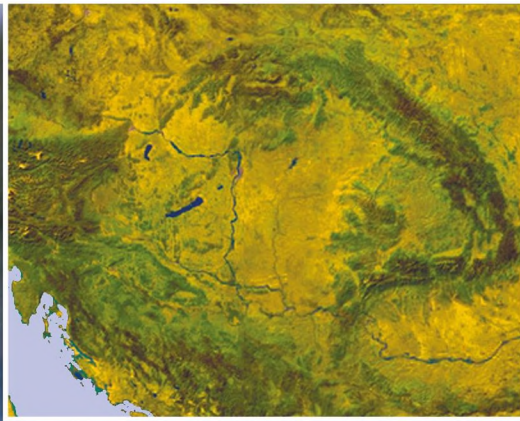


HUNGARIAN GEOGRAPHICAL BULLETIN



**Benefits, challenges and
opportunities of karst
national parks**

**Edited by
Tamás Telbisz**

Volume 71 Number 2 2022



HUNGARIAN GEOGRAPHICAL BULLETIN

Quarterly Journal of the
GEOGRAPHICAL INSTITUTE
RESEARCH CENTRE FOR ASTRONOMY AND EARTH SCIENCES

Editor-in-Chief:	ZOLTÁN KOVÁCS
Deputy Editor-in-Chief:	TIBOR TINER
Managing Editors:	TAMÁS EGEDY, GYÖRGY VARGA
Book Review Editor:	FERENC GYURIS
Cartography Editor:	ZSOMBOR NEMERKÉNYI
Online Editor:	ÁRPÁD MAGYAR

Board Members

ANTOINE BAILLY (Geneva), DAN BÁLTEANU (Bucharest), JÓZSEF BENEDEK (Cluj-Napoca), COLIN BOOTH (Bristol), DOMINIK FAUST (Dresden), BÉLA FILEP (Bern), MICHAEL A. FULLEN (Wolverhampton), VLADIMIR IRA (Bratislava), GERGELY JAKAB (Budapest), STEVEN JOBBITT (Thunder Bay), PETER JORDAN (Vienna), ÁDÁM KERTÉSZ (Budapest), KÁROLY KOCSIS (Budapest), VLADIMIR KOLOSSOV (Moscow), JOSEF KŘEČEK (Prague), THILO LANG (Leipzig), DÉNES LÓCZY (Pécs), MARK MACKLIN (Lincoln, UK), SLOBODAN MARKOVIĆ (Novi Sad), REZSŐ MÉSZÁROS (Szeged), GÁBOR MICHALKÓ (Budapest), CLAUDIO MINCA (Bologna), ATTILA NEMES (Ås), FERJAN ORMELING (Utrecht), JEAN POESEN (Leuven), LEONID RUDENKO (Kyiv), JAMES SCOTT (Joensuu), TOON SMETS (London), JÓZSEF SZABÓ (Debrecen), SZILÁRD SZABÓ (Debrecen), ZOLTÁN SZALAI (Budapest), CHARLES TARNOCAI (Ottawa), ANDREW TAYLOR (Darwin), DALLEEN J. TIMOTHY (Phoenix), ANDRÁS TRÓCSÁNYI (Pécs), ANTONÍN VAISHAR (Brno), DORIS WASTL-WALTER (Bern), AN ZHISHENG (Xi'an), JERNEJ ZUPANČIČ (Ljubljana)

Indexed by Elsevier-GEOBASE[®], Elsevier-SCOPUS[®],
EBSCO Information Services, CAB Abstracts, Current Geographical Publications,
Scimago Journal & Country Rank, Google Scholar

CONTENT

Benefits, challenges and opportunities of karst national parks

<i>László Mari, Zsófia Tábori, Ivan Šulc, Petra Radeljak Kaufmann, Ranko Milanović, Alena Gessert, Zoltán Imecs, Anetta Baricz and Tamás Telbisz: The system and spatial distribution of protected areas in Hungary, Slovakia, Romania, Serbia and Croatia</i>	99
<i>Tamás Telbisz, Ivan Šulc, László Mari and Petra Radeljak Kaufmann: Attitudes and preferences of visitors of Krka National Park, Croatia</i>	117
<i>Zoltán Imecs, András Máthé and Balázs Kohán: Attitudes of local people towards Apuseni Nature Park, Romania</i>	133
<i>Margit Kószegi, Alena Gessert, Janetta Nestorová-Dická, Péter Gruber and Zsolt Bottlik: Social assessment of national parks through the example of the Aggtelek National Park</i>	149
<i>Jelena Kovačević-Majkić, Jelena Čalić, Jasna Micić, Jovana Brankov, Ranko Milanović and Tamás Telbisz: Public knowledge on karst and protected areas: A case study of Tara National Park, Serbia</i>	163
<i>Sašo Gorjanc, Tina Simončič, Aleš Poljanec, Béla Kuslits, Ildikó Arany, Eszter Tanács, Ágnes Vári, Réka Aszalós, Anghel Drasovean, Alin Mos, Laura Maeso Velasco, Andrea Reuter and Udo Gattenlohner: A new ecosystem services approach to enable identification of pro-biodiversity businesses of protected karst areas in Central and South-Eastern Europe</i>	181

Book review section

<i>Andersen, D.J. and Prokkola, E.-K. (eds.): Borderlands Resilience: Transitions, Adaptation and Resistance at Borders. (Andrzej Jakubowski)</i>	197
<i>Demeter, G. and Bottlik, Zs.: Maps in the Service of the Nation: The Role of Ethnic Mapping in Nation-Building and Its Influence on Political Decision-Making Across the Balkan Peninsula (1840–1914). (Maciej Górný)</i>	201
<i>Schelhaas, B., Ferretti, F., Novaes, A.R. and Schmidt di Friedberg, M. (eds.): Decolonising and Internationalising Geography: Essays in the History of Contested Science. (Ferenc Gyuris)</i>	204

The system and spatial distribution of protected areas in Hungary, Slovakia, Romania, Serbia and Croatia

LÁSZLÓ MARI¹, ZSÓFIA TÁBORI¹, IVAN ŠULC², PETRA RADELJAK KAUFMANN²,
RANKO MILANOVIĆ³, ALENA GESSERT⁴, ZOLTÁN IMECS⁵,
ANETTA BARICZ⁵ and TAMÁS TELBISZ¹

Abstract

Protected areas play a key role in nature conservation but are also crucial for tourism. There are international recommendations in nature conservation (IUCN), and several international conservation conventions exist. Nevertheless, the protection categories are different in each country, and the proportion of protected areas also varies. Here we compare the nature conservation systems of some countries (Hungary, Slovakia, Romania, Serbia and Croatia) taking into consideration their nature protection laws. The selection of countries is based on an international project dealing with “Karst and National Parks”. For the comparison, national data sources and an international database (WDPA) are used. Our results show that the protection categories of the studied countries are largely similar, but there are unique characteristics as well (such as “forest park”, “monument of park architecture” in Croatia; “nature conservation area” in Hungary or “protected landscape element” in Slovakia, etc.). On the other hand, the internal proportions of protection categories are more heterogeneous, like, for example, the proportion of national parks within all protected areas which is 57.0 percent in Hungary but 11 percent in Croatia. International protection categories (Natura 2000, Ramsar, UNESCO World Heritage natural sites, UNESCO MAB reserves) are more or less similarly present in the countries studied (except Serbia, where there are no Natura 2000 areas yet). If national categories and Natura 2000 sites are all taken into consideration (and the overlapping areas are counted only once), then Croatia has the highest proportion of protected areas (39.1%), Slovakia is in second place with 37.5 percent, while Romania (23.5%) and Hungary (22.0%) show a similar proportion, and with the lack of Natura 2000, Serbia has 9.1 percent at present. As for the reliability of the WDPA, we found that this varies from country to country, with significant deficiencies for certain countries (e.g. Serbia) and very good reliability for others (e.g. Hungary, Slovakia). However, the availability of WDPA is in many cases better than that of national data, and since it also provides GIS data, it can be considered a useful tool for examining international trends and mapping protected areas.

Keywords: protected area, WDPA, national park, karst, IUCN, nature park, World Heritage, Natura 2000

Received February 2022, accepted May 2022.

Introduction

Protected areas are the most important tools for the preservation of our natural heritage (RODRIGUES, A.S.L. and CAZALIS, V. 2020). In

addition to natural settings, the extent and location of protected areas are strongly influenced by historical, political and economic considerations as well (FROST, W. and HALL, C.M. 2015; KÓSZEGI, M. *et al.* 2019). Although

¹ Department of Physical Geography, Faculty of Science, ELTE Eötvös Loránd University, Pázmány Péter sétány 1/C, 1117 Budapest, Hungary. E-mails: laszlo.mari@ttk.elte.hu; zsofitabori@gmail.com; tamas.telbisz@ttk.elte.hu

² Department of Geography, Faculty of Science, University of Zagreb, Marulićev trg 19/II, 10000 Zagreb, Croatia. E-mails: isulc@geog.pmf.hr; radeljak@geog.pmf.hr

³ Tara National Park, Habi Milentija 3, 31250 Bajina Bašta, Serbia. E-mail: ranko.milanovic@nptara.rs

⁴ Institute of Geography, Faculty of Natural Sciences, University of Pavol Jozef Šafárik, Jesenná 5, 040 01 Košice, Slovakia. E-mail: alena.gessert@gmail.com

⁵ Department of Geography in Hungarian, Babeş-Bolyai University, 5–7 Clinicilor Street, 400006 Cluj-Napoca, Romania. E-mails: zimecs@yahoo.com; bariczanetta@yahoo.com

the IUCN (International Union for Conservation of Nature) formulates recommendations for protected area categories, the system of protected areas varies to some extent from country to country. Therefore, if we want to compare the protected areas of different countries, then we have to compare not only the territorial extent, but it is also important to compare the categories themselves. Thus, the number one aim of our article is to make a comparison of protected areas by areal extent and category on a regional scale.

The spatial framework of our study is provided by an international project („Karst & National Parks”), in the framework of which we examine national parks established in karst areas. First of all, we highlight that national parks are often set up in karsts because of their special hydrological, morphological, pedological and biological features (MARI, L. and TELBISZ, T. 2018; TELBISZ, T. and MARI, L. 2020). In the above mentioned project, we primarily study the relationships among the different actors of the national park, the local population and tourism (NESTOROVÁ DICKÁ, J. et al. 2020; TELBISZ, T. et al. 2020). With the help of historical demographic statistics, GIS analyses, interviews and questionnaires, we examine how the population and land use of the area and its surroundings have changed and how the protection of the area and the emergence of tourism have affected the lives and job opportunities of local residents (TELBISZ, T. et al. 2020, 2021, 2022b).

As a background of these relationships and processes, it is important to acquire knowledge on the system of protected areas in the studied countries and the role of national parks within this. Countries included in the above project are Croatia, Hungary, Romania, Serbia and Slovakia. Accordingly, our regional comparison in this paper also covers these countries, but naturally, this comparison can be extended to other countries in the future. A comparison of these countries is also meaningful in the sense that they have many common features in their history, but they also differ remarkably from each other on certain points. It is, therefore

interesting to examine the common and different characteristics of their protected area systems. Other results of the research carried out in the framework of this project are presented in the further articles of this issue (IMECS, Z. et al. 2022; KOVAČEVIĆ-MAJKIĆ, J. et al. 2022; KÓSZEGI, M. et al. 2022; TELBISZ, T. et al. 2022a). In addition, the presentation of ECOKARST project, which has a similar issue and spatial extent, but the focus is rather on ecosystem services was also included in this special issue (GORJANC, S. et al. 2022).

Data on protected areas bear important information for all stakeholders and are, in principle, publicly available. On the global scale, too, a number of studies have dealt with the questions of how different categories of protected areas increased and what their spatial distribution is. In practice, however, it is observed that reliable country-level data are not always easy to obtain. Fortunately, there is an international database, WDPA (World Database on Protected Areas, <https://www.protectedplanet.net/>), which is the most widely accepted, regularly updated database on this topic (HOCKINGS, M. 2003; BINGHAM, H.C. et al. 2019; RODRIGUES, A.S.L. and CAZALIS, V. 2020). It contains not only aggregated data, but also free GIS files, so it is technically suitable for comparing protected areas of different countries. However, its reliability and accuracy need to be tested, so the second objective of our article is methodological: to compare the data downloaded from the WDPA site to data collected from national databases of the studied countries.

Data and methods

The protection categories of the studied countries were compared taking into account the nature conservation legislation of each country. The following laws and regulations were considered:

- In Croatia: Nature Protection Act (Narodne novine/Official Gazette 80/2013, 15/2018, 14/19, 127/19);

- In Hungary: Act 53 of 1996 on Nature Conservation in Hungary, 03.07.1996;
- In Romania: Government Emergency Ordinance No. 57/2007 on the regime of protected natural areas, conservation of natural habitats, wild flora and fauna (20th June 2007, published in Official Monitor nr. 442 from 29th June 2007);
- In Serbia: Law on Nature Protection (“Official Gazette of RS”, no. 36/2009, 88/2010, 91/2010, 14/2016 95/2018), Law on National Parks (“Official Gazette of RS”, no. 84/2015, 95/2018);
- In Slovakia: Act on the Protection of Nature and Landscapes (2002).

National data for the countries studied were obtained from several sources. Data about Hungarian protected areas were acquired from the Lechner Knowledge Centre (<https://lechnerkozpont.hu/>), the official website of Nature Conservation in Hungary (<https://termesztvedelem.hu/>) and the Hungarian Central Statistical Office (https://www.ksh.hu/stadat_files/kor/en/kor0015.html). The databases of protected areas in Croatia are from the Ministry of Economy and Sustainable Development (<http://www.haop.hr/hr/tematska-podrucja/odrzivo-koristenje-prirodnih-dobara-i-ekoloska-mreza/ekoloska-mreza>) and the Ministry of Environmental Protection and Energy (<http://haop.dev.perpetuum.hr/hr/tematska-podrucja/zasticena-podrucja/zasticena-podrucja/zasticena-podrucja-u-rh>, <http://www.bioportal.hr/services>). The vector files of the protected areas in Romania are from the LEMN Controlat Information Platform on Forest Protection (<https://lemncontrolat.ro/link-urisi-documente-utile/fisiere-descarcabile/>) as they are not available on the website of the Ministry or the State Nature Conservation. The data source for Serbia is the Department for Information System and Cartography Institute for Nature Conservation of Serbia. Data for Slovakia are from the State Nature Protection of the Slovak Republic (<http://www.sopsr.sk/web/?cl=114>) and the Ministry of Environment of the Slovak Republic (<https://www.minzp.sk/spravy/2019/>

[april/100-rokov-statnej-ochrany-prirody-slovensku.html](https://www.minzp.sk/april/100-rokov-statnej-ochrany-prirody-slovensku.html), <https://www.minzp.sk/ochrana-prirody/uzemna-ochrana/prehľad-ochranenych-uzemi-slovenskej-republiky/>).

The WDPA database contains free data from 245 countries. They can be not only viewed online but downloaded in shapefile format by category, country, or other regional bases. The viewer of the database is called Protected Planet, which was created as a result of the collaboration between IUCN and the United Nations Environment Program (UNEP). The regularly updated database has been gradually expanding since 2010 with the help of government organizations and experts. One of the main goals of the international database is to provide a comprehensive image of all terrestrial and marine protected areas on a global platform, along with category classifications, spatial data, and mapping, to make it easy for everyone to understand and inform. It also intends to provide the best possible information to policymakers to raise awareness of the importance of protecting natural areas and their values. On the other hand, it also provides a basis for monitoring international environmental goals, the steps towards which can be easily documented on the basis of this database.

In our study, the GIS data from different sources were converted into a unified projection system, maps were made, and statistical calculations were performed. We have calculated the proportion of protected areas within each country and the proportion of different categories within the protected areas for each country. Furthermore, the relative differences between the areal extent values in the WDPA and in the national databases were calculated as a percentage (the base of the percentage, i.e. 100%, was the value in the national database).

There is often an overlap between different categories of protected areas. Among the national categories, the overlap is generally small, but taking into consideration the international categories as well, such as the European Natura 2000 network, the overlaps are quite significant. In many cases, the international protected area categories are also

mentioned in the laws on nature protection of the studied countries. Thus, we get a false picture of the extent of protected areas if we simply sum up the areas in each category. Therefore, we calculated the sum of the areas of the national categories by simple arithmetic summation (marked as “SUM – with overlaps”) first, but also calculated the total area after merging the shapes. The merging and area calculations were performed in three steps: first, only for national categories (marked as “Real Area without Natura 2000”), second, only for Natura 2000 sites (marked as “Real Area of Natura 2000”), and third, for the merged area of both national categories and Natura 2000 territories (marked as “Real Area of All”). The merged area values therefore provide a realistic value of how much proportion of each country is covered by protected areas.

Results

Short historical review

The first serious steps towards nature conservation in the studied countries were taken in the second half of the 19th century. At that time, most of the territory of the studied countries belonged to the Austro-Hungarian Monarchy. The first nature conservation institution in Croatia was the Croatian Nature Society (founded in 1885), and the Laws on Bird protection (1893), Hunting (1893) and Caves (1900) were issued at that time (SLADONJA, B. et al. 2012). In Hungary, the Forest Act of 1879 was the first law to protect the forests of the high mountains. The scope of this law included the high mountains which now belong to Slovakia and Romania. It was also the period when the designation of areas proposed for protection began, primarily with the help of tourist associations. The first protected area was declared in present-day Serbia in 1874 (Obedska pond), while in the other countries, protected areas appeared between the two world wars. The first national parks of these countries were generally established after the Second World War (Croatia:

1949 – Paklenica and Plitvice Lakes; Hungary: 1973 – Hortobágy; Serbia: 1960 – Fruška Gora; Slovakia: 1949 – Tatra Mountains), except in Romania, where the Retezat Mountains National Park was established in 1935, although in fact the organizational framework was still very rudimentary at that time (BLEAHU, M. 2019). The gradual increase in the number of national parks during the communist period was followed by a significant boom in Hungary and Romania in the 1990s. On the other hand, since the turn of the millennium only a few new national parks have been established in the studied countries (except Serbia, where two new national parks were set up in 2021).

From the end of the Second World War to the 1990s, the communist regime prevailed in the region (albeit in different forms), which also had an impact on nature conservation, and the top-down approach prevailed in the foundation and operation of protected areas (KÓSZEGI, M. et al. 2019). After the change of political regime, or more precisely after the 2000s, the bottom-up approach gradually began to receive more emphasis (NASTRAN, M. 2015; TELBISZ, T. et al. 2020). The first laws on nature protection were issued during the communist period, but these were later replaced by newer laws after the change of regime (see “Data and methods” section; TARDY, J. et al. 2018). An interesting fact about the Slovak nature conservation system was that from 1919 to 1981 (then Czechoslovakia) nature conservation and monument protection worked together within the framework of a joint institution. As for the recent decades, it is true for all countries, but perhaps most for Croatia, that the pressure on natural resources has significantly increased, mainly due to the rapid development of tourism, thus the establishment and proper management of protected areas have become particularly important (SLADONJA, B. et al. 2012; KODERMAN, M. and OPAČIĆ, V.T. 2020). An example which testifies the need for improving protected area management is the recent amendment to Slovakia’s law on nature protection (in 2021) that strengthens the ownership and legal personality of national parks.

Comparison of protected area categories

Table 1 shows the protected area categories, which are defined in each country's Nature Conservation Law, with brief descriptions using keywords. The similar national categories were arranged in the same line and IUCN categories were also added (<https://www.iucn.org/theme/protected-areas/about/protected-area-categories>). There are three categories which are present in each country, and their content is broadly similar, these are the followings: "national park", "natural monument" and "protected landscape". The latter have slightly different names for each country, and in Romania, for example, this is called a "natural park". It is a bit misleading because there are "nature parks" in Croatia and Serbia as well, albeit, with a slightly different content, which means more intense social (tourist) utilization. Moreover, there are "nature parks" even in Hungary, but their legal background is not regulated by the Nature Conservation Act, so this type is not added to the column of Hungary in Table 1. The description of the "national parks" is the most uniform throughout the countries, but it is an interesting fact that the concept of biodiversity is literally mentioned only in Hungarian and Croatian laws. The definition of "strict and special reserves" in Croatia, Romania and Serbia is in line with international practice, while in Hungary and Slovakia, this category is missing. There are also specific categories in each country (see Table 1). Another special feature of Slovakia is that the protection zones belonging to each protected area (i.e. buffers, which are subject to lighter regulations) are registered separately. Correspondence to IUCN categories is vague in several cases. For example, five of Hungary's ten national parks can be classified as IUCN category II, whereas five as IUCN category V.

Regarding karsts and caves, we note that in the case of Hungary, the caves are given great emphasis, and the law also mentions literally the sinkholes. These karstic phenomena (together with other objects) are among the so-called "ex lege" protected sites, which means that they are automatically protected, i.e. there

is no need for a special designation procedure to declare them protected. We can highlight from the Serbian law that the concept of "geodiversity" is mentioned, which is partly due to the fact that Serbian nature protection law is among the most recent, but also to the fact that research on geodiversity plays a significant role in this country. The Serbian Law on Nature Protection also mentions "geoparks". It is interesting because geoparks in most countries were generally created on a completely different basis than other types of protected areas. However, it is noted that most countries have both national and global geoparks (MARI, L. and TELBISZ, T. 2019; TELBISZ, T. and MARI, L. 2020). A Croatian speciality is a concept of "cave park", of which one exists in the country.

As for the terrain types, one can observe that the protected natural areas of the studied countries are mostly mountainous areas. Karst areas are common among protected areas (for example, in Croatia, all national parks are in karst terrains, in Slovakia, most of the national parks are karstic, while in Hungary, Romania and Serbia, about half of the national parks are in karsts (MARI, L. and TELBISZ, T. 2018; TELBISZ, T. and MARI, L. 2020). Besides, river deltas, floodplains, (saline) lakes, and lowlands with different features also occur among the protected areas in these countries.

