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Interactions Between Marine Ecosystems and Tourism on the Adriatic and Mediterranean

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1. Introduction

Tourism today within its quantitative proportions in domestic and international travels around the world has more than 3.5 billion participants, which makes a half of world 's population. International tourism as a vital economic factor of a large number of developed and transition countries is approaching already one billion participants, with the economic effects that exceed 800 billion USD, and makes one of the most distinct economic sectors in world economy (UNWTO 2010).

The largest part of these migrations in the last two centuries is in the Mediterranean, being the most important world tourism mega region that accepts a third of tourists in the international tourism in more than 100 million accommodation units, which makes more than 300 million tourists from abroad and the same number of domestic visitors (Geić S., 2010).

This enormous tourist traffic, supported by the appropriate receptive and municipal transport infrastructure, takes place mostly on the narrow coastal, insular and sea areas of the Mediterranean, using its balneological benefits of the marine and recreational areas of the Euro-Afro-Asian Mediterranean as the most enjoyable climate for tourist recreation, which was recognized already on the UN World Conference on the Human Environment (1972) when this area was declared the **World recreation zone**.

Considering the fact of enormous processes of littoralization that attracted many tourist facilities to the Mediterranean coast, as well as other economic activities that are directly or indirectly related to the sea or naval communications, but also considering galloping urbanization of coastal cities and towns, as well as weekend houses (residencies), one gets to a logical conclusion of the growth of all kinds of pollution that legally or illegally use the Mediterranean waters as an „unlimited“ natural recipient. If one adds frightening pollutions by numerous river flows of the industrially developed European, Asian or African countries that also end in the Mediterranean, situation really becomes alarming.

Namely, the Mediterranean as a relatively closed sea with purifying options by changing water masses that are limited with the narrow Gibraltar defile and the Suez Canal, has been

called symbolically for some time in the professional literature „ a black hole“ of Europe. It effects naturally and in the long run the sustainability of the Mediterranean itself as a quality, economic and fishing resource and its function in the process of health and quality of life preservation for the inhabitants of the coast and the islands, therefore logically tourists as well.

When analyzing the geographical position, distinctive tightness and fewer possibilities of selfpurification by water masses change, as well as ever more intense, traffic, economic and urban progresses, the stated above can also be applied to the Adriatic, although in a much more complex version, being potentially along with the Black Sea the most endangered part of a wider Mediterranean area.

The European and World science have referred to the stated problems on numerous international congresses, on the topic of environment protection and sustainable development, mostly under the auspices of the UN and its specialized organizations, which is very important for sustainable management of marine, economic and tourist resources of the Mediterranean (Stockholm 1972, Barcelona 1975, 1976, 2005, Rio de Janeiro 1992, Dakar 1993, Lanzarote 1995, Sevilla 1995, Istanbul 1996, Kyoto 1997, Poznan 2008, Cancun 2010).

In the context of protection and sustainable management, as well as control of marine and coastal resources of the Mediterranean, one needs to stress in particular the regulations of the Barcelona Convention, i.e. (since 1995) the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean as well as the Mediterranean Action Plan (MAP 1975 and 2005) that all foresee:

- Supervision and effective control of pollution in the sea,
- Sustainable management of marine and coastal resources,
- Effective integration of environment in social and economic development
- The protection of sea and coast with the measures of prevention and pollution elimination,
- Protection of natural and cultural monumental heritage,
- A solid cooperation between the Mediterranean coastal countries on the level of ecological protection,
- A joint effort to improve the quality of life (UNEP, 2005).

In terms of the above, presented work is operationalized through the following matrix:

1. Introduction
2. Approach to the problem and the concepts of coastal and marine resources management in the Adriatic and Mediterranean tourism
3. Selected concepts and models for ecosystems management
4. Conclusion

2. Approach to the problem and the concepts of coastal and marine resources management in the adriatic and mediterranean tourism

There was a relatively quick reaction in the Adriatic to the ever more frequent scientific and professional as well as publicist warnings about the danger that threatens with the pollution

of environment and of natural areas in this precious and ecologically very fragile area. Crucial task in that sense was made by a group of extraordinary international and local scientists within two epochal projects under the auspices of the UN, which defined the concept of coastal management and potentials of the Adriatic. These are:

- UN Development program „Physical Development Plan for Yugoslav Adriatic Region“, Split 1970
- UN Development program - Protection of the Human Environment Project for the Adriatic Region, Rijeka 1978

All of these documents on track of the most excellent achievements of former science and profession in the field of spatial planning and natural and anthropogenic resource protection were later, even today, a foundation of analysis in the sphere of the sea and coastal protection in the Adriatic as well as the basic resources in spatial planning documents of the Adriatic local and regional administration, especially in cultural and natural heritage protection plan, but also areas and zones that are intended for public recreation or tourism construction as a sustainable tourism development.

Cognition and activities of these as well as of the operative projects in progress, connected to protection of the Adriatic, are going to be reasserted in this article, and they are of enormous importance for intensive development of the Adriatic tourism and protection of marine ecosystem. These are the Integral Project of the Kaštela Bay Management by the Split University, UNEP and HAZU and the WHO. There is also a mega-project of the pollution management „Project Adriatic“, which operationalizes the potentials of 20 Adriatic cities and municipalities, with funds of the CBRD, the World Bank and the EBRD.

It is followed by very successful and ever more frequent micro-projects for the particular sites (holiday resorts participants revitalized by tourist function etc.) (Geić S., Voloder F., 2009.).

Projects mentioned above in their ecological, technical and financial component and meaning for the regional tourism and economical development will be compared in this paper to analogue programmes throughout the Mediterranean (Cote d'Azur, Toulon, Monaco, Rhodes, Athens, Istanbul, Rimini, Barcelona, the Balearic Islands, the Canary Islands, Akaba - Israel, Cyprus and Al Hoceima and Agadir - Morocco, etc.).

All of these mega-projects will be analyzed and actualized critically, according to contemporary multinational models of the sea and coastal area management (PREPARE-2001 in authorship of British and Spanish scientists, META by the English experts and famous American LAC PLANNING SYSTEM - Limits to Acceptable Change), or will be put in a concept of a strategic management planning of the coastal area according to the PEST model that looks at problems through Political, Economical, Social and cultural and Technological research component, pointing out to a contemporary macro-concept "Tripple Helix" which assumes coordinated economy activity, local administration and the State, in context of the sustainable development and especially in the development planning of the sustainable contemporary tourism at sea and on the coast. The author's research team of this paper was also set on this concept-project in terms of the multidisciplinary experts and scientists of the economic, geographic and sociological provenance (Geić S. et. al. 2010.).

2.1 Approach to the problem of water resources in the Mediterranean

Tourism as one of the most distinct modern socio-economical phenomena of the world in its quantitative indicators is approaching gradually in the framework of international relations to billions of participants, with the economic effects that exceed the 800 billion USD. These sizes are almost triplicate by inclusion of domestic tourist migration, which gives more impressive social, economic and ecological dimension to a whole figure.

The biggest part of European travel trends, which makes over half of total world tourism in the area of tourist offer and demand, is realized in the Mediterranean coastal region, intensively estimating its water resources, especially the sea as the most important component of attractiveness of the content of the tourist offer.

There are of course needs for enormous amount of fresh water used in the frame of facilities of tourist supra-structure or in complementary sectors, especially agriculture as an important manufacturer of a wide range of raw materials and final goods needed for meet the catering tourist demand.

Given the characteristics of Mediterranean climate with a extremely summer arid period in time of **greatest demand for water** to meet the needs of multiciplinary number of consumers following intense sequences of tourist season in many Mediterranean tourist destinations, **rational management of these resources** represents an important component of the economic policies of all Mediterranean countries and regions.

The fact that the **largest part of pollution** of local population, tourists and economic activities through the river flows and coastal discharges, directly or indirectly, traditionally **oriented towards the Mediterranean Sea** as the most important recipient, is causing increasing concern.

Namely, the Mediterranean is a relatively closed sea whose options of purifying by changing water masses are limited by narrow Gibraltar defile and the Suez Canal, so the professional environmental literature have been calling it symbolically the largest "black hole" of Europe for a long time, expressing **extreme concern for the long-term sustainability of the Mediterranean Sea** as a quality tourism and fishing resource, and resource to the maintenance of health and quality of life for tourists and coastal residents, which by all intensive processes of urban and economic littoralisation is becoming more endangered.

Giving consideration to geographical position, the relative tightness and increased traffic, economic and urban developments, brought in much complex variants can be applied to the **Adriatic, which is with the Black Sea, the most endangered part of the Mediterranean** and its surroundings.

Bearing in mind the fact that the UN experts have declared yet in seventies of last century, how even than, and especially in the foreseeable future that evident are three key problems of humanity in a **deficiency of energy, food and drinking water**, which is particularly actual in the relatively arid areas including the Mediterranean, the rational management of water resources has becoming one of the fundamental conditions of survival of civilization.

Conclusions that have been carried out are precisely elaborated in a number of global conferences beginning with the world conference on sustainable development (Rio 1972...),

and the UN Conference on Climate Change (Kyoto 1997, Poznań 2008...), and from the tourist aspect, the **tourist experts speak about it anxiously**, especially since the World Conference on sustainable tourism development (Lanzarote 1995), International Conference MAB (Seville 1995), and many prominent world statesmen and scientists gathered at the World Summit Habitat II (Istanbul 1996...) which was dedicated to these problems.

All this resulted in the special **hiring of numerous international bodies and organizations** under the auspices of the United Nations (UNEP, UNESCO, FAO, IUCN...) or other regional international organizations (OECD, EU, etc...) including the increasing number of environmental organizations and associations throughout the world, and subsequently rerouting of new ways of international and national policies and legislative measures towards preservation and rational use of water.

This resulted in **sensibilization of businesses subjects** especially broadest part of the population, and by making appropriate more rigorous measures and technical procedures which allude protection of water resources through more efficient technical procedure of conditioning of waste water including mechanical, chemical and biological processes that protect land and water surface, and certainly the Sea as the largest global recipient.

The **modern technologies are appearing and are enabling recycling processes** with which the subdued volumes of potable water are saved in conditioning treatment, transforming waste water in the so-called Industrial water suitable for use in industry, agriculture, tourism, and utilities sectors.

Through this procedure, for example Israel, turns its desert regions into a fertile agricultural area with enormous yields, where organic fertilizers are making the contribution as a by-product in the process of recycling waste water. Naturally, these processes and technologies are much cheaper and more efficient than **procedures of desalting of sea water** as a common practice in the rich Arabic coastal regions, especially relying on the possible effects which are made by Conditioning processes to protect the sea and its fishing, recreational and health components.

These experiences across Europe and the world, especially in the **function of sustainable tourism development** that seeks to successfully develop over 190 countries around the world with the support of UNWTO and the number of regional associations, can be of exceptional benefit for rerouting of specific activities and projects at national and regional level in Croatia. This is particularly important for its coastal part oriented towards intensive tourist economy that is, based on extremely valuable potential provided by marine resources and a Mediterranean climate, already declared as the **global zone for recreation** at the international conference on the environment (Stockholm 1972).

Therefore, while Croatia is approaching toward Euro-Atlantic integrations, a **sustainable concept of rational management of environment**, with the effective **protection of most valuable resources**, especially the **sea and the water**, for the needs of the present generations and for the next generations should be created.

2.1.1 Tourist significance of water supply and pollution management projects in the Croatian Adriatic area

Several key world problems were identified at the UN Conference on the Human Environment in Stockholm (1972), which urgently need to be solved with joint forces by the

IC, and in order to sustain life on our Planet. All of these problems are directly or indirectly closely related to water resources on Earth. It is by all means logical when you look at the fact that water covers 70% of the Planet in all its physical states and therefore represents the most significant resource; the very fundamental source of life indeed.

The Conference accentuated in terms of the facts presented even then as today, and almost for the eternity the ever present issues and questions:

- issues of ever more frequent pollution of international waters and air,
- issues of the rapid population growth, followed by the threats of water shortage, needed for different activities,
- lack of enforceable research programme of protection of the ever more endangered ecosystem including the international waters' system,
- world's incapability to limit the usage of persistent toxic pollutants that mostly settle into the waterways above and under surface, and derogate the quality of drinking water, as well as water for agriculture and food industry, but also water resources for the health and recreational purposes,
- lack of efficient waste recycling systems which results in its discharging on the surface or into waterways, mostly into sea, being the biggest but not the most infinite recipient,
- absence of a convenient development plan for usage of the new energy sources, which includes insufficient exploitation of waterways for new hydroelectric power plants, lack of pumped-storage hydroelectric power plants, lack of usage of the enormous wave power, oscillation tides and similar water potentials,
- insufficient investment of public and private sector in pollution prevention and environmental improvement, including the most threatened water systems and which is still considered to be an unnecessary cost, and not a condition for a local community's and even the global civilization's survival,
- incompetence of states and the international community to develop an enforceable system of ecological surveillance and cooperation, especially when it comes to water resources that are mutually used as recipients, or as waterways in production of drinking water and food, tourist recreation, health etc. (Geić, S., 2002).

All of the problems mentioned above obviously fit into a framework of 3 crucial questions that are an existential burden for the humanity, **i.e. shortage of drinking water, food and energy** and which is directly or indirectly connected to water resources. The UN and its specialized organizations (UNEP, FAO, UNICEF, UNESCO and others) as well as the regional integrations (OECD, EU) specifically emphasize these problems, while intensively trying to remediate current state, with help of numerous non-governmental organizations.

It is urgent to establish a **sustainable water resources management**, as soon as possible, as a significant contribution to the global efforts in this field, in the context of this paper and the correlative terms of water management and tourism development in the Croatian Adriatic that was recognized as an international recreation zone, rich in natural and anthropogenic sources.

