

# LOCAL GEOHERITAGE: ITS IMPORTANCE AND POTENTIAL FOR GEOTOURIST AND RECREATIONAL ACTIVITIES (A CASE STUDY FROM LOMNICKO AREA)

<sup>1</sup>Karel Kirchner, <sup>1</sup>Lucie Kubalíková, <sup>2</sup>Aleš Bajer

*<sup>1</sup>Institute of Geonics of the Czech Academy of Sciences, Branch Brno*

*<sup>2</sup>Department of Geology and Pedology, Faculty of Forestry and Wood Technology, Mendel University in Brno*



PUBLIC RECREATION AND LANDSCAPE PROTECTION - WITH NATURE HAND IN HAND?

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# INTRODUCTION, TERMINOLOGY

## Main goal of presentation

On the example of the Lomnicko area to present:

*with using methodological approach* of assessment area from viewpoint of the concept of geodiversity/Geoheritage to carry out *potential of study area for geotourism and recreation* on the local and regional level

## Geodiversity

is defined as “the natural range (diversity) of *geological* (rocks, minerals, fossils), *geomorphological* (landforms, topography, physical processes), *soil and hydrological* features, including their assemblages, structures, systems and contribution to landscapes” (Gray 2013).

## Geoheritage

The term geoheritage was defined as those components of natural geodiversity of *significant value to humans, including scientific research, education, aesthetics and inspiration, cultural development, and a sense of place experienced by communities* (Dixon 1996 in Dingwall 2005:14)

**Geoheritage comprises** those elements of natural geodiversity which are of *significant value to humans for non-depleting purposes* which do not decrease their intrinsic or ecological values. The import of this definition is that it implies a distinction between the *utilitarian resource* values derived from the removal, processing or manipulation of rocks, landforms and soils by means such as mining, engineering or agriculture, and the *conservation values* of rocks, landforms and soils as heritage in their natural state – Sharples 2002 p. 11.

## **Secondary geodiversity**

The natural features represent bigger part of geoheritage (both on global and local scale), *but the secondary (or man-made) geodiversity* should not be omitted as it also represents a significant resource for tourist and recreation activities (conference Public recreation and landscape protection - with nature hand in hand... 2016 - Kubalíková, Bajer, Kirchner 2016).



### **Modified definition of geoheritage:**

Slightly modified definition of the geoheritage can be presented: *components or features of primary (natural) and secondary (man-made or anthropogenic) geodiversity which are of significant value to humans, including scientific research, education, aesthetics and inspiration, cultural development, and a sense of place experienced by communities.*

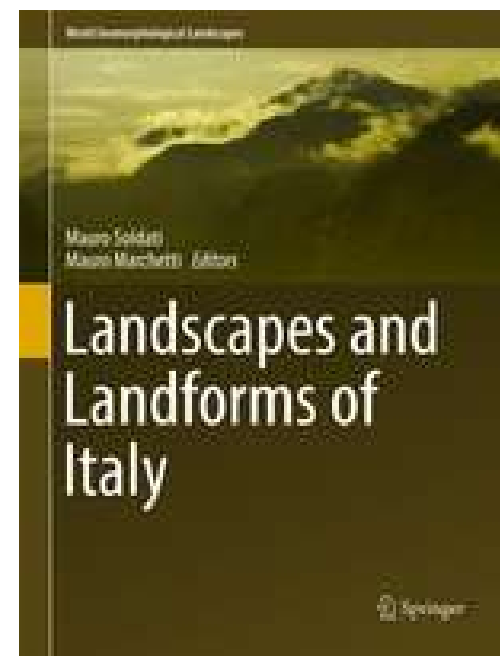
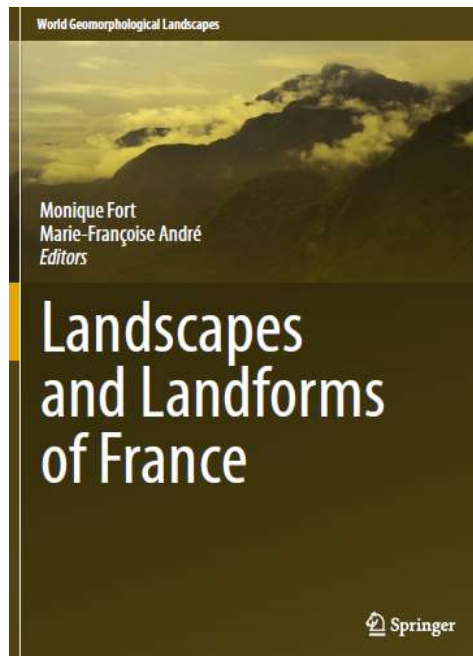
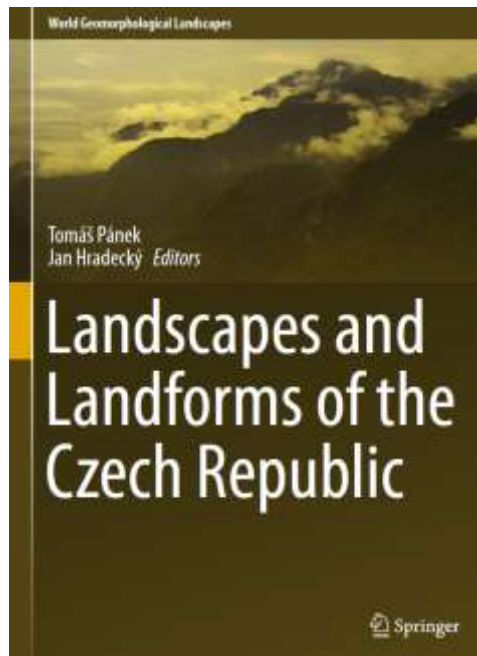
Geoheritage - is represented by particular **geosites and geomorphosites** or their systems and complexes for which can be used a term “wider landscapes” (Reynard, Panizza 2005) – that means the systems or complexes of several particular landforms.

