

SPATIAL AND ENVIRONMENTAL FEATURES OF THE CROATIAN ADRIATIC ARCHIPELAGO AS A SIGNIFICANT NAUTICAL DESTINATION

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Abstract

This paper analyzes spatial and environmental characteristics of Croatian Adriatic from the aspect of nautical tourism development. Sea and coastal area are the most important natural and geographical elements for nautical tourism development, together with historical, cultural, social, and economic characteristics. Analysis of the characteristics important for nautical tourism development will deal with the most attractive locations on the Croatian Adriatic, and it will recommend and suggest further development of all the elements of nautical tourism together with its complementary activities – nautical economy.

Keywords: Croatian Adriatic, nautical tourism, nautical economy, yachting, marina

1. Introduction

The sea and coastal area are most important natural and geographic elements for the development of nautical tourism. The natural resource bases of the nautical tourism development are (Dulčić, 2002) natural geomorphologic forms: relief of the coastal area, hydrographic elements, i.e. physical, thermal and chemical properties of water and climatic features of the area (air temperature, precipitation, winds, sunshine/cloudiness and humidity).

The physical appearance of the coast and of the islands in particular is the result of interactions of man and nature. From the very beginning people built their settlements in the most suitable locations which allowed for the development of the basic survival activities – agriculture, fishing, farming, and later, seafaring. It is the reason why the majority of the settlements built on the coast or islands were in well-sheltered bays where it was convenient to organise a berth for ships, or near fertile fields with promising agriculture potential.

2. Evaluating the environment for the purpose of development of nautical tourism

The variety of relief forms, bays and islands is one of the attractive elements of nautical tourism navigation and sojourn. Indentedness and natural beauties of the coast facilitate cruising and offer good natural shelter.

The main characteristic of the Croatian Adriatic is agreeable Mediterranean climate with warm summer and mild winter. The average temperature in January does not drop under 5 °C, and the annual precipitation is 1,000-1,500 mm in the northern Adriatic and below 1,000 mm in the southern Adriatic and in most of the islands. The sea is warm and of high salinity.

Croatian Adriatic has two main climatic and vegetational zones (Šegota, Filipčić, 1996): the eumediterranean zone and the submediterranean zone. The eumediterranean zone has smaller quantities of precipitation, warm summer and pleasant winter. Vegetation is predominantly Mediterranean coniferous trees like conifers, holm oak, laurel and olive. The submediterranean zone has more precipitation and warm, dry summer and predominantly deciduous vegetation.

The development of nautical tourism in accordance to spatial and environmental features and observing the natural laws will grant unspoiled visual identity of the littoral and a sojourn in an authentic environment with all opportunities that it offers. Tourists, especially boaters, highly evaluate the physical appearance of ports and harbours, where ancient buildings are charmingly intertwined in the settlement.

3. Factors of evaluating the spatial and environmental potentials

The main spatial and environmental features of an area make them recognisable and such an image has an important impact to tourists when evaluating the attractiveness and selecting the destinations for their leisure time and recreation.

A comparative advantage of the territory of the Republic of Croatia is its natural diversity and high level of preservation. The Adriatic coast and islands are most significant in the development of tourism. The littoral makes 30% of the area of the Republic of Croatia (17,850 km²), inhabited by approximately 30% of the Croatian population (1,450,000 inhabitants).

Those tourists who spend their holidays in solid objects arrive usually during their annual vacation period and want another destination each year. Boaters, however, with their vessels at berth, are oriented to a particular location for a longer period, as it becomes the starting point for navigation and for visits to other areas. When evaluating the destinations in the nautical tourism system special importance is given to the following (Riđanović, Bićanić, 1993):

- Indentedness of the coast,
- Climate and vegetation,
- Natural values and cultural wealth,
- Traffic connections and accessibility,
- Population and human potential.

