism, economy, and navigation, traffic and communications.

The documents relative to land-use planning and to environmental protection at the State level are evaluated by the **State Council for Land-Use Planning** and the **Council for the Environment**.

The land-use planning system comprises **County Institutes for Land-Use Planning** which are in charge of the preparation of land-use plans at the county level, and **Offices for Land-Use Planning** which implement the plans. Within the units of local self-government there are departments in charge of land-use planning<sup>3</sup>. Environmental Protection and other sectors have similar constitution.

### Implementation system

**Planning permission** is a key act in the implementation of plans, and is issued on

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<sup>3</sup> Within the right guaranteed by the Constitution on the local self-government and government, and the Law on Local Self-government and Government ("Narodne novine" official gazette of the Republic of Croatia, No. 90/92), the citizens decide, among others, on land-use planning, urban planning, arrangement of settlements, communal services, and on the protection and enhancement of the environment. Units of local self-government are the towns and municipalities, while the local self-governments and governments are the counties.

the basis of land-use planning documents and the opinion of the Directorate for the Protection of Nature and Environment, which bases its approval on environmental impact assessment, resulting from appropriate studies, which are usually prepared after the location has been selected.

Interventions and concessions in the public marine property (made of at least 6 m wide coastal strip) are regulated by the **Maritime Code**. When taking decisions, it is necessary to secure harmonisation with physical plans and regulations on environmental protection.

The possibility of acquisition of property by eminent domain is regulated by the **Law on Eminent Domain**, and applies only to the building of objects of interest for the State. Lack of similar instruments at the local level is a hindrance to achieving public interest on the coast.

### Accents and priorities

The ever growing investment dynamics in the coastal region can hardly be followed by the planning, management and implementation systems, while the rather complex procedure of providing the necessary documents is not easily understood by investors and the units of local self-government.

The tasks of regional planning and local management tasks relative to land-use planning are performed in 7 counties. Those offices offer professional help to towns and municipalities, but face great difficulties at that, due to lack of qualified staff. Of course, the situation is much better in larger towns where, apart from strong county institutes there are also other institutions (universities, institutes, and offices).

In Croatia, the awareness is maturing of the fact that efficient management of coastal resources requires the introduction of a globally promoted method of a strategic and not partial approach to the environment. The optimism is fed by a highly developed scientific-professional basis, the ever improving forms of formal co-ordination and informal co-operation among the relevant experts and institutions (within Croatia and at international level).

### III.5 ROLE OF NON-GOVERNMENTAL ORGANISATIONS IN COASTAL AREA MANAGEMENT

First initiatives by non-governmental organisations aimed at environmental protection in Croatia appeared towards the end of the last and in the beginning of this century, in the form of activities on the protection of Croatian natural and cultural heritage. The first such association was founded in 1898 in Dubrovnik, called "Dub" with the objective to promote the development of Dubrovnik and its surroundings. A little later, the Association for the Protection of Historic Heritage was founded, followed by a number of similar associations in various coastal towns. The most tangible result of the activity of those associations was the proclamation of the first national parks in Croatia, the Plitvice Lakes in 1914, and in 1928 Paklenica and some other areas, but only by a law of limited duration. Since 1969 particularly active has been the Croatian Ecological Association, both in the scientific field and in raising environmental awareness.

In the late 1980s, there were 60-odd "green groups". Some of them even had political ambitions. Later, new NGOs were founded, and today the most important is the nature friends movement "Our Beautiful Homeland" ("Lijepa naša"), which is the NGO with the greatest number of members and with the strongest professional component, operating in the whole of Croatia. In co-operation with the Ministry of Education and Sports of the Republic of Croatia, the Movement is trying to revive and modernise the century-long tradition of environmental protection in Croatia.

At present, there are about 180 NGOs in Croatia, dealing with environmental protection. These have been mostly founded in urban centres, but ever more often such organisations appear outside the towns, especially in the islands. The awareness and interest of the general public has been constantly growing since the late 1980s, although the awareness of the importance

of the environment was present in the Adriatic region immediately after the Stockholm Conference, on the basis of which, the Project on Environmental Protection in the Adriatic Region (Project Adriatic III) was launched in 1972, in co-operation with the United Nations Development Programme (UNDP).

