Scientific Annals, School of Geology, Aristotle University of Thessaloniki Proceedings of the XIX CBGA Congress, Thessaloniki, Greece	Special volume 100	467-472	Thessaloniki 2010

THE MANAGEMENT OF A SUSTAINABLE TOURISTIC ACTIVITY AT THE LACU-ROŞU TOURISTIC RESORT – WITHIN THE "BICAZ GORGE– HĂŞMASUL MARE" NATIONAL PARK

Dombay Şt., Magyari-Sáska Zs. and Seer M.

Babeş-Bolyai University, Faculty of Geography, Gheorgheni University Extension, Str. Grădina Csiky Nr. 53, 535500 Gheorgheni, jud. Harghita, Romania, dombay.istvan@gmail.com, zsmagyari@gmail.com, seermihaly@yahoo.com

Abstract: The "Bicaz Gorge – Hăşmaşul Mare" Natural Park belongs to the Central Group of the Eastern Carpathians, it is located in the Hăşmaşul Mare Mountains. Due to its natural characteristics, geological, biological, zoological, components, these 2128 ha, in 1980, then in 1995, were denounced as Natural Reservation by the County Council. In 2000, under the 5th law, 3rd paragraph, of National Territorial Planning and Administration, the 6575 ha, of The "Bicaz Gorge – Hăşmaşul Mare" region was declared a Natural Park, altogether with the Lacu Rosu Lake Tourism Resort. In the management of the "Bicaz Gorge – Hăşmaşul Mare" Natural Park we should consider three points of criteria: the management of the inland, the management of border areas (buffer areas), the management of the surrounding settlements, around the national park.

Keywords: Natural Park, sustainable tourism, Lacu-Roşu, SWOT analysis

1. Approaching Lacu-Roşu

The tourist resort, is situated 35 km from the town of Bicaz and 25 km distance from the town of Gheorgheni, over the Pângărați pass (1254 m), that is part of the national road 12C, that connects Transylvania to Moldavia.

Jurisdictionally belongs to the town of Gheorgheni. The appearing and development of the resort is closely linked to this town. Gheorgheni was first mentioned in 1332 in a papal census. Its development through time is closely related to the development of the sekler society's development. Its harsh and cruel history (social ranking – horsemen, footman, serfhood – the Mongol invasions, plague, Austrian dominance, the 1848 revolution, the first and second World Wars, the slow evolution of capitalism, centralization of power, socialist economy, the disappointments that fallowed the 1989 changes and the not so favorable climate) led to the closing in of the population, that became weary, suspicious and held back.

The 25,000 people, who live in Gheorgheni, are in majority Hungarians, and the town is the biggest one in the Gheorgheni basin, and an important starting point to numerous touristic attractions (Borsec, Praid, Sovata, Lacu-Roşu Lake, Miercurea Ciuc).

On the eastern side of the city, near the road that leads to the Lacu-Roşu Lake, lies the 77m long, 33m wide, elliptical shaped Both Castle, which was built at the end of the 15th century and the beginning of the 16th century, and its tale has to do with Rákóczi Ferenc the 2nd's revolution. Further up the Belchia creeks valley, near the 4th Km, another cheek enters the main stream, where a fine tourist resort was established, where wooden cabins and huts, a motel, ski slopes for beginners, a lake measuring half a hectare awaits the adventurers. At the 5 Km mark there was established the finest and best established ski slope of the region, with ski lift in the lower part of the course.

Further upstream at km 6 and 7 two more creeks join the Belchia, the Cerbul spring (5+800m), and the Cianod brook (6+600m) and the water collector of the town is located. After this the main brook heads north.

The next important stop is located at Km 9, where a fine restaurant is located at the juncture of the Moghioroş brook with the Belchia brook, from here the road ascends 300m, in just 15 km, to the

Pângărați pass (1257m), located under the Pângărați peak, from where one can have an outstanding panorama over the whole valley and mountain range.

The Pângărați Peak is an important point, from here marked trail (red stripe) leads to the Călimani mountains, fallowing the main crest of the Giurgeului Mountains. The trail marked with a blue stripe leads the adventurers to the Ceahlău Reservation. The red stripe that heads south west, fallows the main crest of the Hăşmaş Mountains and leads to the Ciuc Mountains.

