

PROBLEMS AND POSSIBILITIES FOR SUSTAINABLE MANAGEMENT OF NATURAL PROTECTED AREAS – EXAMPLE OF PROTECTED AREA "SKAKAVAC"

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In the year 2002., for the purpose of specific natural features conservation respecting criteria of IUCN, the decision of its declaring or its inclusion in the third category of protected natural areas was made. This decision defined protected areas borders, total surface coverage, zoning, protection measures, as well as the use and management of this area. In order to assure the sustainable development of natural protected areas, it is necessary to adopt appropriate environmental policy. Environmental policy, which is based on precaution principle and preventive actions is one of the most important and far-reaching policies. In order to protect the natural environment from the negative effects of tourism activities, main preventive measure of is to determine the capacity of tourist visits and activities. Basic requirement of establishing and implementing environmental policy is the establishment and implementation of spatial plans for special purposes. Spatial planning will define multifunctional zones for different needs, which take into account the capacity of the environment, the social identity of the area as well as the needs of tourists who visit this areas. This paper presents component identification and analysis of complex elements that were basis for appointment " Skakavac" as protected area. Based on the research, a diagnosis of the current situation and forecasts of future development will be presented.

Key words: *problems, possibilities, diagnosis, prognosis, sustainable development, protected area, Skakavac, protection measures*

INTRODUCTORY REMARKS

Separation of protected natural areas and their sustainable management is based on a high quality natural environment. Natural environment is a totality of naturalgeographic processes and phenomena, characterized by self-preservation without human intervention. Due to its large changes caused by human activity, whose effects on the laws of wholeness and integrity are transmitted without any obstacles in all parts of our planet, rightly raises the question whether in the modern era natural environment exists in the true sense of the word. On the quality of the environment influence, ecological biotic and abiotic factors. The important role of geographical science in the study of the environment is reflected in the creation of the network of protected territories.

Geography in the broadest sense is invited to implement component and implements diagnostic monitoring with the aim of forecasting the functioning of natural geosystems and geocomplexes. Protection of primeval natural environment assumes full preservation in its original form, if possible, the typical areas of natural landscape or nature reserves, natural and national parks in the strictest sense. This conception is in some cases, no doubt,

commendable, especially when protected areas are used in scientific research of natural processes.¹

Current situation in the field of nature conservation and its sustainable management is very complicated, because every country has its own policy, so there are differences in the management of protected areas in Bosnia and Herzegovina and other European countries. Categorization of protected natural areas of the IUCN in 2003 was included in the Law on Nature Protection of the Federation of Bosnia and Herzegovina and the Republic of Serbia (FBiH 33/03). This law provided four categories of protected natural areas, namely: Protected Natural Area, National Park, Natural Monument and the Protected landscape / scenery.

GEOGRAPHICAL LOCATION AND INDICATIVE TOURIST ELEMENTS OF PROTECTED AREA SKAKAVAC

Nature Monument Skakavac is located in the central part of Bosnia and Herzegovina, in the region of Central Bosnia or Planinsko-kotlinska macro region. In terms of administration, this area is situated in the Sarajevo Canton, ie municipalities Stari Grad, Centar, Vogošća and Ilijaš and is located 12 km northeast of Sarajevo.

Natural Monument "Skakavac" is the first protected natural area in the Sarajevo Canton. According to the order of the Ministry of Spatial Planning and Environmental Protection (Ministarstva prostornog uređenja i zaštite okoliša), on the basis of the research from two studies: "Valorisation of natural values of the area Skakavac", in February 2001, which was created by the Centre for Ecology and Natural Resources Faculty of Sciences, University of Sarajevo and "Separat protection of the wider scope of Skakavac", completed in June 2001 by the Institute for Protection of Cultural - historical and Natural Heritage of Sarajevo Canton (Zavoda za zaštitu kulturno – historijskog i prirodnog naslijeđa Kantona Sarajevo).

These studies were the basis for the adoption of the Decision designating the wider area of Skakavac waterfall nature monument, which covers an area of 1430.7 hectares. Decision established limits and categories of protected areas, protection zones, permitted intervention in the protected area, use of natural assets and its management in order to protect specific natural features of the protected area.

