ENVIRONMENTAL CHALLENGES FOR SUSTAINABLE DEVELOPMENT IN THE CROATIAN NORTH ADRIATIC LITTORAL REGION

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Abstract
The paper presents some geographical aspects of sustainable development in a part of the North Adriatic region in the Republic of Croatia. This sensitive region is confronted with problems of space management, water supply, waste management, transportation and energy, especially during the tourist season because of the pressure on infrastructure in the coastal region where there is a great concentration of population and tourist capacities. Another environmental problem is the oil transportation by a pipeline which is planned to be built in the frames of Russian-Croatian project Družba-Adria.

Key words: sustainable development, environment, human influence, littoral region, Adriatic Sea, Croatia

OKOLJSKI IZZIVI TRAJNOSTNEGA RAZVOJA V HRVAŠKEM DELU SEVERNEGA JADRANA

Izvleček
Članek obravnava nekatere geografske vidike trajnostnega razvoja na območju severnega Jadrana v Republiki Hrvaški. Ta občutljiva regija se sooča s problemi urejanja prostora, oskrbe z vodo, ravnanja z odpadki, prometa in energetike, še zlasti v času turistične sezone, ko se močno povečajo obremenitve infrastrukture v obalnem območju, kjer je velika koncentracija prebivalstva in turističnih zmogljivosti. Dodatne okoljske probleme prinaša načrtovana gradnja naftovoda v okviru rusko-hrvaškega projekta Družba-Adria.

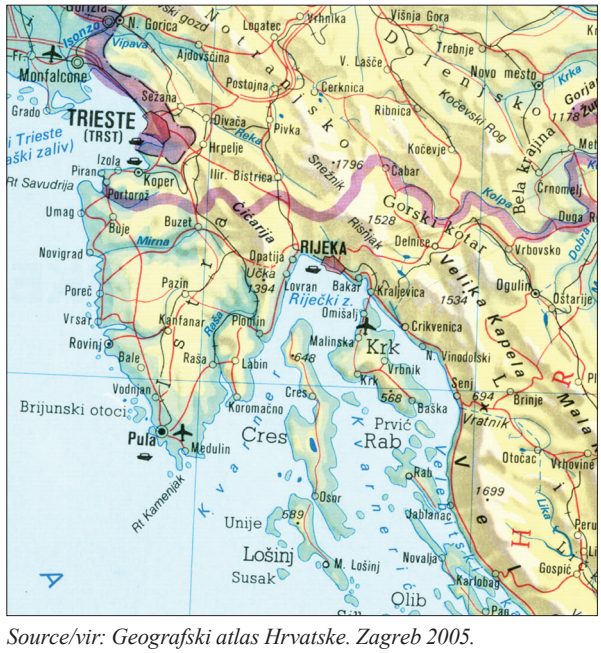
Ključne besede: trajnostni razvoj, okolje, vpliv človeka na okolje, obalno območje, Jadransko morje, Hrvaška

1. INTRODUCTION

»Since the early 1990s, sustainable development has become the central adage of environmental policies around the globe, and the environmental discourse has been globalized and transcended national boundaries.« (Jabareen 2008). In this article we will try to tell more about the problems and alternatives of sustainable development in one part of Croatia, and that is the North Adriatic coast. We think this is important as nowadays 50 % of the worldwide population live and depend directly or indirectly on the coastal zones (Sassi et al. 2006). In the last 40 years, this area was exposed to many changes and it is developing quickly. »And it is obvious that any project, whatever its nature, is going to change the environment and perhaps its ecology.« (Munier 2006).

North Croatian littoral region (Fig. 1) consists of two counties: the County of Istria and County Primorje and Gorski kotar, divided by the mountain Učka (1396 m). Both counties have very prominent littoral belts. 59 islands also belong to this region (45 of them in the County Primorje and Gorski kotar). Coastal lowland regions are often favorable and attractive locations for human settlement, transportation, agriculture, industry and other economic activities. These regions, therefore, become more and more important for development of their activities (Cao Don et al. 2008). Therefore, the North Adriatic littoral region is the transport and industrial centre of this part of Croatia. Islands in the North Croatian littoral region have developed tourism, services and partially agriculture and fishery.

Figure 1: North Adriatic littoral region
Slika 1: Obalna območja na severnem Jadranu



Source/vir: Geografski atlas Hrvatske. Zagreb 2005.