**The geosites** - portions of the geosphere - present a particular importance for the comprehension of Earth history, geological or geomorphological objects that *have acquired a scientific, cultural/historical, aesthetic and/or social/economic value due to human perception or exploitation* (Reynard 2004 in Goudie ed. 2004:440); **geomorphosites** are the landforms to which a value can be attributed and they can be used by society as a geomorphological resource (Panizza 2001).

As for dimensions of particular examples of geoh heritage, Grandgirard (1997 in Reynard, Coratza, Regolini-Bissig 2009:16) states that *geoh heritage is visible at all scales*, from the small isolated landforms to large landscapes (Tab. 1). He provides following classification based on the number of landforms and processes - see table below:

<i>number of processes and landforms</i>	<i>specification</i>
one main process, one type of landforms	isolated landform or group of landforms („simple geosite or geomorphosite“)
one main process, several types of landforms	complex of landforms (wider landscape or complex of geosites and geomorphosites)
several main processes, several types of landforms	geomorphological system or complex (Reynard (2005) introduces the term “geomorphological landscape“)

Tab. The classification of geoh heritage based on the dimensions of particular features *source: Reynard, Coratza, Regolini-Bissig eds. (2009)*



## ***Geoheritage resources for recreational and tourist activities***

The main resource for recreational and tourist activities on the global or national level is the highest level – *geomorphological system or complex, so called geomorphological landscape* see table mentioned above

These landscapes are often the cores of the protected areas and national parks and they are traditionally exploited by tourism industry and abundantly visited.

### ***Another type of sorting***

based on the importance for particular area. It is linked with the dimension (mentioned above), but also with the knowledge and “popularity” of the site and other values (e.g. historical, economical, aesthetic or ecological aspects). From this point of view, we can sort the geoheritage into several groups:

- ***Global Geoheritage*** - represents the highest level including the UNESCO sites or Global geoparks.
- ***National Geoheritage*** - features (complex or system of features) that usually form a significant part (or core) of national parks, large protected areas, nationally protected nature monuments or national geoparks. Level of geoheritage usually corresponds with “geomorphological landscapes” or “geomorphological systems”
- ***Regional or local Geoheritage*** - usually corresponds with simple (or particular) geosites and geomorphosties and “wider landscapes” or “complex of landforms” (usually protected in the lowest category of Nature Reserve or Nature Monument or Natural Park)

# METHODOLOGICAL APPROACH TO ASSESSMENT OF LOCAL GEOHERITAGE WITH NEEDS OF RECREATIONAL PURPOSES

Features of local geoheritage are not usually so breath-taking - amazing, extensive or unique (as the geoheritage features on global and national level).