Management of protected areas at the proposal of the Ministry of Spatial Planning and Environmental Protection (Ministarstva prostornog uređenja i zaštite okoliša), was entrusted to the KJKP "Sarajevo - šume" ie. specially-formed organizational unit "Department of Ecology and management of special purpose" (Sektoru za ekologiju i upravljanje područjima posebne namjene), until the founding of JU "„Zaštićena prirodna područja Kantona Sarajevo“".

Protected area Skakavac has natural and anthropogenic tourist motives, which is very attractive to meet tourist needs. The main natural value of nature monument "Skakavac", is waterfall Skakavac, monument of hydrological value from 1954, when the waterfall area of 4 ha was protected by a special act of the Zemaljska vlada of SR BiH.

¹ Spahić, M., 2011: Geografsko i geokološko obrazovanje u funkciji turističkog, regionalnog i prostorno-razvojnog planiranja, u: Međunarodni naučni skup: Edukacija iz turizma i zaštite životne sredine kao preduvjet turističkog, regionalnog i prostornog planiranja: Zbornik radova (ur. Spahić, M.), Konjic 30.06.-01.07.2011., Prirodno-matematički fakultet Sarajevo, Sarajevo, 61-74.

Waterfall Skakavac is located in the nucleus of the protected area on the left side of Perački stream, and with height of 98 meters is among the highest in Bosnia and Herzegovina. Special aesthetic value of this waterfall are limestones shaped like terraces over which water stream Skakavac flows, and plunge into the abyss at the bottom of the area where it continues to flow towards Perački stream. Because of the water collapse or „jump“ over high rocky cliff, stream and waterfall, were called Skakavac (Grasshopper).

In the protected area Skakva spruce-fir and beech-fir forests dominate. On a shallow carbonate surface near the waterfall developed thermophilic forests and thickets of hornbeam and hornbeam and black ash. Especially interesting is the vegetation on the rocks around the waterfall, which is rich in endemic and relict species, as this area has a special phytogeographic characteristics.

Protected area "Skakavac" also features an exceptional zoogeographical diversity, represented by squirrel, roe deer, badger, hedgehog, fox, weasel, rabbit, wild boar, buck and many insects, butterflies and etc. Zoogeographical diversity contributes to the aesthetic value of this area, and has a great importance for the development of photo safari

Geomorphological phenomena, gorges of Peračko Vrelo and Babin Potok, Sušice, Stublinskog and Jasikovačkog stream, then Crvene Stijene, Vranjska Stijena and Uževice with its geomorphological phenomena and specific already mentioned endemic vegetation, contribute to the attractiveness of the area. In the extreme south is the mountain elevation Bukovik, with its highest peak of 1534 m, which is also the highest peak in the area of naturae monument Skakavac.

Of anthropogenic tourist values in this protected area, the main focus attract tombstones called stećci and events. According to the data of Ministry of Physical Planning and Environmental Protection in Babin Potok, on the site of Podgradina the necropolis of fifty tombstones that was until recently unknown and difficult to access, but the site was cleaned by the manager and arranged during 2009. The tombstones

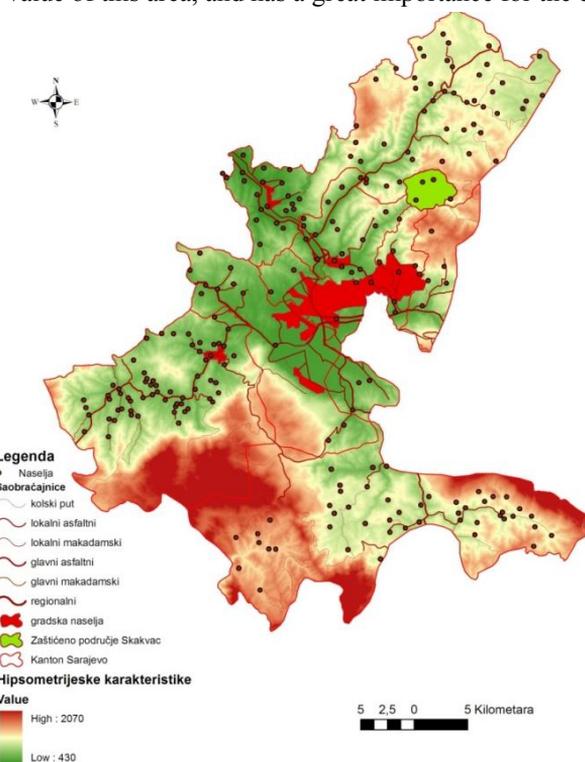


Fig. 1. The geographical position of protected area Skakavac

are arranged in irregular rows, and at about eight of them specific symbolic motif are engraved.