Four Conferences on the Protection of the Adriatic played an important role in the evolution of the public awareness on the need for the protection of the Adriatic environment. The Conferences also stimulated launching of various appropriate activities, such as construction of sewerage systems and waste water treatment plants in the coastal region. The basic recommendation of the Conferences is that it should be abstained from building plants and introducing technologies that could seriously threaten the Adriatic region, so, upon actions taken by local authorities, investors renounced to the construction of several such plants (thermo-nuclear power plant, factory of magnesite sinter, thermo-electric power plant). For the chemical industry at Omišalj in the island of Krk, protection measures were applied, and environmental impact monitoring has been performed continuously for 12 years.

#### Access to information on the environment, and public participation

The Law on the Protection of the Environment of the Republic of Croatia ("Narodne novine" No. 82/94) defines that the basic aims of environmental protection are achieved, among others, by informing the general public on the state of the environment, and by its participation in the environmental protection. The Law also orders that the general public has to be informed in good time, and periodically, on any case when the prescribed limits of environmental pollution have been exceeded.

Efficient access to information on the environment requires the establishment of a clear system of regulations, which should provide procedural and institutional guarantees and appropriate application

programmes. Therefore, the Republic of Croatia has actively participated in the preparation of the **Convention on Access to Information, Public Participation in Decision Making and Access to Justice in Environmental Matters** which particularly stresses the importance of a free access of the general public to the information on the environment, with appropriate inclusion of NGOs.

### III.6 ENVIRONMENTAL IMPACT ASSESSMENT

In the Republic of Croatia, environmental impact assessment (EIA) is an integral part of pre-investment activities for the projects that could cause considerable environmental damage, and the Law on Physical Planning and Land-Use Management of 1980, introduced the obligation of performing that procedure. The new Act on Environmental Impact Assessment was prepared on the basis of the Law on the Environmental Protection.

Land-use management and environmental

protection policy has been implemented in the Republic of Croatia for a relatively long time now. Already in the period between 1966 and 1978, projects of land-use management and environmental protection of the Adriatic region were implemented in co-operation with the United Nations Development Programme. Those projects introduced EIA already in mid-70s, when the construction started of large industrial plants on the coast, and the preparation of EIA was not regulated legally.

The name EIA appears in the Law on Physical Planning and Land-Use Management which obliged the investors into projects that, by their existence, construction or operation could damage the value of the environment, to prepare environmental impact assessments. The contents of EIA were defined in the appropriate Regulations, adopted in 1984.

Since it became legal obligation, some 200 EIAs have been prepared in Croatia, regarding large-scale infrastructure works (roads of higher order, electricity supply



systems, gas lines), hydro-electric and thermo-electric power plants, industrial plants, and marinas.

The initial opposition of the investors, due to the increased investment costs and longer preparatory activities, grew into acceptance of the legal obligation, since the results of EIA application showed that a timely and well planned investment into environmental protection measures was more rational and financially justifiable than recovery of devastated environment.

### III.7 IMPLEMENTATION OF MANAGEMENT PLANS

In this phase, Croatia is making inventories of state and re-considers the earlier concepts in all fields of activity. Owing to its great value and increasing interest it attracts, the Adriatic coastal region is in the centre of attention.

Achievement of relevant goals and evaluation of coastal area management results can partly be interpreted through the implementation of physical plans. So, for example, the *Physical Plan of Croatia* has been implemented rather consequently with regard to large infrastructure and protected areas. Directives for the use and protection of other areas (including the protection and use of the sea) were implemented with variable effects on the local plans, especially with regard to the land use.

In *the physical plans of the (former) municipalities*, for example, islands were considered as planning and management entities, as their territories equalled those of the corresponding municipalities. Now, the islands are divided in several smaller municipalities and towns, and each of them should, in theory, have its own plan. This may cause difficulties in the management of their environment. Therefore, recommendation was made to treat an island as a planning entity, or at least that common criteria be defined for environmental planning and management.

*The physical plans of the national parks* are the most consequently implemented of all

such plans, including a well organised internal management system. Problems regard the satisfaction of the needs of the population of the local settlements, and the tendency towards larger tourist accommodation capacities within the borders of the parks.

