

Preconditions for Sustainable Development of Bojana River Mouth Surroundings

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By his activity, man leads to degradation of the environment. In accordance to laws of nature, man has the possibility to adjust nature to his needs only to a certain limit. We are talking about the limit when man’s behaviour may become devastating when it comes to overall development of living organisms as well as their survival. The aim of this paper is to show that improvement of the environment by appropriate valorisation of the region of the mouth of Bojana river is a precondition for sustainable development of this region which is very interesting both from the economical as well as ecological point of view considering the rich biodiversity and possibilities for tourist development of the region. The term development is usually used to denote growth or progress. Nevertheless, this term, especially during the past two centuries, has become a synonym for economical growth considering gross domestic income or income per capita. This definition has caused a race among nations in order to achieve and maintain development goals. These goals are often controversial when it comes to the idea of environment protection. In order to restore a balanced relationship between man and nature, the term sustainable development has been adopted. In this paper, the term sustainable development is understood as development which only enables satisfaction of contemporary needs without endangering the needs of future generations and distracting systems which support life or reduce biodiversity.

Keywords: sustainable development, sustainability, biodiversity, tourism

Introduction

River deltas are significant to world economy because they support a huge population and biodiversity. That is why they have now been recognised as main points for research and politics in context of environment changes and regional sustainability. Human activities and climate changes enlarge the ecological risks in many deltas (Renaud et al., 2013). Transition of soil use, change of lifestyle, and expansion of engineer approach in managing waters as well as environment protection have only brought failure (Auerbach et al., 2015). It is necessary to integrate our understanding of physical, ecological, and socio-economical dynamics of deltas in order to develop understanding of the systems as well as the sustainable development of these regions (Ramesh, Robin, & Purvaja, 2015). This paper deals with preconditions of sustainable development of the Bojana river mouth, a region which not only has an economical, both locally and regionally, but also an ecological significance. The mouth of Bojana river has an immense significance when it comes to development of tourism.

Besides, the broader region is of extreme importance for preservation of a unique ecosystem in Europe. The Draft of Fundamental Study for Establishing the Regional Park of the Bojana Delta states that the Bojana river delta represents the most significant marsh in Eastern Mediterranean which possesses an unusual diversity of unique and endangered natural and cultural landscapes, habitats, and species.

As far as sustainable development of the Bojana river mouth is concerned, finding a balance between economical development and managing life environment represents a great challenge.

As already stated, deltas are regions of great economical potential and great environmental value, a challenge in sustainable development of deltas is finding a balance between economical development and managing environment. This paper deals with preconditions of sustainable development of the Bojana river mouth. The other focus of this research is on the reaction of the Bojana river delta to many factors such as economical growth and climate change as well as numerous social trends such as privatisation and decentralisation, so it is necessary:

- to analyse the present state in order to define the preconditions for sustainable development of the Bojana river mouth, and,
- to create foundations for undertaking personal and/or community actions aiming at more reasonable use of resources for improving life quality in order to enable sustainable development.

So, in order to imply the concept of sustainability at a local level, that is at the region of the Bojana river mouth, it is necessary to analyse the preconditions for sustainable development on grounds of objectivity as well as on subjective reflections of information gathered by analysing literature and the present state. Thus, the problem, which is primarily of local significance but also of regional and state significance, will be pointed out.

Many authors claim that the implementation of principles of fairness and life within ecological boundaries can be achieved only if social, political, and economical systems have the flexibility to be oriented to sustainability as well as being integrated with one another and the environment (Jovanović, 2013).

The greatest challenge of sustainable development remains the global awareness starting from households to governing boards considering the importance of solving the challenges of the industrial revolution: unlimited human and ecological exploitation (Stanojević, 2011).

The contemporary literature reveals a great deal of different understandings of the idea of sustainability and concept of sustainable development (Buzuk, 2013). Two main elements of the concept of sustainable development, that is development and sustainability, precede the creation of the concept itself. Development and sustainability can coexist and both can have counterproductive effects, but neoclassical economists point out that there is no contradiction between sustainability and development (Klarin, 2018). There is also a suggestion that there is no development without sustainability or sustainability without development (Brodhag & Taliere, 2006).