In relation to its developed European and Mediterranean surroundings, Croatian littoral is famous for its diversity and highly preserved natural values (Horak, Marušić, Favro, 2006). One of the main strategic goals for the development of Croatia and especially tourism and nautical tourism should be their evaluation and protection.

Natural values and attractiveness of the Croatian littoral should be preserved and improved so that they can ensure permanent sustainable development (Črnjar, Šverko, 1998). Human potential is most important for the development of each function in the area, but besides the expert qualifications, the potential should be of the adequate critical mass. Connecting individual human potential is efficient in human settlements, where the results of inhabitants' activities are realised as technical and social infrastructure (Magaš, 1998).

Geographic position of the Adriatic Sea in relation to central Europe is a precondition for good accessibility of the coast. The main European corridors link with the northern Adriatic. The recently constructed modern roads in Croatia have linked most parts of the coast with the main emitting areas in Europe.

The following section of this study gives descriptions of the main spatial and environmental features of individual counties, important for the establishment of the nautical tourism system in Croatia.

3.1. Istarska County

Western and southern coast of Istra is continuously indented, mostly low, with small bays and harbours. There are no major islands, and the Brijuni distinguish among smaller islands. The eastern coast of Istra is mostly steep and not easily accessed, with several deep bays and channels.

The narrow western coast of Istra, including the Brijuni islands, has eumediterranean climate and vegetation. The zone stretches up to Plomin. The coastal area is exposed to western and north-western winds, and less exposed to *bura* and *jugo* (north-eastern and southern winds). Occasionally there are turbulences with whirl-wind which occur in the central part of the coast. The eastern coast belongs to submediterranean zone which has some characteristics of the continental zone, which means that it is colder than the western coast. The area is more exposed to *bura*, and especially to *jugo*.

The Istarska County is closest to West European emitting nautical tourism centres. It is also the first entrance destination to the Croatian Adriatic aquatorium, i.e., it is the north-western nautical gate of the Croatian Adriatic. Marinas in Istra have mostly specialised in transit, although due to the proximity of Central Europe there is a significant demand for permanent berths.



Figure 1. – Current nautical ports in Istarska County
(Designed by Pejo Bročić, HHI, according to the data of the Physical plan of the Istarska County)

3.2. Primorsko-goranska County

The littoral part of the Primorsko-goranska County is dominated by the Kvarner Bay and the port of Rijeka, the major Croatian port. Major islands are Krk, Cres, Rab and Lošinj.

The island of Lošinj and the western part of the island of Rab belong to the eumediterranean zone, while other areas are in the submediterranean zone. The coast and the islands are exposed to strong winds of *jugo* and *bura*. Precipitations are frequent in the northern Kvarner which is the wettest area of the Croatian Adriatic. The island of Lošinj and the eastern coast of Istra and the western parts of Kvarner islands have high vegetation.

Kvarner is the area in which, due to its various climate and vegetation – a connection of the littoral, the islands and the mountains, architecture and culture, and its proximity to the emitting European regions, organised tourism has been present for 160 years. The territory of Primorsko-goranska County has quality traffic connections with central parts of Croatia and neighbouring Western countries.

The longest tradition in Croatian tourism, the offer of various activities throughout the year, and surely the development of selective types of tourism (ecological tourism, big game fishing, sports tourism) all make the rich variety of tourist offer which corresponds to the requests of modern tourists and to their different needs in any season.



Figure 2. – Current nautical ports in Primorsko-goranska County
(Designed by Pejo Bročić, HHI, according to the data of the Physical plan of the Primorsko-goranska County)

3.3. Ličko-senjska County

The peculiarity of Ličko-senjska County is a steep shore and several small bays below Velebit Mountain. The northern part of the island of Pag and the bay Stara Novalja belong to this county.

The main climatic features of the coastal and insular areas of this county are related to the strong influence of the Velebit massif, with strong northern wind *bura*, which frequently has storm and gale force.