*Land-use plans of settlements* (general and detailed) were mostly based upon a comprehensive approach to planning of urban systems (although often too ambitiously), but showed considerable divergence in the implementation.

*The Physical Plan of Croatia* defines the minimum width of immediate coastal strip of 21 m. The local-level plans contained more detailed regulations, but due to a lack of common criteria, those were quite different from one area to another. Those measures failed to produce any significant results, since the fact that the building was moved away from the coastline did not automatically secure public access to the coast, nor was the coast arranged for recreational or other purposes.

All documents in force contain regulations on the protection of the natural coast and on the rational land use, directing development activities to the hinterland. This tendency is often challenged at the local level where individual interests motivated by quick profit collide with long-term interests and principles of sustainable development.

Preliminary results for counties show that building areas take approximately 30% of the coastline. The assessment for the entire coast are in the region of 1,000 km (20%).

The insular part of the region participates with most of the total length of the coastline, but the percentage of the building zones on the islands is much lower than on the mainland. Thus, the islands represent the best preserved environment with the largest share of free, mostly natural coast. It is estimated that since the 1960s, when the intensive building started, the land occupation on the coast has increased 5 times. In some coastal municipalities and towns on the mainland the building zones

cover almost the total length of the coastline, and are almost fully developed.

Tourist complexes outside the settlements, planned, built, and acting as separate management entities, have secured necessary distance from the shoreline, appropriate infrastructure, and controlled bathing and recreation areas, much better than zones for individual building. However, with respect to the plans, about 50% of the areas have remained unrealised.

Although marinas in general represent high quality solutions, they have unfortunately, rather often and without particular reasons, occupied the most valuable parts of bays.

Spatial and functional dispersion of the large traffic systems such as the Harbours System of Rijeka (composed of 4 spatially separated units) suits the types of Croatian coast, especially where there are high concentrations of economic activities and limited space.

Small towns in the immediate hinterland have been almost completely ignored by the investors although the plans included them in the overall development scheme. Recent initiatives in Istria and islands for the rehabilitation of small urban centres, vineyards, and traditional activities, with a strong stress on ecological orientation sound promising.

### **Accents and priorities**

A stronger impetus of the coastal economy is yet to come. At present, a general reduction of harbour traffic together with the general reduction of economic activities have beneficial effects on the environment. However, that diminishes the financial potentials of the community which also reduces the potentials for effective resource management.

In the coastal region, building of small family units for tourism became the dominant form, which is, in principle, an acceptable and generally supported model. However, the management system is not sufficiently prepared to cope with such initiatives when they turned into a mass

phenomenon. Today, it is necessary to introduce a strict control of building through a reduction of building areas, especially if infrastructure and other services have not been provided. A large degree of illegal building in the areas where building is possible confirms the slow reaction of the management system.

The ideas expressed in the new fundamental documents are already being implemented, which particularly refers to the Strategy of Land-Use Planning. It is expected that the application will soon start of the results of new studies performed for the purposes of coastal area management following the methods promoted within international activities and conventions on the Mediterranean<sup>4</sup>. The central issue of the new generation of development documents is objective valuation of the resources and the establishment of measurable value categories. It is estimated that the physical plans of the counties, as a new (regional) planning form, will play an important role in setting criteria for the use of coastal resources, and in the creation of a basis for the management of ecological and functional entities which surpass the local level. It is already certain that it will not be enough unless appropriate instruments are developed, such as rents and taxes relative to the attractiveness of sites and the status of land, and unless active forms of action are adopted, such as programmes, stimulation, directives, subsidies, etc.

### **III.8 INTERNATIONAL CO-OPERATION**

The international co-operation aimed at environmental protection and land-use planning of the Adriatic region started in mid-1960s through the environmental protection projects for the Southern and Upper Adriatic, implemented with the help of the United Nations Development Programme (UNDP).

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<sup>4</sup> The analytical part of the State Strategy of Land-Use Planning, the National Report on the Implementation of the Agenda 21 (1997), and the latest Report on the State of the Environment in the Republic of Croatia.