In this context should the regulations of the **Barcelona Convention and the Mediterranean Action Plan (MAP) for the Protection of the Mediterranean (1975)** be emphasized and which, according to the Supplement in 2005, predict in the Programme for the Protection of the Marine environment and the Coastal Region of the Mediterranean:

- Supervision and effective control of pollution in the sea,
- Sustainable management of marine and coastal resources,
- Effective integration of environment in social and economic development
- The protection of sea and coast with the measures of prevention and pollution elimination,
- Protection of natural and cultural monumental heritage,
- A solid cooperation between the Mediterranean coastal countries on the level of ecological protection,
- A joint effort to improve the quality of life (UNEP, 2005) (www.unep.org).

There were relatively prompt reactions to the more and more frequent scientific, professional and journalistic warnings in the Adriatic about the danger that threatens with the pollution degradation of the natural environment. A complex project supported by the UN, called „Protection and improvement of environment in the region of the Yugoslav Adriatic“ (IET 1978) was realized after this initiative in the seventies and which resulted in an important action and preservation of the coastal water resources for numerous other purposes of our civilization.

It is important to state following important actions in this area of operationalization of local and regional administration, supported by the State and the international community, which had a direct impact on the quality of tourist services:

- Activities for improvement and **construction of necessary utilities, infrastructure and especially water supply facilities**, where numerous projects of local and regional water supply constructions were realized in the seventies and eighties, as well as the actions for the water supply recovery sources and pollution protection, but also actions for the establishment of the sanitary control on the water supply facilities. A specific realization of the regional water supply systems, supported by the international financial institutions began in that sense in the seventies, throughout Dalmatia-in the Šibenik region, for the regions of Omiš, Brač and Hvar, for the Makarska Riviera, Ploče region, Pelješac, Korčula and Mljet, area of Dubrovnik and also joint water supply for Sinj municipality and Split hinterland, that are for several years in function. Unfortunately, the intensity of these activities after the nineties did not follow the objective needs, therefore are the water supply problems still evident on the Dalmatian islands and in the hinterland, but also insufficient supplies on the coast followed by the price that practically obstructs rational agricultural production, especially in the periods of drought. New projects are therefore very significant, where regional water supplies are connected with particular systems on the Jadro, Cetina and Krka river sources, forming a unique ring of a much bigger capacity, that should ultimately solve in the long run the problems of water supply in the coastal area, hinterland and on the islands, being a basis of a socioeconomic development of Central Dalmatia. It should be mentioned that water for agricultural production purpose is free of charge in many developed countries, as an act of support for this activity. These projects were preconditions for an intensive tourism development on the coast and islands.
- Intensive activity for **realization of more regional ecoprojects** with purpose of introducing contemporary disposal of total waste material, meaning contemporary solutions to the city sewage systems and construction of secondary network from the housing, catering and industrial establishments, by water waste conditioning and

permanent sea pollution check-ups as well as bathing and fishing prohibition in certain polluted areas.

The Adriatic and Croatian coastal area are both distinctive and unique because of the richness of life, purity and transparency of the sea, and well-indented and dynamic landscape. In that sense is also Croatia's basic strategic orientation the sustainable management of the Adriatic Sea, coast and islands, and conservation of invaluable treasures and natural diversity of marine ecosystems and coastal areas, allowing balanced development of economic activities in the coastal and island areas. There are the most valuable, but also the most sensitive natural ecosystems in areas of the Adriatic Sea, coast and islands. There are processes carried out that depend on a mutual activity of the sea and mainland. All these peculiarities require very careful and thoughtful management and control. Developing pressures and negative impacts on natural ecosystems are getting more and more evident and come from intensifying processes of the universal littoralisation which endangers coastal and island landscape as well as water surfaces, and especially the sea where pollution of all kinds end up directly or indirectly.

In this sense almost 20 years ago began the **operative program of the sea bathing water quality testing** on beaches, and went through many modifications, adjustments and changes. Legal basis for implementation of this program are the Regulation on the quality of bathing water (NN 110/2007) and the Environmental Protection (NN 82/1994). Program of the sea bathing water quality testing on beaches is financed by the budget of the coastal boroughs, and the testing itself is conducted by the authorized laboratories. Sea bathing water quality monitoring means sampling and analyzing sea water for bathing and recreation, and constant public information. The Ministry of Environmental Protection, Physical Planning and Construction is responsible for coordination of the program, consolidation and valorization of data as well as for informing the public.

Aims of the program are:

- Protecting the health of bathers and public health education,
- Sustainable beach management, due to preserving their natural features,
- Pollution source detecting, functioning of the existing waste disposal system and monitoring of the sewage system construction
- Public information (Geić S., 2007).

For example, the sea in Split-Dalmatian County is sampled at 140 points. Observing the individually evaluated samples in the season 2008, 59,70% of samples were evaluated as being the sea of high quality, 39,37% as suitable for bathing and 0,93% as being moderately polluted, which are relatively favourable indicators if compared to competitive regions.

Results of the sea bathing water quality testing on beaches during 2008 indicate that the sea bathing water in Croatia is of high quality because even 99.01% of samples meet strict criteria stipulated by the Regulation on the standard bathing water quality on beaches. These results can be used in tourism promotion which is particularly effective in example of their publication by ADAC organization, intended for motorized tourists throughout Germany and neighbouring countries (www.mzopu.hr).

In order to preserve high quality of sea on beaches and their natural features, one should approach the issue of beach management and sea bathing water and recreation completely,

bearing in mind economic and management importance on one hand and sea and marine environment protection on the other.

Along with all positive economic effects, tourism brings also a great burden for marine and coastal environment and represents a major risk factor in terms of possible sea quality deterioration, therefore is in that context an especially important for Croatia development of the sustainable tourism.

Bearing in mind the statements already mentioned in this paper, "Eco Kaštela Bay" Project and „the Adriatic Project“ supported by international financial institutions throughout Croatian Adriatic will be particularly analyzed, and that will despite the elements of imperfection of the system have extraordinary positive repercussions for the tourism development and level of health education in the Adriatic sea.

- "ECO Kaštela Bay" project

Having considered the objective needs that Adriatic tourist destinations, in accordance with the requirements of the tourist demand and growth ecological awareness and health culture of the local population, **effectively manage all water resources** of land and sea as the fundamental elements of quality of life, economy and tourism, is logical that they led in the implementation of **modern system of responsible water management** and in complex weather conditions tend to provide enough water for the population, tourism and supporting economy.

This process, although with the time distance, follows a successful **policy of many EU member states** that by its legislation and practical measures and incentives in the coastal regions are achieving exceptional results in the segment of water supply as well as recycling and conditioning of pollutions.

On the relative **backwardness of Croatian regions** for these examples in the near and distant history, says the fact that also today, a significant part of the Dalmatian hinterland and islands is outside of water supply systems, and systems of pollutions conditioning are still in the process of realization.

This is a **paradox**, bearing in mind the fact that in environment of only one hundred km in Central Dalmatia, **there are abundant water flows** (Krka, Jadro, Cetina) sufficient for multiple users, which were possible to be link into a unique system and to ensure appropriate protection, and treat them as an economic resource in the terms of the future when drinking water lack almost half of humanity.

With declared, it should accent the fact that in these regions during the 20th century, economic system was developed by the principle of "it is worth-it damage the environment", which has **completely devastated some of the best spatial coastal resources** (Bays of Kaštela, Šibenik, Bakarska) known for a century traditional farming economy and fisheries, and then tourism.

This fact has contributed to the tragic **process of depopulation** of hinterland and significant negative processes of excessive **coastal littoralisation** with the devastation consequences of coastal zones and arable area and water resources.

In an effort to radically change the status, in the mid-eighties of 20th century the University of Split, in cooperation with HAZU and with the help of international specialized UN

organizations, the World Bank and the European Bank, and the World Health Organization, a multidisciplinary project "**Economy of the broad area of Kaštela Bay**" began.

The basic elements of the project are based on the following conclusions:

- Kaštela Bay as the epicentre of region is contaminated, and its tremendous natural resources does not give positive effects in economic development, and quality of life has been seriously violated.
- Scientific and practical basis of the project is on the modern paradigm of care and improvement of the environment and the strong role of science in the study of eco-systems, in the study of the consequences of development on the environment and measures for preventing pollution and ways of improving the environment.
- Scientific approach is based on the method of integrated approach by the principles of sustainable development and precaution as measures of modern caution to the obsolete but also new technologies.

The project consists of three sub projects: "Methods and Models," "The natural environment and eco-systems" and "socio-economic and spatial systems". Developer scenarios showed the necessity of changing the strategy of the coastal economy by turning toward tertiarisation of economy and European trends of sustainable development, with maximum protection of environment.

Valuable basis for further work was provided by **Ecological sub project** with a detailed analysis of the situation in all spheres of environment, pedological map, the state of water resources, pollution of air, land and sea etc. As the result, the sub project "Integral ecological project of the city of Split with the environment", later called "ECO Kaštela Bay" was conceived (UNIST & UNEP 1993).

ECO-Kaštela Bay is the largest project of this kind in the Mediterranean. In order to achieve a common goal - the crystal clear sea and plenty of drinking water - four cities: Split, Solin, Kaštela and Trogir with Split-Dalmatia County, the Croatian Water and Split Water and Sewage, founded in 1998, the Agency ECO-Kaštela Bay. Price is projected at 143.2 million euro. Sources are the European Bank for Reconstruction and Development (30.7 ml euro), the World Bank (33.2 ml), Republic of Croatia (63.3 ml), Croatian Waters (4.5 ml), and the citizens from the basis of increased prices (11.5 ml). The project includes three sub projects: the sewage system Split-Solin, sewage system Kaštela-Trogir and upgrading of water supply system Split-Solin-Kaštela-Trogir, where the primary task is finding solutions of sewage systems and waste water (www.ekz.hr).

Long-term oceanographic research gave result that the sea of Kaštela Bay, which is a **semi-closed aquarium**, can not be the recipient of consolidated waste waters, so the solutions were found in the drainage of waste water into the sea of large capacity for receipt in this case, the Brač and Split Channel, which according to preliminary research may receive a larger amount of pollutions without a fear of consequence to the ecosystem of the sea.

This has enabled the phased construction of the **facilities for purification of waste water** where the mechanical purification should be started, and then with a chemical biologically systems. While approaching technically to the area of coverage as an optimal solution, two sewer systems were accepted, with two devices for treating and two submarine outfalls in the Split and Brač channel which have defined sewage systems for cities of Kaštela and

Trogir and sewerage system Split - Solin. This region has a population of 300,000 inhabitants, whose number almost doubles in the tourist season (Andročec V. et al., 2003).

It is logical that this mega project is appropriately treated in the **spatial plan** of Split Dalmatia County, in which a significant place is occupied by water supply and drainage along with statements that supply with drinking water from rivers, and the appropriate use of the potential sources has priority in relation to the use of water for other purposes.

Drainage systems in accordance with the plan should lead to steady relationship with the **water supply systems**, and their development or construction is necessary to adjust to protected areas and established criteria of protection and to primarily protect the drinking water and protection of the sea (PP ŽSD 2002).

In the part of the Plan that relates to the **protection of the sea** is particularly underlined the need to reduce the amount of the consumption of technological and industrial water through the models of use of consolidated waste water, as is the trend in developed parts of the world. This imposes the statement that the entire project is only the first step in the management of waters, and what follows are the **recycling systems** and methods of possible use of so-called "Gray water" in agriculture, tourism and other economic and social sectors.

With the solution to the sewerage system Split-Solin in the flow area of Solin, adopted was a concept of connection of concentrated pollution flow, which is the reason that waste water of municipalities Dugopolje and Klis are taken outside of flow area of Jadro River, and where complete protection of this vital source is achieved.

For the rest of the settlement of Splitska Zagora Located in the zone of sanitary protection of the Jadro source and Žrnovnica, as a drainage solution, proposed is to build more local systems with a common device for purification. After that, the consolidated pollutions would be drainage in soil, and could be potentially used for irrigation of nearby debris fields.

Regarding the protection of the sea, the Plan emphasizes measures for preventing and reducing pollution from land through the **construction of modern sewage system**, which is the basic sanitary-health standard, of course, with the appropriate construction of the central device for the purification of the submarine outfalls.

The plan accepted the basic elements of the **study of monitoring the environment status** after the construction of the system as of: the sea as a base recipient with 9 normal parameters, and the atmosphere as recipient of potential odour and noise. (Ivanović M. et al., 2002).

In this sense, it specifies the necessity to complete the mechanical (primary) degree of purification before the under-sea disposition, according to "Directive Council of Europe" about the treatment of waste water of settlements (EEC 271/91)", which specifies how it is necessary to build facilities for consolidation of second degree for the cities greater than 15000 EP (Equivalent population), and on the utility systems with the greatest load of pollution.

Unfortunately, the current status of Conditioning in the system of ECO Kaštela Bay predicts this level only when needed and in the second stage in the foreseeable future when they reach the appropriate percentage of secondary network connectivity. Moreover, it is not a

subject of presented project, which is a serious drawback, which can cause unwanted effects of reducing the quality of the sea in the attractive seaside localities in the vicinity of submarine outfalls, and with the work of sea currents and the wider area.

This, in accordance with the **Study on the environmental impacts** (Ivanović M. et al, 2002) for the Split channel, will yet be the subject of oceanographic research (monitoring) by the system incorporation.

In this context we find it necessary to announce that many analyzed similar systems in the world and especially in the **Mediterranean** ensure **implementation of all three systems** of treatment to preserve the sea as a vital resource in tourist recreation (author's comment).

The plan specifically emphasizes how to **prevent the contamination of underground** with a permanent rehabilitation and prevention measures, and commits industrial facilities in the coastal region on the pollution pre-treatment and connection to public systems, and gradual transition to the application of modern environmentally acceptable technologies, with the recycling and reuse of water.

To prevent pollution of coastal sea caused by marine traffic and port activities, the necessary protection **measures are set out in accordance with international conventions and national regulations**. All these solutions require significant resources as well as effective supervision, which, in the present moment are almost unreachable and represent a serious ecological problem.

Considering that the project does not include the construction of secondary network, which will represent an additional cost of population and economic entities already strained with dedicated separation of the price of water, **the doubt of the functioning system** can be concluded, whose facilities are designed to specific quantities of pollution flow. The next technical problem may be in the dispose of solid waste considering uncompleted systems use of the same in agriculture, and the current problem of the location of Regional Centre for the disposal of waste which in public provoke a number of controversies (author's comment).