Descending from the Pângărați pass, we travel near pine forests, and beautiful brooks, on some of these were constructed alluvium stopping dams, and finally as we reach Km 21 we have the first glimpse of the Lacu-Roşu Lake, and in the background we see the Suhardul Mic.

One of the Hungarian travelers, Orbán Balázs, in its book: "A Székelyföld leírása" (the description of Sekler country) relates that the view that greats any tourist is as catching as any unforgettable view of the Swiss Alps, or north Italy's landscapes, not as big, but remarkably beautiful and breathtaking (Fig. 1).

Fig 1. Weekend houses at Red Lake.

The road passing the Oii brook arrives on the right side of the lake, fallows the shoreline of the lake till we reach Km 25, where we will find the boat renting small harbor.

The trail that fallows the Oii brooks valley, leads to the Poiana Albă Peak, from where the tourists can reach the main crest of the Hăşmaş Mountains, that leads to the mountain cabin at the Piatra Singuratică (Lonley) Peak, on the trail marked with a red stripe.

2. The origin of the lake

Though the lake is relatively young, its origins are still disputed. In the time of its formation no commercial roads led through its valleys, it was difficult to reach it, a document mentions it in 1835, from the town of Bicaz (Dombay, 1998).

Geologist, Bányai János, argues the year 1837, Herbich Ferenc argues 1838 for the formation year of the lake, when an earthquake was noted in January, 1838, that was repeated in February. Maybe this contributed to the landslide that means the origin of the lake. The arguments about the year 1837, talk about the heavy rains and storms in 1837, mentioned by Puskás Ferenc from Ditrău, in its work: "Borszék Története" (History of Borsec Spa).

There are several examples of lakes formed behind massive landslides, is the natural dams are consisted of porous weak materials, the life of the formed lakes is little, they are formed rapidly, and just as they appear they disappear. The Lacu-Roşu Lake has is in a more fortunate situation, its dam is still strong in spite of the harsh meteorological conditions, holding back the water behind it.

Even now we can notice the landmass blocking the valley of the Bicaz River, at the foot of the Suhardul Mare Mountain (Fig. 2).

Fig 2. Suhardul Mare Mountain.

3. How did it get its name?

Some writers noted the lake as "Lacu-Roşu" meaning Red Lake, the name appearing in the works of Károly Benkő (1853), Ferenc Herbich (1866), but the last author in 1878 names it: "Lacul Ucigaş" meaning "Killer lake". Orbán Balázs is the one who uses the name *Killer Lake* more frequently, and due to him it became so well spread in com-

mon knowledge. Probably it got its name from the Ghilcoş Mountain, (Killer Mountain), its name-origin is much older, mentioned as part of the Lázár Family's estate, in 1773.

4. The legend of the lake

Orbán Balázs (1871) does not mention in its work the origin of the lake, this matter is firstly presented by Nándor Urmánczy, in 1895, according to him an old sekler fisherman told him the story about the lakes origin.

A villain living in the Suhardul Mare cave, kidnapped the beautiful Ferenc Anikó, the girl cried so much that the walls of the cave opened and the spirit of the mountain took the girl into its depths, the villain became very angry and with its club rammed the wall of the cave so hard that the whole mountain collapsed. The legend has a couple of variants, known in the common knowledge now.

5. The lakes position and limits

The longer branch of the lake, formed behind the natural barrier is north oriented, the shorter branch is east-west oriented. At its beginning the lake's longer branch reached as far back as Veresszakál massif, of the Luhaşul Mountain. Nowadays the southern part of the lake the Oii-Lacu-Roşu-Licas brooks confluence forms, which are well sedimented and swampy. In the east the slopes of the Ghilcoş Mountain (1384m), in the west the Licaş corner foothills border the lake.

6. The dimensions of the lake

The original dimensions of the lake are presently uncertain, Ferenc Herbich tried to measure the lake, but he warns the readers about the inaccuracy of his measurements in 1859. His measurements were noted and recalculated (750 fathoms long <750*1.83m>, 120 fathoms wide <120*1.83m>, its surface 56*0.57 hectares). By the 1864 census, the surface of the lake is noted as being 36*0.57 hectares. The depth of the lake wasn't measured just estimated by the height of the tree trunks that emerge from the water, having figures between 15-40 m.