The principal activities in the Adriatic aimed at environmental protection with international co-operation are implemented within the Mediterranean Action Plan of the United Nations Environment Programme (MAP-UNEP), and its centres, all within the Barcelona Convention for the Protection of the Mediterranean Sea against Pollution (1976, 1996) and the related Protocols: The Protocol for the Prevention of Pollution of the Mediterranean Sea by Dumping from Ships and Aircrafts; The Protocol Concerning Co-operation in Combating Pollution of the Mediterranean Sea by Oil and Other Harmful Substances in Cases of Emergency; The Protocol for the Protection of the Mediterranean Sea against Land-based Sources; The Protocol Concerning Mediterranean Specially Protected Areas; The Protocol for the Protection of the Mediterranean Sea against Pollution Resulting from Exploration of the Continental Shelf and the Seabed and its Subsoil; and The Protocol on the Prevention of Pollution of the Mediterranean Sea Resulting from the Transboundary Movement of Hazardous Wastes and their Disposal.

Croatia hosts the Regional Activity Centre for the Priority Actions Programme, which has been acting for almost 20 years within the Mediterranean Action Plan-UNEP. The principal activity of the Centre is integrated planning and management of coastal areas. The Centre has developed intensive and fruitful co-operation with all of the Mediterranean countries and their governmental and non-governmental institutions, through organisation of seminars, workshops, conferences and training courses, as well as through exchange of experts. Special stress has been placed at the implementation of the MAP Coastal Area Management Programme. Particularly good co-operation has been established with the Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea (REMPEC), situated in Malta.

Croatia actively participates in the work of other UNEP-MAP bodies, such as the Commission for Sustainable development, and is also signatory of the Agenda 21 for the Mediterranean.



The Mediterranean Technical Assistance Programme (METAP), which is implemented by the World Bank, European Investment Bank, European Bank for Reconstruction and Development and UNDP, financed several studies aimed at resolving important problems of environmental protection (waste waters, solid waste, environmental management).

The Croatian Ministry of Maritime Affairs, Transport and Communications, and the harbour authorities co-operate with IMO in the implementation of a number of international conventions: International Convention on Prevention of Pollution from Ships (1973), with the relevant Protocol of 1978, called MARPOL (1973, 1978); Convention on the Prevention of Pollution of the Sea by Dumping, the London "Dumping" convention of 1972; Convention on the Responsibility for Transport of Harmful Substances by Sea (1990); International Convention on the Preparedness, Action and Co-operation in Cases of Pollution by Oil (1990), the 1992 Protocol on amendments to the International Convention on the Establishment of an International Fund for Compensation for Damages Caused by Oil Spill (1971).

In the year 1974, co-operation on the protection of the Adriatic was established in the form of a joint Croatian-Italian-Slovenian Commission for the Protection of the Adriatic. The Commission acts through various working groups: co-operation and joint activities in cases of accidental pollution of the Adriatic Sea; separate navigation system, i.e. establishment of navigation routes; Master Plan of the Adriatic; monitoring of the state of the Adriatic and its protection.

Croatia participates in the activities of the European Association for sustainable Development of Islands "INSULA", in the project "GILDA", an initiative for economic and ecological co-operation of Croatia, Italy, Slovenia, Albania, Greece and Austria (countries of the Adriatic basin) with regard to the passenger and goods traffic in the Adriatic Sea.

We should also point out the participation in the work of the Committee for the Environmental Protection Policy of the United Nations Economic Commission for Europe (UN/ECE), and in the process "Environment for Europe" within the preparations for the Conference of European Ministers of Environmental Protection (Luzern - 1992, Sofia - 1995, Aarhus - 1998), as well as the co-operation with the European Environmental Agency on the preparation of the Report on the State of Environment in Europe (Dobris Assessment).

Of particular importance are the activities on the implementation of the UN conventions: the Framework Convention on Climate Change, the Convention on Long-Range Transboundary Air Pollution and the related protocols, the Convention on Environmental Impact Assessment in a Transboundary Context, and the Convention on the Protection and Use of Transboundary Watercourses and International lakes, as well as in the preparation of the Convention on the Access to Information, Public Participation in Decision-making processes, and Achieving Legal Protection in Environmental Issues.