International protected area categories

In addition to national categories, there are also internationally designated protected areas. The most important of these is Natura 2000, which is a network of core breeding and resting sites for rare and threatened species and some rare natural habitat types which are protected in their own right. The aim of the network is to ensure the long-term survival of Europe's most valuable and threatened species and habitats. They have a very significant overlap with the national categories but are much larger in scope in order to provide a closely connecting, ecological habitat for the wildlife. They have several catego-

Table 1. Categories of national protected areas in the countries studied and their correspondence to IUCN categories

Croatia	Hungary	Romania	Serbia	Slovakia	IUCN
<p><i>Strict reserve</i></p> <ul style="list-style-type: none"> – unmodified or slightly modified nature – all economic and other activities are prohibited 	<p><i>Scientific reserve</i></p> <ul style="list-style-type: none"> – natural area – scientific significance – all economic and other activities are prohibited 	<p><i>Strict nature reserve</i></p> <ul style="list-style-type: none"> – unaltered and representative natural ecosystem – all economic and other activities are prohibited 	<p><i>Special nature reserve</i></p> <ul style="list-style-type: none"> – unaltered or slightly altered nature – controlled visits – preservation of the traditional way of life 		Ia
<p><i>National park</i></p> <ul style="list-style-type: none"> – large unmodified area – multiple natural values – biodiversity – conservation + scientific, cultural, educational, recreational purpose 	<p><i>National park</i></p> <ul style="list-style-type: none"> – large unmodified area – multiple natural values – biodiversity – conservation + scientific, cultural, educational, recreational purpose 	<p><i>National park</i></p> <ul style="list-style-type: none"> – diverse natural ecosystems – multiple natural values – conservation + scientific, cultural, educational, spiritual, health, recreational purpose 	<p><i>National park</i></p> <ul style="list-style-type: none"> – large unmodified area – multiple natural values – nature protection is of higher priority than other activities – visiting rules established 		II
<p><i>Natural monument</i></p> <ul style="list-style-type: none"> – individual ecological, scientific, aesthetic, educational value – living or non-living 	<p><i>Natural monument</i></p> <ul style="list-style-type: none"> – protection and conservation of natural elements – uniqueness, rarity 	<p><i>Monument of nature</i></p> <ul style="list-style-type: none"> – rather small unaltered or partially altered natural spatial unit 	<p><i>Monument of nature</i></p> <ul style="list-style-type: none"> – rather small unaltered or partially altered natural spatial unit 	<p><i>Nature monument</i></p> <ul style="list-style-type: none"> – point, linear or other smaller ecosystems – caves, natural waterfalls 	III
<p><i>Special reserve</i></p> <ul style="list-style-type: none"> – uniqueness, rarity – special scientific importance – actions and activities only for preservation of the area 	<p><i>Nature reserve</i></p> <ul style="list-style-type: none"> – important habitats and natural species 	<p><i>Nature reserve</i></p> <ul style="list-style-type: none"> – important habitats and natural species 	<p><i>Nature reserve</i></p> <ul style="list-style-type: none"> – locality – natural habitats 		IV

Table 1. continued

Croatia	Hungary	Romania	Serbia	Slovakia	IUCN
<p><i>Nature park</i></p> <ul style="list-style-type: none"> – large natural or partially cultivated area with ecological features – activities and actions allowed that do not damage its values 			<p><i>Nature park</i></p> <ul style="list-style-type: none"> – conserved natural ecosystems – activities harmonized with traditional ways of life 		V
<p><i>Regional park</i></p> <ul style="list-style-type: none"> – ecological features with landscape values 					V
<p><i>Forest park</i></p> <ul style="list-style-type: none"> – natural or planted forests – rest and recreation 					
<p><i>Monument of park architecture</i></p> <ul style="list-style-type: none"> – artificially formed area – group of trees 					
	<p><i>Nature conservation area</i></p> <ul style="list-style-type: none"> – smaller, unitary and characteristic territories 				
			<p><i>Protected habitat</i></p> <ul style="list-style-type: none"> – one or more types of natural habitats – wildlife populations 	<p><i>Protected site</i></p> <ul style="list-style-type: none"> – natural habitats – nature cultivated by human activities 	IV
				<p><i>Protected landscape element</i></p> <ul style="list-style-type: none"> – landscape element as a biocentre, a biocorridor 	
				<p><i>Protected bird area</i></p> <ul style="list-style-type: none"> – bird species, migratory bird species 	IV

ries (SPA: special protection area; SCI: sites of community importance; SAC: special areas of conservation), but these are presented in their merged form in the tables and figures of this paper. As Serbia is not yet a member of the EU, there are no Natura 2000 sites here, but Serbia has already started preparing for the designation of these sites (FILIPOVIĆ, D. 2017). Ramsar sites for wetland protection occur in all countries, but in the largest number in Hungary. UNESCO Man and Biosphere Reserves are also present in each country, usually with 2–4 areas, including cross-border areas such as the “East Carpathians Transboundary Biosphere Reserve (Poland / Slovakia / Ukraine)”. The UNESCO World Heritage List does not specifically include protected areas, instead, this title can be assessed rather as an award and a responsibility. Nonetheless, the natural sites on the UNESCO World Heritage List are also worth to be mentioned, and they are also registered in the WDPA dataset. Among World Heritage natural sites, two are found in Croatia (with four locations altogether), two-two in Romania and Slovakia, and one in Hungary. These numbers also include those sites, which expand to several countries, such as the “Caves of Aggtelek Karst and Slovak Karst” or the “Ancient and Primeval Beech Forests of the Carpathians and Other Regions of Europe”. The maps presenting the protected areas of each country (Figures 1–5) show the national categories, which cover more than 1 percent of the country. In addition, Natura 2000 sites are represented as polygons, and the Ramsar and UNESCO World Heritage Sites, which generally have a small areal extent are represented by symbols. Since UNESCO MAB Biosphere reserves almost fully overlap with other categories, they are not shown on the maps to avoid double markings.

Comparison of WDPA and national datasets

Table 2 shows the number and areal extent of protected areas in each country by category. Further on, aggregate values calculated by

simple summation and on the basis of merged shapes are also provided as mentioned in the “Data and methods” section. This table also contains the values calculated according to the national databases and the WDPA.

In the case of Croatia, we found significant differences in four of the seven categories examined. In the case of the “nature park”, the reason for the difference is that the Dinara Nature Park, established in 2021, is not yet included in the WDPA database. However, if we add the area of Dinara Nature Park (629 km²) to the area included in the WDPA, we get closer to the national data, but still, the area of this category is about 250 km² smaller in the WDPA. As for the “important landscape” category, there are six more units in the national database and an area 100 km² larger. The number of national parks is the same, but the area value is 220 km² higher in the national database. Within the “special reserve” category, the national database contains four more units and an area 110 km² larger. Among the WDPA categories, there is the “horticultural monument”, which really existed in Croatia but has already been abolished and merged into another category.

In the case of Romania, the WDPA dataset includes one more object in the “natural park” category than the national dataset, but the size of the area is almost the same. There are numerical and minor areal differences between the WDPA and national datasets for the cases of “nature reserve”, “scientific reserve” and “natural reserve”.

The largest differences between the two databases are in the case of Serbia. As Serbia does not acknowledge Kosovo as an independent country, the protected areas in Kosovo are included in the national database, while they are missing from the WDPA dataset, thus, in order to make the comparison applicable, these were cut out of the national database. Nevertheless, there are still large differences. The main reason for the discrepancies is that the WDPA contains outdated and inaccurate data on Serbia. Obsolescence is not necessarily old, given that in 2021 several new protected areas were created or others

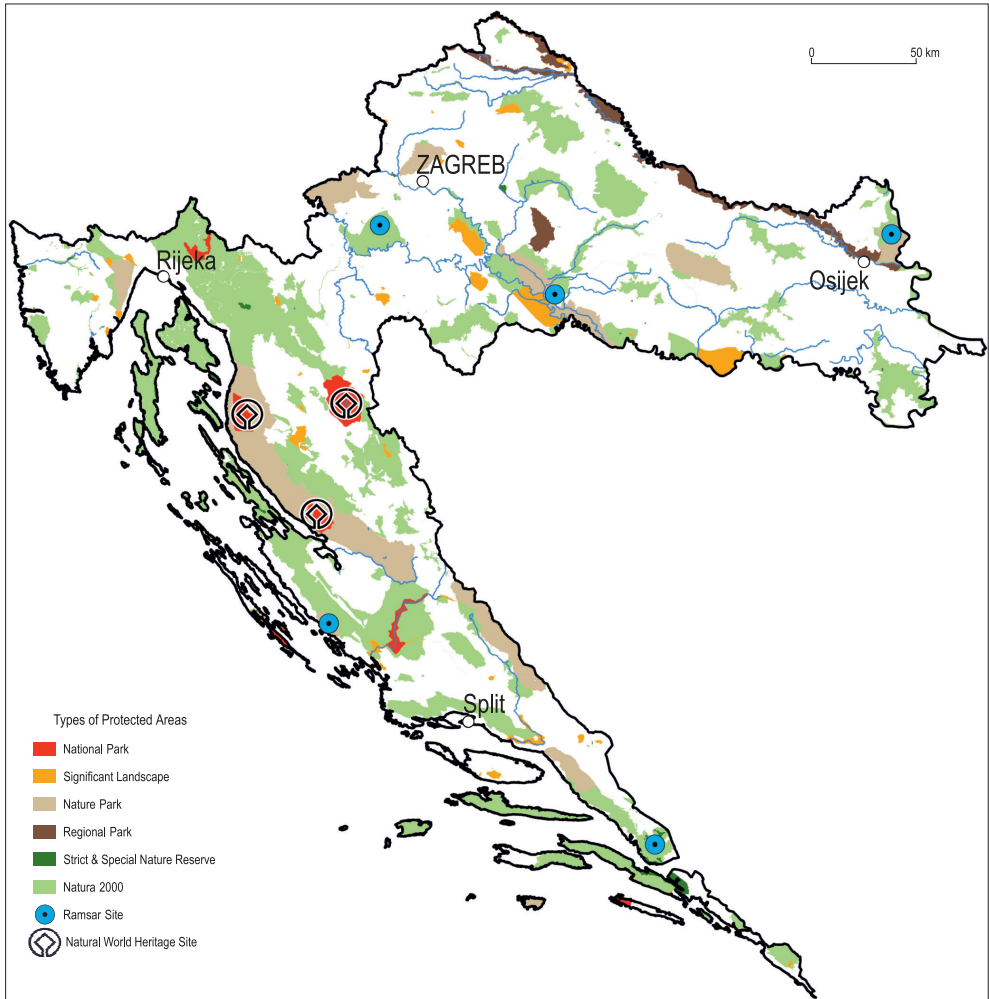


Fig. 1. Protected areas in Croatia

reclassified in Serbia that explains several differences. For example, in the “national park” category, there are six national parks in the national database, while only 4 in the WDPA database. The difference is due to the fact that two new national parks (Stara Planina and Kučaj-Beljanica) were established in 2021 by merging and expanding previously existing protected areas. The largest differences in both number and area are found in the case of “outstanding natural landscape” category.

Regarding the data of Hungary and Slovakia, there are no significant differences between the two databases.

Comparison of proportions

Finally, we got to the point where we can compare the countries based on the proportion of protected areas (Figure 6). Based on the above evaluation, we use data from national

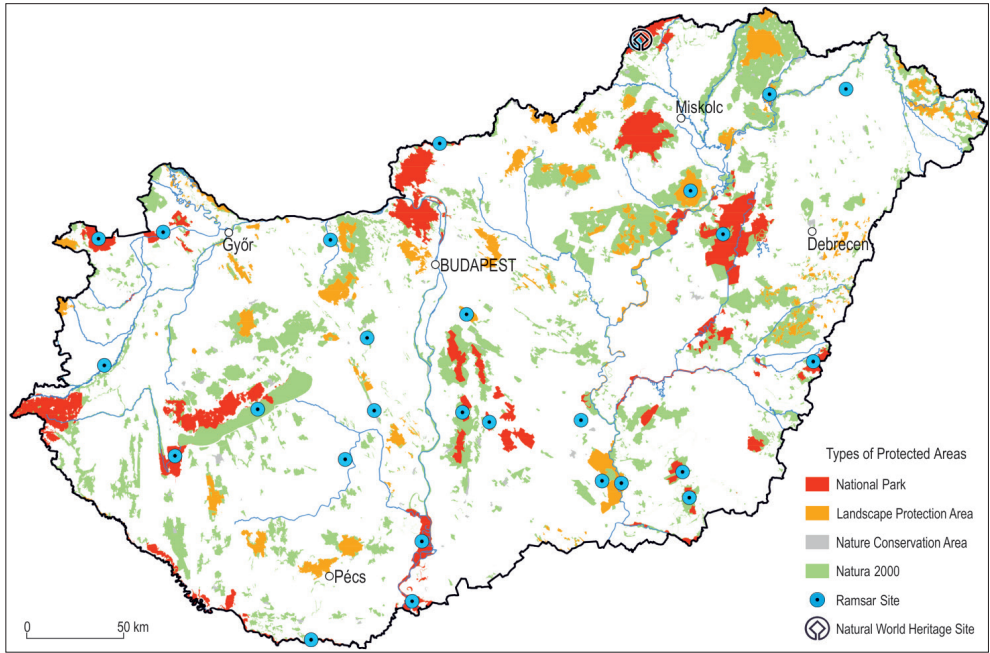


Fig. 2. Protected areas in Hungary

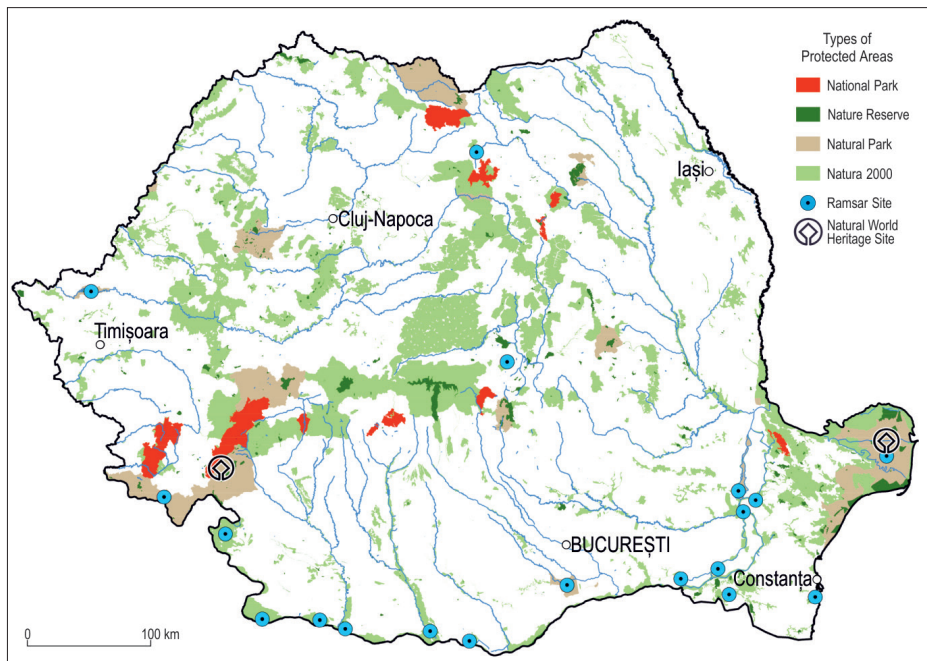


Fig. 3. Protected areas in Romania

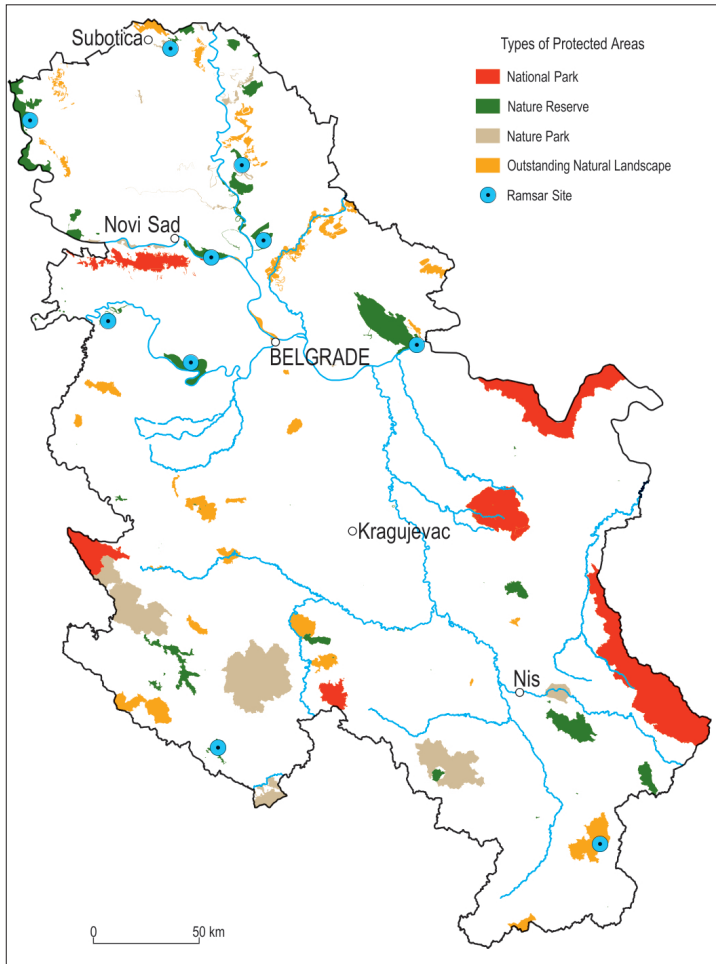


Fig. 4. Protected areas in Serbia

databases to make the comparison. Taking into consideration the percentage of protected areas related to the total area of each country, we can observe significant differences among the countries studied. 23.5 percent of the territory of Slovakia, 14.6 percent of the territory of Croatia, 10.5 percent of the territory of Serbia, 9.1 percent of the territory of Hungary and only 5.4 percent of the territory of Romania are protected by law according to the national categories. However, adding the non-overlapping part of Natura 2000 sites to the nationally protected areas will significantly increase the pro-

portion of protected areas and even change the order of the countries according to this parameter. Calculating in this way, Croatia has the highest proportion of protected areas (39.1%), Slovakia is in second place with 37.5 percent, while Romania (23.5%) and Hungary (22.0%) show a similar proportion. Finally, this aggregate parameter is the lowest in Serbia that is due to the fact that there are no Natura 2000 sites in this country yet. However, according to the estimations, the area of ecological networks will cover about 20 percent of the territory of the Republic of Serbia (FILIPović, D. 2017).

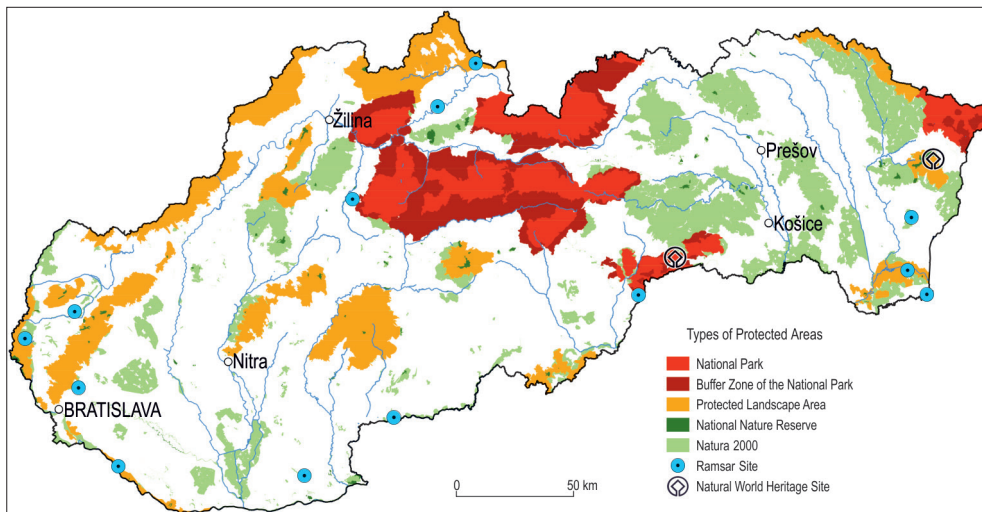


Fig. 5. Protected areas in Slovakia

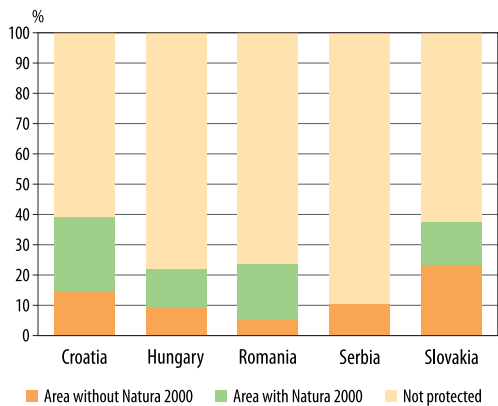


Fig. 6. Percentage of protected areas in relation to the area of each country

It is interesting to observe how different the distribution of the protected area categories is in each country (Figure 7). “Nature parks” are in the absolute majority in Croatia and Romania, while in Hungary, “national parks” provide more than half of the protected areas. In contrast, the situation is more balanced in Serbia and Slovakia. In Serbia, the “national park” is also the category with

the highest proportion (but not an absolute majority), while in Slovakia this is also the case if the buffer zones are added to the area of the national parks. Croatia has the most diverse category system.

Conclusions

Overall, we can state that the nature conservation systems of the studied countries are fairly similar, partly as a result of analogous historical developments. However, in addition to similarities, there are also differences in their systems, such as the lack of “strict reserves” in Hungary and Slovakia, or the existence of certain specific categories in almost all countries (e.g. “forest park”, “monument of park architecture” in Croatia; “nature conservation area” in Hungary, “protected landscape element” in Slovakia, etc.). Despite the similarity of the systems, we can find remarkable differences in the relative proportions of the categories among the countries, with Hungary (57%) and Croatia (11%) being the two extremes in terms of the proportion of national parks. The demand for tourism utilization is increasing in each country, and

Table 2. Protected areas by category and country as calculated from the national dataset and the WDPA

Country	Category	Number	Area, km ²	Percentage of protected areas	Percentage of the country	Rel. diff. to WDPA, %	WDPA number	WDPA area, km ²	
CROATIA	Nature park	12	4,950	56.2	8.7	17.6	11	4,078	
	Important landscape	84	1,379	15.7	2.4	7.3	78	1,278	
	Regional park	2	1,026	11.6	1.8	0.3	2	1,022	
	National park	8	980	11.1	1.7	23.1	8	753	
	Special reserve	80	408	4.6	0.7	29.1	76	289	
	Forest park	27	29	0.3	0.1	1.1	26	28	
	Strict reserve	2	24	0.3	0.0	0.0	2	24	
	Monument of park architecture	115	12	0.1	0.0	0.6	113	12	
	SUM (with overlaps)	330	8,807	100.0	15.6	14.9	428	7,497	
	Real area without Natura 2000	–	8,284	–	14.6	15.9	–	6,966	
	Real area of Natura 2000	–	20,621	–	36.4	–	–	–	
	Real area of all	–	22,101	–	39.1	–	–	–	
	HUNGARY	National park	10	4,812	56.7	5.2	0.4	10	4,793
		Landscape protection area	39	3,365	39.6	3.6	0.0	39	3,364
Nature conservation area		170	313	3.7	0.3	-1.4	174	317	
Natural monument		88	1	0.0	0.0	-5.6	100	1	
SUM (with overlaps)		307	8,492	100.0	9.1	0.2	323	8,476	
Real area without Natura 2000		–	8,492	–	9.1	0.0	–	8,496	
Real area of Natura 2000		–	19,682	–	21.2	–	–	–	
Real area of all		–	20,471	–	22.0	–	–	–	
Natural park		15	7,698	54.8	3.2	0.0	16	7,699	
National park		13	3,174	22.6	1.3	0.0	13	3,174	
ROMANIA	Nature reserve	723	2,883	20.5	1.2	4.4	667	2,757	
	Scientific reserve	32	167	1.2	0.1	-71.1	45	285	
	Natural monument	161	130	0.9	0.1	-5.3	203	137	
	SUM (with overlaps)	944	14,052	100.0	5.9	0.0	944	14,051	
	Real area without Natura 2000	–	12,876	–	5.4	0.0	–	12,880	
	Real area of Natura 2000	–	54,449	–	22.8	–	–	–	
	Real area of all	–	56,032	–	23.5	–	–	–	

Table 2. continued

Country	Category	Number	Area, km ²	Percentage of protected areas	Percentage of the country	Rel. diff. to WDPA, %	WDPA number	WDPA area, km ²	
SERBIA	National Park	6	2,936	35.6	3.8	56.9	4	1,265	
	Nature park	19	2,008	24.4	2.6	-47.7	16	2,965	
	Outstanding natural landscape	33	1,631	19.8	2.1	64.6	19	577	
	Nature reserve	66	1,556	18.9	2.0	6.0	63	1,463	
	Monument of nature	106	64	0.8	0.1	4.3	237	61	
	Protected habitat	9	35	0.4	0.0	22.6	6	27	
	Forest park (former)	10	13	0.2	0.0	100.0	0	0	
	Natural areas surrounding cultural sites	8	1	0.0	0.0	-366.8	27	6	
	SUM (with overlaps)	257	8,244	100.0	10.6	22.8	374	6,365	
	Real area of all	–	8,144	–	10.5	21.9	–	6,361	
	SLOVAKIA	Protected landscape area	14	5,226	42.8	10.7	-2.3	14	5,348
		National park	9	3,175	26.0	6.5	-1.5	9	3,222
		Buffer of national park	9	2,626	21.5	5.4	1.5	9	2,585
National nature reserve		202	803	6.6	1.6	-3.6	208	832	
Nature reserve		376	163	1.3	0.3	13.4	372	141	
Protected site		181	117	1.0	0.2	0.5	182	116	
Buffer of nature reserve, monument		–	64	0.5	0.1	1.0	59	63	
Buffer of protected site		–	24	0.2	0.0	-4.8	6	25	
Nature monument		269	15	0.1	0.0	-11.2	265	17	
National nature monument		60	1	0.0	0.0	0.0	60	1	
Protected landscape element		1	0	0.0	0.0	15.7	1	0	
SUM (with overlaps)		1,121	12,215	100.0	24.9	-1.1	1,185	12,351	
Real area without Natura 2000		–	11,512	–	23.5	–	–	–	
Real area of Natura 2000		–	14,664	–	29.9	–	–	–	
Real area of all		–	18,391	–	37.5	–	–	–	

Notes: „SUM (with overlap)” is calculated as the arithmetic sum of national protected area categories. „Real Areas” are calculated from the merged data (i.e. no double counting). „All” includes national categories and Natura 2000 areas together. For further explanation, see text.