Boaters' demand so far did not require building a marina in this area. However, after the highway Zagreb – Split has been completed, together with the links to Slovenia and Hungary, there is an increased interest of boaters for the whole Croatian Adriatic, including also this part of the aquatorium. The county administration planned to base a part of the future economic development on nautical tourism, and the physical plans contain several locations for the construction of nautical tourism ports - marinas.

3.4. Zадарска County

The main feature of Zadar aquatorium are numerous islands and islets laid in several lines, not distant, and some of them joined with narrow passages. The coastal area of the Zадарска County is a relatively low coast, in some places also sandy. The cliffs of the outer coast of Dugi otok island are famous geological and geomorphological sights. The Kornati islands which partly belong to Zадарска County is the most numerous archipelago in the Adriatic, characterised by small long islands, islets and cliffs.

The coastal area of the Zадарска County and its islands are predominantly in eumediterranean zone. In terms of temperature it is a pleasant area, as in summer there is a light western wind which eases summer heat and sultriness. In winter there are occasional gusts of strong, sometimes gale northern wind. Majority of the forests there are coniferous (Aleppo pine) and autochthonous holm oak, and cultivated olive trees.

Owing to the new highway through Lika and Ravni Kotari the coastal part of the county is now extremely well connected with central Croatia and further with neighbouring countries of central Europe.

Natural features have caused a significant nautical demand which has been mostly met due to the construction of several big coastal marinas most of which are bases of large charter fleets. In the islands, berthing facilities are not sufficient and several nautical tourism ports are planned to be built in the bigger places of the islands.



Figure 3. – Current nautical ports in Zадарска County

(Designed by Pejo Bročić, HHI, according to the data of the Physical plan of the Zадарска County)

3.5. Šibeniko-kninska County

The shore of the Šibeniko-kninska County is highly indented, with distinctive port of Šibenik and the Prokljansko Lake within the Krka river estuary. In this county the islands are all under 50 km² of area, which is the criterion for big islands. The southern part of the aquatorium is open to the sea and there are no islands. The Kornati archipelago is one of last unspoiled corners in the immediate vicinity of urban centres. The Kornati offer a special experience of magic and primeval force of nature.

The coastal part of the Šibeniko-kninska County and its islands belong to eumediterranean zone and pleasant climate with warm summer and mild winter. Strong winds are rare. Boaters are particularly interested in Prokljansko Lake near Skradin, surrounded by rich vegetation and pleasant fresh air during summer. Because of geographical position and land configuration, the Adriatic warmer zone begins towards



the south of Šibenik. This zone of typical Mediterranean vegetation has areas with vineyards and olive grooves.

The traffic significance of Šibensko-kninska County has a special effect to realising accessibility for tourists to this part of the aquatorium and to the national parks. The position of Šibenik in the traffic network gives to that area additional possibilities, as roads, highway and train have come close to the sea.

Šibenik aquatorium, in which there is the most part of the National park Kornati, channel Sv. Ante with smaller islands, is surely one of the naturally best aquatoriums in the Mediterranean. The current development of nautical tourism in this area is at present limited only to coastal marinas, while the development of nautical tourism ports is planned for the future.

Figure 4. – Current nautical ports in Šibensko-kninska County

(Designed by Pejo Bročić, HHI, according to the data of the Physical plan of the Šibensko-kninska County)

3.6. Splitsko-dalmatinska County

Adriatic area of the Splitsko-dalmatinska County is characterised by the typical inclined shore. The strongly indented coast runs from the bay of Trogir to the Kaštela Bay, where the coast becomes flat and the Kaštelansko polje stretches.

The area below the mountain Biokovo has steep shores near the town Omiš, at the Cetina estuary and near Makarska. In the aquatorium there are major islands (Šolta, Brač, Hvar, Vis).