North Adriatic region is 10,812 km² large and, 511,849 inhabitants live there (2002). The largest city of this area is Rijeka with 144,043 inhabitants. Rijeka is the administrative, business, economic and cultural centre and the third largest town in Croatia, after Zagreb and Split. As to its economy, the greatest concentration of capital and production is in the oil industry, shipbuilding and transportation. The second large city in this region is Pula.

This region is the closest to the countries of Central Europe and it makes a connection region and important centre of roads which enable traffic connections between Central Europe, Balkan region and Eastern Mediterranean countries.

There is a relatively great biological and landscape diversity in the researched area. However, the littoralization has a negative impact on the landscape. On the one hand, wild and uncontrolled building makes amorphous areas, and on the other, abandonment of agriculture and depopulation of the interior cause deterioration of traditional rural/agrarian landscape. »To achieve more sustainable development, it is necessary to develop strategic actions to correct the causes of environmental problems due to the past unsustainable social-economic development.« (Braun 2006).

We can say that the recent condition of the landscape in the North Croatian Adriatic, as well as in all Croatia, is not resulting from good protection, but due to the underdevelopment in the past. It is visible by inadequate protection of habitats in areas which have been exposed to the anthropogenic pressure in last decades. »Management of coastal zone is essential to minimize the conflicts since coastal environments have important social and ecological functions, consistent criteria must be established, making possible the management of all activities and uses of these areas, observing the capabilities of the ecosystems.« (Sassi et al. 2006).

2. WATER RESOURCES, SUPPLY AND CONTAMINATION

Groundwater is, therefore, regarded as an important resource of drinking water and the primary source of irrigation water for agriculture (Cao Don et al. 2008). The amount of water is sufficient in favorable hydrological circumstances, while during the summer months the situation gets worse.

Water supply cannot be considered good because the water sources are not spread out evenly to the size of a consumption area. Insufficient connections and great losses in the water network make an obstacle to safe and quality water supply. In some systems, the needs for water during summer months, when many thousands of tourists arrive, highly surpass disposable supplies and prescribed quality of water becomes even greater problem. Islands of Krk, Rab, Cres and Lošinj have their own sources of drinking water which are mostly endangered by local contamination from drainage, and especially from the main island roads and extensive agriculture and cattle rising (Spilanis et al. 2009). »In sum, tourism is highly dependent on water availability and in turn tourism may exert an important influence on the way water is used and managed.« (Rico-Amoros et al. 2009).

Drainage of waste waters in most tourist objects is solved through public systems of drainage with disposal of the preliminarily processed water by long undersea drainpipes. Nevertheless, there are still many tourist areas without conditions for attachment on the public sewage system.

Organized disposal of waste water in the County of Istria significantly varies with the organized water supply. This fact is very unfavorable for the environment, because insured water supplies without insured water drainage means multiple enlargement of unclean and uncontrolled disposal of the waste water into the environment. State of water is especially problematic in interior of Istrian peninsula, where sewage systems exist only in community centres and even there, only partly.

Karst aquifers are very sensitive to external contaminations: speed of flow prevents higher self-purification and because of a developed network of cracks they drain a large basin area (Bonacci 1987). On its way to the underground, the drained water misses the process of self-purification because in the underground it flows through cracks or just through a thin layer of soil above limestone.

Main pressures on sources of drinking water in this area include: unsolved communal waste waters, unsolved industrial waste waters, strain waters, landfills, unsolved precipitation waters, agriculture and occasional contaminations.

In many cases economical subjects are in two positions: they still do not have a legally issued water permit, or they are not co-ordinated with it. This is a problem in the areas where there is no communal infrastructure for draining and purification of waste water. The fact is that a great number of economic firms do business which is potentially negative for environment. For example: numerous mechanic workshops, poultry farms, dye-works and slaughter houses. Besides, there is a relatively large number of stone-pits in Istria, some situated even in zones of water protection (e.g. asphalt-concrete production unit in Plovanija). Illegal dump-sites are especially risky, because there is a possibility of contamination with some sort of poisonous waste in the case of no control. The danger is even greater because many illegal dump-sites are located in natural depressions what accelerates the drainage of contaminated water into the underground. Agriculture production is also a significant pressure on the ground and underground water, especially if we consider irrigation plans in the 60 % of the area in the County of Istria. It is a well-known fact that agriculture is the largest single user of freshwater resources, using a global average of 70 % of all surface water supplies. However, agriculture is both cause and victim of water pollution (Ogaji 2005). On the other hand, the County of Primorje and Gorski kotar has a very small area under agricultural production.