Accurate measurements were done by Ion Pişotă and A. Năstase in 1955, and since 1966, these are the figures on which all calculations rely on. The scientifically done measurement's only defect is that the resulted geometrical form after the measurements didn't correspond with the pictures drawn about the shores of the lake.

Since then the figures and area of the lake is constantly changing, and this requires periodical renewing of the existing database.

In 2002 professor Pándi and crew from the University of Babeş Bolyai, Faculty of Geography, remeasured the lake, the Oii Brook branch measures 900 m, average width 134 m. The Suhard brook branch of the lake measures 438 m long, width 62 m, maximum with 83m. The lakes surface measures 116532 m^2, its volume 643704 m^3, its perimeter 3044 m, its maximal depth 9.63 m close to the outflow (Pándi and Magyari, 2003).

The lake extends in two directions, southwards (on Oii brook) and westwards (on Suhard brook). Its shape is close to a boot or a letter L (Fig. 3).

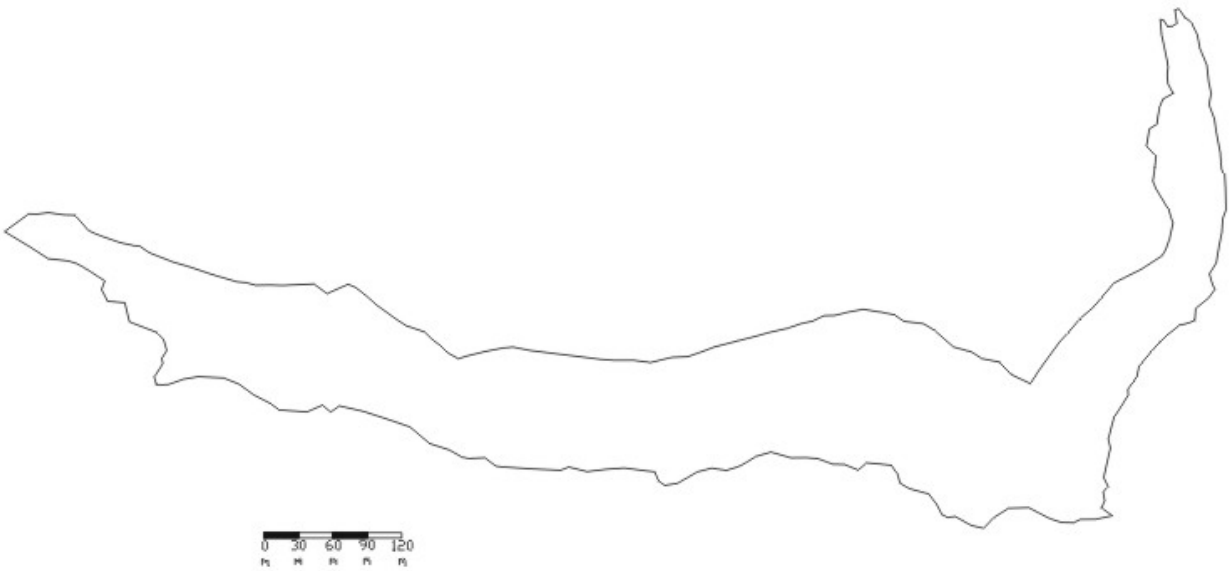

Fig 3. The actual shape of Lacu-Roşu.

The slide that blocked the valley of these brooks, the trees in the lower part of the slopes were covered by the lake's waters, and are still standing in the lake, as remnants of the old forests that existed there. The water, that exits the lake, is the spring of the Bicaz River (Fig. 4).

Fig 4. The Bicaz brook.

The lake is supplied by four major brooks: Oii, Suhard, Piatra Roşie and Licaş, a smaller one: Ghilcoş Brook, and 13 temporary watercourses.

In rainy seasons the watercolor is reddish, brownish, in dry seasons is light green and transparent.