The Adriatic project

This long-term megaproject to protect Croatia's coastal area from water pollution was launched in 2000 by the government of the Republic of Croatia and the **Croatian Waters Company**. **The Croatian Waters Company - the Adriatic project** carries out the project based on the precalculation of the value of the project in the amount of 280 million euro. The realization of the project has been supported also by the International Bank for Reconstruction and Development (IBRD) which in 2004 granted a loan in the amount of 100 million euro over the term of 15 years to be used for financing the improvement of communal wastewaters collection, transport and purification systems for the towns and villages along the Adriatic coast and on the islands.

The project is going to be financed from the **available funds of the Republic of Croatia** (state budget, the fund for the development of islands, water protection funds of the Croatian Waters company, etc.), while the loan is going to be repaid by **the end users** of the loan - **utility companies** - through raised water price, as well as by the Croatian Waters company. The financial participation of IBRD in the planned costs of the project is 50%, the Republic of Croatia 22%, local self-government units 19% and the Croatian Waters company

12%. **The basic premise for this project** is the fact that the management of wastewaters is currently at an unsatisfactory level which implies the inadequate protection of the sea and a possible threat to ground waters. This in its turn poses a serious problem in light of development of Croatian tourism and with regards to the public health. The alarming facts are that only 40 percent of households and 40 percent of industrial facilities at the level of the Republic of Croatia are hooked up to sewerage systems, and less than 12 percent of all collected wastewaters, including those in coastal areas, is being treated. This is especially disturbing in light of necessity to use the Adriatic Sea as a main resource for tourism and recreation. For example, merely 7% of the Sava river basin pollution is purified while in the case of the Danube river basin this percentage is significantly higher – 37% (HRT, 2009). **The deterioration of sea water quality** in some Croatian regions as a consequence of inappropriate discharge of untreated wastewaters has already caused visible problems, including eutrophication and phytoplankton bloom at individual locations, as well as less evident pollution of sea life by organic and inorganic micro-pollutants imposing a continuous threat to tourism, recreational and fishing activities. In this regard, the basic objectives of the project are protection and preservation of water quality to secure unobstructed growth of tourism and economy in accordance with environmental protection requirements which is to be achieved through implementing an internal and external monitoring and management of pollution and sea quality.

For the needs of the preparation of the Adriatic project 1030 cities and villages in 7 counties on the Adriatic coast were analyzed, i.e. 1,149,130 inhabitants, while the selected systems encompass 308,891 inhabitants with the total load of 1,224,800 equivalent inhabitants. The Adriatic project is currently being implemented in 15 towns and municipalities on the Adriatic coast.

The basic objectives of the project are:

1. Protection and preservation of water quality;
2. Establishment of conditions for safe economic development in accordance with environmental protection requirements
3. Preservation and improvement of the achieved degree of environmental protection;

The construction of the suggested projects is going to solve pollution and sewerage problems for several upcoming decades, which is going to secure unobstructed growth of tourism and economy in general in the coastal region. The Project is expected to produce **positive effects on the environment**, including the **improvement of public health** on account of **improved water quality** in the swimming areas and areas inhabited by bivalves, **better ecological conditions** on account of more reliable wastewater treatment, and greater viability of fisheries and aquaculture.

All works encompassed by the Adriatic Project are technically rational, socially and economically justified and acceptable from the standpoint of environmental protection based on the undertaken environmental impact study. **Sea monitoring** which is regularly performed since the 1970s is carried out within the Adriatic Project as well through:

- a. **Internal monitoring** – at the level of program implementation with the objective of determining the status of an area, wastewater characteristics and the characteristics of treated wastewaters;
- b. **External monitoring** – as a control of the implementation of the program as a whole

The Adriatic Project is of **regional character** and implemented **in the coastal region**, whose tourism potential and importance for the development of Croatian economy are great. 'Coastal region' has been defined for the needs of implementation of this Project as the area whose final wastewater disposition is discharged directly into the sea. Several regions that have also been taken into consideration owing to their exceptional natural value (national parks) or their pronounced indirect influence on certain sensitive areas are an exception.

The subprojects whose documentation was better elaborated and which had to be included mandatorily in order for the planned needs of utility companies to be considered more integrally have been selected for implementation in the first stage. The classification of systems by order of priority was carried out by applying **the difficulty classification method** based on **seven criteria**:

1. Equivalent inhabitants (the criterion that reflects the extent of pollution)
2. Recipient's sensitivity to wastewater discharge (the criterion of the sensitivity of the region)
3. Impact on the development of tourism (the influence on the tourist capacities of the degree to which the system has been constructed)
4. The degree to which the system has been constructed (preference is given to projects enabling the completion of the system in order for it to achieve full functionality)
5. Preparedness of project documentation (preference is given to projects at a higher level of elaboration)
6. The degree to which the region is developed (the criterion according to which preference is given to regions that are less developed)
7. The height of the investment in relation to the number of inhabitants

The Adriatic project is currently being implemented in 15 towns and municipalities including 6 (Lovran, Matulji, Novigrad, Opatija, Pula, Rijeka) under **Rijeka water management** and 9 under **Split water management** (Biograd, Dugi rat, Makarska, Omiš, Opuzen, Ploče, Rogoznica, Sv. Filip i Jakov and Zadar).

The analysis of individual subprojects has shown that unfortunately wastewaters are only **mechanically treated** and that they are discharged into the sea in this condition. This is the main characteristic but also one of the major shortcomings of both megaprojects considering the experiences in other parts of the world where higher level of purification is obtained by adopting chemical and biological procedures with an auxiliary recycling method which enables the reuse of greywater but also of hard substances in agriculture and municipal use (www.jadranski.projekt.hr).

2.1.2 Experience of tourist regions of the Euro-Afro-Asian Mediterranean in marine and land water resources management

The **common denominator** of all tourist regions of the **Euro-Afro-Asian Mediterranean** save for the extraordinary climate with the plurality of natural and social attractions, is the problem of **quality of water supply**. Connected with this is also the **problem of wastewater management**, in other words protection of the **sea quality** as the primary tourism resource which is the basis of tourism as the main economic activity of the region.

In the context of resolution of such problems in the Croatian part of the Adriatic sea, it is useful to analyse the applied **modalities and concepts in water supply management and**

waste water management, in other words protection of the sea from pollution, in the relevant Mediterranean countries and destinations which may serve as role models, but which are also our competition in the tourism market. The following is an analysis of national and regional policies, and concrete projects in the sphere of management of these pertinent segments of the tourism offer infrastructure in various developed tourist countries and regions of eastern and western Mediterranean.

The **Mediterranean** as the most notable tourist mega region in the world will remain for a long time, if judging by future prognosis, **the most important receptive macro space**. But for this reason, and given the accompanying ever growing urban development and economic activities with notable wastewater present in the watercourses, this is **an area of particular environmental endangerment**. This problem is further emphasized by the fact that the Mediterranean is the busiest world waterway with enormous amount of traffic related to the transport of oil and other toxic matters, and enormous quantities of weapons, including chemical and nuclear weapons, being transported, which raises possibilities of maritime incidents with grave repercussions.

Many international conventions have been negotiated under the auspices of the UN and regional organisations and associations which regulate this matter from a legal and practical point of view, in an attempt to preserve the Mediterranean and its valuable tourism and fishing potentials. In addition, contribution has also been made by introducing optimisation of systems for monitoring and intervention in the cases of incidents, which need to be continuously improved through international cooperation. All of this remains of particular interest to the tourism organisation.

In this sense, one must emphasize the relevance of provisions from the **Barcelona convention for the protection of the Mediterranean** (1976) and the **Mediterranean Action Plan** (MAP) which operates within the framework of the very Convention.

- **Barcelona Convention and the Mediterranean Action Plan (MAP)**

The **Mediterranean Action Plan** (MAP) was adopted under the umbrella of the United Nations Environment Programme (UNEP) in 1975 as the first of the Regional Seas Programme. MAP was adopted with an aim to secure the quality of life in the Mediterranean, as well as to establish and strengthen cooperation and harmonise strategies of common natural coastal resources management. The goals of MAP are the protection of the environment, promotion of the sustainable development model, as well as harmonizing of relations between Mediterranean countries in relation to the said problems.

The 16 Mediterranean member states Barcelona convention from 1976 was transformed in 1995 in the Convention for the Protection of the Marine Environment and the Coastal Region of the Mediterranean which today has 22 contracting parties, and represents the legal framework for the operation of MAP.

Protocols which regulate the **activity of the Barcelona Convention** with regard to water protection planning are:

- **Dumping Protocol** - Protocol for the Prevention of Pollution in the Mediterranean Sea by Dumping from Ships and Aircraft or incineration at sea (1976., 1995.)
- **Emergency Protocol** - Protocol Concerning Cooperation in Combating Pollution of the Mediterranean Sea by Oil and other Harmful Substances in Cases of Emergency (2002.)

- **LBS Protocol** - Protocol for the Protection of the Mediterranean Sea against Pollution from Land-Based Sources and Activities (1980, 1996)
- **SPA and Biodiversity Protocol** - Protocol concerning Specially Protected Areas and Biological Diversity in the Mediterranean (1995.)
- **Offshore Protocol** - Protocol for the Protection of the Mediterranean Sea against Pollution Resulting from Exploration and Exploitation of the Continental Shelf and the Seabed and its Subsoil (1994.)
- **Hazardous Wastes Protocol** - Protocol on the Prevention of Pollution of the Mediterranean Sea by Transboundary Movements of Hazardous Wastes and their Disposal (1996.)
- **ICZM Protocol** - Protocol on Integrated Coastal Zone Management in the Mediterranean (2008.)

6 Regional Activity Centres (RAC) operate under the framework of MAP, which are all located in the Mediterranean countries

- **REMPEC** (Regional Marine Pollution Emergency Response Centre for the Mediterranean Sea)
- **BP/RAC** (Blue Plan Regional Activity Centre) - in charge of protection of the environment in the context of sustainable development in certain regions of the Mediterranean.
- **PAP/RAC** (Priority Actions Programme Regional Activity Centre) - established with the goal of integrated coastal area management to alleviate and prevent negative effects on the environment resulting from development in built-up coastal areas.
- **SPA/RAC** (Specially Protected Areas Regional Activity Centre) - focuses on the protection biodiversity in the sense of protection of Mediterranean species, their habitats and ecosystems.
- **INFO/RAC** - Centre which provides communication services and technical support to the MAP Secretariat and other MAP regional components. The Centre also focuses on enhancing public awareness concerning environment while establishing working partnerships that enable sustainable development across the Mediterranean region.
- **CP/RAC** (Cleaner Production Regional Activity Centre) - promotes the reduction of industrial waste in the Mediterranean.

Mediterranean Commission on Sustainable Development (MCSD) was established in 1996 as the counselling body of MAP, which also produced the Mediterranean strategy for sustainable development. The role of the **Program for marine pollution assessment and control in the Mediterranean (MED POL)** is particularly important as it represents the scientific and technical component of MAP (www.unep.org).

The Adriatic macro region which is particularly analysed in this paper is actively involved in numerous programs under the umbrella of the Barcelona Convention and MAP, which is realised through the activities of the Split Institute of Oceanography, the University Centre for the Study of the Sea, the UNEP PAP-RAC Centre in Split, as well as the University in Dubrovnik.

In accordance with outlined programmes and global activities, attitudes towards water resources across the globe which make up 70% of the surface out of which 97% is the sea and only 0,01% drinking water, is rapidly changing. This is particularly the case in Europe

and the Mediterranean, with many water supply projects and conditioning and recycling of wastewater projects being in place for the protection of fresh water and seas areas as recipients, and which programs involve international and regional financial institutions. Relevant research in the EU indicated that 75% of the Europeans consider water quality in their country a major problem. Some 27% of EU population or 130 million inhabitants are facing this problem. The Greeks (90%), in particular Cypriots (97%) are especially affected given that they lack their own sources of drinking water (Geić S. et al. 2009).

Climate change has particular influence on the drinking water supplies which is evident given the smaller capacity of certain European rivers especially in the Mediterranean region with a projected fall of 10%. With global warming and reduction in rainfall together with the rising of the temperature and often droughts in the areas of southern and middle Europe which have since the 1970-ties been more intensively affecting Italy, Portugal, Spain, France, Malta, Cyprus, Greece, even Croatia, enormous damage is done to agriculture and tourism, with fires of more and more catastrophic proportions destroying forest areas and creating a new microclimate with even less amount of rainfall.

In line with the new trends from the beginning of the new millennium, the problems of droughts and water shortage in the EU countries have often been debated. Accordingly, the European Commission has drafted an all encompassing assessment of the state in certain member states which envisages more rational handling of drinking water resources, which also presumes more intensive recycling of wastewater for repeated use of water in agriculture, tourism and related industries.

- **Program Blue Flag**

Blue Flag Idea was born in 1985 in France when criteria of environment protection of beaches and water quality were defined. French concept was accepted by the European commission with inclusion of other environment management segments. In 1987 year of environment only 244 beaches and 208 marines from 10 countries were carriers of blue flags.

In 2001 European foundation for education on environment, in the capacity of project coordinator (FEEE) became global organization and was transformed to Foundation for Environmental Education (FEE), it's the most important partners became **UNEP and UNWTO**. This resulted with the fact that in 2008 Blue Flags was fluttering on 2633 beaches and in 620 marines around the world. In program which extends over the boundaries of the European Union 38 countries are already involved.

On the area of the regions that this work relates to, we record in Croatia 125 beaches and 21 marina, Spain 442 i.e. 72, France 225 and 67, Italy 210 and 56, Greece 416 and 8, Turkey 258 and 13, Montenegro 18 and 13 in Morocco (www.blueflag.org, 2008.).

2.1.3 Problems of water management program in the eastern Mediterranean

- **Regions of Afro-Asian Mediterranean**

Greece and the entire south-east of Europe are in a complex situation in relation to water supply, in particular **Cyprus and Malta** that have no watercourses. Cyprus must import water from Greece and Turkey that, among other, exports water even to Israel on the basis of the "water for arms" agreement. Construction of a water supply system from Turkey to

the Turkish part of Cyprus is also envisaged, as well as the construction of a major waste water treatment and recycling facility in the locality of **Mia Milia**. It has been estimated that this project will cost 30 million Euros, and it will be finalised by both Cypriot communities.