As an example of a hydro-technical intervention which has had unpredicted negative consequences on the surrounding valuable ecosystem, we would like to mention the canalizing of one part of Mirna river which resulted in lowering of underground water level as well as in a decrease of surface drainage. One of the consequences was the flooding in the same part of the Mirna river valley.

It is very important to say that water resources in this area make a strategic development resource and the establishment of efficient water systems is one of development priorities. Protection of water is also one of the most significant priorities of environment protection in the area of the Croatian north Adriatic coast. In that case »strong and well equipped institutions should play central role in promoting and intensifying sustainable development.« (Göll and Liong Thio 2008).

3. SUSTAINABLE USE OF THE SEA RESOURCES

In Croatia, there are numerous laws which regulate many aspects of sea protection or activities connected with the sea. There are four basic legal documents which are used to protect the sea: Law on protection of environment (sea included as a part of environment), Law on waters (includes protection of the sea against contamination from islands and coast), Law on maritime goods and sea ports (regulate protection of the sea against contamination from vessels and floating objects) and Plan of intervention if sudden sea contamination occurs.

So far it has been estimated that the ecological state of the most maritime zone part is very good and could be given the highest grade in categorization which Croatia took from the EU. It can be concluded that the sea, except few closed parts with less sea currents, is of the highest quality all along the coast.

Due to the national diagnosis analysis, main sources of sea contamination from the coast are communal and industrial waste waters. Sea is also contaminated by the ships – ballast waters which they throw off. A good thing is that there is not any larger port in Istria, so that the risk of the sea accidents is relatively low. But, in the County Primorje and Gorski kotar that is not the case. In the Kvarner bay the largest Croatian port of Rijeka is situated, which could be a potential source of contamination.

Fishery depends on preserved environment and preserved, healthy and productive sea ecosystems. For the Adriatic Sea, the next statement is valid: many of the sea resources are being drained completely. Measures of protection have to go in direction which will enable an optimal use of renewable, but not indestructible, sea resources and which will, besides of economic and social criteria, take care of ecological aspects such as biodiversity.

Mariculture is an activity which has potential to lower the pressure of fishery by its concurrent prices and quality of sea organisms. Unfortunately, that theoretically environmentally very acceptable substitution shows negative consequences, too. These consequences are caused by the wish to maximize the profit as soon as possible. Environmental capital is less important here. However, mariculture is an activity with an acceptable influence on environment and component of sustainable economic development in the littoral area. Breeding sites are mainly located in very protected locations (Limski kanal, coves), because they represent environment more sensitive to human pressure and contamination.

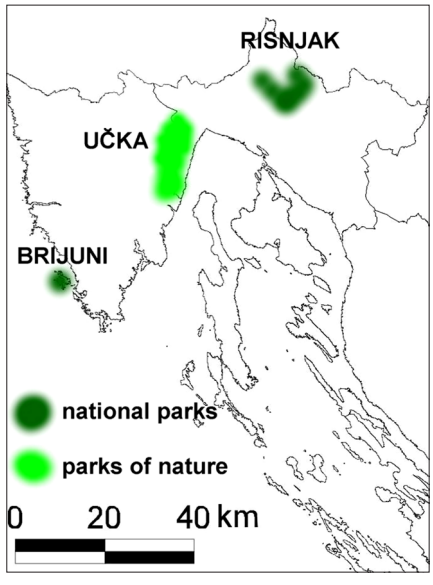
4. PROTECTED AREAS

»Trying to promote economic growth without too much concern about the environment, will cause that sooner or later humankind will run out of water, forests and land, and there will be a stopping or in the best cases, a decline of the economic processes.« (Munier 2006). That's why protection of environment is so important for Croatia. Unfortunately, in Croatia there are no institutions with a long tradition of protecting natural resources. »Countries with long tradition of integrated environmental policy-making are more open to the concept of sustainability.« (Göll and Liong Thio 2008)

Protected areas in Croatia covered 9.9 % of the state territory in 2006 (Fig. 2). There are 73 protected valuable nature areas in the researched region. For few of them, a legal procedure

of protection is in development, and for many of them, the procedure should be started in near future. In this area, a number of nature areas is recognized and already put into planning documents. However, activities of real legal protection should be intensified. It is even more important to make additional efforts to conduct this protection, especially on local level.