Components and Goals of the Sustainable Development Concept

During a broad discussion on use of the concept and its establishment, three components of sustainable development have been acknowledged:

- The economical component: An economically sustainable system must be able to produce products and services at a continuous level and maintain a manageable level of government and foreign debt (Porter & van der Linde, 1999);
- The environment component: An ecologically sustainable system must represent a stable base of resources avoiding overuse of renewable resources and depletion of non-renewable resources just to an extent that can

properly be replaced. This includes maintenance of biodiversity, atmosphere stability, and other functions of the eco system which are not usually qualified as economical resources (ESCAP, CSIRO, The University of Sydney, 2015);

- The social component: Socially sustainable system must achieve equal distribution, adequate social services, including health and education, gender equality, political responsibility and involvement (Strangde & Bayley, 2008).

It is clear that these three elements of sustainability introduce potential complications to the originally simple definition. The expressed and implied goals are multidimensional which opens the question of creating balance between the goals and making judgements of success or failure. For example, what if adequate water and food supply implies change in use of soil which will lead to reduction of biodiversity? What if energy sources which are environment friendly are more expensive and will increase the burden for poor people by becoming a large part of daily expenses? Which goal will have preference?

Within the common definition of sustainable development, equality among generations on a longlasting scale of sustainability is recognised so that the needs of future generations can be met (Cooper & Vargas, 2004).

The National Strategy of Sustainable Development of Montenegro states general goals as follows:

- acceleration of economical growth and development, reduction of regional imbalance in development;
- reduction of poverty and provision of equal rights when resources and services are in question;
- assurance of pollution control and sustainable management of natural resources;
- improvement of the management system and public involvement, engagement of all parties building capacities within all levels at the same time;
- preservation of cultural diversity and identity (Ministry of Sustainable Development and Tourism, 2016).

Nature Value

The Bojana river mouth, as a rare example in Europe, is unique for its absence of disturbance of natural processes at the river mouth. Even though there have been significant interventions as building of dam at the river Drim, Ulcinj salt pans and dams at the banks of Bojana river, there are still regular floods within the flooding area. At the same time, the river brings enough amount of sediment causing land erosion and settling of sediments. Thus, the river Bojana mouth, as a whole, including all biotopes, still owns a preserved ecological function to a large extent. A considerable number of wild animals exist as a provided proof. At the same time, cultivated area along the river mouth has existed for a long time making it one of the very few remaining semi-opened landscapes in Europe. It is a unique kind of landscape formed as a result of mutual involvement of nature and man (D ömpke, 2008a).

Because of great changes in water level, flooding of surrounding areas both on Montenegrin and Albanian side resulting in entering all kind of waste into the sea has become very frequent (extreme floods in 2010 which caused transport of sea waste intaken by the river Bojana). The river Bojana also takes in the wastewater of town Skadar which has not been treated as well as other floating litter from peripheral areas. Slowing down the flow and closing the river bed (because of sediment residuals and relative shallowness) result in increase of pollution as well as the existence of many houses along the river bank which also release wastewater, litter, and packages directly into the water stream. Monitoring of pollution made by tributaries is a component of monitoring of the Montenegrin marine ecosystem but it does not include the intake of sea waste except from data concerning the

amount of suspended particles. Excessive pollution (according to regulations of surface water categories) has been recorded at the rivers Bojana and Sutorina.

Coastal zone is referred to as: coastal water in length of three kilometres into the sea, coastal line along sand beaches and dunes, gulf complex, open mud dams and beach marshes. The overall area of the habitats mentioned includes an area of 2,900 ha, while shallow coastal sea water makes another 8,000 ha. After the sand area of the beach covering dozens of metres, it lies sand vegetation of Ada Bojana and the Long Beach (Velika plaza). Within this area following vegetation belts are distinguished:

- so-called halophytic vegetation;
- temporary marsh and pond vegetation within depressions of older dune areas;
- dry pastures, meadows, unexploited soil, and forest belts (Döpke, 2008b).

The area once called Zoganj lagoon today is mostly applied as Ulcinj salt pans. This area is separated from the Adriatic Sea by an island 10 kilometres long. Although the dam used to prevent flooding of river banks had some effects when it comes to flood regime, there were still regular floods of the area. As a result of the complex effects among winds, the Adriatic Sea and Bojana river, a system of parallel dunes was formed. The increase of sand stability and decrease of salinity within the depressions among dunes led to forming zonal spread of living communities and an especially rich fauna of birds. Ten typical zones within the geomorphological region of the Bojana river can be distinguished: These are: shallow sea, sandy and muddy beaches, sand with scarce halophytic vegetation, halophytic vegetation in initial growth, halophytic and semi-desert vegetation with some trees, tamarix woods, marsh areas, Mediterranean dry areas with some macchia vegetation, alluvial woods, villages and cultivated areas (Döpke, 2008b).