On the same site is cleaned and marked site "Svatovsko groblje" with thirteen tombstones transitional style of the late 15th and early 16th century, which is a valuable element of the cultural heritage of this area. The problems that contribute to less tourist

value of these sites, are bad tracing and marking hiking trails, which will allow tourists to visit with or without guide.

In addition to the material legacy, significant anthropogenic motives of visiting tourists in this area are the result of designing and connecting with natural attractions, manifestational forms of tourist movements, and the most remarkable are bike races, climbing and jumping.

Cycling Track XC Bukovik is held every year in August since 2005 and attracts an increasing number of participants from all over Bosnia and Herzegovina. As the name says, the race takes place from the area Bukovik and participation at this competition have licensed and unlicensed cyclists.

In the spring season, every year the "Mountain march" is held, and the area of natural monument "Skakavac", is visited by mountaineers from mountaineering societies throughout Bosnia and Herzegovina. The main objective of this event is to get together and meet hikers, exchange experience, enjoy the natural beauty, hiking in the protected area as well as surrounding areas.

From waterfalls Skakavac in 2011 was organized the first Base Jump jump in Bosnia and Herzegovina, and this way Skakavac became the new Base Jump exit point and is located on the map of World Base Jump destination. These event also marked the tenth anniversary of the proclamation of Skakavac as nature monument. The event was accompanied by numerous print and electronic media. Association "Aeroclub of modern skydiving in Bosnia and Herzegovina" in Sarajevo within the project "From Sarajevo to Europe through modern sport " organized" Base Jump "an exhibition of international jumps 2012 held at the area of natural monument "Skakavac "

LOAD CAPACITY OF PROTECTED AREA "SKAKAVAC"

The main preventive measure to protect the environment from the negative effects of tourism activities is to determine the capacity of tourist visits and activities. The methodology of estimating the load capacity of protected areas given by the IUCN (The World Conservation Union) contains different levels of capacity:

- Physical carrying capacity (PCC) - defined as the maximum number of visitors who are physically able to stay in a certain place, at the same time;
- Real carrying capacity (RCC) - defines the maximum number of visits to a particular area, after the physical carrying capacity is reduced;
- Effective carrying capacity (ECC) - defines the maximum number of visitors to a particular area given the available capacities of management (Management capacity MC).²

Physical carrying capacity (PCC)

Due to the lack of data needed to calculate the real and the effective carrying capacity, for the purposes of this study were calculated values of the physical carrying capacity for

² Caballons-Lascrain, H., 1996: Tourism, ecotourism and protected areas, IV World Congress and National parks and Protected areas, IUCN.

specific areas within the Nature Monument "Skakavac". This calculate of capacity is needed because the entire protected area is not equally accessed by visitors / tourists. Physical carrying capacity is calculated according to the following formula:

$$PCC=A \times V/a \times Rf$$

A - available area for public use

V/A - one visitor per m²

Rf - rotation factor (number of visitors per day)

Based on the criteria for the area with the most active tourist visits, according to the formula physical parameters of carrying capacity for the area were calculated:

- PCC bottom of the waterfall "Skakavac" with 1602 visits a day;
- PCC Paths (Uževce-Ravna Skakavac) with 800.4 visits per day;
- PCC forest trails (Uževce-bottom of the waterfall grasshopper) with 1400 visits a day;
- PCC routes (Mountain Lodge Bukovik- Dolovi-bottom of the waterfall Skakavac) with 1000 visits a day;
- PCC area Bukovik with 11,375 visits a day;

According to the WTO data, maximum number of visitors have been suggested. For excursion areas of low density of vegetation, the daily number of visitors / ha ranges from 60-200 visitors. On this basis, it can be said that the daily carrying capacity of areas Bukovik, suitable for a visit and movement of tourists on average 130 visitors / ha and 11 375 visitors on 87.5 ha.