The weight of the present day situation in Greece is proven by the example of the island of **Rhodes** as one of most developed tourist regions in Greece with 15% accommodation capacity, 27% of foreign visitors per night, and 20% of foreign currency influx of Greece, which has based its development on the mass tourism development with all of its negative consequences for the environment, water supply and problems of wastewater. This island without continuous watercourses and with only 800 mm of rain a year, with intensive tourism development and enormous water consumption and wastewater problems, required a new concept for tourism and economic development. This necessity was comically announced in 1993 by Greek authors in a meaningful title "His Rodos hic Saltus". According to them, Rhodes has, with its excessive tourism development become a synonym for millions of tourists, but also millions of showers, and enormous amount of wastewater, piles of garbage, frequent catastrophic fires, thermal energy, with all of its pollutants. ..."Rhodes is a constantly milked cow which is inadequately fed or not fed at all" (Tamorri M. et al., 1993).

In an attempt to exert changes, "**Action Plan – Rhodes**" will be operational until 2010 within the framework of UNEP's programmes for priority actions in the Mediterranean which estimated the possibility of sustainable carrying capacity, and ordered territorial relocation and modernisation of tourism superstructure aiming to avoid the formula of mass tourism, and accompanied with implementation of the projects of conditioning and recycling of wastewaters. The result of conditioning and recycling of wastewater activities is that 48 beaches had become part of the Blue Flag which is a 50% in comparison to the 1990-ties.

Turkey has in recent years, with its fast growing tourism development and impressive tourism superstructure, become one of the top 10 most developed countries of the world with around 20 million of foreign visitors and 19 billion USD of foreign currency influx (UNWTO 2008). The majority of the tourism activity is realised in the **wider region of Istanbul** (Sea of Marmara, Istanbul Bosphorus) with over 30% of overall tourist aggregates of this country. However, the unregulated organisation, wastewater and maritime incidents in this busy region endanger the natural anthropogenic features with potentially catastrophic consequences given the intensive traffic of ships carrying oil and weapons, including atomic weapons (Geić S., 2007).

This considered, an urgent plan of activities was drafted by the Ministry of culture and tourism titled "**SOS for Istanbul**" and presented at the international conference Habitat II in 1996. This plan popularises the GAIA doctrine from 1970 as the basis of a new environmental conscience with the message "all of us are in the same boat and it's called the Earth, and there is no nation without responsibility for pollution of the sea, continent and air, concluding how it is a moral and legal obligation of the civilised world to preserve Bosphorus and Istanbul. (Binan C 1996).

This programme in its environmental component seeks reduction of the transport of dangerous cargo via these waterways, and seeks implementation of a major project for conditioning of wastewater of Istanbul and its wider area. The programme's impressive technical version of mechanical, biological and chemical treatment of wastewater has been

presented at the fair which was followed by an international congress, with a high level of recycling of wastewater and a variety of ways to use the so-called “grey water” in agriculture, industry and tourism.

The **Turkish region of Antalya** with its hundreds of thousands of foreign visitors, is an example of extraordinary activity in the field of tourism development due to foreign investments, which having developed detailed Physical and Master plans until 2015, successfully realised its projects related to heritage protection, as well as water resources protection projects following the concept of sustainable development.

Also being a part of this, is the large **integrated environmental project of water supply** and wastewater conditioning worth 235 million USD which has been realised with the help of the World and European banks (Deverci A. et.al., 1996).

As a result, in this region which is nowadays considered the most developed Turkish Riviera, one can find 143 beaches and 2 marinas falling under the EBF system. All of this enabled the expansion of tourism investments of multinational companies turning Alanya into a modern tourist town and an organised tourist destination of the highest category. This town had the strength and funds to resolve its traffic problems which resulted in major pollution with a system of public transport involving the construction of an underground with stations linking the airport, the city centre and all other tourist localities with rich cultural, sports, recreational and health features necessary for modern all year round tourism traffic.

Egypt - Project Alexandria Integrated Coastal Zone Management (MAP): aims to organise sustainable wastewater management in the region of El Mex Bay and Alexandria, as well as to support the efforts for sustainable management of Egypt’s coastal resources.

As for water supply as the basis for tourism and agricultural development of Egypt, projects of construction of grand dams and hydropower plants on the Nile are particularly important. They have, with the help of the international community, secured electrical energy and irrigation of large areas of desert, as well as helped tourism development on the Nile and artificial lakes of upper Nile.

2.1.4 International programs for protection of water resources in Adriatic

- Programs in the Italian regions

Italy as one of the leading industrial and tourist countries of the world, faced among the first counties with the dangerous problems of environmental pollution and in particular on its Adriatic coast, which is the recipient of the biggest part of pollution, and also a significant tourist area that exactly for this reason, is losing on the attractiveness and competitiveness. Especially well-known problems of pollution are at the coastal of tourist region of **Veneto** (Venice) and **Emilia Romagna** (Riviera Romagnola).

This is why in the seventies of the 20th century, the extensive research has been carried out which showed that in 80% of cases the sea along with Italian Adriatic coast was polluted and dangerous to the health of bathers. Therefore, to solve the pollution problem, Italy has extracted the amount of 6000 billion lira, and invested this amount in the next 15 years, which has greatly improved situation on the main tourist sites, especially on the affirmed Riviera at the regions of Veneto and Emilia Romagna.

As a result of these and similar actions, today Italy within the frame of international project **Blue flag** with 38 participating countries, has even 210 beaches and 56 marinas in the European blue flags system, which is almost double from Croatia or fourfold more quality beaches compared to the end of the nineties. Emilia Romagna with the famous Riviera Romagola which, from the former “Golden beach of Europe” was ecologically devastated and with no blue flags, today has 25 beaches and 5 marinas in the European blue flag system, the region of Veneto 9, i.e. 4, and Friuli Venezia Giulia 12 beaches i.e. 4 marinas, as a result of intensive fight for pollution conditioning from the mainland and the prevention and systematic maintenance of the sea surface in difficult conditions following a still large pollutions in the Po river basin as the epicentre of Italian industry and urbanization, and by the frequent navigational route towards large northern Adriatic ports and shipyards.

In this context, in subsequent of global climate change and increasing of sea level as a consequence of inappropriate relation of a man regarding the every kind pollution in the waters, land and air, there is a great project SOS for Venice with participation of UNESCO and UNEP, the Italian government and a number of world foundations. Except the restoration of cultural goods, project provides also the rehabilitation of the watercourses and in particular the construction of dams and the seawall, which will prevent the frequent floods in the city of lagoons, and stop the tragic process of Venice depopulation following the decrease in the level of life quality (Geić S., 2007).

- **Program BIOLFISH - Adriatic**

In the context of more and more sophisticated requests of tourist demand and the environmental awareness of tourists and also of domestic population, very important are more frequently combined inter-regional eco projects in Adriatic, which systematically solve problems of pollution disposal on the land and in the sea, which is most closely related to organic production in the tourism and agriculture.

Same is the inter-regional **project Biolfish**, i.e. the program of ecological agriculture and sustainable Adriatic fishing from the coasts, with the goal of improving the quality and evaluation of olive oil, fish and seafood.

Program applicant is the Apulia region, Italy and the project partners ICEA - Institute for Ethical and Environmental certification from Udine, Padua and Rimini; AIAB Veneto - Italian association of ecological agriculture for the region of Veneto, CiBi - Italian Consortium for Organic Agriculture, Bari; ECO LIBURNIA, Rijeka, Albanian Association of Organic Agriculture, Tirana and Dubrovnik-Neretva County (www.seadriatic.net/aii).

- **Program I.W.M.A. - Korčula**

This is an integrated approach of pollution management (Adriatic New Neighbourhood Program) for the island of Korčula. The applicant is the Dubrovnik-Neretva County, and the project partners are the Province of Ravenna and interested county entities.

The aim of the project is the preservation and revitalization of the natural and cultural heritage of the island of Korčula, through the implementation of the project that will strengthen the existing capacities of local municipal institutions and improve the quality of island life and tourism in accordance with standards of EU for the protection of the environment.

- **Global Environment Facility project (GEF)**

GEF represents a program of strategic cooperation in the Mediterranean, made by UNEP and the World Bank, which relates to programs of protection against pollution of this area and conservation of biodiversity on the shores and in the waters of the Mediterranean. Besides Croatia, participants come from 14 Mediterranean countries, and project partners: World Bank, UNEP, FAO, UNESCO and UNIDO, and numerous associated partners, and donors are Spain, France and Italy.

For the purposes of this work, especially important are management problems in the area surrounding the Trebišnjica river delta, and the delta of the river Neretva, which concerns to all regions of the **southern Adriatic**.

- a. **Trebišnjica Management Project** supports intervention for improving integrated management of surface and ground cross-border water resources which is of extreme importance for the water supply region of southern Dalmatia, Herzegovina and Montenegro's coast.
- b. **Neretva River delta** project is occupied with sustainable management marsh ecosystem and the priority investments to reduce water pollution in the Neretva basin.
- c. **Tourism development project in Montenegro** is the concept of development of alternative forms of tourism, including effective methods of disposal of waste water in Bar and Ulcinj, the management and preservation of wetland areas of the Bojana-Buja delta, and the expansion of the protected area from the coastal section to the inland.

- **World Wildlife Fund Programs on South Adriatic**

Although Mediterranean Sea represents only 1% of the world's sea surface, it contains around 6% of sea species including endangered species and specially protected Mediterranean monk seal, sea turtles, dolphins and blue tuna. Former civilization cradle today is faced with many threats like pollution, pollution from the coast and sea traffic, fish catching beyond measure and excess construction of the coast which is influenced by one third of total world tourism which is accepted by Mediterranean regions.

In that sense organization **WWF** conducts training and protection programs in order to help local organizations in area of nature protection and sustainable forests management, freshwater and sea surroundings and other natural resources.

On wider area of regions this work relates to, WWF helps project „Living Neretva“ and programs of protections of „Livanjsko polje“ and „Skadarsko jezero“, program of protections of Mediterranean monk seal and sustainable development.

Program Living Neretva deals with river basin Trebišnjica which is through karstic terrain connected to Neretva river, on the surface of 10,100 km². On this area of special attractiveness urban and industrial and tourist development, agriculture, construction of hydroelectric power station and hydro-technical objects influenced greatly on area causing numerous problems specially in a part of pollution management which seriously endanger this unique natural phenomena.

Project „Living Neretva“ began in 2006 in both entities in Bosnia and Herzegovina, in order to manage with natural resources of basin Neretva across the border in accordance with basic principles and criteria of General European Union Directives about waters and habitations.

Complete vision of the project is to secure protection of nature and sustainable development of the area that is known as Neretva basin, which will be the basis for long term prosperity and development in the region and direct aim is to develop model of integral management, connecting water management and protection of biodiversity. Project is financed by the Government of Norway and is performed by Mediterranean program of WWF in cooperation with WWF Norway (Geić, S., Voloder, F., 2009.).

- **Protection project of the Montenegro-Albania Green Belt – WWF**

From west Montenegro to north Albania attractive Durmitor massif and the mountain Prokletije spreads, it is area formed by ice blocks and karstic phenomena and river straits deeply carved in landscape which includes longest and deepest, European formed Canyon of Tara River. Some of the most protected forests of southeast Europe are situated here, which are habitation of numerous herbal species and wildlife predators, which was the main reason that this area was included in **UNESCO natural heritage register**.

Despite this values and global protection this area is endangered by clearance of forests and especially by planned dumps and hydroelectric power station constructions along the Drina river coast. The goal of the project is creation of favourable conditions for long term protection of biological diversity and sustainable usage of natural resources in Durmitor, Tara, Prokletije landscape and to establish grounds for long term engagement in Dinaric massif and Dalmatian coast, as well as in south part of Mediterranean eco-region.

2.1.5 Water management programs in west Mediterranean region

Due to the fact that on the area of west Mediterranean the most intensive tourist valorization with almost two-hundred years tradition is recorded, it is logically that we measure here the first activities on protection of water resources, specially the sea as the fundamental tourist resource. In this part of the work we shall present chosen projects which were carried out on French and Spain Mediterranean destinations within the new tourist politics towards environmental protection within sustainable development of tourism development conception initiated in seventies in last century.

- **Programs in tourist regions of Cote D'Azur, Toulon and Corse**

France as one of the leading tourist countries with centuries long tradition of tourism development and with realization of 83 million foreign visits and 54 billion USD in foreign currency influx (UNWTO 2008), is at the forefront of environmental protection activities, in particular in view of the fresh water and sea as important tourism resources.

In this sense, it is particularly important to analyze many mega projects of conditioning of wastewater which have been realized firstly in the destinations of Cote d'Azur, and later throughout the French Mediterranean. The immediate trigger for these projects is the Blue Flag system which assesses the quality of the sea and the beaches and that was started in France in the eighties, marrying activities of the ministry of environment, tourism infrastructure, and health and protection of the coastal area. Activities such as education in environmental protection, wastewater treatment, environmental protection, organization of waste management, quality of tourism services on the beaches and beaches management system, are all under direct jurisdiction of an evaluation team which implements the politics of sustainable tourism.

In the middle of the nineties, **tourism destination of Antibes** was declared a world champion due to a modern system for mechanical, biological and chemical treatment of pollutants and other environmental protection activities. This system is implemented for 172 000 users at the expense of over 300 million Euros, which is double the value of the investment for half the amount of pollutants and users than the ECO-Kaštela Bay project. This speaks of the level of excellence of this very project and vice versa.

A similar project under the name of AMFITRA was realized in the French Riviera area of **Toulon**. This project had the capacity for 550.000 users which is double the number of than inhabitants in that area. Realization of this project that includes all three levels of purification, save for the protection of bathing zones in the Bay of Toulon, has notably contributed to the saving of a rare natural phenomenon of the national part Prot Cros in the wider area of the island Iles d Hyeres.