Co-operation has also been established with the Foundation for Environmental Education Europe (FEEE), and the Blue Flag programme for beaches and marinas.

### **III.9 EXAMPLES OF SUCCESSFUL COASTAL MANAGEMENT PROJECTS**

#### **Cres-Lošinj Archipelago**

The purpose of the proposed management plan for the Cres-Lošinj archipelago is to design an operational instrument for the protection of the natural, cultural and historic resources. The objective of this draft management plan is to provide guidelines to decision-makers at the state and municipality levels for the conservation of the vitally important and irreplaceable ecosystems, and the cultural resources, while contributing to the realisation of an

ecologically and economically sustainable development for the benefit of the local population.

The plan studies technical, institutional, protection, social and economic aspects of the Cres-Lošinj archipelago protection. Its principal aims are:

- a) Protection and management of the eco-systems and habitats of the area, as well as its flora and fauna;
- b) Protection and management of the natural resources (water, soil, biological) and cultural heritage in the context of sustainable multiple goals. This understands a synthesis of the biodiversity protection with the needs of the growing population and the related tourism, urban and agricultural development; and
- c) Evaluation of similar development plans from the point of view of environmental protection and sustainable development. This includes a critical assessment of their economic viability, effects on the society and on the environment.

The plan provides the implementation framework, and launches a process that all the interested parties will be able to join. It also proposes to the authorities a practical strategy, a technical methodology and a flexible approach to the existing institutional arrangements, in order to secure sustainable development and the protection of the natural and cultural heritage of the area and its surroundings. The management plan outlines measures for the protection of those areas, as well as appropriate management measures. The plan is currently in implementation.

### **Kaštela Bay**

The area of the Kaštela bay, in the vicinity of Split, was one of the largest "hot spots" in Croatia. In the period after the 2<sup>nd</sup> World War, as a consequence of the then current policy of intensive industrialisation, a number of large industries developed around the beautiful, semi-enclosed bay. Such industrial development brought about intensive

urbanisation and immigration into the town of Split. Uncontrolled discharging of untreated waste waters, both industrial and urban, into the bay caused intensive degrading of the bay's eco-systems.

In mid 1980s, an initiative was launched to rehabilitate the state of the bay. Partners in that activity were the local communities, the University of Split, a large number of scientific institutions and experts. A national programme of bay rehabilitation was initiated, supported by UNEP, MAP and PAP, and very soon support was offered by the METAP programme implemented by the World Bank. The common action and joint financing by all the partners resulted in a large number of basic studies, and the fundamental programme of the protection and rehabilitation of the bay. That programme served for the preparation of the "Integrated Programme of the Construction of the Kaštela Bay Sewerage System", which was supported by the World Bank and European Bank for Reconstruction and Development. Activities on the implementation of the plan were slowed down in early 1990s by the war in Croatia, but regained impetus after the war ended. The banks have granted the loans, and the beginning of works on the construction of the sewerage network is expected soon.

A special agency has been established for the implementation of the project which gives it special importance. The agency enjoys support and guarantees of the four interested municipalities, and of the Government of the Republic of Croatia. It has to be pointed out that the project was conceived on a commercial basis, and that the feasibility study showed that the loans can be paid back without any state subventions, but only from the profit gained from the water prices. The project also enjoys support from the majority of the local population which offers additional guarantee for success.

Even on the Mediterranean scale this project can be considered as one of the most successful examples of projects where the

initial action of the local and international partners was followed by project implementation through considerable engagement of both international and local sources of financing.



The State Directorate for the Protection of Nature and Environment is a governmental body in charge of environment of the Republic of Croatia, considered to be its principal development resource. As an independent body, it is responsible for the implementation of laws, formulation of regulations for their application, surveillance, and other administrative and professional tasks relative to the general environmental protection policy aimed at creating favourable conditions for achieving sustainable development; protection of the air, soils, waters, sea, flora and fauna, bearing in mind the totality of their interactions; proposing, promoting and monitoring measures aimed at improving environmental protection.

Within the State Directorate for the Protection of Nature and Environment there is a special office for the sea, which has the main task to protect the sea, and the coastal and insular areas of the Republic of Croatia.