ANALYSIS OF THE EXISTING INFRASTRUCTURE IN PROTECTED AREA SKAKAVAC

Decision on declaring the wider area of the waterfall "Skakavac" nature monument and orientation of subsequently performed expertise of individual development-planning authorities, were the basis for the projection of spatial development in the definition of land use of observed area. Its purpose is exclusively oriented to tourism. The development of tourism is heavily influenced by the development of traffic, but on the other hand is in the function of traffic. Traffic infrastructure that allows tourists coming to this protected area is poorly developed. Entry into the protected area Skakavac is possible is from the west, from the village Nahorevo, Gornjih Močioca from the south side, Vučje Luke in the east and Motike at north. Existing communication in the border of the protected area can be classified into the category of forest roads with the gravel or clay finish, which provide conditions for hiking, mountain biking and various kinds of extreme sports, and spending time in nature, relaxation and recreation. Although external transport links is characterized by poor transport infrastructure, favorable traffic-geographical position of protected areas Skakavac makes this area visited. In order to improve the state of the area and the development of tourism several forest paths were arranged, of which the most significant are: an educational trail, on which the wooden boards presented some of valorised value of this area, woodland trails, decorated in a length of 2000 m, with the benches for a short break, road signs and billboards with educational content that adequately allows for different age groups to enter the world of forest communities, and walking routes, which start from the site Uževce and from here the track length of 4000 m, ends in the bottom of Skakavac waterfall.

For the purpose of tourist visits under the waterfall was created wooden footbridge. At the bottom of the waterfalls down a steep slope were built steps with handrail leading to the natural enlargement as a platform from which it is possible to better observe and photograph waterfall. Also, a trail that stretches from the bottom of the waterfall to the top of the rock from which the waterfall and falls down was arranged. Within the areaforms of social infrastructure are represented in a very limited, specific form of capacity and fully adapted to the character and needs of the space as an object of natural heritage.

MONITORING OF PROTECTED AREA SKAKAVAC AND GEOECOLOGICAL PROBLEMS

Natural Monument "Skakavac" is located in four municipalities, but due to its geographical position represents an object of nature, which is very demanding for the monitoring and conservation in terms of stopping illegal logging forests, fires, poaching, illegal construction, prohibiting harvesting of plants and other actions that can cause geo-ecological imbalance. Due to increased tourist visits, this area is exposed to various geo-ecological problems, of which the fire of 2011. caused endangerment and destruction of large amounts of great healing and aromatic herbs. For this purpose, fire protection facilities, as follows were made: fire protection checkpoint equipped with adequate facilities provided for the initial fire possibly resulting fire and fire observation tower - watchtower from which control is taken by the fire observers, trained and educated for the prevention and localization of the same.³

In order to protect the forest from unwanted biotic factors Department of Forest Conservation Faculty of Forestry, University of Sarajevo, regularly inspects the health status of existing forests, on the basis of which, with constant monitoring of employees, decisions on measures that link their increasing stability will be made. In order to protect forests from harmful attacks of forest insects is carried out, in addition to the aforementioned, and constant control of the height of their population-level, which is controlled by the use of bio-traps with pheromone lures. In the framework of the establishment of hygiene around the area, removal of organic material favorable for reproduction and development of bark beetles was removed, in order to prevent their strong attack and possible damage that this variety could cause to this area.⁴

One of the aims of preserving the existing fauna estimates of population and abundance of wildlifewere carried out, and given suggestions of breeding and protection measures to be applied in this area. After a long period of observation and determined movement of some species, certain measures like breeding, construction of the required number of feeding stations, salt licks, water holes, as well as the construction of high watchtower that interested individuals and small groups used for the purpose of observing wildlife and practicing photosafari were undertaken. By field observations movement of deers, hares, wild boars, foxes, wild hens, wolves and bears was detected. According to traces in this area there are 4-5 bears which represents a number that could be a problem in the development of eco - tourism potential and safety of visitors.⁵

³ <http://skupstina.ks.gov.ba/node/3445>

⁴ <http://skupstina.ks.gov.ba/node/3445>

⁵ <http://skupstina.ks.gov.ba/node/3445>

Protected area "Skakavac" is characterized by clean air and water, although there is no monitoring of these two geocomplexes, except state of fish stocks and their protection against unauthorized fishing. One of present geoecological problem is illegal construction within the protected area, where regardless of the inspection warnings and "closing" the site continues with the construction.