Figure 2: National parks and parks of nature in the researched region
Slika 2: Narodni in naravni parki na preučevanem območju



At present, protected areas cover about 24 % of the researched area, mostly in karst areas. The Croatia Karst Ecosystem Conservation project (KEC) was completed in 2008. The government of Croatia is now requesting a new World Bank loan to continue and extend the work of the KEC project, based on the successful experience and established partnership with the Bank. The most significant are the National Park Brijuni and Risnjak Mountain, as well as the Nature Park Učka.

Most of local governments are satisfied with the degree of environment protection in their territory, but sometimes, they are warning on the spreading of illegal building on the coast and other recent trends. Because of that, a proposal of national 'ecological network' has been defined. It consists of 'cores', corridors and protective zones. Nevertheless, it has not been accepted yet. »But also in the world, growing number of governments, local authorities and parliaments have become aware that their traditional working procedures and structures are not functioning optimally to cope with the challenges that the realization of sustainable development poses.« (Göll and Liong Thio 2008).

Another type of protected landscapes is that of degraded anthropogenic landscapes which had to be reclaimed in a specific way. As to the sea landscapes, mostly protected are muddy coasts, coves, sandy beaches, pebble beaches, etc. They have become endangered because of tourism development, so it is really necessary to co-ordinate further development of littoral activities with protection and preservation of the coastal landscapes.

5. TOURISM

Tourism is one of the most important sources of income in Croatia. However, often »people tend to define sustainability in the ways that suit their particular applications, goals, priorities, vested interests, and often use the term with no explicit evidence and recognition of the exact meaning being implied.« (Voinov 2008). This is often the case in Croatia, too.

But tourism is the sector of economy that has a bidirectional relationship with environment. Preserved and attractive environment is one of basic resources for most types of tourism, and its protection can provide a long-term development of tourism. Moreover, tourism, if well managed, can be one of the 'most sustainable' ways of using natural resources in some area. Preserved environment can be used as an economic resource by tourism, so it has a direct interest in stimulating activities that lead to preservation of nature and increase their value. Effects of tourism on environment can, also, be negative (Williams and Ponsford 2008). »Tourism industry operates by appropriating natural resources and transforming them into a product for sale in consumer markets.« (Pravdić 2003). Even so called 'eco-' types of tourism, whose main purpose is to make contact with intact and preserved environment, disturb and make changes in environment (Liu 2003).

Therefore, there are lists of initiatives in the County of Istria which include development of agrotourism, cycling routes, award of Blue Flag and traditional action of the Tourist Association of the County of Istria that is called 'Let my Istria shine', according to the aspects of sustainable development. These initiatives enrich tourist offer of the region, so it becomes wider, more special and more recognizable, and in that way more profitable and competitive. This trend presents more optimal use of environment and more adequately distributed pressure on the environment. Master plan of tourism development in the County of the Istria aims to improve tourist activities towards environmental (30 %) and socio-economic (40 %) criteria, in order to realize the vision of the Istrian 'tourist brand' as a 'Green sanctuary of Mediterranean'.

Table 1. Number of tourists in the counties of Istria, Primorje and Gorski kotar and in Croatia (in thousands)
Preglednica 1: Število turistov v Istrski in Primorsko-goranski županiji ter celotni Hrvaški (v 000)

	2001	2002	2003	2004	2005	2006	2007	2008
Primorje and Gorski kotar	1,853	1,922	1,997	2,024	2,076	2,149	2,247	2,214
Istria	2,377	2,354	2,436	2,515	2,505	2,575	2,719	2,730
Croatia	7,860	8,320	8,878	9,412	9,995	10,385	11,162	11,261

Source/vir: Central Bureau of Statistics – Republic of Croatia.

Accommodation capacities are unequally distributed in the researched region. There are 97.1 % of accommodation capacities in the County of Primorje and Gorski kotar located in littoral area, 32.7 % on mainland coast and 64.4 % on islands. There is danger of saturation of these areas, especially of disturbing of natural and cultural resources on the islands. In the County of Istria most of accommodation capacities are on the coast, especially on the western one. With the development of tourist offer in the interior of the County of Istria, there are also more accommodation capacities in the interior.