However *they have the values that are very important for the tourist and recreational purposes* (respectively for the potential visitors or users) and their possible further development. These can be:

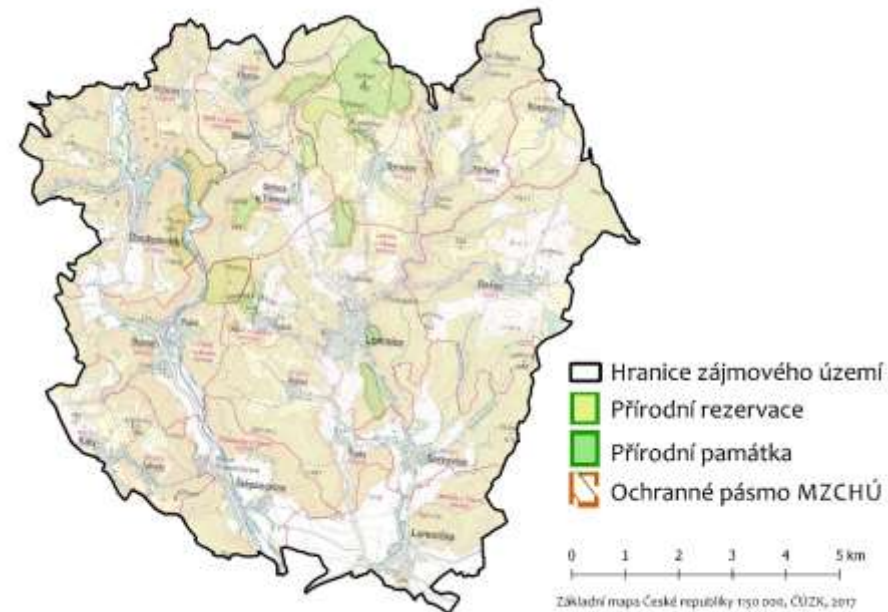
1. *scientific, conservation and educational value*
2. *added values* (e.g. ecological, historical or archaeological values, artistic values represented by local legends linked with geoheritage, aesthetic values)
3. *economic value* (accessibility, presence of tourist infrastructure or background for short-term visits, financial availability)
4. *number of visitors and knowledge/popularity of the site/area* - nice alternative for visitors that are looking for something new, original, calm and not so overcrowded by visitors
5. *stronger feel of local identity* (e. g. local products, local people and services)

## STUDY AREA

Lomnicko Area- situated 30 km northwest from Brno city. Study area lies within the wider surroundings of the metropolis and represents the recreational and touristic background of the city.



The study area is located approximately between these villages: **Osiky – Synalov – Lomnice – Veselí – Ochoz u Tišnova – Běleč – Křepťov**, some specific segments of landscape within the close surroundings are included as well.



## **Characteristic features**

The harmonic landscape with well conserved natural features.

The part of the area is legally protected within the Natural Park Svratecká Hornatina, some specific segments of abiotic and biotic nature are protected within the category of National Reserve or National Monument.

**Natural Monuments:** Horní Židovka, Sýkoř, Míchovec, Synalovské kopaniny, Dobrá studně, Klášterce, Veselský chlum, Veselská lada, Hrušín, Luzichová

**Natural Reserves:** Sokolí skála, Pod Sýkořskou myslivnou.

**Geology** - gneisses of the Bíteš group (part of the Moravicum) covered by Quaternary sediments and in some specific places, there are remnants of the marine sediments of Ottnang age





**Geomorphology** - the most significant landforms were created mainly by periglacial and cryogenic processes: tors, ridges, castle-koppies, structural ridges, block accumulations and bloc streams, nivation depressions, cryoplanation terraces, frost-riven cliffs, abri, rims, etc.

*These landforms are considered the main geoheritage feature with potential for tourist and recreational activities.*



The **anthropogenic features** of the relief are located here: especially of agricultural origin (heaps, terraces, ramparts, small walls).

The study area can be considered a “wider landscape”. The *main process* - represented by group of specific **cryogenic processes** that formed the most significant landforms. These processes *were accompanied* by **anthropogenic, slope and fluvial processes** in several parts of the area that also formed specific landforms (e.g. **anthropogenic agrarian landforms**, river or stream valleys).



The study area is rich in various cultural features - historically and architecturally valuable objects in **Lomnice town** - (Jewish cemetery, synagogue, plaque column, castle, chapel and church). **In the villages** - other sacral objects and traditional agricultural buildings, **In the landscape**, the small sacral objects are common (crosses, small chapels etc.).