Despite the monitoring of ecosystems and prevention of unauthorized activities that disrupt the ecosystem, in this area are present indications of negative anthropogenic activities. Over 50% of the protected area falls under the second category of the ecosystem i.e., most of the area is under moderate human influence, where the negative consequences of the same disadvantages reflect the changes in the structure and dynamics of abiotic components, especially soil and microclimate conditions, which all together does not affect the stability of ecosystems.

ENVIRONMENTAL POLICY AND PLANNING OF TOURISM DEVELOPMENT IN PROTECTED AREA SKAKAVAC

Environmental policy is one of the most important and far-reaching policies, and is based on the precautionary principle and preventive actions. Since the establishment, European Union adopted a total of six environmental action programs and more than 700 acts of environmental legislation. The environmental policy of the European Union, for local and regional authorities is an important effective environmental regulation and promotion of sustainable development. Environmental policy cannot be left to the market. Preparation of legislation, relating to the protection of the environment should be continued in the European Union, with greater attention to the particular conditions in the municipalities and regions of its alliance. In addition, it is necessary to provide space for a variety of ways to achieve mutually agreed goals. Municipalities have an impact on the environment in various ways. They provide the prerequisites for the overall development of the municipality through industrial policy, land use policy, as well as through programs of sustainable development.⁶

The European Union has set the ambitious goal of halting the loss of biodiversity in Europe. For this purpose, a network of protected areas, which has a strategic focus of improving the natural environment and improving the quality of life of people. One of the instruments of the European Union's is "green infrastructure" national control policy, which is primarily related to sustainable development in agriculture, forestry, water management, biodiversity, energy development, health and spatial planning. By investing in "green infrastructure" instrument of spatial planning and environmental policy, individual regions, can offer multiple benefits, only if their geosystems and ecosystems are healthy. Their diversity contributes to their vitality, economic importance and the elimination of environmental disasters. One of the key benefits of the establishment of such an instrument is its ability that at the same time, same area has several functions. Unlike most "gray" infrastructure that have only one goal, "green" infrastructure is a multi-purpose, which means that with low losses substantial benefits for the wider area, implementing this spatial planning oriented instrument can be achieved.

⁶ Evropska Unija vodič za lokalne zajednice u BiH prvo izdanje, (2008): SNV, Holandska organizacija za razvoj, Sarajevo.

Modern way of living, migrations in the Sarajevo Canton, led to loss of space and increased competition for space, by which natural ecosystems are damaged, which contributes to the reduction of biodiversity but also reduces the benefits of living. By using the instrument of green infrastructure the possibility of integral management of natural capital is created, maintaining healthy ecosystems, linking natural and semi-fragmented areas and reinstatement of damaged ecosystems. By using these instruments, creates economic benefits through the possibility of creating new jobs, in the planning, engineering and construction as well as in the restoration and maintenance of urban and rural ecosystems are created.

Green infrastructure is made up of a wide range of different possibilities of environmental protection, which can be performed at different levels. It is noteworthy that all the green areas are not a green infrastructure, which should in spite of high quality of biodiversity have multifunctional land use. In other words, individual components can be part of the green infrastructure, but will be valued if they are an integral part of the larger ecosystem. Undoubtedly protected natural area Skakavac represents part of the green infrastructure of the Sarajevo Canton. However this ecological system is a dynamic living structure, which claims to respect the maximum capacity of its use, in order to remain resistant to change.

One of the key most effective ways of building a green infrastructure in spatial planning, by which are divided the multifunctional zone of land for different needs, on the basis of which decisions are made on the priorities of space use in a transparent, integrated and cooperative way. Strategic spatial planning contributes to finding the best locations for the implementation of projects to improve habitats, which include the restoration or creation of new habitats, which helps connect healthy ecosystems, improve the state of the landscape and increase-bonding of protected areas. The implementation of such measures supported by adequate strategic planning contributed to the maintenance, deepening and improving the network of green spaces in the Sarajevo Canton, which would all collectively improve the quality of life in the wider regional area.