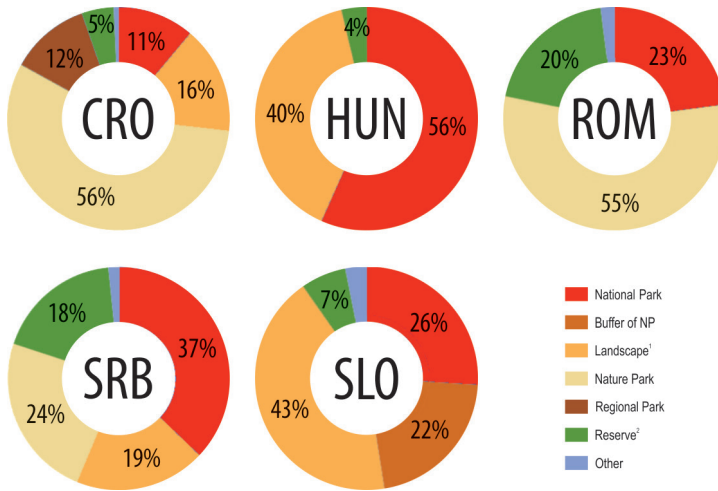


Fig. 7. Percentage distribution of protected area categories within all nationally protected areas. Only categories with a total area of more than 1 percent of each country are presented, the others are shown as “other”. Landscape¹ means “Important Landscape” in Croatia, “Landscape Protection Area” in Hungary, “Outstanding Natural Landscape” in Serbia and “Protected Landscape” in Slovakia. Reserve² means “Special Reserve” in Croatia, “Nature Conservation Area” in Hungary, “Nature Reserve” in Romania and Serbia and “National Nature Reserve” in Slovakia. CRO = Croatia; HUN = Hungary; ROM = Romania; SRB = Serbia; SLO = Slovakia.

the distribution of protection categories may also affect this issue. For example, the title of “national park” has a stronger marketing value, but the associated restrictions are also stricter than in the case of a “nature park”.

International protection categories and titles (Natura 2000, Ramsar, UNESCO World Heritage, UNESCO MAB reserves) are more or less similarly present in the countries studied (except Serbia, where there are as yet no Natura 2000 areas). If we take into account the international categories, we can observe that several areas enjoy multiple, sometimes even five- or six-fold protection. The number of protection categories for a given area may also play an important role in financing the conservation measures of that area. Besides the growing role of tourism, the socio-economic needs of the local population are also increasingly emphasized (Mose, I. 2007), but it is important to emphasize that these aims should be in line with conservation goals.

Among the elements of the geoheritage, caves are literally mentioned in the nature protection

laws of most countries, but they have a varying emphasis. As for the concept of “geodiversity”, it is literally mentioned only in Serbian law.

As far as the WDPA is concerned, we have found that the accuracy of this database varies from country to country. Where there have been no major changes in recent years and the protected area system is stable, the WDPA contains data of acceptable accuracy, but in certain cases (mainly for Serbia in the present study) we found significant differences. Therefore, we can state that the database is only partially suitable for international comparisons and tracking global changes, and before using it for a detailed analysis, the checking of the country data included in the analysis is necessary. However, as WDPA provides GIS files available free of charge, we highly recommend it as an easily accessible database if one wants to create maps about protected areas.

Acknowledgements: This research was supported by the National Research, Development and Innovation Office Hungary (NKFIH) K124497 project.

REFERENCES

- BINGHAM, H.C., BIGNOLI, D.J., LEWIS, E., MACSHARRY, B., BURGESS, N.D., VISCONTI, P., DEGUIGNET, M., MISRACHI, M., WALPOLE, M. and STEWART, J.L. 2019. Sixty years of tracking conservation progress using the World Database on Protected Areas. *Nature Ecology & Evolution* 3. (5): 737–743. Available at <https://doi.org/10.1038/s41559-019-0869-3>
- BLEAHU, M. 2019. *Ariile Protejate și Protecția Naturii* (Protected areas and conservation of nature). București, Paideia.
- FILIPOVIĆ, D. 2017. The treatment of protected natural areas in the planning documentation in Serbia. In *Tourism in Protected Areas of Nature in Serbia and Slovenia*. Eds.: FILIPOVIĆ, D., GOSAR, A., KODERMAN, M. and ĐURĐIĆ, S., Belgrade, University of Belgrade, Faculty of Geography, 27–42.
- FROST, W. and HALL, C.M. 2015. *Tourism and National Parks: International Perspectives on Development, Histories and Change*. London, Routledge.
- GORJANC, S., SIMONČIČ, T., POLJANEC, A., KUSLITS, B., ARANY, I., TANÁCS, E., VÁRI, Á., ASZALÓS, R. et al. 2022. A new ecosystem services approach to enable identification of pro-biodiversity businesses of protected karst areas in Central and South-Eastern Europe. *Hungarian Geographical Bulletin* 71. (2): 181–195.
- HOCKINGS, M. 2003. Systems for assessing the effectiveness of management in protected areas. *BioScience* 53. (9): 823–832. Available at [https://doi.org/10.1641/0006-3568\(2003\)053\[0823:SFATEO\]2.0.CO;2](https://doi.org/10.1641/0006-3568(2003)053[0823:SFATEO]2.0.CO;2)
- IMECS, Z., MÁTHÉ, A. and KOHÁN, B. 2022. Attitudes of local people towards Apuseni Nature Park, Romania. *Hungarian Geographical Bulletin* 71. (2): 133–148.
- KODERMAN, M. and OPAČIĆ, V.T. (eds.) 2020. *Challenges of Tourism Development in Protected Areas of Croatia and Slovenia*. Koper, University of Primorska Press and Croatian Geographical Society.
- KOVAČEVIĆ-MAJKIĆ, J., ČALIĆ, J., MICIĆ, J., BRANKOV, J., MILANOVIĆ, R. and TELBISZ, T. 2022. Public knowledge on karst and protected areas: A case study of Tara National Park, Serbia. *Hungarian Geographical Bulletin* 71. (2): 163–179.
- KÓSZEGI, M., BOTTLIK, Zs., TELBISZ, T. and MARI, L. 2019. A „nemzeti park” koncepció tér- és időbeli változásai (Spatial and temporal changes in the concept of “national park”). *Földrajzi Közlemények* 143. (4): 308–323. Available at <https://doi.org/10.32643/fk.143.4.2>
- KÓSZEGI, M., GESSERT, A., NESTOROVÁ-DICKÁ, J., GRUBER, P. and BOTTLIK, Zs. 2022. Social assessment of national parks through the example of the Aggtelek National Park. *Hungarian Geographical Bulletin* 71. (2): 149–162.
- MARI, L. and TELBISZ, T. 2018. Karsztvidékek az európai nemzeti parkokban (European national parks with karst landscapes). *Karsztfejlődés* 23. 207–217.
- MARI, L. and TELBISZ, T. 2019. Karsztos területek az európai geoparkokban (European geoparks with karst landscapes). *Karsztfejlődés* 24. 79–92.
- MOSE, I. 2007. *Protected Areas and Regional Development in Europe: Towards a New Model for the 21st Century*. Aldershot, Ashgate Publishing Ltd.
- NASTRAN, M. 2015. Why does nobody ask us? Impacts on local perception of a protected area in designation, Slovenia. *Land Use Policy* 46. 38–49. Available at <https://doi.org/10.1016/j.landusepol.2015.02.001>.
- NESTOROVÁ DICKÁ, J., GESSERT, A., BRYNDZOVÁ, L. and TELBISZ, T. 2020. Behavioural survey of local inhabitants’ views and attitudes about Slovak Karst National Park in Slovakia. *Sustainability* 12. (23): 10029. Available at <https://doi.org/10.3390/su122310029>.
- RODRIGUES, A.S.L. and CAZALIS, V. 2020. The multifaceted challenge of evaluating protected area effectiveness. *Nature Communications* 11. (1): 5147. Available at <https://doi.org/10.1038/s41467-020-18989-2>.
- SLADONJA, B., BRŠČIĆ, K., POLJUHA, D., FANUKO, N. and GRGUREV, M. 2012. Introduction of participatory conservation in Croatia, residents’ perceptions: a case study from the Istrian peninsula. *Environmental Management* 49. 1115–1129. Available at <https://doi.org/10.1007/s00267-012-9851-4>
- TARDY, J., SCHMIDT, A., CSEPREGI, I. and ZSEMBERY, Z. 2018. Nature conservation. In *National Atlas of Hungary Vol 2. Natural Environment*. Ed.-in-chief: KOCSIS, K., Budapest, MTA CSFK Geographical Institute, 144–155.
- TELBISZ, T., GRUBER, P., MARI, L., KÓSZEGI, M., BOTTLIK, Zs. and STANDOVÁR, T. 2020. Geological heritage, geotourism and local development in Aggtelek National Park (NE Hungary). *Geoheritage* 12. (1): 5. Available at <https://doi.org/10.1007/s12371-020-00438-7>.
- TELBISZ, T., ČALIĆ, J., KOVAČEVIĆ-MAJKIĆ, J., MILANOVIĆ, R., BRANKOV, J. and MICIĆ, J. 2021. Karst geoheritage of Tara National Park (Serbia) and its geotouristic potential. *Geoheritage* 13. (4): 88. Available at <https://doi.org/10.1007/s12371-021-00612-5>.
- TELBISZ, T., ŠULC, I., MARI, L. and RADELJAK-KAUFMANN, P. 2022a. Attitudes and preferences of visitors of Krka National Park, Croatia. *Hungarian Geographical Bulletin* 71. (2): 117–132.
- TELBISZ, T., RADELJAK KAUFMANN, P. and BOČIĆ, N. 2022b. Inland-coastal demographic transformations in a karst area: a case study of the surroundings of Krka National Park (Croatia). *Journal of Mountain Science* 19. (2): 305–321. Available at <https://doi.org/10.1007/s11629-021-7032-8>
- TELBISZ, T. and MARI, L. 2020. The significance of karst areas in European national parks and geoparks. *Open Geosciences* 12. (1): 117–132. Available at <https://doi.org/10.1515/geo-2020-0008>.

Internet references (Accessed between 23 December 2021 and 20 January 2022):

<https://www.protectedplanet.net/>

<http://www.bioportal.hr/services>

<http://www.haop.hr/hr/tematska-podrucja/odrzivo-koristenje-prirodnih-dobara-i-ekoloska-mreza/ekoloska-mreza>

<http://haop.dev.perpetuum.hr/hr/tematska-podrucja/zasticena-podrucja/zasticena-podrucja-u-rh>

https://www.ksh.hu/stadat_files/kor/en/kor0015.html

<https://lechnerkozpont.hu/>

<https://termeszetvedelem.hu/>

<https://lemncontrolat.ro/link-uri-si-documente-utile/fisiere-descarabile/>

<https://www.minzp.sk/spravy/2019/april/100-rokov-statnej-ochrany-prirody-slovensku.html>

<https://www.minzp.sk/ochrana-prirody/uzemna-ochrana/prehľad-chranených-uzemí-slovenskej-republiky/>

<https://www.iucn.org/theme/protected-areas/about/protected-area-categories>

<http://www.soprs.sk/web/?cl=114>

Attitudes and preferences of visitors of Krka National Park, Croatia

TAMÁS TELBISZ¹, IVAN ŠULC², LÁSZLÓ MARI¹ and PETRA RADELJAK KAUFMANN²

Abstract

The primary function of national parks (NPs) is nature conservation, but for the majority of them, tourism also plays an important role. Tourism generates significant incomes, but the benefits are often unequally distributed in space, as are the disadvantages. The karst regions are generally less developed terrains in terms of traditional livelihoods, but due to their special morphology, tourism offers great opportunities. Nonetheless, mass tourism can also pose increased environmental risks. In this article, we examine the above questions on the example of Krka NP, especially from the perspective of tourists, as we conducted a questionnaire survey with visitors. The results confirmed that there is a high degree of spatial inequality both in the awareness of attractions and the distribution of tourist accommodation. This fact has already been recognised by the management of the NP, and serious steps have already been taken to reduce inequality, but their impact is not yet significant enough. Based on the survey, tourism in Krka NP is determined by same-day visits. Tourists who come here primarily consider waterfalls, lakes and rivers to be the most important values of the landscape, while cultural values are considered less significant and even less known. Local products are virtually unknown in the NP palette, so this could be a direction for development. Another point that could be developed is the awareness of visitors in the field of karstification. As the survey was conducted during COVID period, its impact on tourism was also briefly examined. This impact was manifested in the fact that the proportion of retirees and tourist buses was very small, whereas the majority of visitors (90%) arrived in the NP as independent travellers. For one third of foreigners, COVID played a role in choosing Croatia as a destination. As for domestic tourists, two thirds chose to find a destination in Croatia because of COVID.

Keywords: national park, protected area, questionnaire, tourism, karst, spatial inequality, geotourism, COVID

Introduction

National parks are perhaps the best known institutions for nature conservation. Although their primary task is, above all, nature conservation, in fact, the 150-year history of national parks shows that they have a number of other responsibilities. Historically, tourism has played a significant role in national parks (BUTLER, R.W. and BOYD, S.W. 2000; FROST, W. and HALL, C.M. 2015) from the beginning (Yellowstone National Park, USA, 1872), despite tourism (especially mass tourism) has many adverse side effects (BUTLER, R.W. and BOYD, S.W. 2000). National park as a concept has also been an important

element of national identity from the beginning, although not equally in all ages and countries (FROST, W. and HALL, C.M. 2015). The relatively untouched national park areas are also invaluable areas for scientific research, as well as excellent locations for education (primarily in geography and biology) to increase environmental awareness (FROST, W. and HALL, C.M. 2015). Cultural values were less significant in the original concept, but during the boom of European national parks after World War II, these were also incorporated into the national park model (FROST, W. and HALL, C.M. 2015).

In many places and times, the relationship between national parks and the local popula-

¹ Department of Physical Geography, Faculty of Science, ELTE Eötvös Loránd University, Pázmány Péter sétány 1/C, 1117 Budapest, Hungary. E-mails: tamas.telbisz@ttk.elte.hu; laszlo.mari@ttk.elte.hu

² Department of Geography, Faculty of Science, University of Zagreb, Marulićev trg 19/II, 10000 Zagreb, Croatia. E-mails: isulc@geog.pmf.hr; radeljak@geog.pmf.hr

tion has not been conflict-free at all (KŐSZEGI, M. *et al.* 2019). Stronger restrictive rules in national parks are often perceived as negative by local residents (TRAKOLIS, D. 2001; MOSE, I. 2007; TELBISZ, T. *et al.* 2020), but a similar or even greater problem may be that local residents often feel that the national park is part of the state administration far from their own world, and national park benefits (mainly related to tourism) are enjoyed by others (KŐSZEGI, M. *et al.* 2019; TELBISZ, T. *et al.* 2020). Therefore, there is today an expectation that the national park should support the socio-economic development of the local population (ROMANO, B. 1995; MOSE, I. 2007), however, many believe that focusing on economic development may conflict with the primary goals of nature conservation. Thus, they emphasize that the management should use various tools to maintain the primary role of conservation if development were to conflict with this (DUVAL, M. 2006; KALISCH, D. and KLAPHAKE, A. 2008; PETRIĆ, L. and MANDIĆ, A. 2014). The much later concept of geoparks also aims, from the outset, to contribute to the sustainable development of the local population (MCKEEVER, P.J. and ZOUROS, N. 2005; FARSANI, N.T. *et al.* 2011; LAZZARI, M. and ALOIA, A. 2014). Regardless of intent, the direct economic impact of national parks is difficult to measure in many cases (MAYER, M. *et al.* 2010).

The above issues related to national parks are examined from several perspectives in the framework of a research project aimed at exploring the specificities of karst national parks in selected areas of Central Europe. Karst terrains are often depopulated areas, at least in Europe (PEJNOVIĆ, D. and HUSANOVIĆ-PEJNOVIĆ, D. 2008; TELBISZ, T. *et al.* 2014, 2015, 2016, 2019, 2022), but due to their special natural features (caves, gorges, collapse sinkholes, stream sinks, etc.), national parks are often found on them (TELBISZ, T. and MARI, L. 2020). Thus, in many places the question arises as to what these national parks can offer to the aging and decreasing local population. Karst areas can be important targets for *sensu stricto* or *sensu lato* geotourism (Božić,

S. and TOMIĆ, N. 2015; ANTIĆ, A. *et al.* 2020; TELBISZ, T. and MARI, L. 2020).

The project uses a variety of methods: semi-structured interviews, questionnaires with the local population and tourists, and statistical and GIS analyses to answer the above questions, of which we now present and analyse the results of a tourist questionnaire survey in the Krka National Park.

Study area

Croatia is an area rich in karst terrains, six of its eight national parks are located in completely karstic, two in partly karstic terrain (TELBISZ, T. and MARI, L. 2020). In Croatia, tourism plays a particularly important role, and the existence of national parks (and protected areas in general) has been shown in many places to have contributed to local socio-economic development (KODERMAN, M. and OPAČIĆ, V.T. 2020). However, in many cases the consequence was an increase in spatial inequalities (ŠULC, I. and VALJAK, V. 2012).

Krka National Park (*Figure 1*) is located in the south-central part of Croatia, in the county of Šibenik-Knin. This county is typically an aging and depopulating area (LAJIĆ, I. and MIŠETIĆ, R. 2013; MRĐEN, S. and BARIĆ, D. 2016; RADELJAK KAUFMANN, P. 2016). 89 percent of the county is built up from well-karstified limestones and dolomites (TELBISZ, T. *et al.* 2022). Within the county, one can observe sharply differing population processes between the coastal and the interior areas (RADELJAK KAUFMANN, P. 2016; TELBISZ, T. *et al.* 2022). The Krka National Park, founded in 1985, belongs to the inner, sparsely populated areas, and its elongated stretch of 109 km² can also be divided into two sharply different parts in terms of tourism. The part close to the coast (and the motorway), where the most spectacular limestone tufa waterfalls are visited by the vast majority of tourists. On the other hand, the long sections along the upper river branches are much less visited, although there are also beautiful and interesting sights: wide gorges, tufa cascades

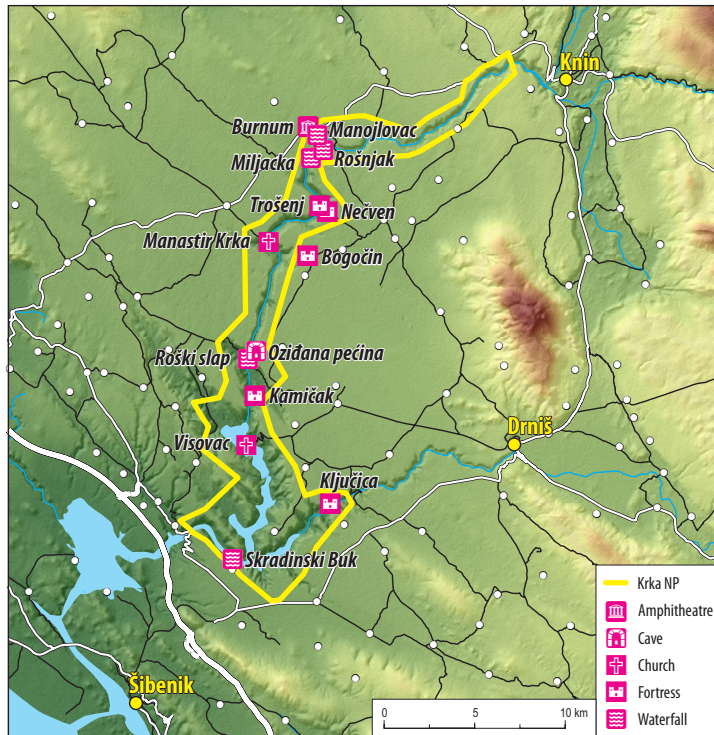


Fig. 1. Location and main tourist sights of Krka National Park

(albeit with slightly less water) and cultural attractions (island of Visovac with monastery, Roman monuments, watermills).

The visitors number of Krka NP increased rapidly after the War of Independence in the 1990s, reaching 1.4 million by 2018 (RADELJAK KAUFMANN, P. 2020), so restrictions had to be introduced: on the one hand, the number of people in the area of Skradinski Buk waterfalls was limited to 10,000; on the other hand, bathing at waterfalls was banned (GOJMERAC, M. 2018). This second restriction not only disappoints many tourists who come here (unaware of the new regulations), but a significant portion of the local population are also dissatisfied with this measure (*Photo 1*). The rapid increase in the number of visitors is in line with the global trends that characterise nature-based tourism (ecotourism, geotourism) in most countries on Earth (KUENZI,

C. and McNEELY, J. 2008; BALMFORD, A. *et al.* 2009). COVID, of course, here as everywhere, caused a sharp decline in 2020 (with 423,000 visitors), but by 2021, that decline has partly been compensated (734,000 visitors this year).

Considering the characteristics of the sample area, we are looking for answers to the following questions:

- To what extent does the spatial inequality characterise the Krka NP? I.e. how perceptible are the inner areas from the point of view of the average tourist? The attractions of the inner areas and potential accommodation possibilities?
- How do tourists rate the sights of Krka NP?
- What are the motivations of visitors to come here? Where do they get information?
- How satisfied are they with what they are experiencing here and what kind of development would they support?