6. WASTE MANAGEMENT

Waste management of communal and industrial waste in the North Adriatic region is appropriate neither to the current legislative of the Republic of Croatia, nor to the EU regulations that will be implemented in near future. Communal waste in the researched area is mostly collected by city communal companies. There is no processing or recycling of different types of waste, although during last several years there have been positive changes (Table 2).

Table 2: Landfills in the researched region
Preglednica 2: Odlagališča odpadkov na preučevanem območju

Landfills	Capacity (in m³)	Exploited	Founding year
Cere	260,000	50	1975
Cetin	50,000	70	1985
Donji Picudo	700,000	86	1984
Duplje	74,000	64	1969
Griža	70,000	71	1977
Jelenčići V	100,000	32	2001
Kalvarija	350,000	80	1967
Kaštijun	1,200,000	60	1967
Košambra	820,000	37	1977
Lokva Vidotto	210,000	18	2001
Osojnica	470,000	74	1975
Petrkov Laz	54,000	33	1989
Pržić	200,000	40	1980
Sorinj	600,000	71	1969
Sović Laz	125,050	20	1995
Treskavac	270,000	90	1975
Viševac	1,350,000	100	1964

Source/vir: Report on the state of environment in the County of Primorje and Gorski kotar; Programme of environment protection in the County of Istria.

The price of the communal waste collection is being adopted and approved by bodies of the local government, so it is not determined by market, but is deliberately a political decision. In that way, social peace is being bought by the price of the communal waste collection. That means, the principle 'those who pollute pay' is appreciated only declaratively.

One of the greatest problems is occupancy of the existent landfill capacities, especially those where the waste from larger cities is collected (Rijeka, Pula). Organized waste collection covers more than 90 % of researched region. Collected waste is being disposed in 17 official landfills (Fig. 3). Communal waste is disposed in all mentioned landfills, but dangerous, electronical, medical or organic waste cannot be disposed in either of them (at least not officially). Data given in Table 2 suggest that ten landfills need urgent measures because the remaining capacities provide only few years of normal functioning.

In the researched region, organized waste collection covers more than 90 %, but the degree of the communal waste primary selection is unsatisfactory. Moreover, the fact that waste is being disposed without any preceeding processing is also rather unsatisfactory. The fact that 7 of 10 landfills in the County of Primorje and Gorski kotar satisfy the minimum of the prescribed technical requirements is relatively positive (in the relation to the previous situation). In the County of Istria only the landfill Lokva Vidotto satisfies modern standards of waste disposal in some basic requirements.

Figure 3: Present and planned regional landfills in the researched region
Slika 3: Obstoječa in načrtovana regijska odlagališča odpadkov na preučevanem območju

Besides official landfills, which do not satisfy modern standards, illegal landfills make big problem. About 300 illegal landfills were noted in the County of Istria in 2004. Some of these illegal landfills function as deliberative landfills, because population disposes waste there and local government organizes actions to clean it up. The case when those illegal landfills are covered by soil is even worse, because the problem is being accumulated and not solved.

There are numerous projects which try to improve waste management. Three aspects of waste management must be considered: environmental, economic and social (Morrissey and Browne 2004). The most important is the project to integrate currently fragmented system into an integral system of waste management in both counties. The study 'System of waste management in the Kvarner and Istrian region' gives a new system of waste management in the researched region. Elements of this study are used in the Physical Plan of the County of Istria. According to this study, regional landfills would be located near Kaštijun (County of Istria) and Marišćina (County of Primorje and Gorski kotar) (Fig. 3). This plan anticipates a transitional period of 10 to 15 years.

7. PIPELINE TRANSPORT

Transport of oil by pipelines can have a potentially negative influence on environment. It is estimated that this negative influence will be enlarged in the future. The EU tends to create strategic partnerships with oil and gas exporting countries. Russian Federation and ex-SSSR countries, which have great reserves of oil (Caspian Sea region) and take part in the oil import in EU-states with 41 % (2003) are of great importance for the EU. They will be also their big suppliers in future.