## **A method for the analysis of the potential for tourism and recreational purposes**

Our assessment is not numerical, it only follows selected criteria that were set in specific methodologies. The result is **qualitative evaluation** of the touristic and recreational potential **supplemented by SWOT** analysis of the study area.

### ***Main assessment values:***

**Scientific values** (Earth-science importance and rarity/uniqueness, Diversity of particular landforms and processes, Integrity, conservation, Educational value)

**Added values** (Aesthetic, cultural, ecological value)

**Economical values** (Accessibility, Supporting services and tourist infrastructure, Promotion of the area)

<b>Scientific values</b>	
Earth-science importance and rarity/uniqueness	scientific importance – from the geological, geomorphological point of view; presence of specific features, existence of the features that are unique also on the higher level, e.g. national level
Diversity of particular landforms and processes	number of different landforms and processes within the study area
Integrity, conservation	the degree of disturbance or the damage of the landscape within the study area, risks and threats to the landscape – both anthropogenic and natural, management measures to prevent the possible damage and disturbance, existence of legal protection, proposals of legal protection, other types of protection
Educational value	visibility and comprehensibility of the landforms and processes, intelligibility to the laic public, possibility of explaining the corresponding processes
<b>Added values</b>	
Aesthetic value	viewpoints, landscape pattern and visual diversity, colours etc.
Cultural value	historical, archaeological, artistic features of the study area
Ecological value	presence of specific biological features – protected species, rare ecosystems...
<b>Economical values</b>	
Accessibility	both by public and individual transport, parking places, the access to the particular site, the "permeability" of the landscape, safety of the access
Supporting services and tourist infrastructure	accommodation, catering, local products, tourist paths and shelters, information centres
Promotion of the area	promotion on the web pages of the local communities and elsewhere, where can potential visitor obtain more information, knowledge of the area, its popularity, eventually attendance etc.

Tab.: Criteria for the assessment of geotourist and recreational potential *source: Kubalíková (2013), Kubalíková, Kirchner (2016)*

<b>Scientific values</b>	
Earth-science importance and rarity/uniqueness	The landforms of cryogenic origin are important from the palaeogeographic point of view (they help to understand the processes that formed landscape). Similar features are situated on the many places within Moravia, so the degree of rarity/uniqueness is not high. The landforms of anthropogenic origin (especially agricultural landforms) and the anthropogenic processes are important from the historical point of view as they serve an evidence of the use of the landscape in the past.
Diversity of particular landforms and processes	The study area is rich in cryogenic landforms (tors, frost cliffs, block accumulations, cryoplanation terraces...) which are the most important feature of relief there. The cryogenic processes are still in progress, however, the intensity is low (e.g. movements of blocks within the block accumulation). In the study area, the anthropogenic, slope and fluvial landforms can be found and corresponding processes can be observed.
Integrity, conservation	The current status of the study area is good and it represents a nice example of co-existing of the nature and man, respectively it shows the sustainable and regardful use of the natural resources (both in past and present). Also, the conservation of the specific landforms (especially cryogenic landforms) is adequate – it can be influenced by existing legal protection (most of these landforms are protected within the category Natural Reserve or Natural Monument) and lower recreational and tourist use of the area.
Educational value	The cryogenic landforms are well visible and if the short explanation is given (e.g. via information panels), they are also comprehensive for the public. Anthropogenic landforms and processes are also easy to understand as they are related to the common activities of humans (e.g. picking the stones from the fields and accumulating them on the agrarian heaps or ramps).
<b>Added values</b>	
Aesthetic value	Within the study area, there are a lot of viewpoints to the open landscape. The landscape pattern is quite diverse (small pieces of fields, forests, little villages...), so the study area is quite attractive from this point of view.
Cultural value	Probably the most important cultural features are concentrated in the Lomnice municipality (Jewish cemetery, synagogue, Catholic church and chapel). There are numerous small sacral objects both in the villages (chapels) and in the open landscape (wayside crosses). Also, there are some old agricultural buildings and other objects of folk architecture. These issues (e.g. buildings or walls built of local stone) represent a significant part of geoheritage too and they enables to see the historical, architectonic and cultural features in the context of using the natural resources. There is also a specific artistic feature: the pathway of Jára Cimman which is attractive for the theatre-lovers and admirers of this unappreciated Czech genius.
Ecological value	Most of the landscape segments which are legally protected are home to the specific and rare species, so the ecological value of the study area is quite high.
<b>Economical values</b>	
Accessibility	Generally, there is a possibility of parking a vehicle in the villages. The public transport is sufficient as the area is partly included into the Integrated transport system of the South-Moravian region. The accessibility to the particular sites is quite easy and safe as the terrain is not very difficult, there is a network of paths and local communications (both marked and not marked). The „permeability“ of the landscape is quite good thank to the presence of that network.
Supporting services and tourist infrastructure	There are marked paths within the study area, which lead through the most attractive segments and the main attractions are well signed. The limited possibility of accommodation is possible in the Lomnice or Tišnov (outside the study area), but as the area is rather used for one-day trips, this is relatively sufficient. There are also some local restaurants even in the smaller villages.
Promotion of the area	The area is promoted especially via web pages of the local communities and web pages devoted to the touristic attractions of the South-Moravian region. The information about scientific features of the particular landforms can be found on the Database of geological localities which is kept by Czech Geological Survey. Some specific sites are mentioned in the local guides and leaflets that are occasionally issued by local communities or other institutions. The knowledge and popularity of the area is rather local/regional (it can be said that it is not known on the national level), the area is used especially for short-term recreation and one-day trips as it is situated not far from Brno city. Due to the fact that there are more attractive areas close to the Brno (e.g. Moravian Karst), the study area do not suffer from the excessive number of tourists and it is not overcrowded even during the holidays and week-ends.