Photo 1. Skradinski Buk waterfalls before (left) and after (right) the ban on swimming

- From the point of view of tourists, what is the order of tasks for the Krka NP?
- Does it mean something to tourists that this is a karst region? And in general, how aware are visitors of the geological heritage?

Notwithstanding the more general questions above, as the survey was conducted during the period covered by COVID, we were also interested in the local effects of the pandemic, and we asked two questions specifically about it.

Methodology

The knowledge about certain objects in national parks and geoparks, the motivation of visitors, the source of information, and visitors' attitudes to certain issues of nature conservation or development ideas are often examined with the help of questionnaires (PAPAGEORGIOU, K. and KASSIOUMIS, K. 2005; ZGLOBICKI, W. and BARAN-ZGLOBICKA, B. 2013; ALLAN, M. *et al.* 2015; ŠTRBA, L. 2019). These can be carried out on-site or online. Similar surveys have been conducted in several national parks in Croatia (ŠULC, I. and VALJAK, V. 2012; KRPINA, V. 2015).

We conducted an on-site questionnaire survey in Krka NP from 30th August to 3rd September 2021. This was the first week after the overcrowded summer period, when there were still quite a few tourists, but the overcrowding was no longer typical, and there were relatively few visitors in the early

morning and late afternoon hours. According to the official statistics, there were 28,704 visitors during this week in the Krka NP.

The questionnaires were filled with the help of 9 assistants at several resting points in the area around Skradinski Buk waterfalls, which corresponds to convenience sampling. Visitors had the option to complete the questionnaire themselves or with the help of a questionnaire assistant. The questions were written on both sides of an A4 sheet. There were a total of 28 questions, mostly with multiple-choice or Likert scale questions, but there were also some open-ended questions. Filling the questionnaire was typically a few minutes in most cases. The questionnaire was available in 5 languages (English, German, Croatian, Italian, Hungarian) with the same content. Tourists from countries of other languages could also choose from these options.

The results were evaluated using MS Excel. Due to the size limitations of this article, not all questions are processed individually below.

Results

Demographic characteristics

In total, 525 people took part in the survey. About a third came from Germany, 10–10 percent from France and Poland, 7–7 percent from the United Kingdom and Croatia, and more

than 1 percent from the Netherlands, Austria, Hungary, Switzerland, the USA, Belgium, Italy, Ireland, Romania and Slovakia. The whole sample allows for statistically reliable conclusions (of course only for the given period), but the analysis of the differences between tourists from different nations is not really possible given the number of items for most nationalities. However, some simple observations can be made even if it is not statistically reliable.

According to the age distribution (*Table 1*), young people (18–30 years old) were in the majority among respondents (59%), and the proportion of respondents decreased with increasing age. On the one hand, it is a common feature that young people are always more likely to complete a questionnaire. Nonetheless, the lack of the elder generation (retirees) is particularly striking, which can be clearly explained by COVID because the pandemic reduced the number of older travellers much more strongly. In terms of education, the sample was dominated by people with tertiary education (72%), which is typical for surveys conducted at natural sites (ZGŁOBICKI, W. and BARAN-ZGŁOBICKA, B. 2013; ALLAN, M. et al. 2015; ŠTRBA, L. 2019). In addition, in the national park visitor survey in 2019, the most numerous respondents were those between 21 and 36 years of age and 68.5 percent of respondents had university degree (Krka National Park, 2019).

Table 1. Demographic data of respondents

Indicator	Number	Percentage of answers, %
Age, year		
18–30	308	59.1
31–50	139	26.7
51–65	59	11.3
over 65	15	2.9
Education		
Primary school (or less)	6	1.2
Secondary school	127	26.3
Higher education (university)	349	72.4
Sex		
Male	225	43.6
Female	290	56.2
Male/Female	1	0.2

Slightly less than half of those who completed the questionnaire were men (44%) and the majority were women (56%).

Some basic characteristics of tourism in Krka National Park

The next group of questions examined some general technical characteristics of tourism. From these, it can be stated that two-thirds (65%) of the respondents arrived at the Krka NP by car, a little less than a third (29%) by bus (tourist bus or regular bus service). It is clear that these rates have also been significantly modified by COVID, as tourist bus groups have been the most severely hit by the pandemic. An insignificant but interesting highlight is that 3 percent of visitors arrived in the national park by boat, which is possible because in a deep, ria-type valley you can sail from the sea to the gates of the national park. In addition, we can mention 2 percent of environmentally conscious visitors, who arrived here by bicycle.

Consistent with the above, only 10 percent arrived organized by a travel agency, the rest being independent travellers, either with family (43%) or independent group / friends (43%) or alone (3%). The vast majority of visitors (92%) spend only one day in the Krka NP, while 5 percent stay for 2–4 days, and even fewer (3%) for longer. This is an unfavourable ratio in terms of tourism revenues, however, it is typical for many other karst regions where there is a single prominent attraction (e.g. Baradla Cave in Aggtelek NP – TELBISZ, T. et al. 2020).

Spatial inequalities

We can examine spatial inequalities from two sides, on the one hand in terms of sights and on the other hand in terms of accommodation. It is true that the Skradinski Buk waterfalls are the most spectacular within the NP, but the rest of the NP also hides beautiful and interesting sites. But when visitors were asked “what other attractions do you visit within

the NP?”, only a minority (40%) answered, and even within that, most of the respondents (24%) said “nothing”. As for the remainder, many mentioned destinations, which are in fact not in the area of Krka NP. So finally, only 21 percent of respondents left, who could mention destinations (Visovac, Roški Slap) and activities (hiking, visiting caves) that are possible within the Krka NP (but in fact even the latter activities were quite common activities, which are not necessarily linked to Krka NP). Therefore, we conclude, that the spatial inequality is extremely strong in this respect.

As far as accommodation is concerned, the disproportion is also remarkable. Only a minority of respondents (23%) answered the question about accommodation, and only 14 percent of those respondents mentioned accommodations in Krka NP (more precisely, next to it), while all other respondents named accommodations along the coast (Split, Vodice, Šibenik, Zadar, etc.). It is in line with the fact that most of them visit Krka NP within a same-day visit that usually takes only a few hours and visit the region for other motives (e.g. coastal tourism). Therefore, the disproportion is significant in this respect as well, and we can conclude that the inner settlements cannot benefit much from the accommodation business related to the national park tourism. However, although the share of visitors who stay in the vicinity of the national park is small, the inland settlements still benefit from it, especially when we look at it in relative terms. Given how small and depopulated these settlements are, these numbers are locally significant and growing over the last 10–15 years. The national park is one of the attractive factors for this, while the other one being that tourists look for cheaper accommodation in places that are not overcrowded as an alternative to the coast.

Values of the national park from the point of view of tourists

One of the multiple choice (multiple answer) questions in the questionnaire examined what

the values of this landscape are according to tourists (*Figure 2*). As expected, of the pre-specified response options almost everybody chose the “waterfalls” (92%), and the vast majority (82%) also marked the “lakes and rivers” option. The “forests” option got the third place (66%) that is somewhat surprising as Krka NP is not a classic “densely wooded” area. Nonetheless, it is an unambiguous fact that the forest cover of the NP along the valley sides of the river Krka is relatively high compared to its surroundings. Half of the visitors (51%) also selected the “peaceful landscape” option, despite the fact that it may not be so easy to experience in an often crowded park. The option “animals” are in fifth place (49%), although most visitors are likely to meet only fish in Krka NP. However, pictures and information about the animals in the area are prominently displayed on the information boards, and many people links nature conservation to the protection of animals and plants.

The option “caves” received few votes, which is not surprising as only one cave (Oziđana pećina) can actually be visited in the NP area, and in fact few people get there. Furthermore, there have been few votes for “surface karst landforms”, which are less obvious along the main visitor route, and few visitors are aware that the waterfalls them-

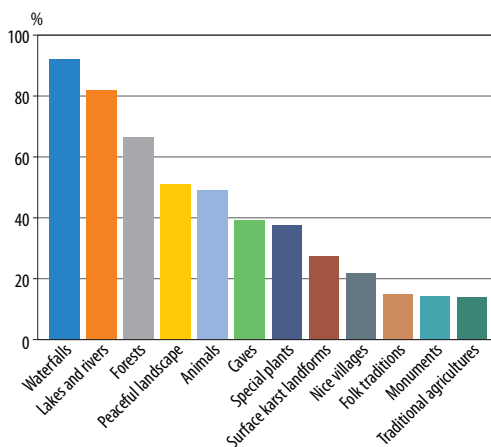


Fig. 2. Values of the national park according to visitors

selves and the gorge valley were formed by karst processes. Cultural values (i.e. the options “nice villages”, “monuments”, “traditional agriculture”, “folk traditions”) are important for only a small number of people in the Krka NP (15–20%), which is understandable because these values, although present, are really not as significant as they are in relatively nearby other areas, such as cities along the coast. In addition, most visitors do not even experience the cultural values because they spend only a few hours in the NP.

The following aspect was mentioned in a separate question, but we write about that at this point. In several national parks, the existence of local products are also among the values, partly due to the preservation of cultural heritage and partly as a contribution to the socio-economic development of local people. The actual situation in Krka NP according to our survey is that 85 percent of the respondents provided an answer to the question “Do you know local products with the trade mark of Krka NP?”, but only 4 percent of them answered “yes”.

Motivation and source of information

In another multiple choice (multiple answer) question, visitors could answer why they chose Krka NP as the destination of their visit (Figure 3). The vast majority (73%)

pointed out that they were interested in natural attractions. The second most important factor was to know the country (“I like to get around the different parts of this country”) with 38 percent of respondents. Somewhat less significant factors were “friends suggested” (27%), “looked for relaxation” (22%), “wanted an adventurous tour” (23%). “Interest in karst landforms” is a motivation factor for only a small minority (6%). As noted above, no statistically relevant conclusions can be drawn for selected nationality given the small subsample size, but here we note that “relaxation” and “getting around the different parts of this country” were significantly more important for Croatians than for foreign respondents.

Regarding motivations, it is also meaningful to examine the effect of the title of an area (e.g. national park, world heritage, geopark) on visitors’ motivations (REINIUS, S.W. and FREDMAN, P. 2007; TELBISZ, T. et al. 2020). Therefore, we also asked a question in this connection, which revealed that “the fact that Krka is a NP” is an important aspect for more than half of the visitors (56%), it matters a little to 31 percent and only 13 percent answered that it doesn’t matter at all.

The main source of information (Figure 4) is, as expected, the “internet in general” (62%). Compared to this, “personal relations” (28%) and “social media” (20%) lag far behind, but

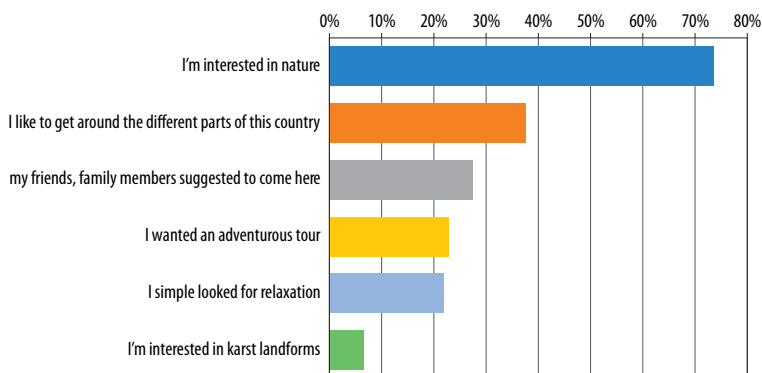


Fig. 3. Motivation of visitors to visit Krka NP

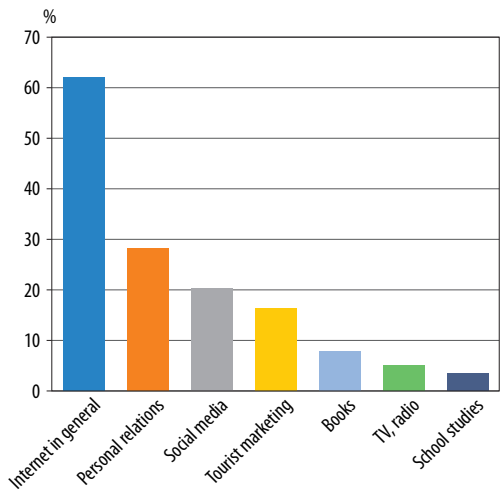


Fig. 4. Information sources of visitors

obviously their role should not be underestimated. The classic “tourist marketing and brochures”, although slightly less important than these (16%), still adds to the information of tourists. At this point again, a clear difference can be observed between Croatian and foreign respondents: in the case of Croatians, “school studies” (42%) and “TV and radio” (35%) are also significant sources of information, in contrast to foreign respondents.

Visitor satisfaction and development ideas

Respondents could answer to the questions related to satisfaction that covered five different topics on a 4-point Likert scale.

Basically, visitors are predominantly satisfied with the services (Figure 5). The highest score was given to “accessibility”, which is completely reasonable as most visitors arrive here by car (bus) and the two main entrances to the Krka NP are close to the highway. Although the average scores for the other four questions are quite similar, for the “eating options” and “accommodation” the answer option “3: rather yes” received slightly more votes than “4: perfectly” unlike the questions of “guidance” and “visitor

information”. So when it comes to services, maybe it is worth focusing the development on accommodation and eating option – but only with maximum consideration of the environmental aspects!

To some extent, the number of days that tourists spend in a given area is also a measure of satisfaction. As we have seen above, the vast majority only come here for one day. In the questionnaire, there was another question, which asked how many days the visitor would spend here if (s)he had more time. 48 percent said they would spend here only one day to visit the waterfalls. However, 30 percent answered that they would spend here more days even with the present conditions, and 22 percent chose the option that they would spend here more days only if there were more possibilities (sites, programs). Interestingly, in the 2019 Krka NP visitor survey 70.3 percent of respondents stated that they would have spent several days in the area if they had known about other sites and options in the national park in advance. Furthermore, 67.5 percent said that were they to spend more than one day in the area, they would opt for accommodation in the surrounding rural area (Krka National Park, 2019).

Of the tourist development options, the respondents could vote for seven options also on a Likert scale 1–4 (Figure 6). The results reveal that most of the respondents would support the construction of new panora-

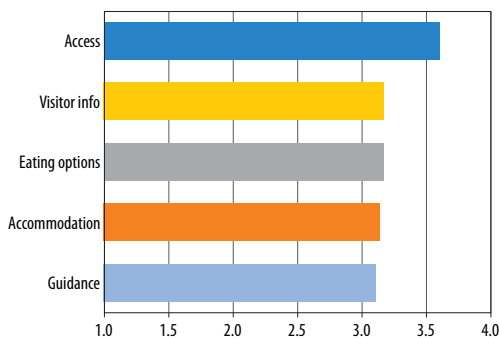


Fig. 5. Visitors’ satisfaction. Average scores on a 4-point Likert scale.

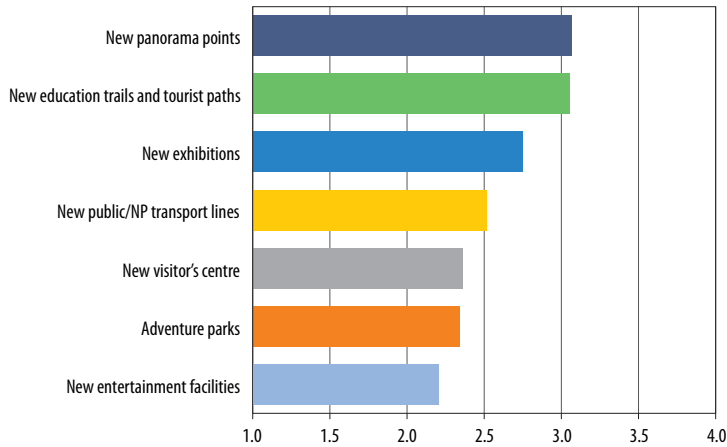


Fig. 6. Visitors' support to different development ideas. Average scores on a 4-point Likert scale.

ma points, presumably because, although there are already excellent panorama points around the waterfalls, they are often overcrowded. In addition, people in general like lookout points. The creation of new education trails and tourist paths got similarly high popularity. Nevertheless, the actual situation is that there are already a relatively large number of education trails and tourist paths in the NP, but most people do not visit them (except for the Skradinski Buk waterfalls) – partly perhaps due to a lack of information and partly due to the typical 1-day long visit.

The creation of new exhibitions is slightly less supported, but much more than the construction of a new visitor centre. These opinions seem slightly paradoxical as visitor centres often contain exhibitions. The “construction of new public/NP transport lines within the Park” received an average score, which means that it is neutral for a large part of the visitors as they visit only Skradinski Buk waterfalls. Nevertheless, this could be an important element in bringing the interior of the park closer to tourists, therefore to decrease spatial inequality.

The lowest support in the average score, and more importantly, a significant proportion of dismissive opinions exist in relation to the establishment of new entertainment possibilities or adventure parks. But even for

these development ideas the proportion of supporters is slightly higher than that of the opponents. However, the relatively high rejection rate indicates that many people consider this type of development to be incompatible with the classic nature conservation tasks.

Tasks of the national park according to tourists

Naturally, the tasks of a national park are prescribed by the relevant law of the given country (see MARI, L. et al. 2022 in this issue). Nonetheless, an important question is how much visitors are aware of these tasks and which ones they consider important. This was measured on a 1-5 Likert scale, listing 8 different tasks.

Taking into account the characteristics of Krka NP, the visitors placed the protection of the “hydrological values” in the first place (average score 4.79) (Figure 7). “Biological values” (4.76) and “landscape” protection (4.7) received similarly high average scores. It is normal as these goals are almost everywhere among the most important tasks in national parks. The preservation of “geological values” (4.59) did not lag far behind the above goals, which is a little bit surprising, because in many places the experience is that geological preservation is significantly behind the

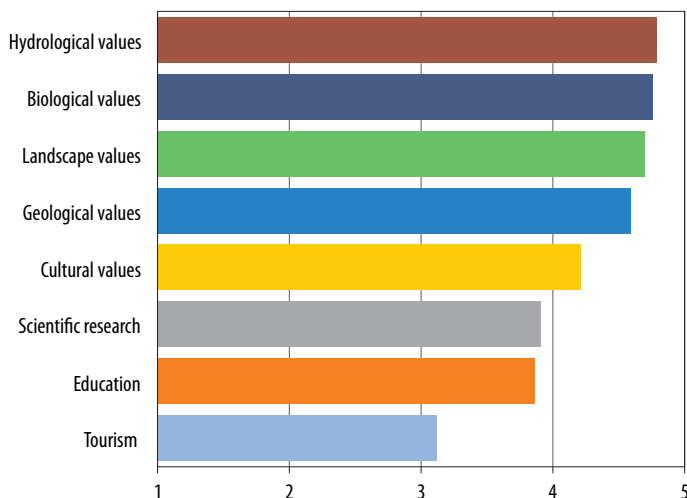


Fig. 7. Importance of the tasks of the national park according to visitors. Average scores on a 5-point Likert scale.

biological issues (BRILHÁ, J. 2002; GORDON, J.E. et al. 2018; SZEPESI, J. et al. 2018). However, in Krka NP, it seems that visitors are aware that the tufa waterfalls as the main attractions are after all geological values. “Cultural values” (4.21) are even further down the list, which is evident, as this is historically a later task for national parks, and the primary responsibility of national parks is still nature conservation. However, it is noted here that Krka NP is about the coexistence of man and nature/river for centuries (as especially visible in watermills and the use of hydro energy, but also agriculture etc.), therefore, this should clearly be better presented in the NP. The tasks of “scientific research” (3.91) and “education” (3.86) have got even lower scores, which is a typical result of similar surveys (NESTOROVÁ DICKÁ, J. et al. 2020; TELBISZ, T. et al. 2020), although these roles are very important for most national parks. However, this opinion of visitors is easy to understand as only a small proportion of them are in connection with these activities. The most surprising result is that “tourism” received the lowest average score (3.12). The interpretation and significance of this fact is explained in more detail in the Discussion section.

Awareness of geological heritage and karstification

One of the important issues in our research is how well people are aware of karstification and the geological heritage in general. On the one hand, because karstification is a very important practical topic in water supply in many places, and national parks could or should provide education on this topic. On the other hand, the role of geotourism related to either karstic or non-karstic geological heritage is constantly growing nowadays. Nevertheless, a common experience is that people are still less aware of the meaning and values of geotourism.

Well, this latter fact was also confirmed by the results of our survey. When people were asked if they “know the meaning of the word *karst*”, only 18 percent answered “yes”. And when the meaning of the word ‘karst’ had to be explained shortly, only 30 percent of those who answered “yes” could give a more or less accurate answer. Another third (31%) could write only general adjectives (like “rocky” or “barren” surface), and the remaining more than third part (39%) gave no or incorrect answers. We obtained roughly similar proportions when asked if the

visitor had already visited other karst areas. 24 percent of respondents answered “yes”, but only a few of them were able to name any karst region within Croatia or abroad. In this respect, only Croatian respondents differed significantly from the average, as more than half of them (57%) said that they had visited other karst areas. By the way, the most frequently named karst region among both Croatians and foreigners was the Plitvice Lakes – which is a correct answer.

When asked about geotourism (“Have you ever heard the expression geotourism?”), roughly a quarter of respondents (27%) said “yes”. And only 14 percent of all respondents were able to give a more or less adequate description of what the word “geotourism” actually means.

The effect of demographic characteristics

The question arises as to how the above results are influenced by certain demographic characteristics such as gender, age, or education. In most cases, we found that these factors did not result in a statistically significant difference in responses. However, some cases can be highlighted when their effects have been observed. The effect of age is the most noticeable: the knowledge of young people (18–30 years old) about karst and geotourism is significantly lower than that of older people (the age group 51–65 is the best in this respect). Unsurprisingly, young people are much more likely to be adventure-seekers than older people.

Among the information sources, books are the most popular among the 51–65 age group, while their significance is negligible among young people. In contrast, the internet and social media are much more important for the younger age group. It may be surprising, but the level of education has less influence on the results, and even where the difference is statistically significant, there is no clear explanation either. For example, people with university degree mentioned less frequently the “animals” among the NP values, but they

selected the option “I am interested in nature” more often among the motivations. As for the information sources, “school studies”, “TV and radio” and “social media” are less important for those with a higher education degree, while the “internet” was mentioned in a higher proportion. Gender is even more indifferent to the questions examined, but we can mention, for example, that among the values of the NP, “special plants” were selected by a significantly higher proportion of women, and among the information sources “social media” was also chosen more frequently by women.

The role of COVID

Issues about COVID were not among the primary goals of the study, but because “life brought it so” that the survey fell by the time of COVID (the survey took place in fact at the end of a wave trough), we also asked respondents two COVID-related questions. The first question was whether COVID motivated visitors to visit natural areas (like the Krka NP). Behind this question was the idea, that in many places during COVID period, it was experienced that people visited outdoor natural places to a greater extent than exhibitions or programs in enclosed spaces (either out of compulsion or for personal consideration).

In the case of Krka NP, this was not the case for 71 percent of the respondents, but for 19 percent it was slightly important, and for 10 percent it was a predominant or decisive factor in the choice of a natural site as a tourist destination.

The second question was whether COVID influenced the choice of Croatia as a destination for foreign visitors. For Croatian respondents this question was slightly modified: “did Covid-19 crisis motivate you to take your holiday in Croatia”. 34 percent of foreign visitors answered “yes”, which is a fairly significant proportion. In the related open-ended question (“why did you choose Croatia”), respondents generally argued that the number of incidence was small in Croatia, or that it

was administratively easier to travel here (as Croatia was on the “green list” at the time). For Croatian respondents, COVID played an even more important role with 67 percent saying that COVID influenced them to spend their holidays in their home country.