Monaco joined in these activities and initiated in relation to the Monaco Riviera an eco project of complex conditioning of pollutants with a capacity for users (100,000) three times greater than the number of inhabitants, bearing in mind the intensive tourism development (OTV 1996, 1997, 1998.).

The Sovereign Prince of Monaco Albert II is particularly active when it comes to environmental protection, in particular in relation to the sea, with its ecological trust fund dedicated to projects in the Mediterranean drawing on the **EU's program for the Mediterranean** headed by France, also including Monaco.

All of these activities for the protection of physical space and the bay area follow the critical development of the mass tourism of today. It was back in the 1960s that French scientist B. Kayser (1960) wrote: "*....once the most beautiful natural Riviera, after a hundred years of chaotic construction today resembles a harlequin...*". In the context of mentioned above has a concept of tourism penetration from the coast to hinterland of Provence been elaborated, which creates a syntagm "provencelization" recognized all over the world.

Comparison of the technical systems management pollution Antibes, Toulon, Monaco (France), Antalya (Turkey), Rhodes (Greece) and Eco-Kastela Bay (Adriatic Project) is given in Table 1.

Tourist region of the Corsica island (Corse) covers area of the French mountainous island in the Mediterranean sea of 8722 km² with about 300 000 inhabitants. Woods occupy 20%, underbrush 45%, while the rest is under pastures and arable land.

From the eighties became Political initiatives frequent, supported by France and Italy, but also the EU, in order to realize the economic, cultural and ecological international **interregional cooperation** of two neighbouring islands of Corsica (France) and Sardinia (Italy). There is an area of the Strait of Bonifacio with the Archipelago of neighbouring islands, which is ecologically particularly interesting. In this spirit was the Paris Convention adopted in 1986, with the project of cooperation and marine delimitation in the Strait of Bonifacio, followed by the resolution of the European Parliament in 1989.

Protecting natural and historic values program was developed and institutionalized on both islands. All the way back in 1972 Corsica declared the nature park of an area of one third of the island with 250,000 acres, that covers mountainous area but also coastal area on

Suspension systems / sites	Antibes	Monaco	Toulon	Antalya (Turkey)	Kastela Bay	Rodos (Greece)	Project Adriatic (7 counties)
Number of rezidents	172.000	100.000	550.000	600.000	279.000	128.000	308.100
Per day range pollution	40.500	31.000	103.000	120.000	130.000	35.000	140.000
Capacity m3/h	3.375	1.800	9.000	15.000	13.000	2.800	15.000
lit/sec		500	2.500	3.700	3.650	2.600	4.000
Price in mil.euros	300	150	500	350	143,2	200	280

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- Deveci, A. et. al., Antalya – world city, Turkey, 1996.
- www.jadranski.projekt.hr

Table 1. Technical characteristics of the eco-system of Antibes, Monaco, Toulon, Eco-Kastela Bay, Antalya, Rhodes, and the project Adriatic during the mid nineties

the northwest of the island, including the coastal sea with significant restrictions in economic exploitation of land and marine resources. The southern part of the Corsica coastline is especially important, where several smaller nature reserves were formed with purpose of protecting the geological forms as well as native animal and plant species of the area. They include the coast and the islands in the Strait of Bonifacio, where the Cerbicale islands represent a specific nature reserve on 5 small islands that close Porto Vecchio.

This extraordinary valuable area in the surrounding of Cape Girolata and Cape Porto, including the nature reserve Scandola, is already in the World Natural Heritage register by the UNESCO organization.

An insular marine reserve around Lavezzi islands was founded in 1982 on 5000 acres of sea surface and 80 acres of Cavallo island. Every possibility of urbanization is here excluded, in order to protect geomorphological forms of flora and fauna.

The INTER-Reg Programme was developed from 1991 to 1993 under the auspices of the EU, and it predicts, among other things, formation of an international reserve in the Bay of Bonifacio. Regional governments of Corsica and Sardinia are working on the programme, as well as the Universities of Corsica and Sassari (Sardinia) and also local and regional authorities (Merler, A., 1993, 39).

The biggest help in the project was prohibition of oil tankers transportation and other ships with dangerous cargo through the Strait of Bonifacio, being a precondition of nature reserve existence on the islands between Corsica and Sardinia.

- **Programs in the Balearic and Canary islands, as well as in Catalonia**

Spain has for decades been one of the world tourism leaders with 60 million foreign visits and 58 billion USD income (UNWTO 2008). This was possible based on an impressive tourism superstructure which in many regions superseded the carrying capacity of the area,

even the social surroundings, and had a negative effect on what use to be extraordinary natural and social values.

Spain has for the past two decades been the leader in activities for a new balanced tourism development pursuant to the sustainable development concept as part of the so-called “**Politics of third generation**” accentuating the concept of “**Total Quality of Management**”. Many programs for improvement of the quality of the environment titled “**Planes de execelenica**” (plans for improvement) with full participation of regional and local authorities were initiated, and many international conferences were organized such as the **Man and the Biosphere World Conference** MAB – Seville 1995, as well as the **International Conference on sustainable tourism** - Lanzarote 1996. These events drew attention to the need to maximize activities for the overall protection of natural and social resources on the continent as well as the sea.

The **Balearic islands** as one of Spain’s top tourist regions with over 20% of all tourism aggregates of Spain, are experiencing an extraordinary environmental endangerment as a result of overly intensive development of mass tourism in the 1970-ties, so much so that the term “balearisation” was coined to describe this negative occurrence. This was an incentive for the drafting of the 1970-ties Tourism Management Plan for the Balearic islands (“**POOP**”) envisaging strict conditions for new tourism construction and reduction of capacities, with realization of many environmental projects for conditioning of pollutants. A direct result of this initiative and programs is the fact that many beaches already have the Blue Flag status since 1995.

The project **EKOMOST** organized by the German Tourism Institute and the University of Munich enabled the possible sustainable development of Balearic islands and the island of Rodos which have been, according to J. Batle and M. Robledo (2000) under attack from the virus “Eristion” – a Greek god eating its own flesh – meaning tourism which is destroying its own essence. The goals of this project are sustainable environmental tourism in line with objective tourism capacities of the area and with maximum protection and revitalization of natural resources on the continent and the sea, as well as diagnosing and resolving problems of water supply management and pollution. (Faige M., 1995).

In order to protect a very attractive area of Cabrera islands, south of Mallorca, it was declared a national park, which includes 10 000 acres of land surface and the waters. Numerous species of Mediterranean flora and fauna on 1863 acres of land and marine surface were protected by the strictest regime according to situation in other 8 national parks in Spain-while 5 of them are on islands-4 on the Canary islands and one on the Balearic islands (ICONA, 1995).

A similar project **PREPARE** was realized by scientists from the international organization WTFC for towns **Alcudia (Balearic islands)** and numerous tourism centres in the United Kingdom and the Netherlands, also being supported by the EU Program Archway. This project established a model promoting sustainable development policy through responsibility and consciousness concerning the environment, and with necessary activities including a developed procedure for reporting and review. This also includes sustainable management of water supply and wastewater in line with RIO Agenda 21 ((Bruce M.D. et.al. 2000).

The **MENORCA** island (705 km, 62,000 inhabitants) along with its natural attractions, is characterized by numerous **prehistoric sites and monuments from the later periods of turbulent history**, scattered around the island also known as an open-air museum (MIT 1976).

Because of its exceptional **natural and historical heritage**, Menorque d'Astudis Institute (IMA) and the Spanish MAB Committee applied to UNESCO in 1989 that the islands becomes one of 13 reserves of Spanish biosphere, so that this status does not disturb the economical development of the island. UNESCO accepted it in 1994 by declaring Menorca a Biosphere Reserve.

The geological diversity of islands represents also its **picturesque landscape** with an interesting **Mediterranean ecosystem** preserved also in the inhabited areas (1,000 types of vegetation, with 7% endemic plants; 25 types of land birds and many sea birds as well – several out of them are endemic).

Extensive tourism growth in the eighties threatened the Menorca ecosystem seriously. Large public works and projects connected to tourism often neglected the landscape and rural architecture values, even the native way of living of the inhabitants, causing painful migrations and depopulation of the villages and also causing flora and fauna reduction. Beginning of the nineties was a critical turning point of the trends that took some different courses after the Declaration of Biosphere Reserve.

Backbone of the **Biosphere Reserve of Menorca** are 3 Natural Park zones, declared by the regional government's decision. First zone on the northeast is S'ALBUFERA DES GRAU with lagoons that are long up to 10 km (70 acres), numerous endemic vegetation and abundance of wetland birds threatened with extinction. Second zone is LA VALL, a northwest sparsely populated part of the island with rich holly oak and pine forests and also underbrush, cliffs 100 m high, attractive system of „dunes“ in a closed bay with numerous bird communities. There is also, opposite the coast, the best preserved marine ecosystem of Menorca, in the buffer zone.

The third zone of reserves is the south of the island with three canyons about 7 km long, 100 m wide and 50 m high with the pertaining coast. Flora and fauna are subtropical. Among the zones of reserve, which represent Menorca's ecosystem, there are forests and agricultural surfaces with farms, as the counterpoint of natural and anthropological system.

Thanks to these projects Menorca has, with over a million visits per year, become a part of 7,000 declared protected zones in the world and of a special **UNESCO system of islands biosphere reserves**, such as for example: Aleutians and Virgin Archipelago - USA, the Channel and Juan Fernandez Archipelago - Chile, Galápagos Archipelago - Ecuador, Yakushima Archipelago - Japan, Rhum and St. Kilda Archipelago - Great Britain, Molène Archipelago - France, Hiiumaa Archipelago - Estonia, Zembra and Zembretta Archipelago - Tunis, and other (Geić S., 2002).

Menorca is a unique example of an island with relatively developed economy that has accepted the program of further economic and tourist development, but with systematical protection of natural and historical heritage that are guaranteed by UNESCO, Spanish and county government, MAB committee and NGO organizations (Rita, J., 1993).

Could these examples be an incentive to associations of protection and relevant structures of Split-Dalmatia County to start a similar initiative for a beautiful and still preserved archipelago that closes the Bay of Trogir and Split Channel from the islet Arkandel via Dvojenik to Šolta, which in addition to natural attractions and rarities has an exceptional cultural and historical component, especially the one closing the Bay of Kaštela with UNESCO sites of Split and Trogir? (author's comment)

Canary Islands, with almost 20% tourist dimensions of Spain, have recorded an intensive tourist development threatening to natural and anthropological resources. In that sense the **GUMP program** has been developed at the initiative of the Multidisciplinary Centre of University of Canary and numerous world scientific institutions, with a famous Institute of New Technologies and Sustainable Development. The project has been developing a pilot program of alternative energy use, seawater desalinization, purification and economic use systems, waste waters, along with revitalization of agriculture, cattle breeding, fishery and mariculture as traditional activities on islands together with modern selective forms of tourism (CIT 1995).

This is where the **ECO-ISLAS project**, sponsored by the EU, has been realized, which covers smaller islands of **La Palma and Fuerteventura** (Canaries) and islands of **Elba** (Italy), **Alonnisos** (Greece) and **Pelworm** (Germany). The project offers modern solutions of resources registration, identification of acceptance capacity and water management, pollutions, energy and traditional economy, all of this in the attempt to revitalize autochthonous economy and tourism for the purpose of preventing islands depopulation (Cavana, M., 1995).

LANZAROTE is famous as a Canary island with 300 extinct volcanoes that as late as at the beginning of 19th century created and modified its landscape, flora and fauna with its eruptions, creating the world's **unique ambience** resembling the lunar surface.

Organized tourism in this island was declared as the UNESCO world heritage and a part of MAB program (1993); it seems especially interesting in the context of development orientations of tourism on the insular part of Croatian Adriatic.

Timanfaya National Park is the most attractive among the world nature rarities of volcanic origin with surprising relief forms, geological forms and manifestations in the environment of specific vegetation and human creation in the fight for survival on a waterless inhospitable area of the island.

Since the 1960s, **tourism has expanded** thanks to **intensive investments** and **revitalization program** of these areas with a special treatment of Spanish government and the European Community, with the concept of classic forms of credit arrangements and joint investments of Spanish and foreign investors (Marin, C., 1993).

It makes sense that such **tourist development** has completely **changed the quality and style of life** on the island. However, thanks to a very serious program of local and regional governments with the cooperation of science, numerous accompanying negative effects have been avoided, which are much present and fatal on many other destinations around the world. A great contribution was given to this by C. Manrique, a local artist with the world reputation. Thanks to him **modern postulates in urbanism and protection of heritage** have been accepted, so it is difficult today to distinguish where autochthonous rural architecture of the island villages ends and where a tourist settlement begins.

Exceptional **care of natural environment** is also proven by the Canary Island Natural Areas Protection Act from 1987, by which 12 localities, or **70% of the island's surface area**, obtained a special treatment of protection (Echenique, J. 1993).

It is evident that in these areas the reasoning of the great Michelangelo has been fully accepted: "...The true work of art is but a shadow of the divine (natural) perfection" (author's comment).

In the context of such, for Croatian conditions almost unbelievable information and the fact of years-long wanderings of the current Croatian economic, spatial and tourist policy, the following question makes sense: Are we situated in the same European and Mediterranean environment, do we belong to the same civilization circle???? (author's comment)

The mega project of the coastal area revitalization of the Catalanian capital **Barcelona**, within the scope of preparing the city for the Olympic Games in 2002, is also worthy of attention. By an exceptional project solution, once an unsightly port area has been turned into a modern attractive tourist and business zone that has enriched this Mediterranean city, the leading cruiser port on the Mediterranean. The project has created 18 km of beach with numerous tourist, catering and recreational facilities on the land and sea with the state-of-the-art pollution purification systems, by which Barcelona has become an exclusive holiday tourist destination (Geić, S., 2007).

- Projects on the island Sardinia (Italy)

Tourist region of Sardinia (Sardegna) represents an Italian island in the west Mediterranean with the surface area of 23,812 km² with 1,601,586 inhabitants (1979). It is separated by 12 km from Corsica by the Strait of Bonifacio and by the Tyrrhenian sea from the Apennine Peninsula.