Tab.: Assessment of the geotourist and recreational potential of the Lomnicko area  
*source: authors*

Strengths	Weaknesses
<ul style="list-style-type: none"> <li>- harmonic landscape with well-conserved natural issues and evidences of the regardful use of the landscape by man-made</li> <li>- the landforms and processes are well visible and comprehensible for the public</li> <li>- the terrain is not difficult, the accessibility is quite good</li> <li>- marked paths leading to the most attractive natural features</li> <li>- the network of the paths and communication that assure the permeability of the landscape</li> <li>- the area does not suffer from excessive attendance</li> <li>- presence of important cultural and ecological values</li> </ul>	<ul style="list-style-type: none"> <li>- the tourist infrastructure is not sufficient if the visitors want to spend here more time</li> <li>- the educational, recreational and tourist potential is not still fully recognized</li> <li>- the geoheritage features are not promoted to the public</li> </ul>
Opportunities	Threats
<ul style="list-style-type: none"> <li>- a good option for one-day trips from Bmo city and other towns situated within the outskirts of the metropolis</li> <li>- better promotion of the area as the alternative to overcrowded sites</li> <li>- educational potential of the geoheritage that can be used both for the laic public (visitors) and organized groups of students of local/regional schools</li> <li>- reasonable developing of the recreational and tourist potential as a driving force for the local development (on the level of communities, voluntary associations of the municipalities or subjects within Local Action Groups etc.)</li> </ul>	<ul style="list-style-type: none"> <li>- the fast and inadequate development of the tourism can cause the disturbances and damages to the landscape</li> <li>- the building – up and construction of the tourist infrastructure can negatively affect the character of villages or generally, the harmonic character of landscape</li> </ul>

Tab.: SWOT analysis of the Lomnicko area *source: authors*

## RESULTS and CONCLUSIONS

The analysis of the potential for recreational and geotourist purposes was done for the whole study area, not for particular geosites and geomorphosites.

We present main results from SWOT analysis:

### Strengths

- harmonic landscape with well-conserved natural issues and evidence
- presence of important cultural and ecological values

### Opportunities

- a good option for one-day trips from Brno city
- educational potential of the Geoheritage
- reasonable developing of the recreational and tourist potential as a driving force for the local development (on the level of communities, voluntary associations of the municipalities or subjects within Local Action Groups)

### Weaknesses

- the tourist infrastructure is not sufficient if the visitors want to spend here more time
- the geoheritage features are not promoted to the public

### Threats

- the fast and inadequate development of the tourism can cause the disturbances and damages to the landscape
- the building – up and construction of the tourist infrastructure can negatively affect the character of villages or generally, the harmonic character of landscape

Lomnicko area - a good example of an area with high geodiversity and cultural-historical heritage. The region has a high tourist recreational potential, but that there are no top tourist attractions. The area can be considered as alternative to tourist overloaded top destinations (e.g. Bohemian Paradise, Moravian Karst).



**THANK YOU FOR THE ATTENTION!**