The coastal area of Splitsko-dalmatinska County and its islands are in the eumediterranean zone, with pleasant climate, with warmer summer and winter. Summer heats are eased by the light northern wind *burin*. Besides the typical Mediterranean vegetation, there are also vineyards, olive grooves and Mediterranean orchards. Makarska littoral is characterised by pine forests which stretch to the shore.

The climate in the islands is warm throughout the year, with a lot of sunny days and little precipitation. The southern parts of the islands are exposed to strong southern winds and waves.

The coastal area of Splitsko-dalmatinska County, being the most populated and most developed, has always had important role in traffic. It is the junction of traffic corridors which run in parallel with the coastline and of those which come vertically from the hinterland (Bosnia and Herzegovina) and continue in the direction of the islands and across the Adriatic Sea.

In the coastal area of Splitsko-dalmatinska County there is a great demand for berths in marinas which greatly exceeds the offer. There are several marinas near larger settlements, but marinas in the islands are rare. It is planned to build a significant number of marinas for permanent berthing and as transit berths in the islands.



Figure 5. – Current nautical ports in Splitsko-dalmatinska County

(Designed by Pejo Bročić, HHI, according to the data of the Physical plan of the Splitsko-dalmatinska County)

3.7. Dubrovačko-neretvanska County

Dubrovnik coastal area is divided in two parts due to a part of the territory near Neum that belongs to the neighbouring country of Bosnia and Herzegovina. The northern area is flatter with the Neretva estuary and the port of Ploče. To the north of Ston there is the Malostonski channel and the beginning of the peninsula Pelješac, to continue with Dubrovnik littoral. The area of Konavli towards the south is higher, with hardly accessible Konavoske cliffs. The furthest southern point of the Croatian part of the Adriatic is cape Oštra (Prevlaka) at the entrance to Boka Kotorska.

To the northwest of Dubrovnik there is a group of smaller Elafiti islands. The islands of Korčula, Mljet and Lastovo have indented coasts and small pebble beaches.

The entire area of Dubrovačko-neretvanska County belongs to eumediterranean zone. It is pleasant climate with warmer summer and warm winter. Dubrovnik littoral and islands are exposed to southern winds and waves. Besides the typical Mediterranean vegetation there are special features by the Neretva estuary, where fruit and citrus fruit is cultivated, including vegetables as well. The peninsula Pelješac and the islands have coniferous vegetation and high quality vineyards.

This area has been neglected due to poor traffic connections. It has exceptionally low nautical infrastructure. The highway network will create basis for the development of economy, including nautical economy – nautical tourism and complementary activities.

The area of southern littoral and islands have several valuable geographical features: natural values of the national park Mljet, islands Korčula and Lastovo and the Elafiti archipelago have not seen the expected development of nautical facilities. The only two marinas are located in the island of Korčula and in Komolac. In the next period it is planned to build a higher number of nautical accommodation capacities on the coast and islands which will enable economic and social prosperity of this area.



Figure 6. – Current nautical ports in Dubrovčko-neretvanska County

(Designed by Pejo Bročić, HHI, according to the data of the Physical plan of the Dubrovačko-neretvanska County)

4. Protected nature and cultural assets

The territory of the Republic of Croatia boasts with a high level of preserved nature and great biological diversity at a relatively small area. Historical and geographical development has left world-famous valuable sites. Some of them are situated in the Adriatic coast, its immediate hinterland or in the islands. These values have greatly contributed to the popular position of Croatia among tourist destinations (Koščić, 1997).