As far as fish is concerned, in accordance with IUCN classification of animal taxons, it has been established that Šasko lake, the river Bojana, and Skadar lake basin are of a great significance when it comes to protection. They also represent very important places at the Mediterranean and the whole of Europe because of the existence of many endemic fish species. According to existing data, it has been concluded that there are at least five endangered fish species. Fish in this area is a significant part of the food chain for endangered birds and mammals such as pelicans and dolphins.

As far as amphibians and reptiles are concerned, the broader area of river Bojana and Skadar lake is recognised as one of the centre of biodiversity of reptiles in the Balkans concerning reptiles living in the water or near it. The Association of Herpetologists of Europe has declared Ada Bojana and the Long Beach as areas of priority within the Adriatic Sea. Because of their dynamic terrain, various habitats, and significance when it comes to protection of species, Ada Bojana and the Long Beach are of great value (Döpke, 2008a).

Because of the size of the area, whole network of habitats containing marshes, coastal zones, open habitats, pastures, woods and hills, conditions for nesting, and resting of birds are extraordinary. The area of the Bojana river mouth represents one of the most important areas for birds at the Adriatic coast on Balkan Peninsula as more than two hundred of bird species have been registered. Some habitats in this area are of great importance concerning the spring migration of birds but also spending the winter and nesting.

Although there are no systematic researches on mammals, three marine and 18n inland species of mammals have been registered. Among them, one is vulnerable according to the IUCN Red list. It is the Mediterranean bat. According to some recent researches which included dolphins in the Bojana river, bear prints on Albanian beaches, a great population of jackals during hunting ban on Ada Bojana, it is evident that the Bojana river mouth

represents a significant area for big mammals. The mouth of the river is also unique because it is the habitat of the blind mole and the mound-building mouse. These distinguished habitats are rare and well preserved and they give shelter to two genetically isolated populations. All in all, the conclusion is that the fauna of mammals provides a significant contribution to the importance of the Bojana river mouth. It is necessary to provide a corridor for migration of bears and the gold jackals over Briska mountain and Šasko hills. On the other hand, presence of dolphins has been registered in the Bojana river. All this indicates that an intense research on mammals in this area is essential.

As far as tourism is concerned, this area has a longlasting potential for tourism development. Long sandy beaches, an active town with its historical castle, marina, an interesting surrounding which offers a great number of opportunities for organising trips and special tours, all go in favour for tourism development. Natural surrounding which is interesting and versatile can serve as a destination for interested tourists or as a way of prolonging the season during spring and autumn. When it comes to the Long Beach and Ada, they are not only the biggest sandy beaches in this area of Adriatic but beaches which are highly undeveloped and with an undeveloped coastal area. This is why they also represent a good opportunity for sale which also gives a special opportunity for tourism development. Economically speaking, this area could have a very high potential for economical development. Nevertheless, it is a fact that big chances are followed by big challenges. Tourism can potentially help the development. But, tourism can also bring to the destruction of the foundation; it is being built on giving the opportunity to forget everyday problems. Pure, healthy, and pleasant natural environment, absence of social problems, and other negative impressions are in question.

Ada Bojana and beaches have a positive effect when it comes to tourism development. As far as negative aspects are concerned, the following can be recognised: big crowds, waste disposal issues, illegal building. Future development of tourism will depend on the fact whether it will achieve its economical potential without negative side effects but with a maximum profit both for the municipality and state. In accordance with the tourism strategy of Montenegro, tourism development is not the only goal but also to open new work places, increase of life standard as well as public incomes. Tourism should be based on the principles of sustainable development. Thus both present and future generations will have the same opportunity to make a living out of tourism (Dömpke, 2008a).

Development Management of the Bojana River Mouth—Legal, Administrative, and Practical Measures

With an effective delta planning, ecological improvement of the infrastructure and investment in social welfare, a longlasting delta sustainability can be achieved (Sebesvari et al., 2016). Preconditions for development of the Bojana river mouth include managing the mouth development in a proper manner by legal and administrative measures, practical measures, building and revitalising infrastructure as well as informing of the public.

