THE BĂILE FIGA GEOSITE (BISTRIŢA-NĂSĂUD COUNTY)
GEOMORPHO-CULTURAL ASSESSMENT AND TOURISM
VALORIZATION

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Abstract. Baile Figa is an important tourist location in Bistriţa-Nasaud County, known for its salty waters. In 2005, archaeological works in this area have brought to light numerous ancient remains from the Bronze and Iron Age relating to the exploitation and use of salt. In 2009 the City Hall of Beclean opened in Baile Figa an entertainment complex that attracts important tourist flows, given the proximity of the National Road 17 (E 58) and cities Dej, Beclean and Bistrita. In this context, this paper has proposed a geomorpho-cultural assessment of the Baile Figa geosite, to establish its attractive potential and to develop some strategies for planning, valorization and management thereof.

Key words: geosite, geomorphosite, total history, cultural tourism, geoarchaeology, salt formations, salt extraction, Baile Figa

1. Introduction


The scientific, aesthetic, ecological and cultural significance of the landscape can be exploited by tourism activities. Therefore, geomorphological concerns have focused in recent years to inventory and evaluating the geomorphosites, to develop a database to serve as support for the activities of planning, operation and management of areas with landscape potential (Panizza, M., Piacente, S., 1993, Grangirard, V., 1999, Reynard et all., 2007, Reynard, E., 2006, Pralong, J.P., 2005, Panizza, M., Piacente, S., 2008, etc.).

This paper deals with Băile Figa geosite, from Bistriţa-Năsăud County, which, by its natural and human potential, has become an important tourist location for the population of this area, within the project "Beclean-tourism city" initiated by the Beclean City Hall in 2009.
2. Methodology

For drafting the present study there was several stages as follows:
- reading bibliography about inventory and assessment of the geomorphosites;
- analysis of topographic and geological maps prepared for the Beclean-Figa area;
- conducting field research to assess and geomorphological mapping

3. Results and discussions

3.1. Location and description

The Băile Figa geosite is located in the northern part of the Transylvanian Depression, in the diapirs area, south-southeast of the Beclean city, on the county road 172, which goes to Figa village. (fig.1). This is a punctual type, represented by a depression as a natural amphitheater, carved into a hill spur, posted inside the Figa valley, where appear salt formations of Badenian-Wielician age, exploited in tourism by Leisure Complex Băile Figa.

The name of the geosite comes from the past name given by people for such surroundings of salted water and sludge from here (Chintăuan, I., 1998).

Fig.1: The Geographical position of Baile Figa geosite
The intrusive salt deposit from Baile Figa, is located on the eastern flank of anticline Figa, appreciated by the researcher at 1.6 km thickness and 1.0 km diameter, drew human attention in ancient times, proof being the remains discovered in three archaeological sites in the Salt riverbed valley, which drains the depression area (fig. 2).

Fig.2: Arcaeoological vestiges in the riverbed of Valea Sărată
This salty archaeological complex, scientifically comparable to that of Hallstatt (Austria), was investigated during three decades, by Chintăuan, I., from County Museum Bistrița-Năsăud (1977, 1986, 2005), Kavruk, V., from National Eastern Carpathians Museum Sfântu Gheorghe (2005) and Harding, A., from Exeter University of Great Britain (2005-2008). The vestiges discovered here show the early habitation of this area and contain many artifacts related to the process of obtaining salt [www.mncr.ro, Chintăuan, I., 2005].

From the chronological perspective of the three archaeological sites are found material evidence belonging to neo-Eneolithic ages, millennia VI-IV B.C. (fragments of pottery, isolated), the final phase of early Bronze Age period, 3000 years BC (traces and fragments of pottery), Middle-Bronze Age-1600-1400 B.C (wooden trough for the exploitation and mining hammer made of stone), first Iron Age-1050-950 BC (trough, mining hammer, wooden stairs, facilities for water uptake and salt), the second Iron Age-400-300 B.C. (sink input salt mine) and the nineteenth century.

3.2. Morphogenesis
The Băile Figa geosite has certain peculiarities of genesis and evolution which must be viewed in the context of modeling the diapirs from northern part of Transylvania Depression, under the control of mio-plioene tectogenesis and of the base level represented by Someșului Mare valley (Irimuș, I.A., 1998). Major events which led to drafting developments of the geosite are related of the evolution of Figa anticline, located between neighboring sinclines Rusu and Agriș (fig.3).