Its relief is the combination of a hilly area and gorges with steep shores intertwined by wetlands and lagoons. The island has lately recorded intensive **tourist development of elite and various selective forms of tourism**, especially on the north-west coast (Costa Smeralda) and represents Italian "hit" destination.

Natural and historical places of interest, due to the development **various civilizations** during three thousand years, form a part of tourist attractions of the island that at the end of the 1990s managed 4.1% tourist capacities of Italy.

Within the framework of **protecting and valorizing the island's natural attractions**, a significant role is played by the **National Park Orosei**, organized at the area of 100,000 ha in the bay with the same name that also covers the mountain massif Gennargentu and the island Asinara. This is the only nature park of Sardinia that at the same time protects the land and the marine area. In compliance with the foundation deed from June 1992, special protection measures are foreseen on the island Asinara at the territory of 51.9 km², which covers 100 km of marine coastal line and expands up to 17 km into the island's interior.

In the same year Italian Ministry of the Environment established the **marine reserve** around the island **Budelli** in the **La Maddalena archipelago**. **Protection measures** were supposed to save natural specificities of advancing expansive tourism and sudden urbanization. Almost entire archipelago is now monitored and protected as the nature park; one also organized the provision of normal activity of local population within the areas between protected parts

and zones of controlled economical development. A special regional legislation has been made for this, which is supplemented by the one on the national level and within the framework of European Union. This is exceptionally important since the development of the Aqua Marine Park and its integration with the planned **international nature park** in the Strait of **Bonifacio**, enables a special integration of the entire area into the social and economical fabric of the Mediterranean.

In addition, further specific initiatives on the northern part of Sardinia are underway that need to be economically and protectively integrated to the trans-border protected area with the south of Corsica (France). Also interesting is the **Tavolara-Capocoda-Cavallo Nature Park** that contains a combination of a coastal and marine Aqua Park.

Events within the scope of natural and cultural resources have resulted at the beginning of the 1990s in the new significant development processes with both positive and accompanying negative connotations. **The positive ones** are primarily a successful fight of local population and regional authorities for the prohibition of hazardous cargo transport in the strait based on the agreement between the two authorities from 1993. At the same time an interstate and interregional deed was signed for the foundation of the **international nature park in the Strait of Bonifacio**.

In the same year a feasibility study was finished on the **protected marine area** Tavolara - Capocoda Cavallo between Capo Ceraso (Olbia) and Cala Finocchio (San Teodoro) by which the Italian Government aimed at activating the national park in this area. An international workshop sponsored by the UN was also supposed to contribute by models of mutual cooperation, which was organized by the University of Sassari and the research centre of Sardinia Co.Ri.Sa. with the topic of aqua marine parks.

Dubious factors in these cases are too sudden decisions with huge restrictions without sufficient appreciation of local attitudes and undue communication with local population.

Negative factors of these processes are specific contradictions, such as the case of keeping the function of a correctional institution on the islet of Asinara, which has impeded the realization of the national park project. There is also a sporadic military use of the area that was as early as in 1993 defined for the foundation of the **Gennargentu National Park** in the central part of Sardinia (Merler, A., 1993, 39 - 42).

Therefore, the problems due to awkward attempts of considering physical and geographical elements of the area as separated from social and cultural components of urbanized zones were evident in this environment as well. Evidently, the population, its culture and tradition and the relation to the area always need to form integral part of protected zones and be an active factor on which a successful protection and revitalization depend a great deal.

These valuable international projects necessitate great efforts of both regions, countries, international community and multidisciplinary science. This implies active inclusion of local population, but also adequate relation of numerous visitors that visit this area via forms of excursion tourism.

- **Programs of water supply and pollution in Morocco**

Morocco, a developing country with strong tourism ambitions in the Mediterranean and the Atlantic, is also developing tourism policies of maximizing protection of the natural

resources, in particular in its coastal area. In this sense – **the Project of sustainable development for Nador Lagoon and Al-Hoceima (MAP)** envisages protection of the coastal eco-system of Morocco and global development of Moroccan coastal area pursuant to sustainable development principle which is particularly relevant for tourism ambitions of this region.

This is practically continuance of a major project for **revitalizing of the tourist region of Agadir** devastated by a catastrophic earthquake in the 1960s, which with the help of major projects initiated by the international community, became a modern tourist destination with organized water supply and wastewater management systems enabling further projects of tourism superstructure in accordance with the models “concession” and “joint venture” (Mohamed VI. 2004).

2.2 Tourism in programs of “Adriatic-Ionian Initiative” organization

Within the scope of new development concepts of “soft” tourism, which wants guests to see and experience more in the shortest possible period, international and interregional cooperation of neighbouring Mediterranean regions and the joint appearance on the market have become ever more frequent, which is also especially emphasized by the EU, via the program AII.

On a global scale, exceptional natural and social tourist resources of a relatively small area of the Adriatic and the Dinarides are based on exceptional attractiveness of the coastal area and hinterland with attractive climatic, relief and vegetational characteristics.

They are nowadays protected and tourist valorized via eight marine and land national parks and numerous other relevant institutions of heritage protection in compliance with the international legislation, which has turned them in recognizable tourist attractions at the international plan.

Within the scope of this natural matrix, by human action throughout millennia within the Dinara and Mediterranean cultural circle, and under the influence of various civilizations and cultures, an impressive cultural heritage has been created that is nowadays established internationally via 8 historical sites protected as world cultural assets included in the UNESCO register, which are first-class tourist attractions. Together with natural localities, they form over 80% of total attractive resources treated by the neighbouring South Adriatic countries, even the basis of their tourist and economical development.

The Adriatic-Ionian initiative as a regional coordinative body, founded at the Conference on the Security and Development of the Adriatic and Ionian Sea, held in Ancona on 20 March 2000, obligates all the member countries (Greece, Italy, Croatia, Slovenia, Albania, Monte Negro, Serbia and Bosnia and Herzegovina) to co-operate according to the documents of the UN, OESS, COE and EU.

Parliamentary cooperation provides basis and guidelines on these levels: economy, maritime affairs, transport, tourism, environmental protection, science, culture, fighting all forms of organized crime and cross-border co-operation which brings to social and economical development and strengthens the peace, regional security and stability.

The AII bodies are the Adriatic-Ionian Council and the High Officials' Committee as the main executive body. The administrative body is the permanent administrative secretariat

that operates through Round Tables in six thematic units: Small- and Middle-Sized Entrepreneurship; Transport and Maritime Affairs; Tourism, culture and Interuniversity and Education Cooperation; Environmental Protection and Sustainable Development. The Forum of the Adriatic and Ionian Chambers of Commerce Forum is especially active, and it operationalizes initiatives on the regional, economical, and especially tourist collaboration, ever since the year 2001. (www.uniadrion.net).

The representatives of the Chambers of Commerce and the other institutions that participate in the Forums of the AII try to conciliate and mutually promote the communication policy in order to successfully represent the Adriatic-Ionian region as an attractive macro region and a unique tourist entity with a possibility of creating a competitive tourist product in a way that individual, mutual and specific resources combine through an innovative and effective transborder cooperation, creating a unique image of a region within the boundaries of a homogeneous tourist system.

Its purpose is to unite the regional, natural, cultural and service resources as well as to enable the competitiveness of the region on an international level. In that way you emphasize traditions and various natural, historical and ecologically preserved entities and patterns the total tourist offer that is then recognizable on the international tourist market.

Along with the monitoring and analysis of the tourist movements, and especially within the selective means of tourism, follows the concept of harmonization and coordination of the tourist marketing policy and the coordination of the tourist legislature. There is also a continuous collaboration and communication with the university and scientific institutions with a purpose of stimulating young people to get involved with the tourist activities and improvement of tourism. Special emphasis is on promotion of nautical tourism by connecting the nautical ports with the attractive cruising destinations in the Adriatic and Ionian Seas. In the context of protection of tourist resources, there is a concept of a joint approach to preventing and improving, in case of natural disasters or possible eco incidents at sea or on coastland.

Taking in consideration that there are no separate funds dedicated solely to economical and social subjects, the **AII stimulates more projects and measures, as well as activities** within the Initiative as following:

- Cooperation with PADMA LAB project (Pan Adriatic Destination Management Learning Laboratory),
- Project MARINAS (Modelling Adriatic routes integrating networks and areas in the Adriatic sea)-Interreg IIIA - with a purpose of integrating of the Adriatic tourist offer,
- Project ITAC (Innovation technology for Adriatic competitiveness) - Interreg IIIA NPPA - with a purpose of stimulating small- and middle- sized companies as well as the public and private research centres, development of new products and services (www.seadriatic.net/aia).

The role of AII is particularly important in exchanging experiences connected with the environmental protection and preservation and in particular of the sea ecosystem by the intersectional approach. In these terms the following activities and documents occur:

- Protocol on integrated coastal zone management in the Mediterranean that needs an urgent ratification and implementation.

- The Mediterranean strategies of Sustainable Development and the directives of the EU connected with the maritime strategies, as important frames for the maritime activities in the region of the AII countries.
- Studies based on ecological research and monitoring for the purpose of objective and comprehensive picture of ecological condition of the region.
- Intensifying of use and exchange of results in the regional research studies, in particular in fishery monitoring, debalasting, eco incident prevention plan and similar.
- Declaration of the Adriatic Sea as a Particularly Sensitive Sea Area (PSSA).
- Improving of port capacity for the acceptance of pollution in order to insure a more efficient sea protection (www.seadriatic.net/aaii).

2.2.1 Selective tourism in protected nature parts of the South Adriatic

A wider area of the South Adriatic is rich in protected natural resources starting from national parks and other forms of protected areas as oases of untouched nature with exceptional possibilities for the development of alternative aspects of tourism. Exactly hundred-years long bad traffic connectivity and isolation, as well as a weak economical development of some parts of this area, have contributed to the preservation and numerousness of natural attractions, which will be faced with ever more intensive tourist valorization with the possibility of creating numerous tourist itineraries throughout the entire year.

In that sense the UNESCO locality of Durmitor National Park with the surroundings need to be pointed out, which has already been intensively touristically valorized, and then Bay of Kotor as an exceptional natural phenomenon, the nearby Skadar Lake and many other natural attractions in Montenegro.

Natural attractions that are in the protection regime on the territory of south Dalmatia are the localities of Mljet National Park, archipelago and Neretva Delta. In Herzegovina these are the Middle Neretva, where the World Wildlife Found project of river preservation was developed, as well as the Hutovo Blato Natural Park.

What especially stands out is the attractive area of **Lower Herzegovina**, recognizable in terms of rich natural heritage. This area represents a developed karst relief with Popovo Polje in the centre, the site of Zavala and preserved Vjetrenica cave, then the locality of Grepca with tens of caves, rivers Bregava and Radimlja on the north, river Neretva and Hutovo blato on the west. On the right side of Neretva the attractive karst relief has developed in tectonic and morphological sense (Ravlička cave) with water islands and famous travertine waterfalls (www.rb-donjahercegovina.ba).

Nearby are also recognizable traces of distant and recent past: Illyrian sites of Badanj and Daorson, medieval archaeological site of Mogorjelo, numerous findings of standing tombstones (*stećci*), medieval towns – fortifications, water supply cistern on Hrasno etc. All of this makes it the unique treasury of cultural and natural heritage, which is supported by the growth of interest of experts and scientists, but also of tourists, lovers of nature and history.

In geological, tectonic, hydrological, hydrogeological, speleological, biological and ethnological sense, the area of the Lower Herzegovina, with specific karst processes and

underground world of water architecture finally connected with the sea, represents one of the most interesting areas in Europe, where 500 different karst formations have been recorded significant for scientific, research, as well as for tourist development. This special natural underground world with 74 endemic species, along with other natural and cultural heritage, needs an organized care of today's people and systematic documentation with a stronger support of international scientists and associations. This is also supported by a long history of research, and even a partial tourist valorization that goes back to the beginning of the 19th century.

This also refers to Trebišnjica river basin (98 km) with underground flows 187 km long, as the biggest sinking river in the Balkans and one of the biggest in the world. Trebišnjica river basin also includes sub-basins of the river Mušnica - Sušica, majority part of Ombla sub-basin in Dalmatia with the adjoining underground flows and more than a hundred water sources with the end in the sea near Dubrovnik. This area in Herzegovina and southern Dalmatia is protected in various ways and it represents an exceptional tourist value for both regions (www.trebinje.rs.ba).

In karst ambience on the left bend of the river of Neretva, Hutovo Blato Nature Park is a unique sub-Mediterranean wetland in Europe, important from ornithological, ichthyological, scientific, ecological and tourist aspects as one of the biggest winter quarters of birds within the area of Europe.

Skadar Lake, at the border of Montenegro and Albania, which was declared a national park in 1983, located in Zetsko-Skadarska Valley, keeps the contact with the Adriatic Sea via Bojana river. With the total surface area of 530 km², it represents the biggest lake in the Balkans and the most interesting biotope of the region with exceptional limnological characteristics, exceptional abundance of ornithofauna and ichthyofauna as well as abundant wetland-like vegetation. As a significant habitat of water birds, Skadar Lake was registered in the World List of Wetlands of International Importance at the Ramsar Convention in 1996 (www.nparkovi.cg.yu).

All the afore stated offers exceptional possibilities of developing selective aspects of a wider region's tourism, which has also been increasingly recognized by the modern tourist demand, so it combines numerous attractions and activities within the scope of a top quality active holiday.

Coastal and island natural attractions of the **southern Dalmatia** are led by the **Mljet National Park** declared as one in 1960. It is located on the north-western part of the southern Dalmatia, with 5,375 hectares of protected land and surrounding sea, and it represents the first institutionalized attempt of protecting the original ecosystem on the Adriatic. Its specificity is the combination of natural and historical heritage due to the values of a Romanesque Benedictine monastery on the islet in Great Salt Lake.