Discussion

The above results reflect that in the Krka NP both the distribution of visitors and the distribution of accommodation are highly unequal. However, in order for the local population to benefit from the NP, it would be important to reduce inequality and develop the interior. This idea is not new, as the management of the NP has already recognized this fact and started along this line as the project “Unknown Krka: the hidden treasures of the upper and middle courses of the Krka River” testifies it (RADELJAK KAUFMANN, P. 2020). The reconstruction of lesser-known attractions in the interior (development of access, new exhibitions, hiking trails, Burnum project) has started and these locations also appear on the NP’s website and in its leaflets. However, this does not seem to be effective enough yet, as the survey reflects that the vast majority of visitors are unaware of these opportunities. As for rural tourism or simply, accommodation in the interior areas, these places obviously cannot compete with the attractiveness of the coastal zone, but for those who want a bit quieter and more affordable accommodation, they can be a good alternative to stay here. So, this can be a very important part of the development of the interior areas and the entrepreneurial layer of the local population can also be involved in its implementation. The creation of Krka NP trademark and the marketing and selling of local products by the NP could also help the local people, especially the local business community. However, it seems that this trade has not yet really developed here, so it is no accident that only a small fraction of tourists could name local products. Thus, this could be a potential direction for the fu-

ture development of Krka NP in the service of the local population.

One of the unexpected results of the survey was that among the tasks of the national park, the role of tourism was rated relatively low by visitors. In several other national park surveys (Aggtelek NP, Hungary; Slovak Karst NP, Slovakia; Tara NP, Serbia), tourism received a higher score in the ranking of national park tasks and an even higher score in the questionnaires completed by local people (TELBIŠZ, T. *et al.* 2020; NESTOROVÁ DICKÁ, J. *et al.* 2020). There are several possible reasons for this. Local residents experience the “benefits” of the national park most directly through tourism, so they understandably expect the development of tourism from the national park as well. This is especially true in the former socialist countries, where the entrepreneurial culture is less developed, especially in disadvantaged areas (KŐSZEGI M. *et al.* 2019; TELBIŠZ, T. *et al.* 2021). Thus, people expect that the national park can also manage tourism development in the most efficient way. This approach is deeply rooted in people, although in some places (e.g. in Aggtelek NP) there is a definite change of concept at the managerial level, the NP trying to step back in the development of tourism and entrusting this issue to independent contractors. To the contrary, in capitalist countries, the majority of people consider it natural for a long time that the development of tourism should be the responsibility of the private sector, whereas the national park should focus primarily on nature conservation issues. If tourism development is predominantly managed by the national park, conflicts between nature conservation and development occur within the national park organization, while if the private sector enters into tourism development, the conflicts arise between the national park and the economic actors. Both can have advantages and disadvantages. In any case, the fact that in the case of the Krka NP, tourism received the lowest score among the tasks of the national park may be the result of the fact that the majority of visitors come from countries that

have long followed the capitalist economic model. In contrast, the proportion of domestic visitors to the above-mentioned national parks (Aggtelek NP, Slovak Karst NP, Tara NP) is much higher than in Krka NP.

One of the tasks of national parks is to “educate” or, more generally, to increase knowledge or awareness of people in environmental or scientific issues. In our opinion, in the case of Krka NP, one of the most basic issues of this education would be the presentation of karstification, as karst processes created the dominant surface landforms of the NP. However, the survey revealed that knowledge transfer in this area is not efficient enough. However, as the relatively small size of Croatian subsample demonstrates, where the issue of karstification is more emphasized in public education, the knowledge of the karst-related concepts and facts may be slightly higher. In our previous survey, we found that the concept of “karst” was significantly better known in the Tara NP, Serbia (TELBIŠZ, T. et al. 2021). Nevertheless, we must add to the Tara case, that the proportion of teachers among the respondents was relatively high, as school groups, and consequently teachers, make up a large proportion of the Tara NP’s visitor composition, and it could significantly increase the knowledge about karst in the Tara survey). Nonetheless, we feel that the presentation of the concept of karst processes and the accentuation of the practical significance of karst hydrology should be given more emphasis in the knowledge dissemination activities of Krka NP. Knowledge transfer in NPs may include ‘individual’ learning, but organized field education programs can make a major contribution to deepening students’ knowledge of both karstification and the specific landscape (SÜTŐ, L. et al. 2020).

“Geotourism” is actually a long-standing form of tourism, but it actually got its own name only in the 1990s and has been on the rise ever since. Geotourists are usually divided into several groups (HOSE, T.A. 2008; BOŽIĆ, S. and TOMIĆ, N. 2015), and the vast majority of tourists in Krka NP can be classified as

general geotourist (or *sensu lato* geotourist) according to our survey. It means that they do not come here with a well-defined geological interest, however, what they actually visit is a (hydro)geological formation. Although Krka is not a geopark but a national park, if the geological heritage were given a little more emphasis, it would help raise awareness of the concept of geotourism and possibly help do some marketing to other lesser-known geotourism sites. And it would be a small step forward towards a spatially more even distribution of tourism. According to our survey, the link between Krka and Plitvice is well defined in the thinking of visitors, but other lesser-known geo-destinations could also be better advertised for Krka visitors.

Conclusions

Our survey conducted in Krka NP confirmed that there is a high degree of spatial inequality both in the awareness of attractions and the distribution of tourist accommodation. This fact has already been recognised by the management of the NP, and serious steps have already been taken to reduce inequality, but their impact is not yet significant enough.

Based on the survey, tourism in Krka NP is determined by the one-day long visits. Tourists who come here primarily consider waterfalls as well as lakes and rivers to be the most important values of the landscape. Cultural values are considered less important and even less known here. Local products are virtually unknown in the NP palette, so this could be a direction for development.

The main motivation of Krka visitors is “to look for natural beauties”, and the internet is their main source of information, but personal contacts and social media are not negligible either. Visitors are basically satisfied with the services (accommodation, eating options, guidance, visitor information), and the accessibility of the area is considered excellent, which can be explained by proximity to the highway (or in general, proximity to the coast). Among the development opportuni-

ties, the new panorama points and the educational trails / hiking paths enjoy the greatest support, while the development of entertainment facilities and adventure parks has a significant rejection rate (although these latter also have supporters). The awareness of the visitors in the field of karstification and geotourism is not very high, its development would be a reasonable goal.

The impact of COVID in the study period was manifested in the fact that the proportion of retirees and tourist buses was very small, whereas the majority of visitors (90%) arrived in the national park as independent travelers. For one third of foreigners, COVID played a role in choosing Croatia as a destination (because it was easier to travel here and the number of incidence was smaller than in other countries). As for the domestic tourists, two thirds chose to find a destination in Croatia because of COVID.

Visitors consider the preservation of hydrological values, biological values, landscape and geological values to be the main tasks of the NP, whereas they position education, research and the development of tourism as being less important (naturally, these latter tasks are also supported). Based on this, one can say that the idea that national parks should (also) serve the socio-economic development of the local people (cf. MOSE, I. 2007) is not really reflected in the opinions of visitors.

Of course, the above statements do not mean that in the development of the strategy of the national park, the managers should rely predominantly on the opinion of the visitors. These opinions may be overridden on the basis of other considerations. Nonetheless, these opinions are worth considering when answering the questions below.

In fact, the management of the NP (or its higher authority, the state) must decide whether

- they want quantitative development in tourism? (Because the NP is already experiencing overcrowding for a significant part of the year.)
- they want qualitative development in tourism?

- they want to adapt the developments to the needs of the local population?
- to what extent is it important to increase NP income as a development priority? (To what extent is the national park forced in this direction from the budget side?)
- or is the principle of nature conservation a decisive factor in contrast to the above points?

However, the discussion of these questions will be the subject of another article, in which the results of the questionnaire survey with the local population and the interviews with the main actors will be taken into account.

Acknowledgements: This research was supported by the National Research, Development and Innovation Office Hungary (NKFIH) K124497 project. The authors thank the permission of Krka NP to carry out this research.

REFERENCES

- ALLAN, M., DOWLING, R.K. and SANDERS, D. 2015. The motivations for visiting geosites: The case of Crystal Cave, Western Australia. *GeoJournal of Tourism and Geosites* 16. (2): 141–152.
- ANTIĆ, A., TOMIĆ, N. and MARKOVIĆ, S. 2020. Karst-based geotourism in Eastern Carpathian Serbia: Exploration and evaluation of natural stone bridges. *Geoconservation Research* 3. (2): 62–80. Doi: 10.30486/gcr.2020.1903486.1023.
- BALMFORD, A., BERESFORD, J., GREEN, J., NAIDOO, R., WALPOLE, M. and MANICA, A. 2009. A global perspective on trends in nature-based tourism. *PLoS Biology* 7. (6): e1000144. Available at <https://doi.org/10.1371/journal.pbio.1000144>.
- BOŽIĆ, S. and TOMIĆ, N. 2015. Canyons and gorges as potential geotourism destinations in Serbia: comparative analysis from two perspectives – ‘general geotourists’ and ‘pure geotourists’. *Open Geosciences* 7. (1): 531–546. Available at <https://doi.org/10.1515/geo-2015-0040>.
- BRILHÁ, J. 2002. Geoconservation and protected areas. *Environmental Conservation* 29. (3): 273–276. Available at <https://doi.org/10.1017/S0376892902000188>.
- BUTLER, R.W. and BOYD, S.W. (eds.) 2000. *Tourism and National Parks: Issues and Implications*. Chichester UK, Wiley.
- DUVAL, M. 2006. Tourism and preservation policies in karst areas: Comparison between the Škocjan Caves (Slovenia) and the Ardèche Gorge (France). *Acta Carsologica* 35. (2–3): 23–35. Available at <https://doi.org/10.3986/ac.v35i2-3.225>.

- FARSANI, N.T., COELHO, C. and COSTA, C. 2011. Geotourism and geoparks as novel strategies for socio-economic development in rural areas. *International Journal of Tourism Research* 13. (1): 68–81. Available at <https://doi.org/10.1002/jtr.800>.
- FROST, W. and HALL, C.M. 2015. *Tourism and National Parks: International Perspectives on Development, Histories and Change*. London, Routledge.
- GOJMERAC, M. 2018. *Održivi razvoj turizma Nacionalnog parka Krka* (Sustainable development of tourism in Krka National Park). PhD Thesis. Karlovac, Karlovac University of Applied Sciences, Business Department.
- GORDON, J.E., CROFTS, R., DÍAZ-MARTÍNEZ, E. and WOO, K.S. 2018. Enhancing the role of geoconservation in protected area management and nature conservation. *Geoh Heritage* 10. (2): 191–203. Available at <https://doi.org/10.1007/s12371-017-0240-5>.
- HOSE, T.A. 2008. Towards a history of geotourism: definitions, antecedents and the future. *Geological Society Special Publications* 300. (1): 37–60. London. Available at <https://doi.org/10.1144/SP300.5>.
- KALISCH, D. and KLAPHAKE, A. 2008. The dilemma of recreational use versus nature protection – Responses from national park authorities in Austria, Germany and Switzerland. In *Management for Protection and Sustainable Development. The Fourth International Conference on Monitoring and Management of Visitor Flows in Recreational and Protected Areas. Conference Proceedings MMV4*. Eds.: RASCHI, A. and TRAMPETTI, S., Montecatini Terme, Italy, CNR-Ibimet, 404–408. Available at https://mmv.boku.ac.at/refbase/files/kalisch_dennis_kla-2008-the_dilemma_of_recre.pdf
- KODERMAN, M. and OPAČIĆ, V.T. (eds.) 2020. *Challenges of Tourism Development in Protected Areas of Croatia and Slovenia*. Koper, University of Primorska Press and Croatian Geographical Society.
- KÓSZEGI, M., BOTTLIK, Zs., TELBISZ, T. and MARI, L. 2019. A „nemzeti park” koncepció tér- és időbeli változásai (Spatial and temporal changes in the concept of “national park”). *Földrajzi Közlemények* 143. (4): 308–323. Available at <https://doi.org/10.32643/fk.143.4.2>.
- Krka National Park, 2019. *Analiza ankete provedene u Nacionalnom parku „Krka” 2019*. (Analysis on results of surveys in Krka National Park 2019). Šibenik, Krka Nacionalni Park. Available at <https://www.np-krka.hr/upload/stranice/2018/03/2018-03-01/205/analizaankete2019.pdf>
- KRPINA, V. 2015. Analysis of the relation between visitors and protected natural areas in the Zadar County. *Šumarski list* 139. (11–12): 535–551.
- KUENZI, C. and MCNEELY, J. 2008. Nature-based tourism. In *Global Risk Governance: Concept and Practice Using the IRGC Framework*. International Risk Governance Council Bookseries. Eds.: RENN, O. and WALKER, K.D., Dordrecht, Springer, 155–178. Available at https://doi.org/10.1007/978-1-4020-6799-0_8.
- LAJIĆ, I. and MIŠEVIĆ, R. 2013. Demographic changes on Croatian islands at the beginning of the 21st century. *Migracijske i etničke teme* 29. (2): 169–199. Available at <https://doi.org/10.11567/met.29.2.3>.
- LAZZARI, M. and ALOIA, A. 2014. Geoparks, geoheritage and geotourism: opportunities and tools in sustainable development of the territory. *Geojournal of Tourism and Geosites* 13. (1): 8–9.
- MARI, L., TÁBORI, Zs., ŠULC, I., RADELJAK KAUFMANN, P., MILANOVIĆ, R., GESSERT, A., IMECS, Z., BARICZ, A. and TELBISZ, T. 2022. The system and spatial distribution of protected areas in Hungary, Slovakia, Romania, Serbia and Croatia. *Hungarian Geographical Bulletin* 71. (2): 99–115.
- MAYER, M., MÜLLER, M., WOLTERING, M., ARNEGGER, J. and JOB, H. 2010. The economic impact of tourism in six German national parks. *Landscape and Urban Planning* 97. (2): 73–82. Available at <https://doi.org/10.1016/j.landurbplan.2010.04.013>.
- McKEEVER, P.J. and ZOUROS, N. 2005. Geoparks: Celebrating Earth heritage, sustaining local communities. *Episodes* 28. (4): 274–278.
- MOSE, I. 2007. *Google-Books-ID: fl3dR_WiuKwC. Protected Areas and Regional Development in Europe: Towards a New Model for the 21st Century*. Aldershot, Ashgate Publishing Ltd.
- MRDEN, S. and BARIĆ, D. 2016. Demographic ageing of the population in the County of Šibenik-Knin: Grandparent boom. *Geoadria* 21. (1): 113–142.
- NESTOROVÁ DICKÁ, J., GESSERT, A., BRYNDZOVÁ, L. and TELBISZ, T. 2020. Behavioural survey of local inhabitants’ views and attitudes about Slovak Karst National Park in Slovakia. *Sustainability* 12. (23): 10029. Available at <https://doi.org/10.3390/su122310029>.
- PAPAGEORGIU, K. and KASSIOUMIS, K. 2005. The national park policy context in Greece: Park users’ perspectives of issues in park administration. *Journal for Nature Conservation* 13. (4): 231–246. Available at <https://doi.org/10.1016/j.jnc.2004.11.001>.
- PEJNOVIĆ, D. and HUSANOVIĆ-PEJNOVIĆ, D. 2008. Causes and consequences of demographic development in the territory of Velebit National Park, 1857–2001. *Periodicum biologorum* 110. (2): 195–204.
- PETRIĆ, L. and MANDIĆ, A. 2014. Visitor management tools for protected areas focused on sustainable tourism development: The Croatian experience. *Environmental Engineering and Management Journal* 13. (6): 1483–1495.
- RADELJAK KAUFMANN, P. 2016. Challenges of the regional development in Dalmatia. *Studia Mieskie* 24. 107–127.
- RADELJAK KAUFMANN, P. 2020. Rural tourism in the surroundings of Krka National Park: Factors of development and spatial impacts. In *Challenges of Tourism Development in Protected Areas of Croatia*

- and Slovenia. Eds.: KODERMAN, M. and OPAČIĆ, V.T., Koper–Zagreb, University of Primorska Press – Croatian Geographical Society, 53–73.
- REINIUS, S.W. and FREDMAN, P. 2007. Protected areas as attractions. *Annals of Tourism Research* 34. (4): 839–854. Available at <https://doi.org/10.1016/j.annals.2007.03.011>.
- ROMANO, B. 1995. National parks policy and mountain depopulation: A case study in the Abruzzo Region of the Central Apennines, Italy. *Mountain Research and Development* 15 (2): 121–132. Available at <https://doi.org/10.2307/3673876>.
- ŠTRBA, L. 2019. Analysis of criteria affecting geosite visits by general public: A case of Slovak (geo)tourists. *Geoheritage* 11. (2): 291–300. Available at <https://doi.org/10.1007/s12371-018-0283-2>.
- ŠULC, I. and VALJAK, V. 2012. Zaštićena područja u funkciji održivog razvoja hrvatskog otočja – primjer otoka Mljeta (Protected areas as a factor of sustainable development of the Croatian island – the example of Mljet island). *Croatian Geographical Bulletin* 74. (1): 161–185.
- SÜTŐ, L., ÉSIK, Zs., NAGY, R., HOMOKI, E., NOVÁK, T. and SZEPESI, J. 2020. Promoting geoheritage through a field-based geo-education event: A case study of the Hungarian Geotope Day in the Bükk Region Geopark. *Geoconservation Research* 3. 81–96. Available at <https://doi.org/10.30486/gcr.2020.1906171.1029>.
- SZEPESI, J., ÉSIK, Zs., SOÓS, I., NOVÁK, T.J., SÜTŐ, L., RÓZSA, P., LUKÁCS, R. and HARANGI, Sz. 2018. Földtani objektumok értékminősítése: módszertani értékelés a védelem, bemutatás, fenntarthatóság és a geoturisztikai fejlesztések tükrében (Methodological review of geosite inventory and assessment work in the light of protection, sustainability and the development of geotourism). *Földtani Közlemény* 148. (2): 143–160. Available at <https://doi.org/10.23928/foldt.kozl.2018.148.2.143>.
- TELBISZ, T., BOTTLIK, Zs., MARI, L. and KÓSZEGI, M. 2014. The impact of topography on social factors: A case study of Montenegro. *Journal of Mountain Science* 11. (1): 131–141. Available at <https://doi.org/10.1007/s11629-012-2623-z>.
- TELBISZ, T., BOTTLIK, Zs., MARI, L. and PETRVALSKÁ, A. 2015. Exploring relationships between karst terrains and social features by the example of Gömör-Torna Karst (Hungary-Slovakia). *Acta Carsologica* 44. (1): 121–137. Available at <https://doi.org/10.3986/ac.v44i1.1739>.
- TELBISZ, T., IMECS, Z., MARI, L. and BOTTLIK, Zs. 2016. Changing human-environment interactions in medium mountains: The Apuseni Mountains (Romania) as a case study. *Journal of Mountain Science* 13. (9): 1675–1687. Available at <https://doi.org/10.1007/S11629-015-3653-0>.
- TELBISZ, T., STERGIU, C.L., MINDSZENTY, A. and CHATZIPETROS, A. 2019. Geological and geomorphological characteristics of Vikos Gorge and Tymphi Mountain (Northern Pindos National Park, Greece) and karst-related social processes of the region. *Acta Carsologica* 48. (1): 29–42. Available at <https://doi.org/10.3986/ac.v48i1.6806>.
- TELBISZ, T., GRUBER, P., MARI, L., KÓSZEGI, M., BOTTLIK, Zs. and STANDOVÁR, T. 2020. Geological heritage, geotourism and local development in Aggtelek National Park (NE Hungary). *Geoheritage* 12. (1): 5. Available at <https://doi.org/10.1007/s12371-020-00438-7>.
- TELBISZ, T., ČALIĆ, J., KOVAČEVIĆ-MAJKIĆ, J., MILANOVIĆ, R., BRANKOV, J. and MICIĆ, J. 2021. Karst geoheritage of Tara National Park (Serbia) and its geotouristic potential. *Geoheritage* 13. (4): 88. Available at <https://doi.org/10.1007/s12371-021-00612-5>.
- TELBISZ, T. and MARI, L. 2020. The significance of karst areas in European national parks and geoparks. *Open Geosciences* 12. (1): 117–132. Available at <https://doi.org/10.1515/geo-2020-0008>.
- TELBISZ, T., RADELJAK KAUFMANN, P. and BOČIĆ, N. 2022. Inland-coastal geomorphological transformations in a karst area: a case study of the surroundings of Krka National Park (Croatia). *Journal of Mountain Science* 19. (2): 305–321. Available at <https://doi.org/10.1007/s11629-021-7032-8>.
- TRAKOLIS, D. 2001. Perceptions, preferences and reactions of local inhabitants in Vikos-Aoos National Park, Greece. *Environmental Management* 28. (5): 665–676. Available at <https://doi.org/10.1007/s002670010251>.
- ZGŁOBICKI, W. and BARAN-ZGŁOBICKA, B. 2013. Geomorphological heritage as a tourist attraction. A case study in Lubelskie Province, SE Poland. *Geoheritage* 5. (2): 137–149. Available at <https://doi.org/10.1007/s12371-013-0076-6>.

Attitudes of local people towards Apuseni Nature Park, Romania

ZOLTÁN IMECS¹, ANDRÁS MÁTHÉ¹ and BALÁZS KOHÁN²

Abstract

Nature parks are protected natural areas whose purposes are the protection and conservation of landscapes in which the interaction of human activities with nature over time has created a distinct area, with significant landscape and/or cultural value, often with great biological diversity. This is the case of Apuseni Nature Park, which includes a significant karst terrain and is a very important tourist destination. In this article, we examine the attitude of local people towards the protected area with the help of a questionnaire composed of 32 questions. After the general questions, the economic situation was examined first. Then the respondents had to evaluate the values and the difficulties of their region and their relation to tourism. The answers reveal that they are aware of the importance of tourism, which may represent a serious complementary income for them. The most intriguing questions were some open-ended questions, which focused on the relationship of locals to Apuseni Nature Park. Based on the answers, we can conclude that the negative opinions slightly dominate. The dissatisfaction of the locals, the feeling of limitations due to the park are expressed in many different ways. But probably the most relevant problems can be linked to the rules and laws. As it is a nature park, people in fact, live inside the park, thus, the equilibrium between their lives and the purposes of the park should be approached. The administration of the nature park should involve local people more closely in decision-making, and maybe certain rules should be changed.

Keywords: nature park, local people, questionnaire, karst, geotourism, protected areas

Received March 2022, accepted May 2022.

Introduction

In the framework of an international project (Karst and National Parks 2022), we are examining the attitudes and opinions of people living in karst national parks (NPs) and of tourists visiting these parks (MARI, L. *et al.* 2022). Although Apuseni Nature Park (ANP) is “only” a nature park, it is a protected area with invaluable bio- and geoheritage, including remarkable karst features. It is a popular tourist destination and also home to almost 10,000 people. Thus, it is a perfect location to study the attitudes of local people towards the protected area, and their relation to tourism.

ANP is situated in the territory of Apuseni Mountains, the western part of the Romanian Carpathians (*Figure 1*). In translation “apuseni” means “sunset” referring to the position of the mountains relative to the central part of the country.