![Diagram of Băile Figa area](image)
After the exondation of north side of the depression area, the processes shaping from Sarmatian-Pannonian interval will build higher levels of erosion (500-550 m), which is kept like a patch near the anticline. On this surface a hydrographic network installed, tributary to the Someşul Mare, adapted to the structural pattern.

Driven by Rhodanic movements of the Pannonian, higher earlier terrain breaks up and will be perfected lower erosion level (420-460 m), by erosional processes initiated from neighboring valleys (Someşul Mare, Meles, etc.).

Wallachian tectonic movements of the early Pleistocene launched a new morphogenetic spurt, represented by frontal assault carried out by the tributary rivers of Someşul Mare on the ridge of the anticline, finalized by the curving of Figa basin in its axis.

Deepening valleys Livadia (tributary of Meles) and Râtul (tributary of the Someşul Mare) within the Figa basin during the Holocene, will be completed with deployment of hilly morphostructure Băile Figa, and encrustation of Salt Valley creek (tributary of river Livadia) within this morphostructure will lead to individualization of Băile Figa depression and to intersection of salt formations.

Fig.4: Geomorphological map of Baile Figa geosite

This basin has an oval shape in the horizontal direction, oriented North-South and amphitheater shape in the vertical direction, pointing out the modest
size: 0.7 km wide (E-W axis), 1.2 km long (N-S axis) and 75 m depth, shares between 285 m and 360 m (fig.4).

Table 1. Geomorpho-cultural assessment of the Băile Figa geosite (after Reynard, 2006, modified)

<table>
<thead>
<tr>
<th>1. Scientific value</th>
<th>Evaluation</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integrity</td>
<td>The geosite has undergone human intervention since the Bronze Age, because of salt resources. Currently operating an entertainment complex here</td>
<td>0,20</td>
</tr>
<tr>
<td>Representativeness</td>
<td>The geosite is a good example for morphogenesis of diapirs of the Transylvanian Plateau and for the capitalization of salt formation</td>
<td>0,80</td>
</tr>
<tr>
<td>Uniqueness</td>
<td>In Transylvania Plateau there are numerous diapir morphostructures, but the geosite Băile Figa is distinguished by ancient evidence of salt exploitation</td>
<td>0,80</td>
</tr>
<tr>
<td>Paleogeographic value</td>
<td>The individualization of the geosite Băile Figa is the result of complex modeling of Figa anticline</td>
<td>0,80</td>
</tr>
<tr>
<td>Educational value</td>
<td>The geosite provides information on relief evolution on diapirs, about salt formations and their impact on human communities</td>
<td>0,80</td>
</tr>
<tr>
<td>Geohistoric value</td>
<td>In this area were discovered archaeological remains of old neo-Eneolithic, Bronze Age and Iron Age, related to the presence of salt deposits</td>
<td>1,00</td>
</tr>
<tr>
<td>Global value</td>
<td>The geosite is represents for the evolution of the landforms on diapirs of Transylvania Plateau and for the study of salt formations</td>
<td>0,73</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Cultural value</th>
<th>Evaluation</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Religious importance</td>
<td>No significant religious activities</td>
<td>0,00</td>
</tr>
<tr>
<td>Historical importance</td>
<td>The geosite provides information on age and means of exploitation and utilization of salt</td>
<td>1,00</td>
</tr>
<tr>
<td>Literary and artistic</td>
<td>Is not mentioned in literary and artistic works and does not support such activities</td>
<td>0,00</td>
</tr>
<tr>
<td>Global value</td>
<td>Due to archaeological remains here the geosite Baile Figa is an undeniable proof of habitation in this area from ancient times and an important point on the map of Europe concerning the forms of salt exploitation</td>
<td>0,33</td>
</tr>
</tbody>
</table>

The frame of the basin is between 311-360 m and preserves the lower valley level (340-360 m), where the Salt Valley creek deepened. This creek has carved in the lower sector, on a length of 500 m, a gorge, whose width is 225 m at the top, 50 m from the bottom, and its depth is between 25 and 30 m.

On the bottom of the basin salt symptoms are observed as efflorescence, salt mud, springs, streams, swamps and ponds with salt water, also salt vegetation
and adjacent slopes are marked by thick flysch deposits, which indicate extensive mobilization processes during the Holocene-Nowadays period (fig.5).