In the protected area Skakavac formation of tourism offer and significant tourism development cannot be achieved without improving the infrastructure, which will be in accordance with the environmental policy development. In order to develop sustainable tourism in this area is necessary to develop the tourism plan, which should be in accordance with the carrying capacity of the area. This document requires integration with other plans for the protected areas, such as management plan of flora and fauna, a risk management plan in the fire situation and etc. All this should take place with a view to specific tourism management practices, distribution of tourist activity facilities, policies to guide tourism rations, pricing policy and etc.

Da bi se u procesu donošenja odluka osiguralo sudjelovanje svake interesne grupe u skladu s njenim specifičnim znanjima, nužno je definisati program uključivanja javnosti, koji može biti veoma opsežan ili skroman, u ovisnosti o potrebama. Ovim pristupom bi bili eliminisani konflikti koji nastaju između različitih interesnih grupa.

Natural Monument Skakavac need a plan that will define the management of tourism development and, with it, the related activities. Such plan should detail the specific aims and objectives for tourism development, and specify the management activities, budget, financing areas, etc., all in order to achieve planned goals of development. Management Plan for tourism in protected areas is aimed at maximizing the benefits of tourism while

minimizing its costs. In designing the planning process it is important to adopt an easily understandable enacting a consistent and rational decisions development. It is particularly important that the process includes, not only protected area managers, but also the local community, public, visitors, private entrepreneurs and experts in various fields. To ensure the participation in the decision-making process of each stakeholder in accordance with its specific knowledge, it is necessary to define a public involvement program, which may be comprehensive or modest, depending on needs. With this approach conflicts that arise between different interest groups would be eliminated.

CONCLUSION

Comparative advantages of protected area " Skakvac " are its favorable natural conditions, high quality natural attractions and quality environment. The existence of cultural and historic resources and organization of outdoor sport activities combined with natural base completes tourist facilities. An important role in the development of tourism plays a favorable traffic and geographical position , ie the complementarity of protected areas with other natural and anthropogenic tourist values within the Sarajevo Canton. According to the presented facts, it can be concluded that within the protected area Skakvac exist ecotourism potential, but insufficiently valorized. Based on the fact that in this region, despite the existence of rich natural and social basis, it can be concluded that necessary facilities for the reception of tourists are organized only to certain level.

A significant development problem of protected area "Skakvac" is a poor implementation of the spatial plan for special purposes, which would make opportunities to complement the content intended for rest and recreation. Poor planning and implementation of plans also contributes the lack of statistical data on the number of visits, and the lack of cooperation between the manager of a protected area with hiking clubs travel agencies and other mediating factors of tourist offer in order to increase tourist visits.

The underdevelopment of transport infrastructure, lack of adequate parking space, info-points, poor markings courts, an insufficient number of holiday checkpoints, lack of maintenance and poor markings of hiking and biking trails are just some of the problems that contribute to poor tourism development. In addition, the lack of financial investment in the development of tourism and the negative migration activities contribute to unsustainable state, which planning documents originally predicted .

In order to assure that this protected area has its full meaning is necessary, first of all, to increase the number of tourist arrivals with quality tourist promotion. In addition, it is necessary to encourage the return of resident population, by creating new work places in rural areas, primarily on the development of tourist souvenirs, rural tourism development, manufacture and marketing of agricultural products, etc. Based on presented informations, it can be concluded that the design and implementation of a comprehensive master plan that would include the development plan, plan of spatial usage, carrying capacity, plan for sustainable tourism development, is the possibility of complete tourist development of protected natural area "Skakavac" .

Changes in fundamental opposition attitudes of tourism and economic development, rural and regional development are based on green infrastructure initiative. Spatial planning would define multifunctional zones in meeting a variety of needs. Green infrastructure would become the standard of territorial development of protected area "Skakavac". In addition, it would trigger innovative and sustainable solutions that would contribute to better

social, economic and territorial cohesion, and creating new opportunities for sustainable regional development .

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