7. The extinction of the lake

From extinction the lake can be saved for a while but not for good. In the beginning just after its birth the lake lost some of its water because of the barriers constitution, the upper, less resistant and soluble soil was first diluted and transported, then the remaining rock formations were segmented and cut through. When the level of the lake reached the less soluble and hard rocks of the barrier, its decrease diminished, and by this the only extinction factor that remained is the siltation of the lake (Ciangă, 1997).

All the affluent bring a lot of alluvium, that is deposited at their entrance in the lake, factor enforced by the tree cuttings and logging done in the area.

The most dangerous brook is the Oii, but the other 3 major brooks contribute to this phenomenon. Initially all 4 entered individually the lake, but now, the Ghilcoş brook enters the Oii, and the Roşu Brook after joining with the Licaş brook also end up in the Oii brook. So alluvium catching artificial dams were made to slow down the siltation of the lake. On the Ghilcos brook a barrier was made in 1913, on the Piatra Roşie and Oii brooks dams were made in 1954, but the one on the Oii was destroyed in 1975 and on the Suhard one wasn't built so far.

Another factor that leads to the slow extinction of the lake is the extension of the back vegetation. Some shallow areas, are covered by Potamogeton natans. In swampy areas plants like Sparganium erectum, Glyceria, Equisetum fluviatile, Poa trivialis and Ranunculus repens find home.

To the extension of the vegetation the logs that become loose from the bottom of the lake contribute largely. On these logs after a while other plants raise roots, contributing to the view of the area but destroying it in the same time as well. So human intervention just delays these processes, but it can not stop them.

On the other hand, the industrial activities contribute for quite some while to the degradation of the lake (Roşu, 1980). Since 1895, when the first mill, and barracks for the workers were built on the southern part of the lake, and the first pub and store was established, a lot of sawdust and other leftovers got into the lake, and by the building of the roads that lead through the gorge today, after the explosions all the materials were washed into the lake.

The originality and charm of the lake is affected by the choked forest's disappearance. Limestone is deposited on the tree trunks, algae and other dissolved minerals cover the trees, after a while changing their balance, they detach and then float on the surface, drifting to the entrances of the brooks, where they get stuck in the shallows. And some boating tourists contribute to this as well, to enlarge the visitable areas (Dombay, 2002).

Otto Herman in 1871 writes about the flooded forests death: the pine trees struggled with the new, unnatural conditions, but eventually died. Slowly the needles fell off the branches, the bark of the trees fell off, and the elements of the nature whitened out the remaining trunks. They look like skeleton arms rose to the skies asking for an answer (Fig. 5).

By the development of tourism a great amount of trash landed in the vicinity of the lake (plastic, glass, paper, domestic garbage, rubber, metals, etc.).


Fig 5. The Red Lake.

8. The natural values of the lake and surrounding area

The forces of nature formed a breathtaking landscape here in the Hăşmaş Mountains, presenting a varied relief (Tab. 1), with narrow corridors and steep walls, dolinas, underground water systems, caves, uvalas, rock slides, etc. the classification of the caves (Ciangă, 2001):

- Licaş cave (gully hole): its entrance on the top on the Licaş Peak (1675m), thought bottomless, formed is limestone vertically, its depth 51 m, from its 8 m wide entrance the gully hole is 37.5 m deep, where a permanent ice and snow formation can be found.
- The Piatra Vitoş tectonic cave (1609), in the eastern part of the limestone mountains, formed by three caves having tens of m in depth.
- The caves along the Bicaz river, numerous, more then 51, the most significant one is the Ghiocelul (Snow flower) cave, measuring 28 m in length, 26 m wide, discovered in 1973. Initially it was full of stalactites, stalagmites and pillars, but till it was made reservation it was destroyed.

After the last glacial age this area was and is a resting point in the path of the migrating flocks of birds.

9. Protected plants and wildlife

Plants: edelweiss, yew tree, globe flower, thyme, Romer grass, primrose, etc.

Animals: lynx, chamois, brown bear, muscardine, weasel.

Birds: crow, black woodpecker, tichodroma.