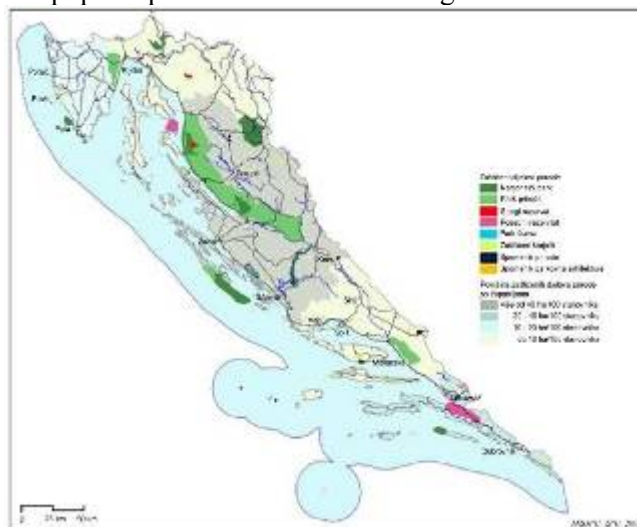


Figure 7. Protected areas of the nature

(Source: Ministry of the environment protection and spatial development, Bureau for spatial planning, 2003.)

5. Population and human potential

The most important factor for the development of any function in the area is the human potential. Besides the expert qualifications the potential has to be of sufficient critical mass. Connecting of particular human potential is concentrated in human settlements (Figure 8). There, the results of the inhabitants' activities are observed in realising technical and social structure (Magaš, 1998).

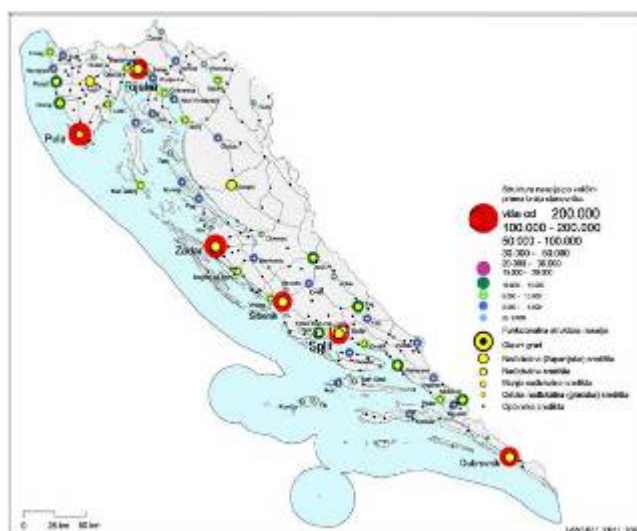


Figure 8. Map of the settlements

(Source: Ministry of the environment protection and spatial development, Bureau for spatial planning, 2003)

6. Conclusion

Croatia has one of the most beautiful and most indented coasts in the world. The Adriatic Sea and its coast and islands, recognised world-widely, are an important basis for economic development of Croatia and of its littoral in particular. Unfortunately, that most important natural resource has not been sufficiently and adequately economically evaluated, and present development has not been sufficiently engaged in environment protection. Certain parts of the resource have been saturated by tourism during the summer season and the development should be continued in accordance to the principles of sustainable development. Unspoiled and non-industrialised sections of the coast, which received the attribute of attractive tourist destination, need to be protected in order not to disturb, in quality or quantity, the ecological and natural balance of the areas by uncontrolled development of accommodation capacities for tourists - boaters.

A more significant development of nautical tourism in Croatia began with the construction of marinas. Marinas are nowadays in Croatia most important and best organised objects for accommodation of boaters and their vessels. However, because of its solid objects, marinas in fact, intrude into the environment and cause drastic changes in its physical appearance and the quality. Although the development of nautical tourism has so far been unorganised and random, fortunately, there have not been serious damages to the environment.

Nautical tourism has to be developed within the limits of acceptable intrusions and recognisable features of the space, with maximum preservation of attractive natural environment as an advantage of Croatia. When making decision on the location of a nautical tourism port and tourist harbour, multiple development effects have to be taken into consideration (economic, social and ecological), including those that will stimulate other aspects of life. That is extremely important for strategically sensitive areas, for instance islands and can be ensured by further development of nautical tourism based on the principle of sustainable development. Preservation of natural resources for the purpose of quality in nautical tourism reflects the situation of the activity, as only superior quality can promote on long-term basis nautical tourism of the Adriatic nautical ports.

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