The neighbouring **Lastovo archipelago** is a nature park with the surface area of 195.83 km² that covers Lastovo with 44 surrounding islands, small islands, cliffs and reefs, and which is one of the most preserved marine areas on the Adriatic. It is protected as a "spacious natural and partially cultivated area of land and sea with ecological features of international and national value, with emphasized landscape, educational, cultural and historical as well as tourist and recreational values" (Strčić et al. 1983).

Neretva Delta covers the area of about 20,000 ha, of which 12,000 ha is in the Republic of Croatia, and the rest in the Republic of Bosnia and Herzegovina, and it has been increasingly frequently in the tourist valorization in selective tourism. In the area of the Delta there some of rare remaining European wetland areas enlisted as Ramsar areas and protected by the Barcelona convention as specially protected Mediterranean areas. The valley of Neretva river includes five protected areas with the total surface area of 1,620 ha. These are ornithological reserves Pod gredom, Prud and Orepak, ornithological and ichthyological reserve of Neretva Valley and protected areas Modro oko and Desne lake. Kuti and Parila lakes are in the procedure of being declared ornithological and ichthyological reserves (www.panda.org).

- **Selective forms of nautical tourism on the South Adriatic**

The Adriatic Sea is a relatively closed no part of the Mediterranean Sea. The border of the Adriatic Sea and Ionian Sea are the Strait of Otranto 75 km wide between Italy and Albania. The characteristics of the eastern Adriatic coast is high coast with a mountain range above the sea and exceptional indentedness as the consequence of the sunken mountain relief forms due to melting after the Ice Age, when the sea level elevated for 100 m, so that the peaks of the former mountains became the islands and the valleys bays and straits. This area is considered to be the most attractive and clearest sea surface in Europe, so it is, along with the preserved historic nucleuses, the reason of increasingly intensive development of the nautical tourism, including the round trips of large cruisers (Šamanović, 2002).

A special jewel is Dubrovnik as a magnet with the port in front of which numerous “floating hotels” and anchored. Around Dubrovnik there is a series of natural and historical pearls attracting the navigators, as well as the cruisers. Nearby is Korčula, an attractive island of famous wines, beautiful beaches, specific urbanity radiating the history, as well as the peninsula Pelješac, the home of skilful seamen, wine producers and vineyards, rural settlements and peculiar flora and fauna. Starting from Mljet to Dubrovnik towards Cavtat (Epidaurum), there is a collar of attractive Elaphiti Islands.

Nautical tourism and round trips have a long tradition in this area. Development of this aspect of tourism has been intensifying due to important improvement projects as well as the AII projects. However, the lack of nautical berths is still evident, as well as the lack of modern ports for big cruisers, although Dubrovnik has become the second cruiser port on the Mediterranean and the town of Korčula has become an important cruiser point. Two ACI marinas in this area (Korčula and Dubrovnik) contribute to the advancement of nautical tourism of the South Adriatic, which still lacks the high quality supporting facilities.

Also in accordance with this are the activities in Montenegrin Littoral that has realized intensive investments in the last couple of years as well as the creation of recognizable tourist destinations. These are two probably greatest investments on the Mediterranean in the realization phase that also include nautical facilities.

This is a tourist and business settlement **Astra Montenegro in Budva** and Tivt marina in Boka Kotor Bay next to which a real tourist town **Porto Montenegro** is going to be built. Thee value of the project is estimated at about EUR 600 million and it covers the yacht marina with 800 berths (150 for mega yachts), series of luxury residential, business and

tourist buildings, two high class hotels that are constructed by the multinational tourist giant Four Seasons. Here are also the attractive public areas, galleries, squares, nautical museum and numerous other facilities that will give a dimension of an exclusive tourist site to this area (www.nacional.hr).

Huge foreign investment is also provided on the cape of Zavala in Budva with the Hyatt Hotel and luxurious apartments and business facilities. Business and tourist settlement **Astra Montenegro** includes 2 luxury hotels with 600 rooms and 40 elite villas covering 66 thousand square meters.

These investments of mainly foreign capital will raise the level of tourism of Montenegrin destinations that were until today mostly known for the massive bathing tourism. This will also affect the neighbouring observed regions. However, when analyzing these facilities, greater attention should be given to the estimation of accepting capacity and the concept of sustainable development, which the foreign capital is often not ready to accept and which then causes the long-term damage to natural and anthropogenic resources. These problems are also emphasized by numerous round tables within the framework of the AII.

2.3 Tourist policy of the EU regarding sustainable tourism

The European Union is a community of countries in which **strictly specified rules are applied** as well as standards on tourism so that it could improve its quality level and develop in compliance with the wishes of the modern tourist demand. It increasingly prefers new whole-year selective forms of offer and challenges new processes in the management of total tourist destination oriented to the satisfaction of consumer requests, with maximum ecological protection, especially of the coastal area.

Tourist policy of the European Union in the upcoming years will be – according to the forecasts in relation to the past ones – more quality, imaginative and efficient. It will adjust to the current opportunities, which will contribute to the increase of alternative aspects of tourism. The EU in the role of a moderator approximates various interests of the southern host countries (primary growth of tourism) with general interests (avoiding harmful consequences for the environment, respecting cultural heritage, quality of services) by means of elaborated measures of the joint tourist policy.

The EU especially advocates the assurance of a quality and standardized service in tourism, protection of tourists and above all protection of natural and cultural heritage, by setting high ecological standards that can ensure sustainable tourist development and satisfaction of consumers.

Individual features of the tourist policy of relevant EU tourist countries, as well as Croatia and Turkey as soon-to-be members, regarding environmental protection can be seen in the following table 2.

Namely, the measures for the increase of EU potentials in tourism put a special emphasis on the promotion of environmental protection and sustainable development of tourism, more specifically via the policies covering natural and cultural heritage as well as transport and energy.

Strategic goals	Croatia	France	Italy	Greece	Spain	Turkey	Cyprus
Protection of human environment	Eco project and Blue Flag, education, eco services	Special attention paid to the ecological aspect of tourism	Care of environmental protection and prevention of possible ecological incidents	Systematic environmental protection, stimulation of eco projects	Development of sustainable tourism, elimination of damages in the environment caused by tourism	Elimination of pollutants for the region Istanbul-Bosporus	Eco projects in the sphere of pollutions, eco tourism

Reference: OECD, Tourism Policy and International Tourism in OECD Member Countries, Paris 1992/96 according to Petrić L. 1998, 152. - Geić, S., 2007.

Table 2. Tourist and ecological strategic goals of Mediterranean countries, current and soon-to-be EU members

In the year of 2000 a new directive was adopted with the following goals in environmental protection, and especially of waters (Water Framework Directive (2000/60/EC):

- protection of all waters, lakes and rivers, underground and coastal waters and ensurance of quality of these waters,
- water management based on water capacity and not on administrative borders by engaging the government of citizens and interest groups,
- prevention of pollution by controlling emissions and setting the quality standards for all waters.

The implementation of the Natura 2000 network is s a part of a nature protection activity. The European Commission especially points out the possibilities for sustainable tourism in the areas covered by projects of Natura 2000. LIFE-Nature projects refer to activities regarding the resources preservation in the areas covered by Natura 2000 projects. The goal of this activity is to prevent uncontrolled tourist activities and to raise awareness regarding natural values of the area.

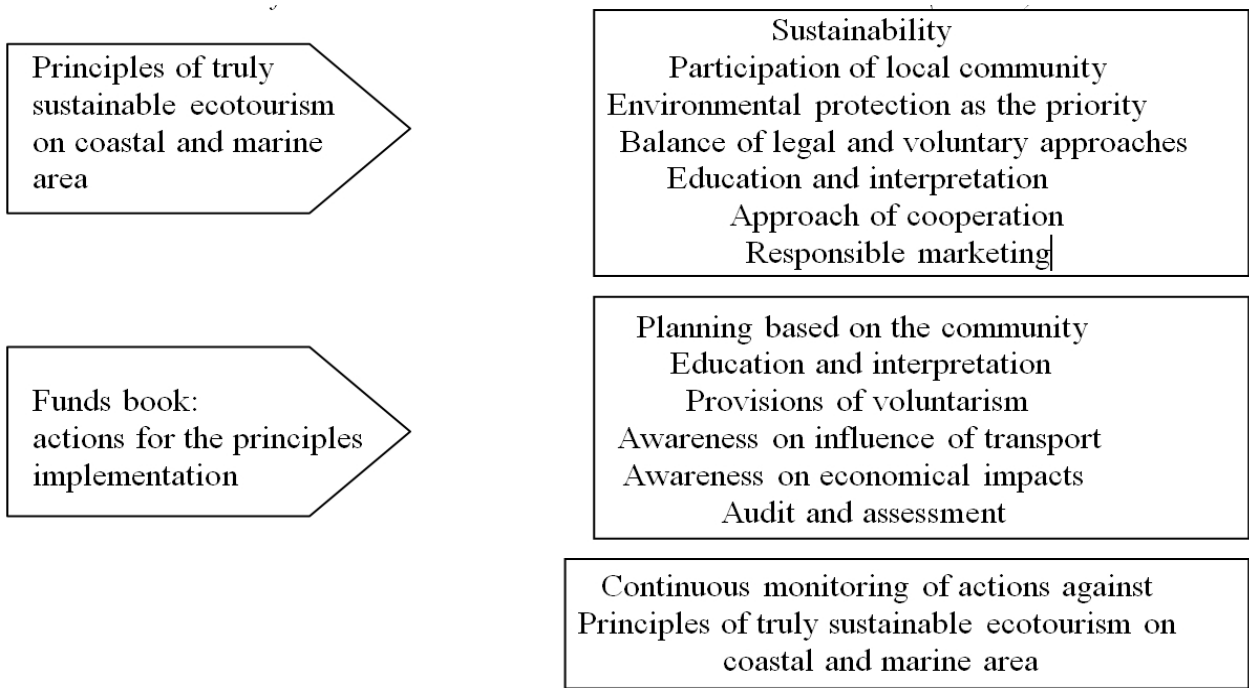
As early as in 1999 a **document of spatial development ESDP** (European Spatial Development Perspective) was adopted and the ESPON (European Spatial Planning Observatory Network) was established, with the aim of ensuring tools for the implementation of spatial management measures, which directly and indirectly affects tourism by following developmental trends in especially sensitive areas (islands, mountains, sparsely populated areas, coastal zones and similar) and regional management of natural disasters as well as potential technological incidents in general and regarding climatic changes. The document is especially important for the area of the Mediterranean as a most attractive European and world mega region for tourist, which is threatened by different human activities, and therefore by tourism as well.

3. Selected concepts and models for ecosystems management

After several decades of extensive development in tourist travels, with neglecting of accompanying problems and limiting factors in the environment itself, the world **UN Conference on Sustainable Development** (Rio, 1992), by Agenda 21, finally at the highest level promotes the need of taking care of **ecologically rational as well as socially and culturally sustainable tourism**.

It also identifies **three basic means** that must be used for the realization of this goal in all activities that use nature as a resource or are allocated in such a way that they may have impact on the environment. These are:

- Introduction of a **new regulation** in the assurance of environment protection and human health as a whole,
- Introduction of such **market mechanism** that assures that the price of goods and services also includes the price of **environment protection**, taking into consideration the sensitivity and limitation of spatial and water resources and energy around the globe,
- Introduction of **ethical management** in all activities, with attention to **health and ecology**, by integrating them into elements of planning and making developmental decisions, along with enabling the widest dialogue with employees and international public (UN Agenda 21, 1992).



Reference: Group of authors, Planning for Marine Ecotourism in the EU Atlantic Area, UWE, Bristol, 2001.

Scheme 1. Model of ecotourism in coastal and marine environment (META)

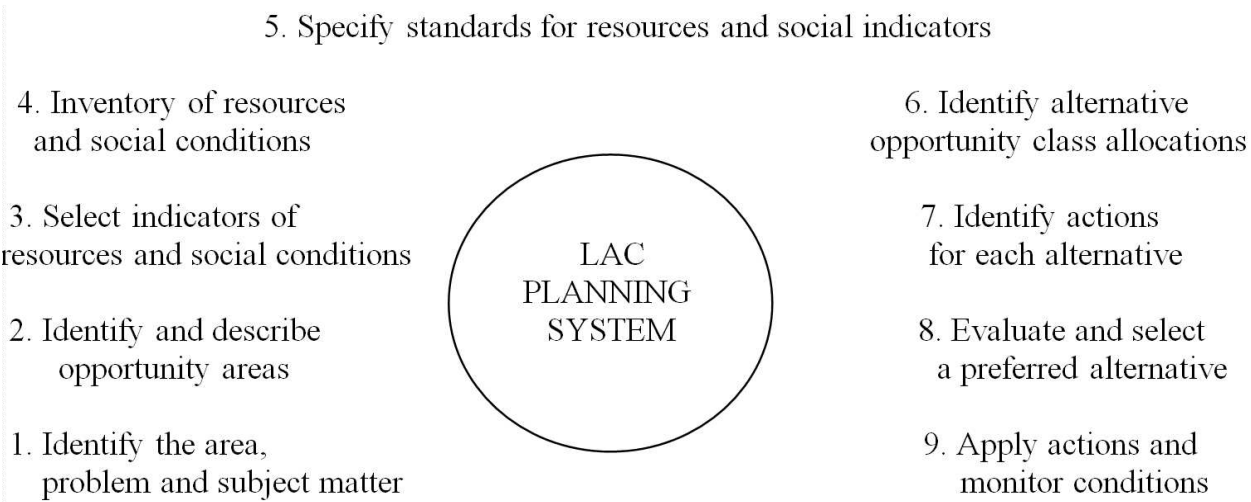
Along these lines, the scientists of the Bristol University West of England have been elaborating the **system of META** (Transnational Model for Marine Ecotourism) for the coastal and marine area of the Atlantic tourist mega region Europe, which specifies the

necessary actions of all participants in the segment of developed forms of ecotourism on this coastal and marine area that may also be applied on the Adriatic area.