Nature parks – as IUCN Category V - Protected Landscape – have a lot of roles (IUCN 2022), among which we now mention only the most important ones:

- to maintain a balanced interaction of nature and culture through the protection of landscape and associated traditional management practices, societies, cultures and spiritual values;

¹ Department of Geography in Hungarian, Babeş-Bolyai University. Strada Mihail Kogălniceanu, 400347 Cluj-Napoca, Romania. E-mails: zoltan.imecs@ubbcluj.ro; andras.mathe@ubbcluj.ro

² Department of Physical Geography, Faculty of Science, Eötvös Loránd University, Pázmány Péter sétány 1/C, 1117 Budapest, Hungary. E-mail: balazs.kohan@gmail.com

- to contribute to broad-scale conservation by maintaining species associated with cultural landscapes and by providing conservation opportunities in heavily used landscapes;
- to provide opportunities for enjoyment, well-being and socio-economic activity through recreation and tourism;
- to provide natural products and environmental services;
- to provide a framework to underpin active involvement by the community in the management of valued landscapes and the natural and cultural heritage that they contain;
- to encourage the conservation of agrobiodiversity; to act as models of sustainability so that lessons can be learnt for wider application.

Some authors call “protected landscapes” as the conservation model for the 21st century (BERESFORD, M. and PHILLIPS, A. 2000). Some researchers even call protected landscapes as the most effective conservation mechanism in some situations (MALLARACH, J.M. et al. 2008), whereas others discuss whether protected landscapes are really protected areas at all (DUDLEY, N. et al. 2010).

Like national parks, nature parks may also present serious values but also constraints for the local population that may be occasionally more severe than in a national park. This fact will be emphasised in the conclusions of this article. The karst landscapes are often popular destinations due to their spectacular forms, such as caves, gorges, collapsed dolines or special vegetation (CIGNA, A.A. and FORTI, P. 2013; BOŽIĆ, S. and TOMIĆ, N. 2015; DOLLMA, M. 2018; RUBAN, D. 2018; TELBISZ, T. and MARI, L. 2020; TELBISZ, T. et al. 2020, 2021). The tourism based on these values can be complementary or, for some local people, even the main source of livelihood and can have a serious impact on the deterioration or preservation of the environment.

Nowadays, the extent to which the management of protected areas should also serve the socio-economic development of the local inhabitants is a frequently examined question (MOSE, I. 2007). In addition, it is also important to get to know the relationships between different actors of the park – local people – tour-

ists triangle (HAYES, T.M. 2006). One part of these complex relationships is the attitude of local people toward the protected area which is often examined with the help of questionnaires (TRAKOLIS, D. 2001; ZURC, J. and UDOVČ, A. 2009; ŠULC, I. and VALJAK, V. 2012; MIKA, M. et al. 2019; NESTOROVÁ DICKÁ, J. et al. 2020; ZAWILIŃSKA, B. 2020).

In this article, we present the results of a questionnaire survey conducted among the locals from Apuseni Nature Park. We focus on the following issues:

- What is the priority order of the nature park goals according to local people?
- To what extent do local residents perceive that the nature park also serves to their benefit?
- How do local people see the values of these landscapes?
- Are there conflicts in the local people – tourism – nature protection triangle?

Brief description of Apuseni Nature Park

Natural conditions

Based on geological maps of 1:200,000 scale and our GIS-analysis (TELBIŠZ, T. et al. 2016), it is calculated that in almost half (48%) of the area we can find partly or fully karstifiable rocks that explains the large number of karst landforms. Actually, karst landforms are present in more than 24 percent of the territory. Metamorphic rocks occupy 30 percent of the area, whereas plutonic and volcanic rocks are present in smaller amounts. Thus, the diversity of rocks ensures the diversity of landscapes, too.

The mean altitude of the park area is 1,120 m with 66 percent of the surface between 1,000 m and 1,400 m a.s.l. (Figure 1). The relief is characterised by large plateaux with many deep valleys and gorges.

The rivers belong to three main river basins, Someş in the East, Arieş in the South and Criş in the West, all of them are tributaries to Tisa and finally to the Danube. Also, from a hydrologic point of view, we have to mention the presence of a large endorheic area with a

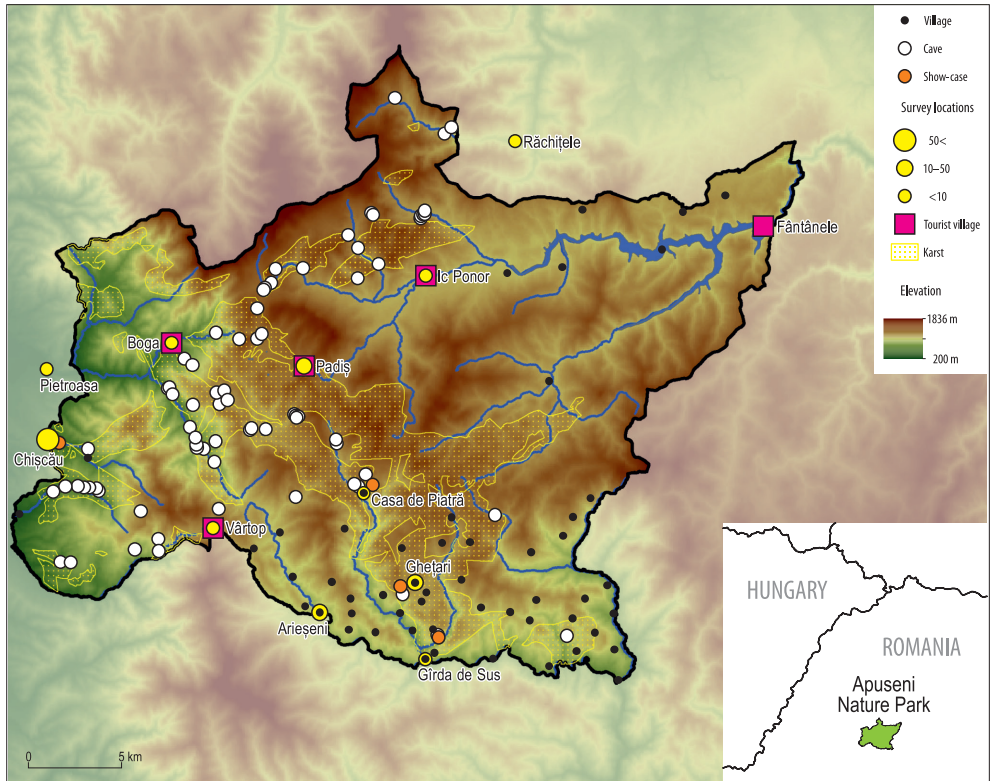


Fig. 1. Location of Apuseni Nature Park and the extent of karst area (with caves), settlements and survey locations

surface of 59 km² (ORĂȘEANU, I. 2016). There is also a 7.5 km² size artificial lake and several temporary lakes on the karst surfaces.

The climate is characterised by an average temperature of 4 °C to 10 °C, decreasing with the altitude. The highest precipitation values in all of Romania (more than 1,400 mm a year) are measured in the western side of the mountains (BADEA, L. 1983). A specific feature is the fog that can be often seen in the karstic depressions especially in autumn.

Based on CORINE Land Cover database, forests cover more than 70 percent of the park, the rest is covered by pastures and grasslands. A very small amount is agricultural land. The forest cover has been seriously modified by human impact since the Middle Ages (JAKAB, G. et al. 2021).

Socio-economic situation

Being a mountain region, the nature park is characterised by small villages. Among the 53 settlements, 43 have a population of less than 300. The structure of the villages is dispersed. The 53 settlements belong to 17 municipalities (local administrative units), and these are parts of 3 counties. It is interesting that none of the municipalities is entirely inside the park. The total number of inhabitants is around 10,000. The main economic activities are forestry and agriculture, mainly farming. As the region represents an attractive destination for tourists, the number of touristic facilities – pensions, restaurants, shops – is growing (CUCU, V. 1984; HORVÁTH, GY. 2006; Tempo online 2022).

Nature protection history

At the beginning of the 20th century, Gyula CZÁRÁN was the first who created touristic trails. Some of them are still used. The famous scientist Emil RACOVITĂ suggested protecting large areas in Apuseni Mountains in 1928. The first protected elements inside the park were caves: Scărișoara ice cave – 1938, Cetățile Ponorului – 1955. The first scientific documentation considering nature protection of the area was made in the 1970s. In 1990, the area was declared a “national park”, however, this declaration was not followed by setting up a really working institution. In 2000, as part of the National Spatial Planning Plan - Section III about protected areas, it was transformed into a “nature park”. It corresponds to IUCN Category V - Protected Landscape. With a total area of more than 767 km² it includes 3 Natura 2000 sites, and further 55 protected areas, mainly nature reserves and natural monuments, 41 of them are karstic. The Apuseni Nature Park Administration was established in 2004 (BLEAHU, M. 2019).

Tourism

The park area is not closed and there is no entry ticket, so there is no precise data on the number of tourists entering the area. The park administration estimates that the number of visitors is about 500,000 a year. Hiking-type tourism is very typical, and a well-developed network of hiking trails is available, there are more than 30 trails with a total length of over 400 km.

There are more than 1,500 caves in the park. According to legislation (GEO, 2007), 37 caves are “classified” (i.e. have international, national or local importance under different categories), that is more than 28 percent of all classified caves in the country. There are four “show caves” (Bear Cave, Scărișoara ice cave, Vârtop ice cave, Poarta lui Ionele Cave), and the number of visitors to these caves is registered. In the last decade, the number of visitors was 128,000 a year on

the average, taking into consideration all four caves (data from ANP Administration).

According to National Statistical Institute data there are 114 accommodation facilities in the municipalities intersected by the park, with a capacity of more than 2,500 beds. The tourist overnights spent in these municipalities are more than 110,000 a year (Tempo online, 2022). We can presume that the real number of tourists is higher, because not all of them are officially registered. Further on, there are some free camp places in the area of ANP, where the number of tourists is not registered, thus, we can assume that the total number of visitors is even higher.

Methodology

Our questionnaire survey was planned using the experiences of similar surveys conducted in other protected areas (TRAKOLIS, D. 2001; PAPANAGEORGIOU, K. and KASSIOUMIS, K. 2005; ZURC, J. and UDOVČ, A. 2009; ŠULC, I. and VALJAK, V. 2012; ZGŁOBICKI, W. and BARAN-ZGŁOBICKA, B. 2013; KRPIŃA, V. 2015; MIKA, M. et al. 2019; ZAWILIŃSKA, B. 2020).

The questionnaire survey that provides the basis of the results presented in this article was conducted in the summer of 2019 and in the summer and autumn of 2021. Questionnaires with locals were conducted at 11 locations, at the entrances to major tourist caves and other busy tourist sites or in villages situated near the park. Questionnaires were filled onsite, with direct, face-to-face questioning, with the help of assistants (university students). The method of convenience sampling was used. Thus, the results are not strictly representative in the statistical sense, but they are nevertheless suitable for the evaluation and analysis of characteristic proportions in the views and attitudes of local people.

The questions were written on both sides of an A4 sheet. There were a total of 32 questions, mostly with multiple-choice or Likert scale questions, but there were also some open-ended questions. Filling the questionnaire was typically a few minutes in most cases. The results were evaluated using MS Excel.

A further note is that some of the questionnaires were filled in locations that are outside the park but in the close vicinity, generally where accommodation or other service facilities are present.

We also have to mention that it was very difficult to convince some locals to complete the survey. There were several cases when after finding that there are questions regarding the park, they refused to complete the questionnaires.

Results

A total of 139 questionnaires were completed during the survey. In the following analysis, the percentage is always related to the actual number of answers for each question (i.e. not counting the forms, in which the actual question remained unanswered). The demographic data of the respondents are shown in *Table 1*.

Table 1. Demographic data of the respondents

Indicator	Categories	Percentage of answers
Sex	male	63.8
	female	36.2
Age, years	14–18	2.9
	19–30	14.4
	31–50	32.4
	51–60	27.3
	over 60	23,0
Education	primary school	29.1
	secondary school	50,0
	higher education	20.9

It can be seen that there is an almost 2/3 to 1/3 proportion for males. About 1/4 of respondents are of inactive age. As for education, those with a secondary education dominated.

Living place and jobs

The first group of questions refers to the actual living place and job of the respondent. The survey was done in 11 locations, but the respondents live in 29 different places, including the survey places, of course. The

other places are very close to the survey locations. Only 17 respondents mentioned that they had moved from their childhood settlement to another one, but even in these cases, the movements took place between very near settlements. So, we can say that the population of the region is very stable.

For the question “*What is your actual job?*” 52 different answers were given, from a total number of 136. To better understand the structure of jobs, they were grouped into 10 categories, and the result is presented in *Figure 2*.

Comparison of the attitudes and perceptions of local residents

In order to assess the relationship of local people to the karst landscape, the nature park and tourism, it is important to know how they perceive their economic situation; therefore, the second group of questions was about that. Of course, in addition to local conditions, these views are also influenced by the macroeconomic situation. Thus, there were three questions about the economic situation, which could be answered on a 1-4 grade Likert scale. The results are shown in *Figure 3*.

It can be seen that for their own economic situation there is an equilibrium between “*bad*” (51.1%) and “*good*” (48.9%) answers, though “*bad*” is slightly dominant. As there

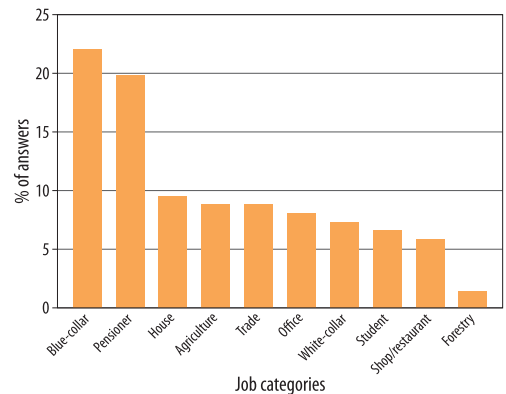


Fig. 2. Job categories of the respondents

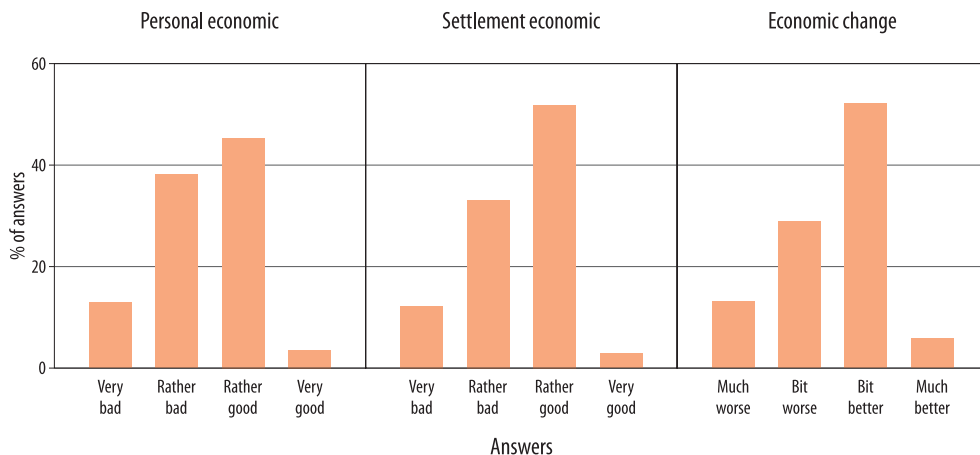


Fig. 3. Opinion of the local people about the economic situation. The questions: a) How do you see your personal (family) economic situation? b) How do you see the economic situation of your settlement? c) How has the economic situation changed during the last 10 years?

are 139 answers, the difference in absolute values is only 3 respondents. Referring to the situation of the settlement, the proportions are somehow reversed. From the 139 answers the “good” has a value of 54.7 percent, while “bad” is 45.3 percent. It is interesting to see the figures for the “change” question. Again, the “better” dominates (58.0%), while “worse” is 42.0 percent, which is slightly similar to the opinion about their settlement. We can conclude that the respondents generally feel the positive changes that took place in their region. But we have to underline that the domination of positive feelings is very weak, and the amount of “very good” or “much better” is insignificant (2.9% and 5.8% respectively).

Another question in this group is connected with the opening of the borders. The respondents had to say “yes” or “no” for the question whether the opening of borders had a positive or negative effect on their life. (After joining the EU, even if Romania is not a member of the Schengen convention, crossing the border became significantly easier as it is possible to do it only with an identity card.) They were also asked to give some reasons for their answer. Of the 126 answers 92 said “yes” (73.0%) but only 60 respon-

ents gave some explanation. They emphasised that travelling became easier (30.2%) and only 4.0 percent said that by the opening of borders, the number of tourists coming to their region will increase.

In addition to the general questions, we also asked some open-ended questions, in response to which they had to formulate the “good” and “bad” things in the current situation of their settlement. As it can be expected the answers to the open-ended questions are very diverse and therefore difficult to interpret.

For the question “What is good in your settlement?” 120 answers were given, with 65 varieties. The categorised results are presented in Figure 4.

Almost $\frac{1}{4}$ of the respondents revealed the importance of tourism (24.2%). 20.0 percent underlined the development of infrastructure, mainly the asphaltting of the roads (more than 6.0%) and the connection to water supply and waste-water systems (about 6.0%). The answers included in “good” group are very different. Some examples: “better life”, “everything is good”, “we have everything”. The most interesting answers are: “you can feel a small prosperity”, “the young went to work abroad bring money to home”, “the tractors help the work” or “it is good that we



Fig. 4. Good things in the actual situation of the settlement

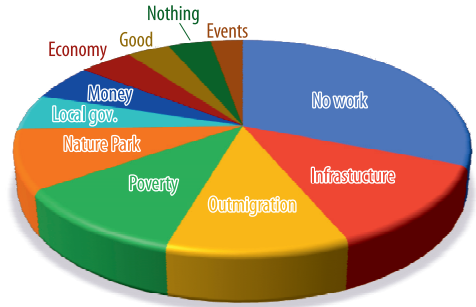


Fig. 5. Bad things in the actual situation of the settlement

do not have to buy food on tickets” – these answers recall the sad memory of the communist era. All the presented answers are unique in some way. The next element is simply “nothing” (13.3%). It is strange to give such a categoric negative answer to a question which is about the good things. The local government is the next element with 7.5 percent of the answers. Some examples: “good management” (2.5%), “the mayor is doing his job”. To some surprise, only 6.7 percent of the respondents consider nature as being a good thing in their settlement. The other types represent a small amount. But the following answer is also interesting: “it is nice, but the young are gone and no one stays...”

We were curious about how often “nature” or the “nature park” appeared in these responses. As mentioned before, “nature” has a very low representation (6.7%), while the “nature park” does not appear at all among the answers to the “what is good...” question.

For the question “What is bad in your settlement?” 127 answers were given, with 86 varieties. We tried to group the answers into 23 categories, which is still too much. In Figure 5, only the categories with more than two answers are presented.

The most important element is “unemployment – no work” (26.8%). In the second place is “infrastructure” with 11.0 percent. This is interesting because in the previous question, 20.0 percent of the respondents considered the infrastructure to be good. It is also interesting that the same elements are considered

“bad” by certain people that were considered “good” by others in the previous question, namely “asphalt roads” or “water supply”. Naturally, it is obvious that the respondents are from different places. The results clearly show that the different villages in the region develop in different ways. A more detailed analysis of this topic would reveal some interesting conclusions. Outmigration and poverty are in the third place with 9.4 percent each.

A few lines up we were wondering if the “nature park” appears as a good thing. In fact, it did not, but it appeared as a bad thing with 7.9 percent. Some of the answers simply mentioned the park as being “bad” (2.4%), but there were some other noteworthy answers regarding the park: “the park is bothering people”; “the park hinders us”; “the park gives laws and harsh fines”, “they make fun of people”.

Local government is also mentioned by some people as a bad thing (4.7%). However, one should remember that it was also mentioned as a good thing in the previous question (7.5%). It is similar to the opposite views about “infrastructure”.

Some interesting answers from the less important categories among the “bad things”: “few money”, “small pension” (money category); “people do not cultivate the lands”, “development is not allowed” (economy category); “good, everything is good” (good category); “we have no possibilities”, “we are forgotten by the world” (nothing category); “there are few places for fun, recreation” (events category).

Finally, some remarkable answers from the individual ones: “stopping the economic activities of wood processing”; “mafia leadership”; “crowd”; “logging not allowed”. Even if these answers are isolated and some of them extreme, they raise up some questions. However, answering these questions is not among the aims of our study.

At the end of this group of economic questions, we asked local residents if they would like to move out from their settlement. We got 135 answers, of which 74.1 percent were “no”. Those who might move out expressed their will to move to a city (11.1%) or abroad (7.4%). This is interesting because after reading the answers for the economic questions one could feel that a significant proportion of the locals – almost half of them – expressed a kind of dissatisfaction. Still, the majority choose to stay.

Connection with the landscape

The next group of questions examined people’s relationship to the landscape. First, they were asked to select the values of their region. Nine elements were listed and they could choose several of them. The results are visible in Figure 6. “Caves”, “forests” and “peace” are the most considered values.

The second question referred to the difficulties of the region. Five elements were listed and respondents could choose several of them. The results are visible in Figure 7. 129 answers were given, it seems that this question was less interesting or the options less expressive, as generally, the number of chosen elements is lower.

In this question, the respondents had the possibility to give their own answers, too. 19 answers were gathered, and their structure is very similar to those from the questions referring to the bad things of the settlement. 36.8 percent underlined the lack of jobs again.

The next question in this group refers to the direct connection of inhabitants to caves and nature. Does anyone who lives here often go to the caves or to the nature (the surrounding forests)? The responses (Figure 8) show that the relationship between local residents and caves is rather weak, as the majority of people “never” (54.7%) or only “1–3 times a year” (37.2%) visit a cave. The proportion of those who go to a cave on a monthly or weekly basis is only 8 percent.