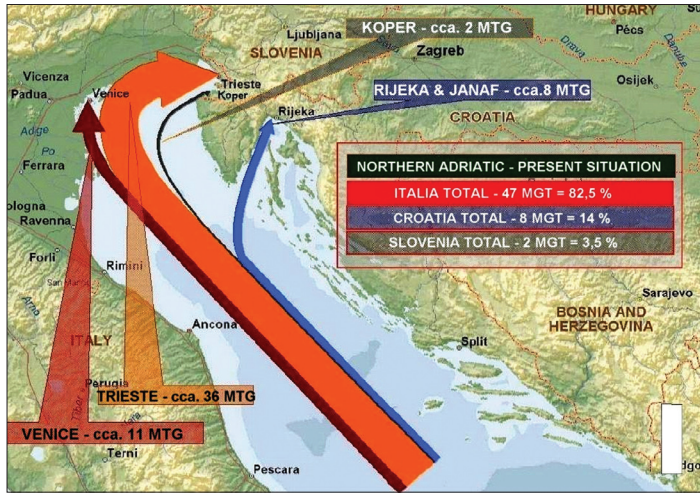
Petrochemical industry and oil terminal of international importance, that can be a great threat to the environment, were built near the Omišalj on the island of Krk in the 1970s (Fig. 4). At the terminal of the oil pipeline JANAF (Jadranski naftovod; in English: Adriatic pipeline) in Omišalj there is a constant threat of oil spill into the Adriatic Sea. To protect the sea against pollution, an underwater air lock has been set up at the entrance to the bay.

The JANAF pipeline starts in Omišalj and goes towards Sisak, from where it diverges towards Hungary and the Czech Republic and Slovakia in the one direction, and towards Bosnia and Herzegovina in the other. Oil pipeline at the sea bottom was built from the Omišalj port to the Rijeka refinery in Urinj in 1994. The capacity of continental pipeline is 20 million tons per year, and capacity of the branch towards the Rijeka refinery is 6 million tons per year.

Omišalj terminal is trendily equipped by trans-shipment and port facilities, and it can accept the ships of all generations and highest tonnage. The capacity of tanks comes to 800,000 t of oil and 11,500 t of oil derivates.

Extension of the oil pipeline and building of terminal for liquefied gas on the island of Krk, could be problematic and a potential environmental threat for this, to the tourism oriented region. In the territory of the Republic if Croatia, project Družba-Adria means the oil transport using the existing JANAF pipeline system from the Croatian-Hungarian border to the Omišalj terminal on the island of Krk, trans-shipment of oil from the tanks in the Omišalj terminal to tankers, and its transport by the Croatian territorial sea to international waters.

Figure 4: Amount of oil and oil derivates transport in the Northern Adriatic
Slika 4: Količina transportirane nafte in naftnih derivatov na območju severnega Jadrana



Source/vir: http://www.mzopu.hr/doc/DruzbaAdria3.pdf.

Project Družba-Adria means the establishing of a new transport corridor for the Russian oil export and transport of other countries'oil to the world market via the Omišalj port, by using available capacities of the existent oil pipeline systems Družba and Adria. The oil pipeline systems of Družba and Adria extend from Samara in the Russian Federation via Belorussia, Ukraine, Slovakia, Hungary and Croatia to Omišalj port. Both pipeline systems of Družba and Adria are already connected in Szazhalombatti (near Budapest, Hungary) and oil can be transported from Russia toward Sisak. To complete technical integration of both oil pipelines, the existing JANAF pipeline must be reconstructed and upgraded. Project Družba-Adria is joint project of six countries – Russia, Belorussia, Ukraine, Slovakia, Hungary and Croatia, whose representatives signed in Zagreb, on 16th December 2002, the 'Intergovernmental agreement on supporting the project of integration of the Družba and Adria pipelines'. The importance of this project for JANAF pipeline is in its great importance within the Eurasian oil pipeline system.

Ecological organizations question economic cost effectiveness of this project, because every incident situation threatens tourism in a wider area.

8. DISCUSSION

The paradigm of sustainable development is the base of development in the researched region. This is presented in official development plans of the County of Istria and of Primorje and Gorski kotar. This way of development is supported by the EU policies, too. Sustainability is the key concept of the fifth Environmental Action Programme, in which sustainable development is defined as »development, which meets the needs of the present without compromis-

ing the ability of future generations to meet their own needs«. This entails preserving the overall balance and value of the natural capital stock and a re-definition of short-, medium- and long-term considerations to reflect the real socio-economic costs and benefits of consumption and conservation (Ogaji 2005).