When developing a program on a limited Adriatic area according to the formula of sustainable tourist development on ethical, ecological and economical principle, it is necessary to take into strict consideration the notion of “**carrying capacity**”, which talks about the optimum possibility of tourist construction or optimum valorization of a specific area from the aspect of its physical, emotional, legal or economical limits that depend on the sensitivity of an individual locality. On this level, Hendee, Stankey and Lucas (1990) have elaborated the **LAC PLANNING SYSTEM**, i.e. LAC (Limits to Acceptable Change) model that defines the scope of acceptable changes on a specific locality via four basic principles:

- Specification of acceptable and achievable elements of an individual resource and its social conditions defined by a series of measurable parameters,
 - Analysis of the relationship between the acceptable and unacceptable conditions,
 - Identification and judgement of management actions necessary to achieve wanted acceptable goals,
 - Program of evolution monitoring and control of management effectiveness. These principles are elaborated by the authors in **nine phases** of the LAC model:
1. **Identification of the scope of the problem and subject matter** represents the foundation of each decision-making in the area, especially from the aspect of its tourist valorization.
 2. **Definition and description** of all segments of the area that is the subject matter of investors, which includes its immediate and wider environment due to polyfunctional tourist phenomenon that forms a unique area with important interactive functions. In this context the existence of physical plans and plans of social and economical development, including global and national strategy, especially important due to timely elimination of possible incompatible activities on the same areas and their immediate environment. This is especially relevant for the precious insular areas of the Adriatic.
 3. **Selection** of numerous quality indicators of **tourist resources**, as well as of very complex **social conditions** on appropriate area, is necessary to identify and quantify forms of tourist development. Namely, they need to be in complete compliance with natural and social environment, which is the prerequisite of a successful long-term option of tourist and general economic development of a specific region.
 4. In compliance with the afore stated, it is necessary to **inventorize and classify** all natural and historical attractions that form the resource basis of tourism, as well as to analyze social conditions in which these resources exist. Namely, it is exceptionally important for tourist development to have a number and quality of cultural and natural monuments that are usually categorized as monuments of the world, national, regional and ambiantal value and are protected via various forms, in accordance with the legislative of individual countries (national parks, nature reserves, natural monuments...). This also includes provisions of relevant international organizations (UNESCO, UNEP, IUCN, MAB and similar). In the context of **social conditions**, which need to be analyzed and adequately valued, numerous examples of the world attractive localities are known that exactly due to specific social conditions (religious, political and similar motives) that are not at all and cannot be the subject of tourist valorization.

- 5. The level of tourist valorization of a specific area depends on the set **standards** that a specific area defines in the context of resources protection and valorization. If standardization and appropriate social indicators relevant for tourist development of a specific area do not exist, it is necessary to, in compliance to the LAC model, specify them within the scope of the project task itself and to incorporate them in a concrete investment report, i.e. development program, as an important indicator in making tourist development decisions.
- 6. With respect to the importance of opinion and attitudes of the local community, which implies the need to timely consult appropriate institutions, the public and the entire population (public insight, referendum and similar), it is necessary to **identify** and offer a few alternative solutions out of which the optimum one will be selected with general acceptance.
- 7. Within the scope of this procedure it is necessary to specify and foresee all elements and necessary **actions** (financial, technical and similar) by precisely stating environmental impact as well as the plan for each of the offered alternatives.
- 8. After the **identification and selection of a preferred alternative**, there is a procedure of selecting the most favourable alternative in given conditions, which also implies the appropriate process of decision-making in proper state and local authorities.
- 9. According to the adopted program (project), the **implementation of appropriate actions** takes place along with constant **monitoring** of the project realization elements.



Reference: Hendee, Stankey and Lucas, Wilderness Management, International Wilderness Leadership Foundation, North American Press, Colorado, 1990

Scheme 2. Limits to Acceptable Change (LAC model)

Contemporary British tourist theoreticians that have analyzed the problem matter of sustainable tourism, with a special sensibility to protection of natural, as well as historical and cultural tourist resources, have elaborated an interesting model called **PREPARE** (Policy, Responsibility, Eco-awareness, Programme Audit and Review). This model implies the combination of eighteen activities grouped in six phases and notions implying the segments of tourist policy, responsibility, ecological sensibility, program of activities with needed indicators, registration and constant audit of plans and procedures as well as specification of the reporting procedure for the segment of sustainable tourism. The concept

was elaborated on the example of four European cultural and tourist localities: Conwy, Chapstowe (Wales), Naarden (Netherland) and Alcudia (Spain) included in the international association WTFC that has, a later also included Slovenian Piran, obtained the support of the program and fund EU ARCHWAY. By analyzing and quantifying the results in the period from 1993 to 1996, a significant progress of all five localities has been indicated regarding the protection of tourist resources and the complete application of the sustainable tourism concept based on the application of tourist policy in compliance with Rio - Agenda 21.

Application of this model in the Balearic destination Alcudia has shown excellent results regarding the protection of marine and terrestrial ecosystems, resulting in a number of international environmental awards, and the same can be applicable to other Mediterranean regions.

		Portion (%)
P	Prepare: prepare policies for sustainability	20
	Initial audit of the city tourist offer	
	Identification of sustainable tourism system	
	Policy for sustainable tourism	
R	pRepare: prepare responsibility and resources	15
	Responsibilities within local authorities or other public body	
	Resources for measurement of key environment indicators	
	Executive official responsible for policy development	
E	prEpare: prepare ecological awareness/communication and education	15
	Communication procedures within and outside local authorities	
	Ecological and ambiental awareness within and outside local authorities	
	Register of relevant documents for operationalization and development of tourism	
P	prePare: prepare action programs with objectives and indicators	30
	Register of ambiental indicators for tourism	
	Ambiental objectives	
	Program of improving environmental protection for tourism	
A	Local manual of sustainable tourism of the local tourist industry	15
	prepAre: prepare the procedure of reports controlling (audit)	
	Procedure of controlling tourism sustainability	
	Plan of controlling tourism sustainability	
Re	Reports for control of tourism sustainability	5
	prepaRe: prepare policy revision	
	Procedure for audit of sustainable tourism policy	
	Audit of sustainable tourism policy	

Reference: Bruce, M.D. et al., A Model to Aid the Development of Tourism Policies, THR-UNIS, Great Britain, 2001

Scheme 3. PREPARE – Analytic network with phases and elements

In the same context one may also use the modern model of **PEST analysis** that implies the method of analysing business environment and represents the basis for strategic planning. Its name derives from the acronym for political and legal, economic, social and cultural as well as technical and technological environment, which applied to Adriatic conditions looks as follows:

- *Political and legal environment* – The problem of inconsistent and inefficient county organization of the Republic of Croatia, which is outside historical tradition and breaks the entirety of the region of Dalmatia and the unity of Istria and Kvarner as two traditional historical regions to artificial political formations – counties that are most often the purpose to themselves for the formation of political personnel of the governing structures and obsolete local officials who have lost the elective legitimacy due to their incompetence. In that sense, there is a lack of educated destination managers in tourism, even the conjoint personnel and institutions that are competent for monitoring of marine and coastal ecosystems. For example, no quality institutions with a long tradition, such as Hydrographic Institute in Split and Institute for Health Protection, are prominent here, and maritime guard has not yet been established, while inspection services for monitoring are inefficient and unequipped.
- *Economic environment* – in our conditions it is observable via the problem of monocultural development of the coast towards tourism and speculative trade, while agriculture and fishery have experienced the collapse due to decades of harmful import policy, high exchange rate of kuna and prevailing trade lobby in politics. Shipbuilding with a centuries-old tradition and exceptional references is nowadays also almost collapsing, which leads to even bigger monocultural orientation of economy. Small entrepreneurship is the holder of economy and employment due to tourist development, while huge systems have been destroyed in criminal transformation, which refers even to huge tourist systems and systems in tourist entrepreneurship that could have generated new investments in growth and sustainable development.
- *Social and cultural environment* – shows a shattered cohesion in small tourist places that are nowadays turned into tragicomic political stage with excesses of incompetent and corrupted politicians. Tourist ambitions of populations are reduced to survival from season to season, and instead of own product guests are offered imported goods of foreign retailers. The same can be said for cultural and entertaining attractions that are more numerous, but without a firm program scheme and appropriate quality. Preparation of the season is most often late due to comprehension of tourism as an exclusively seasonal activity, which is wrong with respect to year-round nautical, culturological and natural resources. Rustic areas of the coast should be an attribute and something new in tourist offer, and they are nowadays turned into so called “news-stand culture” and resemble more to flea markets borrowed from eastern cultures, devastating the beauty of the area and traditional culture.
- *Technical and technological environment* – Competitive regions have advantage since they have had exceptional organization for decades as well as the system in utilities, roads and all other technical and technological programs that are requested by modern tourism on land and sea, which is still missing on the Croatian coast, especially including the systems of sea protection and pollution management, which have only started to be solved.

Within the scope of tourist destination management, the concept of “**triple helix**” needs to be noted, which implies harmonized activities of **science, state and entrepreneurship** for the purpose of long-term sustainable management of valuable natural and cultural resources, especially in the outspread sphere of modern selective forms of tourism. All of this is exceptionally actualized by the latest global economic and financial crisis that has shaken the foundations of past (prevailing liberal) economic development. The stated may result in realization of optimum economic and social impacts enabled by tourism in the framework of its polyfunctional social and economic functions and characteristics with minimizing supporting negative manifestation on the spatial and social and economical matrix, especially on the sensitive world’s valuable areas of the Adriatic and Mediterranean.

4. Conclusion

The Mediterranean and the Adriatic Sea in their marine and coastal area, based on outstanding natural and cultural attractions, are the most important tourist world mega region that realizes over 30% of global international tourist arrivals and foreign exchange inflows (UNWTO 2010), taking in addition the flow of domestic tourist traffic.

For the purpose of indulging a huge number of over half a billion tourists, a grandiose tourist receptive and utility infrastructure and superstructure on the coast and sea was built, that in conjunction with tourists and local population affects with different types of pollution the degradation of marine ecosystems. They are a valuable resource of current and future tourism development, whose contents and the so-called selective forms of these activities are increasingly oriented toward the sea. These are of course ever more intensive sport and recreational activities followed by numerous complex water-transport systems in the open sea, ports and coastal areas, as well as the ever more intense development of fisheries and mariculture with purpose of doubling the number of consumers during the summer season with its attendant pollution and many other degradational effects.

When added to current huge amounts of pollution from land that follow drainage infrastructure directly or through rivers, often untreated flow into the Mediterranean, the situation is becoming alarming and requires urgent intervention by the appropriate national and international institutions within the UN, EU, Council of Europe, OECD and its specialized institutions and associations.

In this context, since the 70-ies of the 20th century a particularly active programme of the UN Environment Programme (UNEP) which, in the framework of the Barcelona Convention and the Mediterranean Action Plan (MAP) to its many projects and protocols, more successfully regulates the issue of protection and sustainable management of marine ecosystems and the Adriatic. In the framework of these international, then national and regional programs for the protection of marine and terrestrial ecosystems we can point out that they were realized on the developed Mediterranean tourist areas, which in the recent past have been leading to programs of sustainable tourism development, especially in the field of water management and land attractive resources, which is the basis for tourism development.

On that note, the paper critically analyzed and compared projects in several regions of the Mediterranean, which were implemented with the support of international financial institutions (EBRD, IBRD) and organizations (UNESCO, UNEP, IUCN, EU-ESDP) and

others. These projects logically use the latest models for the management of coastal and marine systems based on the achievements of contemporary science and practice in the sustainable management of these resources. These are the model of eco-tourism in the coastal and marine area - META, developed by a group of English scientists, then the model of American scientists, which defines the width of the permitted changes in a particular locality through four basic principles - LAC PLANNING SYSTEM, then the model dedicated to the issue of sustainable tourism, with special emphasis on the protection of natural and historical and cultural tourism resources - PREPARE, which was developed by a group of scientists in the WTFC, supported by the European Union, and finally the PEST analysis and the "triple helix" activities that involve complex environment of tourist destinations in the affirmation of the role of science, government structures and of entrepreneurship. This is the case with programs in the implementation phase of the Croatian Adriatic (Eco-Kastela Bay, Adriatic Project) regarding pollution control programs for the protection of marine systems with a comparison to several complementary systems in the Mediterranean region (Côte d'Azur, Rhodes, Antalya).

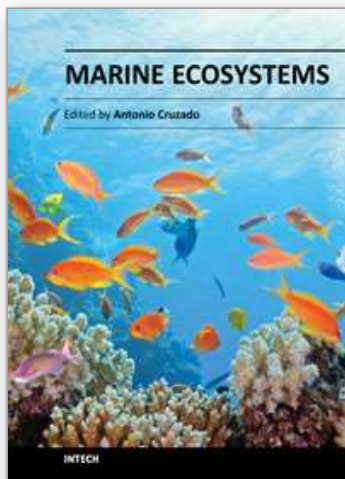
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Marine ecosystems, a very wide topic, includes many different processes, groups of organisms and geographical peculiarities. The objective of this book is to present various topics of great importance for understanding the marine ecosystems, what they are, how they work and how we can model them in order to forecast their behaviour under changing conditions. They have been thoroughly reviewed and accepted for publication. The chapters cover aspects such as: Threats to ultraoligotrophic marine ecosystems (Ch. 1); Modelling the pelagic ecosystem dynamics: the NW Mediterranean (Ch. 2); The marine ecosystem of the Sub-antarctic, Prince Edward Islands (Ch. 3); Meiofauna as a tool for marine ecosystem biomonitoring (Ch. 4); Chemical interactions in Antarctic marine benthic ecosystems (Ch. 5); An Interdisciplinary Approach on Erosion Mitigation for Coral Reef Protection- A Case Study from the Eastern Caribbean (Ch. 6); A revisit to the evolution and ecophysiology of the Labyrinthulomycetes (Ch. 7); Seabed mapping and marine spatial planning: a case-study from a Swedish marine protected area (Ch. 8); Management strategies to limit the impact of bottom trawling on VMEs in the High Seas of the SW Atlantic (Ch. 9); Hydrocarbon contamination and the swimming behavior of the estuarine copepod *Eurytemora affinis* (Ch. 10), and Interactions between marine ecosystems and tourism on the Adriatic and Mediterranean (Ch. 11).

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