Visiting nature (surrounding forests), on the other hand, is much more significant, with more than half of the people (53.6%) going to nature daily and 21.7 percent weekly. These answers can be explained probably by

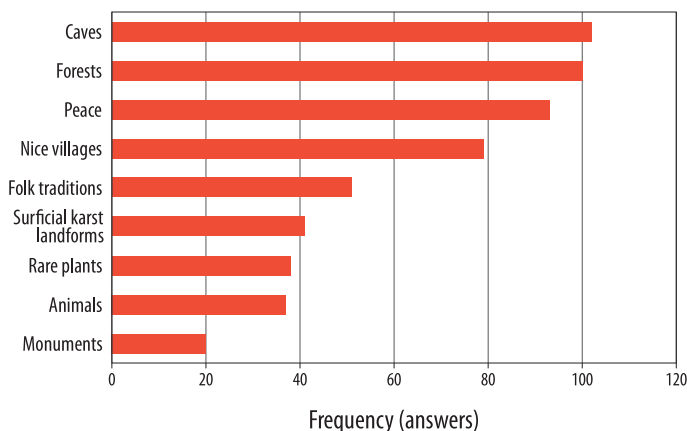


Fig. 6. The values of the region according to the respondents

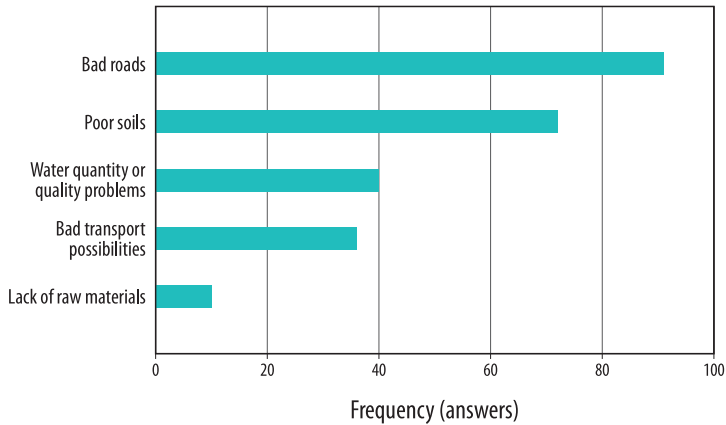


Fig. 7. The difficulties of the region according to the respondents

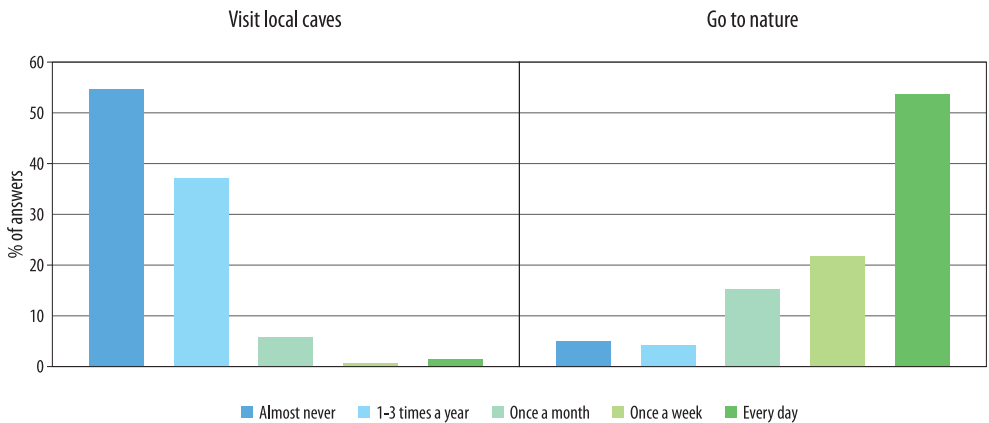


Fig. 8. Local people and caves / nature

the fact that locals live in villages, which are closely connected to nature. Caves are not so interesting for locals, but they represent a very important attraction for tourists.

Living in karst terrain is never easy (RAVBAR, N. 2004; DAY, M. 2010), so we also asked local people about how they consider living in a karst region as a whole: a blessing or a curse? We got 127 answers and the absolute majority considered living in a karst region a “blessing” (92.1%), while only 3.1 percent considered it a “curse”. The others gave an evasive or mixed answers.

Tourism

The next group of questions deals with tourism through four questions. First, we wanted to know how the number of visitors is perceived by locals, whether they perceive mass tourism or just stagnant or scant tourism. The responses – 135 answers – show that 55.6 percent perceived a high number of tourists (i.e. “crowd”), whereas 24.4 percent a small number of tourists. The remaining 20.0 percent believe that the number of tourists is more of a transitory nature.

As can be seen in Figure 9, 91.2 percent of the respondents thought that “more tourists would be better”. This answer suggests that locals have an interest in developing tourism.

The next question tries to detect the personal relation of locals to the tourists or tourism in general. As it was an open-ended question the 128 answers had 26 varieties. It was easy to group them into categories as the majority of the answers is clearly “no” (Figure 10). 58.6 percent of the respondents have no relation with tourists at all, 14.1 percent offer rooms, while 25.0 percent work in tourism services including accommodation, catering, guiding etc. The remaining 2.3 percent consider themselves as “friend of tourists”, which means that they have a positive attitude towards tourists without any direct involvement.

The fourth and last question of this group deals with the topic of geotourism. This concept, which has been developing rapidly since the end of the 20th century (DOWLING, R.K. 2011) may open up new opportunities in karst tourism. The question was if they knew what the term “geotourism” means, and if their answer was “yes” they also had to give some kind of definition. Only 19.0 percent of the 105 answers stated to know the meaning of “geotourism”, and only 18 answers were given to the open-ended part of the question, using the following terms in their definition:

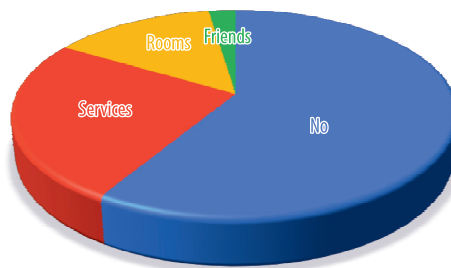


Fig. 10. Personal relation to tourism

“nature” (5.0%), “geography” (3.6%), “geology” (2.2%) and “caves”, “karst”, “mountain” (0.7% each). These results prove the fact that the theoretical knowledge is very poor, even if practically all of them live in a place where geotourism is in fact significant.

Relation to the nature park

One of the key issues is the relationship between local residents and the nature park. Seven questions were formulated in order to explore the details of this relationship.

First, we were curious to see if locals were aware of the protection category of their region. They had to choose from: “nature

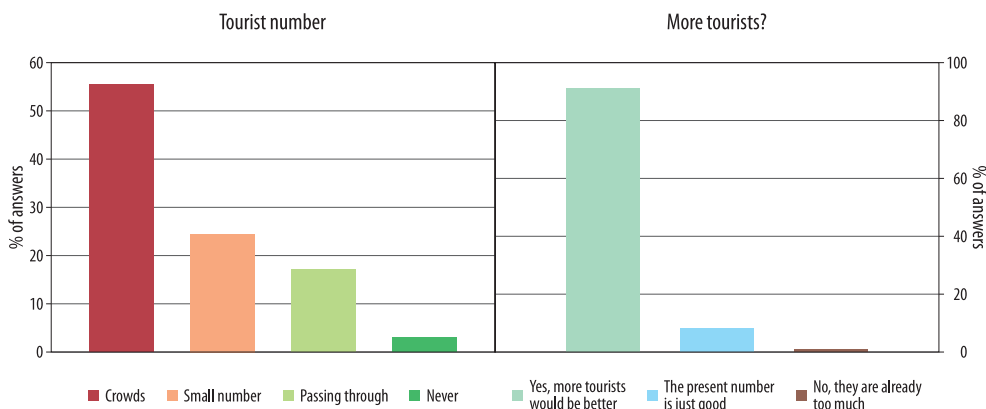


Fig. 9. Perception of tourism by local people

park”, “national park”, “natural monument” or “protected area”. From the 127 respondents, 83.5 percent knew correctly that they lived in a “nature park”. However, 7.9 percent thought that they were in a “national park”, probably confusing the two terms. The rest chose the “protected area” or the “natural monument” category (6.3% and 2.4%, respectively).

The second question was “Do you have any personal connection to the nature park?” 68.3 percent of the 126 respondents declared that they had no relation. Those who pretended to have relations gave 12 different answers, which were grouped in three categories. The proportions can be seen in Figure 11.

24.6 percent described their relationship as “friendship with someone working at the nature park”, 5.6 percent had a working relation and 1.6 percent a relation of respect. It seems that the nature park doesn’t have an important role in the lives of the majority of inhabitants – at least not at the level of personal relations.

There was also a question for families with children about how often their children meet nature park programs (in school or other ways). This is an important factor in increasing awareness. We got only 90 answers, and from these, only 12.2 percent affirmed that their children heard about the nature park. There were two very clear answers saying that in their child’s school there was a thematic competition about the park and another parent remembered that the repre-

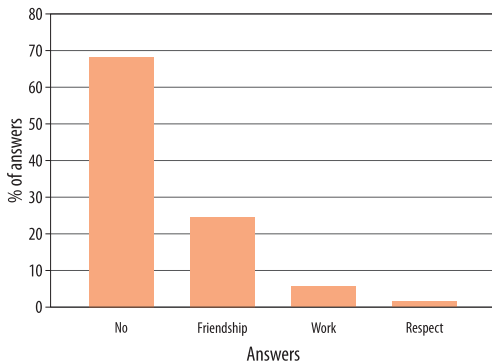


Fig. 11. Personal relation to Nature Park

sentatives of the park attended the classes. The distribution of the other answers can be seen in Figure 12. 46.7 percent affirmed that their children did not hear about the park, the others were not sure (28.9%) or they simply did not know (12.2%).

The next two questions were open-ended. The respondents were asked to specify the advantages and the disadvantages of the park for the locals. As we saw at the question referring to the economic situation, the nature park appeared rather as a bad thing though not in a high frequency. So, one can expect that in these open-ended questions, the “rather bad” reputation of the park appears again.

For the question about advantages 123 answers were given with 50 varieties. We grouped them into 19 categories. In Figure 13, only the categories with at least three answers are presented.

The figure speaks for itself. “Nothing” has an absolute majority with 52.0 percent. But the next two categories (disadvantage – 7.3%, and not many – 6.5%) can also be considered as rather negative attitudes. So, altogether, the neutral and negative answers have a proportion of almost 2/3 (65.9%). Tourism has a value of 4.9 percent, while the further answers have less than 4.0 percent. Some interesting descriptions for advantages: “for locals absolutely nothing, maybe for nature”; “too little, maybe some tourists”; “I don’t think the locals feel it”.

For the question about disadvantages 118 answers were given with 106 varieties. It was rather difficult to group the answers. Their

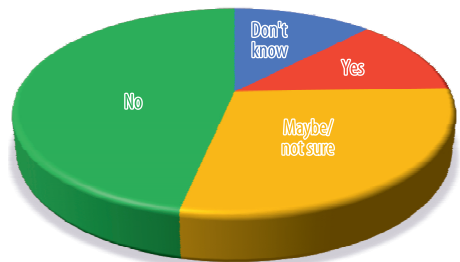


Fig. 12. The respondents’ answers to the question “Do your children meet nature park programs in the school or other ways?”

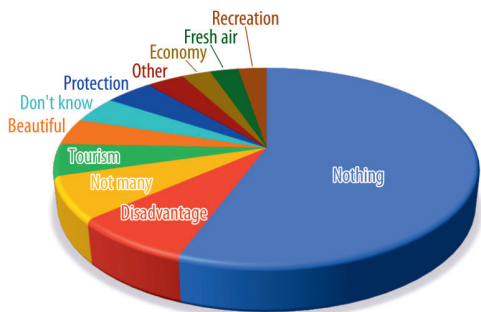


Fig. 13. Advantages of the nature park for the local inhabitants

structure can be seen in Figure 14. Those who consider that the park has no disadvantages represent 13.6 percent of the respondents. To better understand the structure of the groups, we can highlight some representative opinions from each group. For group “wood cutting” (22.0%): “you can’t cut trees”; “we don’t have access to our own forest”; “we can’t collect firewood”. In the group “penalty” (13.6%) there are some hostile opinions: “many disadvantages, fines over fines”; “we are fined, we are afraid of them”; “they don’t let us sell our products, they charge us taxes”. The group “many” has a proportion of 11.9 percent. Some examples: “lot

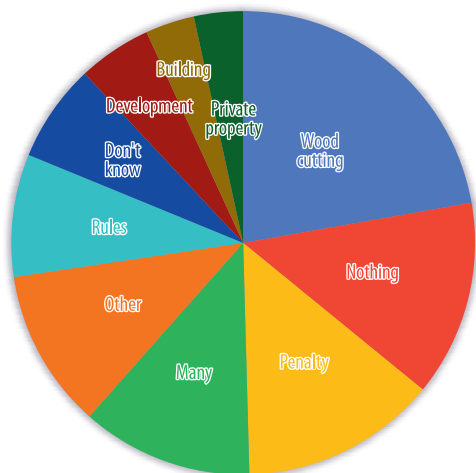


Fig. 14. Disadvantages of the nature park

of disadvantages”; “many limitations”. Finally, some examples from the group “rules” (8.5%): “we have stricter laws than other communes”; “laws invented by them”.

After considering the detailed answers, we can look at the overall opinion of local residents whether they consider the advantages or the disadvantages of the nature park to be more important (Figure 15).

The general opinions seem to be more balanced than we would expect based on the previous open-ended questions. “Good” answers have a proportion of 46.2 percent, while “bad” answers of 53.8 percent, i.e. the negative opinions slightly dominate.

Learning from past conflicts in the operation of national parks and other protected areas worldwide, there is a strong emphasis in many places on involving local people as much as possible in the NP decision-making mechanism or at least holding frequent consultations with them (NOLTE, B. 2004; HAYES, T.M. 2006; MOSE, I. 2007; ZURC, J. and UDOVČ, A. 2009). When local people were asked whether they had any influence on park business (e.g. forums, councils), 53.2 percent of respondents answered “no”, and only 23.0 percent said “yes”. The others did not know or were not interested. An interesting opinion here: “people have lost their interest, they don’t go any more to meetings”.

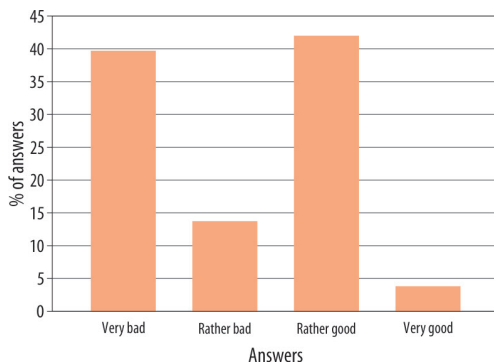


Fig. 15. General opinion of local people about the nature park

Based on the official documents (laws) and the literature, we summarised the general tasks of the parks in seven points. Respondents could express on a 1-5 grade Likert scale how much they agreed with these goals for the Apuseni Nature Park.

As it can be seen in *Figure 16*, the results show that the protection of geological and biological values are the most highly appreciated. At the same time, it should be noted that in the daily activities, budget proportions and publications about protected areas, biological conservation is generally given more emphasis than geological conservation, but it is a worldwide phenomenon (cf. GORDON, J.E. et al. 2018). The lowest score was given to “cultural values” followed by “education”. “Scientific research” is somehow in the middle; however, it should be a very important task for nature parks. Tourism is also under-rated. Probably locals are not yet aware that tourism – which is important for them – can be developed within the framework of the nature park. Conflicts may arise between tourism and conservation (e.g. waste material, etc.), but for the benefit of local people, it is important to find ways that make sustainable development of tourism possible while preserving the integrity of nature.

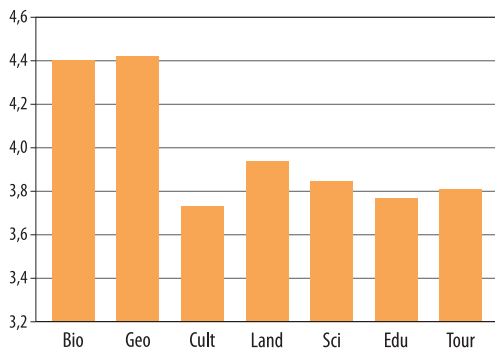


Fig. 16. Mean scores given to the importance of each task of the park according to local people (1.00 = not important at all, 5.00 = very important). Bio = biological preservation; Geo = geological values; Cult = cultural values; Land = landscape protection; Sci = scientific research; Edu = education; Tour = tourism.

Discussion and conclusions

The most intriguing questions were those in connection with the nature park. As we already mentioned in the Introduction, there were several situations when potential respondents refused to fill in the questionnaire after realising that there were questions regarding the park. As for the economic questions, we can feel a kind of optimism, and the proportion of inhabitants who would like to move away from their settlement is equal or less than in similar surveys conducted in other karst areas. For instance, the proportion of locals who would move away from the Slovak Karst was between 23.0 and 55.0 percent, depending on their attitude cluster (NESTOROVÁ DICKÁ, J. et al. 2020), 37.0 percent for Aggtelek karst (TELBISZ, T. et al. 2018), and 36.0 percent for Tara National Park in Serbia (BRANKOV, J. et al. 2022). However, when speaking about the park, the balance tilts towards the negative opinions. The dissatisfaction of the locals, the feeling of limitation due to the park are expressed in many different ways.

The most relevant problems can be linked to the rules and laws. From discussions with the park administration, it is revealed that they also have difficulties in making the locals to follow the rules. This may be due to the inherited mentality of the communist period when the nature protection rules were less severe and even they were taken less seriously. Or are the rules really too severe? This is a question that should be analysed based on cooperation and mutual understanding. The administration of the nature park should involve local people more closely in decision-making, as stated by many other authors (HALL, D. and RICHARDS, G. 2000; TOSUN, C. 2006; JAMAL, T. and STRONZA, A. 2009; PUHAKKA, R. et al. 2009). Most dissatisfactions are connected with forestry and wood. At this point, a strange fact should be noted that the administration of the park – actually of all national and nature parks in Romania – belongs to the state-owned National Forest Administration (ROMSILVA), which is primarily interested in the economi-

cal use of forests and less in nature protections (BĂLTĂREȚU, A. and BUSUIOC, M. 2009).

From the answers, we can conclude that tourism is already an important issue for a significant part of local people, but it could be a complementary or even basic revenue for an even higher proportion of them. However, keeping the equilibrium between tourism development and nature protection is very important (WILLIAMS, P.W. and FENNELL, D.A. 2002). In this process, the nature park and also the rules – and respecting them - have a major role.

Another question is whether we can talk about geotourism in Apuseni Nature Park. In the broadest sense of the word, the answer is yes (for types of geotourists, see HOSE, T.A. 2008; BOŽIĆ, S. and TOMIĆ, N. 2015). In parallel with this survey a closely similar survey was made among tourists, the results of which will be presented in another article. In that survey, more than 400 questionnaires were completed, and more than 52.0 percent of the respondents affirmed that they heard about the term “geotourism”. But when asked if they consider themselves as being “geotourists” only 29.4 percent answered affirmatively. Thus, it seems that the term is not well known even to the majority of tourists. Still, their knowledge about geotourism is better than that of locals. More intensive use of this notion could strengthen the networking with other geotourism sites (learning ideas from each other, promoting each other), which could directly or indirectly contribute to the development of tourism of Apuseni Nature Park.

Acknowledgement: This research was supported by the National Research, Development and Innovation Office Hungary (NKFIH) K124497 project.

REFERENCES

- BADEA, L. 1983. *Geografia României, Vol. I. Geografia Fizică* (Geography of Romania, Vol. I. Physical Geography). București, Editura Academiei RSR.
- BĂLTĂREȚU, A. and BUSUIOC, M. 2009. The management of the natural protected areas at a national level. *Romanian Economic and Business Review* 4. (2): 101–111.
- BLEAHU, M. 2019. *Ariile Protejate și Protecția Naturii* (Protected areas and conservation of nature). București, Paideia.
- BERESFORD, M. and PHILLIPS, A. 2000. Protected landscapes: A conservation model for the 21st century. *George Wright Forum* 17. (1): 15–26.
- BOŽIĆ, S. and TOMIĆ, N. 2015. Canyons and gorges as potential geotourism destinations in Serbia: comparative analysis from two perspectives – general ‘geotourists’ and ‘pure geotourists’. *Open Geosciences* 7. (1): 531–546. Available at <https://doi.org/10.1515/geo-2015-0040>
- BRANKOV, J., MICIĆ, J., ČALIĆ, J., KOVAČEVIĆ-MAJKIĆ, J., MILANOVIĆ, R. and TELBISZ, T. 2022. Stakeholders’ attitudes toward protected areas: The case of Tara National Park (Serbia). *Land* 11. (4): 468. Available at <https://www.mdpi.com/2073-445X/11/4/468/html>
- CIGNA, A.A. and FORTI, P. 2013. Caves: the most important geotouristic feature in the world. *Tourism and Karst Areas* 6. (1): 9–26.
- CORINE Land Cover database, 2022. Available from <https://land.copernicus.eu/pan-european/corine-land-cover>
- CUCU, V. 1984. *Geografia României, Vol. II. Geografia Umană și economică* (Geography of Romania, Vol. II. Human and Economic Geography). București, Editura Academiei RSR.
- DAY, M. 2010. Human interaction with Caribbean karst landscapes: Past, present and future. *Acta Carsologica* 39. (1): 137–146. Available at <https://doi.org/10.3986/ac.v39i1.119>
- DOLLMA, M. 2018. Canyons of Albania and geotourism development. *Acta Geoturistica* 9. (2): 28–34.
- DOWLING, R.K. 2011. Geotourism’s global growth. *Geoheritage* 3. (1): 1–13. Available at <https://doi.org/10.1007/s12371-010-0024-7>
- DUDLEY, N., PARRISH, J.D., REDFORD, K.H. and STOLTON, S. 2010. The revised IUCN protected area management categories: the debate and ways forward. *Oryx* 44. (4): 485–490.
- GORDON, J.E., CROFTS, R., DÍAZ-MARTÍNEZ, E. and WOO, K.S. 2018. Enhancing the role of geoconservation in protected area management and nature conservation. *Geoheritage* 10. (2): 191–203. Available at <https://doi.org/10.1007/s12371-017-0240-5>
- GEO, 2007. *Government Emergency Ordinance No. 57/2007 on the regime of protected natural areas, conservation of natural habitats, wild flora and fauna* (20th June 2007, published in Official Monitor nr. 442 from 29th June 2007). Available at <http://legislatie.just.ro/Public/DetaliiDocument/83289> (in Romanian)
- HALL, D. and RICHARDS, G. 2000. *Tourism and Sustainable Community Development*. 1st Edition. London, Routledge.
- HAYES, T.M. 2006. Parks, people, and forest protection: An institutional assessment of the effectiveness