10. SWOT analysis

Strong points:
- lies near a main national road;
- rare and protected natural resources:
  - numerous relief formations in limestone: Suhardul Mic, Cupaş, Şugău cave;
  - unique natural resource: Romania's only naturally formed barrier lake;
  - a healthy climate, long lasting snow (till april);
  - rich and protected wildlife;
  - rich in birdlife;
  - specific mountain vegetation, rare, endemic plants, area suitable for multiple purpose forms of tourism:
    - resting tourism;
    - adventure tourism;
    - climbing tourism on the 47 acknowledged and marked trails;
    - winter sport tourism;
    - speotourism;
    - hunting parties;
    - fishing;
    - ecotourism;
    - transition tourism.

Weak points:
- concerning the general infrastructure and equipments:
  - the bad condition of the roads;
  - the absence or the aging of the existing drinking water system;
  - the absence of a filtering station;

Table 1. The "Bicaz Gorge-Hăşmaşul Mare" National Parks protected areas

Location	Area (ha)	Category	Notes
Bicaz-Hasmas national Park	6937.09	Protected area	No local administration
Licas cave	5	Speological reservation	Belongs to the National Park
Bicaz Gorge, Lacul Rosu Lake	2128	Natural reservation	
Hasmasul Mare, Piatra singuratica Peak, Fekete hagymas Mountains	800	Natural reservation	
Buffer area			Holds the refiries of the Natural Park
Transit area			Holds the agricultural and lived areas in the vecinity.

- bad street lighting;
- the absence of centralized heating;
- the bad management of waste dumping, collection and disposal.

- other needs and lack of equipment:
  - appropriate health care;
  - cultural infrastructure;
  - safe parking spaces;
  - the degradation of the majority of the housing facilities;
  - constructions raised illegally;
  - administrative problems raised in the dispute of the drawing of the county borders with the neighboring county;
  - entertainment, relaxation and recovery facilities;

The strong points and the weak points give enough information so that we can start working on a management program (Tab. 2) on efficient and sustainable touristic activities.

Table 2. A management plan for a sustainable touristic activity within the Bicaz-Hasmasul Mare Natural Park

Required steps	**Goals**
The building of a visiting center within the park	Functioning an information center.
Putting together information packages and selling them.	Harmonized advertisement.
Presenting the plant life of the N.P.	Posting the rules of personal conduct, and decreasing inappropriate behavior.
A better usage of local means of transportation.	Better, environmentally friendly means of transportation.
Improving the road conditions.	Controlling the movement of tourists.
Marking camping grounds, walking and biking trails.	Monitoring the active touristic activities.
Building appropriate housing facilities.	Improving the housing conditions.
Improving the quality of services provided: tour guides, equipment rentals.	Involving the local population in these activities.
The introduction of ecotourism.	Attracting specific groups of tourists with special interests.
Studying the behavior of the tourists.	Decreasing the negative impact of tourism upon the environment.
Interviewing with questioners.	Interviewing the tourists about their needs and comments.
Integrating the activities in a national and international system.	Establishing information points at the entering points of the N.P.
Marking the boating routes on the lake.	Protecting the flora and fauna of the lake.

References

Ciangă N., 1997. Tourism in Easter Carpathians (in Romanian), Cluj University Press, Cluj, Romania.

Ciangă N., 2001. Romania. Tourism Geography I. (in Romanian), Cluj University Press, Cluj, Romania.

Dombay Șt., 1998. The Recreation Spas in Harghita county (in Romanian with English abstract), "Dimitrie Cantemir" Ecological University, Târgu-Mures, Romania.

Dombay Șt. et all, 2002. The rehabilitation of tourism in Lacu-Roșu (in Romanian), Romanian Ministry of Tourist research, Bucharest, Romania.

Orbán B., 1871. Description of Székelyföld (in Hungarian), Tettey Nándor and co., Pest, Hungary.

Pandi G., Magyari Zs., 2003. The creation of batimetrical maps using computer. The Lacul Rosu model. (in Romanian with English abstract) Studia Universitatis "Babes-Bolyai", Geographia, XLVIII, 2, Romania.

Roșu Al., 1980. Physical Geography of Romania (in Romanian), Didactic and Pedagogical Press, Bucharest, Romania.

***, 1984. Geography of Romania. Physical Geography (in Romanian), Romanian Academic Press, Bucharest, Romania.