As far as management development of the Bojana river mouth is concerned, legal and administrative measures include:

- amendments to law concerning genetically modified organisms in order to completely ban testing and exploiting organisms which are genetically modified within protected areas and regional parks;
- making a management plan which will involve every stockholder;
- division of overlapping responsibilities and transferring responsibilities if needed;

- creating a shared management of fish resources at the Bojana river and Skadar lake;
- shortening of the hunting season for water birds;
- introducing strict inspections of hunters' luggage when leaving the state;
- obtaining specific training for supervisors for protected species.

Practical measures can be implemented in hunting, fishing, agriculture, cultural inheritance, waste water, solid waste, development of sustainable tourism and economical development.

Practical measures concerning hunting include implementation of strictly controlled hunting and hunting ban within protected areas. Besides, it is necessary to develop an economical programme in order to turn hunting into a bird watching business. The state should make an effort to declare hunting ban during the period from January 15th to October 1st and permit hunting only during hunting season. In order to improve hunting control and its inspection, it is necessary to enlarge human resources, equipment and financial capacities at the municipality level.

Practical measures concerning fishing include an urgent implementation of measures which would prevent exploitation of fish as well as extinction of some species. It is also necessary to prepare and implement a plan concerning the removal of fish species which do not originate from the Šasko lake. Besides, it is necessary to protect the nesting places of loggerhead sea turtles and put up signs (Döpke, 2008a).

Practical measures concerning wastewater include the development and implementation of programmes for processing wastewater of the whole basin and Bojana river mouth in accordance with ecological demands and future development (Döpke, 2008a).

Practical measures concerning solid waste include development and implementation of functional systems which could manage solid waste in accordance with ecological requirements and future development, creating recycling programmes for plastic bottles and bags as well as cleaning beaches in order to preserve the environment but without using vehicles (Döpke, 2008a, p. 74), so that birds and turtle eggs could be protected (Döpke, 2008a).

Practical measures concerning economical development include the development of highly valued traditional art and crafts for making valuable souvenirs. It is also necessary to build an unpaved single lane road from St. George to Fraskanjel along the river Bojana in order to connect these two communities, a better connection of Fraskanjel with Ulcinj so that tours can be made (Döpke, 2008a).

In relation to everything stated, it is also necessary to enable a more intensive water flow which can be achieved by removing artificial obstacles such as trees, bridges, and sunk vessels. It is also necessary to deepen and widen the river basin, its cleaning in the vicinity of bridges and its mouth (Ministry of Agriculture and Rural Development, 2013).

Conclusion

The contemporary concept of economical sustainability strives to maximise the flow of incomes which can be generated and still sustain the asset stock (or capital) along with useful results. Economical efficiency continues to ensure an efficient distribution of production resources and efficient choices of spending which maximises usefulness. The problem is in identification of types of capital which are sustainable (i.e., produced, natural, human, and social capital) and its substitution. It is often hard to qualify these assets and offered services especially when ecological and social resources are in question. Main economical resources can even be neglected, especially with informal and existential economies where transactions based on non-market basis are important.

Now, when Montenegro has the opportunity for a completely independent economical development and possesses all preconditions for an overall development, Ulcinj is going through dramatic changes. Since there is a period of deindustrialisation of big traditional industry centres, there is no need to open bigger production complexes in the municipality of Ulcinj. The economy will undergo significant changes considering the wish of the state to join the European Union so an adjustment to agricultural markets of Europe will be inevitable. When the river Bojana mouth is concerned, agricultural areas due to a poor productivity can secure income for a small number of people or may even stop the production in some areas. In order to support sustainable agricultural development in this region, drainage of big areas would be necessary, removal of fences and creating fields where a big agricultural business could be initiated with the goal of enlarging the production. Even if conditions for an increase of production would be created and even if the production would be competitive to products of the European Union, big investments would still be needed which could cause a decrease of ecological values and still open only a few new working places. For this reason, it would be much more efficient to maintain family farms and develop eco-products of high quality based on a unique agro biodiversity typical to the region of the river Bojana mouth. Besides, it would be necessary to secure marketing in order to support tourism. Namely, this is the biggest economical sector so a further growth in the future is expected. More will be said about issues which will condition other sectors like agriculture, fishing, transport, culture, all kind of purchases... But, it is very important to bear in mind that even if there are a great number of overnights the profit can only grow to a certain limit and after that limit, the cost of overnights lessens and thus cuts down the profits. These are the reasons why there should be a responsible approach to tourism, emphasising the beauty of protected nature which attracts tourists to visit this area.

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