3.3. The assessment of the geosite

In the course of assessment of the geosite Băile Figa there were followed geomorphological and cultural aspects, based on criteria known in the literature (Reynard, E., 2006), which were scored from 0 to 1 (Table 1).

The global value resulting from geomorpho-cultural assessment is 0.53, comparable to values recorded by other geosites in Romania or in other countries. (Comănescu, L., Dobre, R., 2009, Comănescu, L., Nedelea, A., 2010, Reynard, E., et al., 2009).

4. Tourism valorization of the Băile Figa geosite

Table 2. Economical assessment of Băile Figa geosite (after Reynard, 2006, modified)

<table>
<thead>
<tr>
<th>Economic value</th>
<th>Evaluation</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accessibility</td>
<td>Easy access on the modern roads DN 17-E58 (Dej-Beclean-Bistriţa-Vatra Dornei) DJ Beclean-Figa</td>
<td>1,00</td>
</tr>
<tr>
<td>Visibility</td>
<td>Excellent visibility upon the geosite and surrounding regions</td>
<td>1,00</td>
</tr>
<tr>
<td>Present capitalization and geomorphological interest</td>
<td>The Entertainment Complex capitalizes the salt formations and the landscape</td>
<td>1,00</td>
</tr>
<tr>
<td>Present capitalization and historic and cultural interest</td>
<td>The archaeological complex provides information on the age of the salt exploitation and on the techniques of salt extraction</td>
<td>1,00</td>
</tr>
<tr>
<td>Legal protection and utilization restrictions</td>
<td>The three archaeological sites in the Salt Valley are managed by the National Museum of Eastern Carpathians from Sfântu Gheorghe and the County Museum Bistriţa-Năsăud. Artifacts will be preserved and used here in a future museum.</td>
<td>0,50</td>
</tr>
<tr>
<td>Equipment and services</td>
<td>Spa, swimming pools with salty water and fresh water, mud pool, sports fields, playgrounds, access roads, walkways, parking lots</td>
<td>0,80</td>
</tr>
<tr>
<td>Global value</td>
<td>Through its recreational complex the natural, archaeological and therapeutic potential of Băile Figa geosite is capitalized</td>
<td>0,88</td>
</tr>
</tbody>
</table>
Based on the landscape and salt resources in this area, in 2009 there was opened The Entertainment complex Băile Figa, as part of the PHARE 2005 project “The Increasing of the SPA potential value of the salt lakes from the Northwestern Region”, proposed by the Local Council of Dej, in collaboration with the local councils Becelan and Cojocna, County Council Bistrita-Nasaud and County Council Cluj.

In this context, the geosie Băile Figa is an important regional tourist attraction, which is sustained by the proximity of National Road DN 17-E 58 (Cluj Napoca-Vatra Dornei), and cities of Dej, Beclean and Bistrita, which provides large flows of visitors (Table 2).

In the near future, Beclean City Hall intends to turn this entertainment complex into a genuine ecotourism resort. Natural therapeutic factors, represented by the salty waters and sludge Chlorosodics will be used, in the treatment of diseases of the peripheral system, musculoskeletal and female genitalia, abdominal periviscerites, chronic dermatoses, etc. (Chintăuan, 1998).

Therefore, management measures are required in the major forums that manage this geosite (Beclea City Hall, Bistriţa-Năsăud County Museum, National Museum of Eastern Carpathian), related to the operation of salted water, archaeological sites and environmental conservation.

5. Conclusions

The geosite Băile Figa Geosite is distinguished by scientific, cultural and economic dimensions, represented by the hilly landscape, sedative climate, salted water and sludge, archaeological remains related to the salt exploitation of bronze and iron age, and by the proximity of National Road DN 17-E58 and of the city of Beclean. As seen from table 3, the highest value is recorded by the economic component.

<table>
<thead>
<tr>
<th>Scientific value</th>
<th>Cultural value</th>
<th>Economic value</th>
<th>Global value</th>
</tr>
</thead>
<tbody>
<tr>
<td>0,73</td>
<td>0,33</td>
<td>0,88</td>
<td>0,64</td>
</tr>
</tbody>
</table>

Therefore, exploitation of these resources is a potential threat to the environment, which will manifest as overuse of space, which might harm the natural components and historical artifacts.
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