Counties of Istria and of Primorje and Gorski kotar are among the most developed counties in Croatia. Therefore, it is necessary to maintain economic development according to the concept of sustainable development. Empirical studies have considered a broad relationship between economic development and environmental quality, and a wide variety of results has been obtained. In general, the results of these empirical studies are mixed up depending on the measure of environmental degradation and countries considered. On the one hand, some extreme viewers have suggested that the growth of economic activity inevitably leads to environmental deterioration and ultimately to a possible economic and ecological collapse. On the other hand, some analysis suggests that environmental problems will be addressed more or less automatically as a consequence of economic growth (Kahutku 2006).

The economy of the researched region is in the process of economic transition, which causes additional problems to the contemporary economic development. Thereby the environment preservation is often neglected. Except the process of transition, the process of globalization influences the economy, too. Globalization leads to scale effects that are expanding overall outputs of the economic activities by increasing economic efficiency and productivity; yet it is uncertain whether the scale effect of globalization will lead to positive or negative environmental effects. This will depend on the environmental policies implemented and on the trade patterns (Kahutku 2006).

Local governments play an important role in planning and implementing measures which make possible the sustainable development. Measures must be carried out in all sectors of activities. Planned measures and their implementation must be accorded with the regions which they are made for. Sustainable development of the Croatian islands must be considered. Because of their ecological sensitivity sustainable development of the Croatian islands must take into account the traditional way of life, where sea and soil are the sources of existence. Tourist activities in the littoral region and on islands should be organized. These activities should be: fishery, fishery cruising, sailing, bike riding, island mountain climbing, field working, etc.

Sustainable development of the islands in the researched region should be considered:

- how to protect preserved areas;
- which are comparative advantages;
- which are limits of development;
- the role of local and state government;
- should development be based on cultural, historical and economical characteristics or a new base of development should be created;
- how to create a pattern of development that would not endanger itself (Vidučić 2007).

Measures for implementing sustainable development are more than just environment protection. Tourism can be a very effective activity for sustainable development. Researched region is one of the leading tourist regions in Croatia, so the measures for mitigation of

negative effects of tourism are necessary. In counties of Istria and of Primorje and Gorski kotar numerous measures are already being carried out. They include:

- spatially equal development of tourism;
- concept of tourist regions capacity;
- avoiding of tourist monoculture, that is combining of tourism with other complementary activities;
- priority of nature protection;
- planning and developing of an ecologically acceptable model of transport connections among tourist regions;
- education and development of ecological conscience and way of thinking and acting of the population included in tourist activities;
- supporting actions of local tourist agencies.

Beside the above-mentioned, many measures must still be carried out concerning environment protection, water and waste management, which will lead to a better quality of environment. Tourism is an activity which, if properly managed, can be 'very sustainable', so it's further development in the researched region is highly recommended. That must be done in accordance with the development of other economic activities.

It is also necessary to improve water and waste management. Special attention must be paid to building new and modern landfills, improving the existing landfills and solving the problem of illegal ones. Nevertheless, improving of waste management is a long and expensive process, which can be problematic because of temporary financal crisis.

It is also important to educate people and develop ecological conscience, because a strategic approach to sustainable development requires new ways of thinking and tackling the environmental development dilemma to implement this process at the local level (Braun 2006). If local population accepts the fact that nature must be preserved, not for us, but for future generations, their attitude will change.

The aims of sustainable development must be clearly focused, too. The ambiguity of the sustainability concept, as some argue, severely diminishes its usefulness; as sustainability is coupled with popularity, anything can be pronounced 'sustainable (Butula 2003).

9. CONCLUSION

Sustainable development is a paradigm of modern development. This is especially the case in the Northern Adriatic, because of its fragile environment. »Some activities, as tourism, amusement and aquaculture are in expansion and may contribute to local changes in near future, increasing competition with traditional uses and promoting landscape alterations« (Sassi et al. 2006). This is the case during summer months because of great number of visitors who make pressure on the environment. It is especially visible in the northern Adriatic islands. Therefore, investments in infrastructure, which would decrease negative influences on the environment, becomes necessary. More investments into the usage of renewable energy sources is necessary, too. Republic of Croatia will become a member of the EU in near future and will accept new and higher standards of environment protection. This is

important because of the fact that tourism plays an important role in economic development and it is not possible without a preserved and protected environment. Despite the official state policy, which promotes environment protection, in reality, the advantage is given to economic and not environmental interests. The local governments must develop their own projects, which would promote environment protection under their jurisdiction. Sustainable development is not a spontaneous process; if it wants to be effective, it can be lead only as a conscious and planned process (Lay 2007).

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