- of protected areas. *World Development* 34. (12): 2064–2075. Available at <https://doi.org/10.1016/j.worlddev.2006.03.002>
- HORVÁTH, Gy. 2006. *Északnyugat-Erdély. A Kárpát-medence Régiói 4.* (Northwestern Transylvania. Regions of the Carpathian Basin 4.) Pécs–Budapest, Dialóg Campus Kiadó.
- HOSE, T.A. 2008. Towards a history of geotourism: definitions, antecedents and the future. *Geological Society Special Publications* 300. (1): 37–60. London. Available at <https://doi.org/10.1144/SP300.5>
- IUCN, 2022. *Protected Areas. Category V. Protected Landscape.* Gland, Switzerland, IUCN. Available at <https://www.iucn.org/theme/protected-areas/about/protected-areas-categories/category-ii-national-park>
- JAKAB, G., PÁL, I., SILYE, L., SÜMEGI, P., TÓTH, A., SÜMEGI, B., FRINK, J.P., MAGYARI, E.K., KERN, Z. and BENKŐ, E. 2021. Social context of late medieval and early modern deforestation periods in the Apuseni Mountains (Romania) based on an integrated evaluation of historical and paleobotanical records. *Environmental Archaeology*. Taylor and Francis online publications, 2021. Available at <https://doi.org/10.1080/14614103.2021.1942744>
- JAMAL, T. and STRONZA, A. 2009. Collaboration theory and tourism practice in protected areas: stakeholders, structuring and sustainability. *Journal of Sustainable Tourism* 17. (2): 169–189. Available at <https://doi.org/10.1080/09669580802495741>
- KRPINA, V. 2015. Analysis of the relation between visitors and protected natural areas in the Zadar County. *Šumarski list* 139. (11–12): 535–551.
- Karst and National Parks 2022. Budapest, ELTE Eötvös Loránd Tudományegyetem. Online project content description. Available at <https://karst.elte.hu/knp/>
- MALLARACH, J.M., MORRISON, J., KOTHARI, A., SARMIENTO, F., ATAURI, J.A. and WISHITEMI, B. 2008. In defence of protected landscapes: a reply to some criticisms of category V protected areas and suggestions for improvement. In *Defining Protected Areas: An International Conference in Almeria, Spain*. Eds.: DUDLEY, N. and STOLTON, S., Gland, Switzerland, IUCN, 31–37.
- MARI, L., TÁBORI, Zs., ŠULC, I., RADELJAK KAUFMANN, P., MILANOVIĆ, R., GESSERT, A., IMECS, Z., BARICZ, A. and TELBISZ, T. 2022. The system and spatial distribution of protected areas in Hungary, Slovakia, Romania, Serbia and Croatia. *Hungarian Geographical Bulletin* 71. (2): 99–115.
- MIKA, M., ZAWILIŃSKA, B. and KUBAL-CZERWIŃSKA, M. 2019. Exploring the determinants of local people's attitude towards national parks in Poland. *Folia Geographica* 61. (1): 5–16.
- MOSE, I. 2007. *Google-Books-ID: f13dR_WiuKwC. Protected Areas and Regional Development in Europe: Towards a New Model for the 21st Century*. Aldershot, Ashgate Publishing Ltd.
- NESTOROVÁ DICKÁ, J., GESSERT, A., BRYNDZOVÁ, L. and TELBISZ, T. 2020. Behavioural survey of local inhabitants' views and attitudes about Slovak Karst National Park in Slovakia. *Sustainability* 12. (23): 10029. Available at <https://doi.org/10.3390/su122310029>
- NOLTE, B. 2004. Sustainable tourism in biosphere reserves of East Central European countries. Case studies from Slovakia, Hungary and the Czech Republic. *Policies, Methods and Tools for Visitor Management. MMV2 Proceedings*, 349–356.
- ORĂȘEANU, I. 2016. *Hidrogeologia Carstului din Munții Apuseni* (Hydrogeology of karsts in Apuseni Mountains). Oradea, Belvedere.
- PAPAGEORGIU, K. and KASSIOUMIS, K. 2005. The national park policy context in Greece: Park users' perspectives of issues in park administration. *Journal for Nature Conservation* 13. (4): 231–246. Available at <https://doi.org/10.1016/j.jnc.2004.11.001>
- PUHAKKA, R., SARKKI, S., COTRELL, S.P. and SHIKAMÄKI, P. 2009. Local discourses and international initiatives: sociocultural sustainability of tourism in Oulanka National Park, Finland. *Journal of Sustainable Tourism* 17. (5): 529–549. Available at <https://doi.org/10.1080/09669580802713457>
- RUBAN, D. 2018. Karst as important resource for geopark-based tourism: Current state and biases. *Resources* 7. (4): 82. Available at <https://doi.org/10.3390/resources7040082>
- RAVBAR, N. 2004. Drinking water supply from karst water resources (The example of the Kras Plateau, SW Slovenia). *Acta Carsologica* 33. (1): 73–84. Available at <https://doi.org/10.3986/ac.v33i1.316>
- ŠULC, I. and VALJAK, V. 2012. Zaštićena područja u funkciji održivog razvoja hrvatskog otočja – primjer otoka Mljet (Protected areas as a factor of sustainable development of the Croatian island – the example of Mljet island). *Croatian Geographical Bulletin* 74. (1): 161–185.
- TELBISZ, T., IMECS, Z., MARI, L. and BOTTLIK, Zs. 2016. Changing human-environment interactions in medium mountains: the Apuseni Mts (Romania) as a case study. *Journal of Mountain Science* 13. (9): 1675–1687. Available at <https://link.springer.com/article/10.1007/s11629-015-3653-0>
- TELBISZ, T., MARI, L., GRUBER, P., KŐSZEGI, M., BOTTLIK, Zs. and STANDOVÁR, T. 2018. Képes-e egy nemzeti park a regionális fejlődést előmozdítani? – Az Aggteleki Nemzeti Park speciális esete (Can a national park improve regional development? – The special case of Aggtelek National Park). In *Földrajzi Tanulmányok 2018*. Eds.: FAZEKAS, I., KISS, E. and LÁZÁR, I., Debrecen, Debreceni Egyetem, 251–254.
- TELBISZ, T., GRUBER, P., MARI, L., KŐSZEGI, M., BOTTLIK, Zs. and STANDOVÁR, T. 2020. Geological heritage, geotourism and local development in Aggtelek National Park (NE Hungary). *Geoheritage* 12. (1): 5. Available at <https://doi.org/10.1007/s12371-020-00438-7>
- TELBISZ, T., ČALIĆ, J., KOVAČEVIĆ-MAJKIĆ, J., MILANOVIĆ, R., BRANKOV, J. and MIČIĆ, J. 2021. Karst geoheritage

- of Tara National Park (Serbia) and its geotouristic potential. *Geoheritage* 13. (4): 88. Available at <https://doi.org/10.1007/s12371-021-00612-5>
- TELBISZ, T. and MARI, L. 2020. The significance of karst areas in European national parks and geoparks. *Open Geosciences* 12. (1): 117–132. Available at <https://doi.org/10.1515/geo-2020-0008>
- Tempo online, 2022. INSSE tables, București, Institutul Național de Statistică. Available at <http://statistici.INSSE.ro:8077/tempo-online/#/pages/tables/insse-table>
- TOSUN, C. 2006. Expected nature of community participation in tourism development. *Tourism Management* 27. (3): 493–504. Available at <https://doi.org/10.1016/j.tourman.2004.12.004>
- TRAKOLIS, D. 2001. Perceptions, preferences and reactions of local inhabitants in Vikos-Aoos National Park, Greece. *Environmental Management* 28. (5): 665–676. Available at <https://doi.org/10.1007/s002670010251>
- WILLIAMS, P.W. and FENNEL, D.A. 2002. Creating a sustainable equilibrium between mountain communities and tourism development. *Tourism Recreation Research* 27. (3): 5–8. Available at <https://doi.org/10.1080/02508281.2002.11081369>
- ZAWILIŃSKA, B. 2020. Residents' attitudes towards a national park under conditions of suburbanisation and tourism pressure: A case study of Ojców National Park (Poland). *European Countryside* 12. (1): 119–137. Available at <https://doi.org/10.2478/euco-2020-0007>
- ZGŁOBICKI, W. and BARAN-ZGŁOBICKA, B. 2013. Geomorphological heritage as a tourist attraction. A case study in Lubelskie Province, SE Poland. *Geoheritage* 5. (2): 137–149. Available at <https://doi.org/10.1007/s12371-013-0076-6>
- ZURC, J. and UDOVČ, A. 2009. Local inhabitants' opinion about the triglav national park management. *Sociologija i proctor / Sociology & Space* 47. 43–56.

Social assessment of national parks through the example of the Aggtelek National Park

MARGIT KŐSZEGI¹, ALENA GESSERT², JANETTA NESTOROVÁ-DICKÁ²,
PÉTER GRUBER³ and ZSOLT BOTTLIK⁴

Abstract

Karst areas, which are less involved in productive activities are often declared protected areas that can have a positive impact on the lives of the local communities. To verify this hypothesis, we examine karst areas, where national parks have been established to preserve mostly geological but also biological values. According to the threefold system of objectives in national parks, not only protection and conservation, but also the presentation of the natural values to the outside world is important. Thus, tourism and related services are essential and often exclusive economic activities in these protected areas. Our questions are how national parks appear in the daily lives of the local communities and how much locals perceive the beneficial effects of national parks. The selected area of our study is the Gömör-Torna / Gemer-Turňa Karst on the Hungarian-Slovak border, where national parks have been established on both side of the border (Aggtelek National Park in Hungary and Slovak Karst National Park in Slovakia) to preserve karst landforms and caves. We conducted structured interviews with leaders of settlements in and around the national park. Interviews reveal the ambivalent system of everyday relationships. Local communities are experiencing multiple conflicts with national parks. The conflicts stem from the contrast that usually occurs within the threefold system of objectives of national parks (the tension between the practice of protection/preservation and presentation). Locals are negatively affected by the presence of national park as an authority, which limits to some extent their economic activities. They perceive national parks as barriers that prevents them from building a more diversified economy, so the existence of the national park is seen by the majority as a disadvantage rather than an advantage. Some people even question the need to protect nature, which can be seen as a legacy of the former socialist regime. Thus, we conclude that there is a need to change the attitudes of local communities more positive towards nature conservation.

Keywords: national park, human environment relationship, preservation protection, presentation

Received February 2022, accepted June 2022.

Introduction

National parks are special areas of modern societies. They are common but very different in the conditions of their creation and operation (HILL, M.A. and PRESS, A.J. 1993; GLENDINNING, M. 2003; WEST, P. *et al.* 2006; FROST, W. and HALL, M. 2009; GISSIBL, B. *et al.* 2012; KŐSZEGI, M. *et al.* 2019; BÖHN, D. 2021).

They were brought to life by a social demand arising from modernity (BEATTY, R.O. 1952; MCCONNELL, G. 1954; CRONON, W. 1995). As an alternative to their way of life, communities away from nature, determined by artificial conditions, want to keep areas where natural situations can still be found (DUNLAP, T.R. 1999; HALL, M.C. and FROST, W. 2009; NASH, R. 2014).

¹ Department of Cultural History, Faculty of Humanities, Institute of Historical Studies, ELTE Eötvös Loránd University, Múzeum krt. 6–8, 1088 Budapest, Hungary. E-mail: koszegi.margit@btk.elte.hu

² Institute of Geography, Faculty of Natural Sciences, P.J. Šafárik University. 041 80 Šrobárova 1014/2, 04001 Košice, Slovakia. E-mails: alena.gessert@upjs.sk, janetta.dicka@upjs.sk

³ Aggtelek National Park Directorate, Tengerszem oldal 1. H-3758 Jósfafő, Hungary. E-mail: info.anp@t-online.hu

⁴ Department of Social and Economic Geography. Faculty of Science, Institute of Geography and Earth Sciences, ELTE Eötvös Loránd University, Pázmány Péter sétány 1/C, 1117 Budapest, Hungary. E-mail: agria@gmx.net

Our research group, which has been studying the relationship between man and the environment for many years, focuses on national parks in karst areas (KŐSZEGI, M. et al. 2019; TELBISZ, T. et al. 2020; TELBISZ, T. and MARI, L. 2020). National parks can also be interpreted as symbolic spaces for dissolving the dichotomy between man and nature (KŐSZEGI, M. et al. 2015). As a basic idea of our research, we suggested that *the utilisation of limestone areas (that are less involved in productive activities) for touristic purposes can have a positive impact on the communities living there.*

One of the sample areas of our investigations is the Gömör-Torna/Gemer-Turňa Karst on the Slovak-Hungarian border. On the Hungarian side, the Aggtelek National Park, on the Slovak side, the Slovak Karst National Park. These are connected protected areas, separated by a border (TELBISZ, T. et al. 2014, 2020). The questions in our research presented here are as follows. *How do national parks appear in the daily lives of the communities? What is the assessment of national parks? Do locals perceive the beneficial effects of national parks, which we assume?* We sought answers through interviews with local community leaders.

Theoretical background – the national park as a social actor

From the very beginning, the existence of national parks has been determined by a threefold system of objectives (COMSTOCK, T.B. 1874; WAUGH, F.A. 1918; KŐSZEGI, M. et al. 2019). The basic idea of the national park, the need to keep the stunning landscape, was first articulated by CATLIN, G. (1844) in the 19th century. CATLIN says pristine places are treasures of special beauty that must be *protected* and *preserved* for future generations and *shown* to the rest of the world (NASH, R. 2014). *Preserve, protect, and present* – basic terms for discourses related to national parks. In addition to the *preservation* of the “wilderness”, and in connection with this, the *protection* of

the natural values found in the demarcated area also appears. At the same time, the third pillar is influenced by the intention to make protected nature *accessible and open* to people for their recreational activities (ANFIELD, J. 1993; MAYER, M. 2010; BYSTRÖM, J. and MÜLLER, D.K. 2014; DOLLMA, M. 2019; BOLLOBANI, E. and URUÇI, R. 2019; TELBISZ, T. et al. 2020).

The national park is present in our study as a social construction that has an impact on the local communities associated with it (WHATMORE, S. 2006). We looked for the actors of power that play a role in shaping these effects, in creating and operating the frameworks. Regulatory actors appear at different levels, i.e., different scales. The formed hierarchy is shown in *Table 1*.

A special organisation, the IUCN (International Union for Conservation of Nature and Natural Resources), was set up in 1948 to organise nature conservation worldwide. The associated WCPA (World Commission on Protected Areas) has classified protected areas according to management objectives (*Table 2*). The IUCN and WCPA do not provide a binding classification and regulatory system. The guidelines set out in their documents can help individual countries to organise nature conservation (BISHOP, K. et al. 2004). They also have an impact on the laws of individual states, which is why we called the role of the IUCN *symbolic* in the first table.

At the *international* level, continental factors also play a role in shaping the rules for national parks. Among them, the European Union’s nature conservation directives are the most important in the national parks we have examined (VAN BEECK CALKOEN, S.T.S. et al. 2020). The best known is the European ecological network, Natura 2000, whose main goal is to *preserve* and *protect* natural values and biodiversity.

The formal definition of national parks as social actors is primarily a matter of *state-level* regulation. In Hungary, for example, the protection of nature is regulated by a law enacted in 1996 (Act LIII of 1996 on the Protection of Nature). The introductory text of the law mentions the general objectives in

Table 1. Actors regulating the operation of national parks

Scales, levels	Actors	Role in regulation and enforcement	Impact on the lives of local communities
Global	IUCN	symbolic	indirect
Continental	European Union		
National	state	practical	direct
Regional	national park directorate		
Local	municipalities		

Table 2. The classification of protected areas according to the WCPA

Classification	Name
Ia	Strict Nature Reserve
Ib	Wilderness Area
II	National Park
III	Natural Monument or Feature
IV	Habitat/Species Management Area
V	Protected Landscape/Seascape
VI	Protected area with sustainable use of natural resources

line with international guidelines, including the protection of natural areas and the three-fold system of objectives for national parks (these are highlighted in the text):

“Recognising that natural values and natural areas are a special and irreplaceable part of the national wealth, their maintenance, management, improvement of their condition, preservation for present and future generations, ensuring the economical and rational management of natural resources, the protection of natural heritage and biological diversity and the establishment of a harmonious relationship between man and nature, in accordance with our international obligations, as an essential condition for the survival of mankind, requires the establishment of effective protection of nature and therefore constitute the following law...”

With the increase in the social distance between the local community and the actors belonging to the national park, a symbolic interpretation can be observed in public thinking. In the absence of a direct connection, the state as an actor becomes an *abstract concept and symbol* for local communities. The same goes for the *national park directorate*. At the same time, *employees of the national park or local leaders* (mayors, municipal employees)

are more of a *direct experience* for the local population (SELBY, A. et al. 2011).

In this paper, we focus on the relationship between national parks and local communities, specifically from the community side. In line with the research questions, we examine how the symbolic role of national parks and the interpretation of their international and national system of objectives occur at the local level. On the other hand, we also explore the image that is formed by gaining direct experience. It also provides information on the specifics of the operation defined by the different actors. The threefold system of objectives in national parks and the local representatives of the current state power must cooperate in everyday life in such a way that they can even balance conflicting interests (CARRUTHERS, J. 1989; ARNBERGER, A. and SCHOISSENGEIER, R. 2012; YAKUSHEVA, N. 2019; ARPIN, I. and COSSON, A. 2021; FIENITZ, M. et al. 2022).

Based on the literature, we can assume that the *contradiction* between protection/preservation and demonstration works here at the local level as well (FINE, K. 1988; TURNER, R.W. 2000; EAGLES, P.F.J. 2002; DEXLER, Sz. et al. 2003; NOLTE, B. 2004; WEST, P. et al.

2006; JUUTINEN, A. et al. 2011; SABO, H.M. 2012; ZGŁOBICKI, W. and BARAN-ZGŁOBICKA, B. 2013; BELL, J. and STOCKDALE, A. 2015; GAYNOR, A. 2017; WIDAWSKY, K. and JARY, Z. 2019; ESFANDIAR, K. et al. 2021).

The protection of values is opposed by the *economic interests* associated with services, especially tourism, which can generate conflicts in the lives of communities (ANFIELD, J. 1993; WALLSTEN, P. 2003; SZALAI, K. and SZILÁGYI, Zs. 2007; PUHAKKA, R. 2008; ARNBERGER, A. et al. 2018, 2019; KIM, M. and JAKUS, P.M. 2019; WARCHALSKA-TROLL, A. 2019). At the same time, official activities *restricting* traditional economic activities in communities are often at the root of conflicts (AAGESEN, D. 2000; TRAKOLIS, D. 2001; ANDERSON M.K. and BARBOUR, M.G. 2003; MUKHERJEE, A. 2009; DAIM, M.S. et al. 2011; HIDDLE, K. 2019). Another factor is the contrast between the *nihilistic* environmental mind set of nature in the former Eastern Bloc and the protection of nature (COHN, J.P. 1992; HABECK, M. 2004; PETROVA, S. et al. 2009). *Distrust* of the state and state-owned areas, including national parks, is also a post-socialist feature (SCHWARTZ, K.Z.S. 2006; NIEDZIAKOWSKI, K. et al. 2014). These factors are also reflected in the *attendance* at the national park, which we also expected in the interviews (ARNBERGER, A. et al. 2012; PIETRZYK-KASZYŃSKA, A. et al. 2012; MARCEL, G. 2013; GETZNER, M. and ŠVAJDA J. 2015; SCHAMEL, J. and JOB, H. 2017; GESSERT, A. et al. 2018; STEMBERK, J. et al. 2018; MATEUSZ, R. 2021).

Study area and research methodology

Our research area is the Aggtelek National Park and the Slovak Karst National Park (Figure 1). The protected areas were established in the Aggtelek Karst and the Slovak Karst. Both are part of the Gömör-Torna/Gemer-Turňa Karst. The peculiarity of both national parks is that they were created specifically to protect geological values, i.e. karst forms and caves (VERESS, M. and UNGER, Z. 2015; TELBISZ, T. and MARI, L. 2020). The Aggtelek

Karst became a national park in 1985 and the Slovak Karst in 2002 (SZVOBODA, L. 1998). The Aggtelek and the Slovak Karst caves have been a World Heritage Site since 1995. The protected karst areas on the Hungarian-Slovak border are adjacent to each other. Due to their border situation, they are peripheries in both countries (POTTER, R.B. and BEYNON, B. 2000; TELBISZ, T. et al. 2014, 2020; GÁLOSI KOVÁCS, B. and HORVÁTH, G. 2018).

The natural endowments of the karst areas posed challenges before modernity, but even after the Industrial Revolution they did not have the economic potential to change the situation of the periphery due to the natural endowments (JAKÁL, J. 1975; TELBISZ, T. et al. 2015, 2016). Mining, which was linked to forced industrialisation during the period of socialism, was loss-making. The mines were closed, leaving only environmental damage and unemployment (GERASZIMOV, I.P. 1978; HORVÁTH, I. et al. 1979; COHN, J.P. 1992; HABECK, M. 2004). Far from the larger centres (Košice on the Slovak side, Miskolc on the Hungarian side), the villages of the regions with poorer infrastructure, located in the shadow of traffic, are ageing communities, and there are many commuters among their inhabitants. Locally, there are few job opportunities for them, and their livelihood as entrepreneurs and employees is directly or indirectly linked to the tourism of the national park, the municipalities, and the institutions they maintain (such as schools; TÓZSA, I. 1996; TELBISZ, T. et al. 2014).

In our research, we conducted guided conversations with the leaders of the local governments. We were more successful on the Hungarian side in conducting the interviews. On the Hungarian side, the selected settlements included Aggtelek and Jósvalfó within the Aggtelek National Park, as well as villages (Bódvasszilás, Perkupa, Szin, Szögliget, Tornakápolna and Trizs) in the immediate vicinity of the national park. In Slovakia, the mayors of Kecső, located within Slovak Karst National Park, and of Rožňava, the largest settlement closest to the Slovak Karst, could only be interviewed. Interviews were con-



Fig. 1. The area of the selected national parks and the nearby settlements

ducted in 2018 and 2019. There is only one woman among the respondents. According to age, the range of interviewees ranged from 23 to 70 years. The conversations took place along pre-defined questions. Everyone was given the same set of questions (structured interview). Audio recordings and notes were also made of the interviews. The questions were as follows (beyond the basic data):

The social situation of the settlement:

How do you see the situation of the settlement where you live? How has the situa-

tion changed in recent decades (if you have lived here for a long time)? Has there been any change since the “abolition” of borders (Schengen, 2007)? What future do you see for the settlement? If you got money for development, what would you spend the most on?

Karst landscape:

What does it mean to live in a “karst region”? What are the values of the landscape? To what extent are traditional forms of farming still present? Is it important to maintain or possibly recreate them? Is it good to live

here? Is karst more a blessing or a curse? Do you visit the sights of the national park? With what regularity?

Connection to the national park:

Is it more advantageous or a disadvantage for the people living here? What are the positive benefits of the national park for the locals? What is more of a disadvantage? What are the most common conflicts? What are the relationships with the national park? Of the settlement, approximately how many people work directly at the national park? How many are indirectly affected?

Tourism:

Are the impacts of tourism felt in the settlement? Where do tourists come from? Does the municipality itself strive to develop tourism? Would it be nice if more tourists came to the settlement? Are there any harmful effects of tourism? Which form of tourism should be developed? What is the proportion of holiday homes in the settlement?

Summary, evaluation questions:

Overall, does the national park contribute to the development of the settlement? Is it important to you that “the national park is part of our national heritage, and we can be proud of it”? Which title do you feel more important: part of a national park/world heritage site?

Using the answers to the above questions, we present the assessment of the selected karst national parks based on the opinions of the local community leaders. Respondents are distinguished by codes in the text. As we only had two interviewees from the Slovak side, we do not indicate the country separately in the text to avoid identification.

In the next subsection, we explore the symbolic, value-bound interpretation of the national park as a social actor through conversations. Afterwards, we present the practical side, the everyday experiences, and the challenges of coexistence. Thereafter, we examine the possibility of merging the two, the assessment of tourism (which was also considered useful from an economic point of view). Finally, we devote a separate subchapter to the peculiarities that make people distrustful of the national park as a legacy of the socialist past.

Results

Social perception of the national park as a symbolic actor

Leadership conversations agree that it is a pride for a local person to live in or near a national park. The term “glory” was used in several interviews. The landscape is a value that the state and the world appreciate. It is difficult to separate the love of the birthplace from the values of the national park. “*This is my home; I can’t put it into words.*” (I1), “*This place is beautiful; I don’t want to live anywhere else.*” (I5). Compared to other landscapes, the emotional attachment also appears: “*Coming home from the Great Plain or the coast, I think: well, that’s beautiful.*” (I9).

However, it is difficult to relate to the common value as a local. Locals don’t necessarily see what others are willing to travel for (from other parts of the country, from different parts of the world). “*It doesn’t mean much to those who live here.*” (I3), “*It doesn’t even occur to me; I’ve been living here for over 50 years.*” (I2), “*I was born here, it’s natural for me.*” (I8), “*The value of this does not appear to the local population. The thinking of those who live here should be shaped in this. In the forest they see not the beauty but the firewood.*” (I10). Leaders agree that locals do not visit the national park’s main attraction, the caves.

A sign of mistrust is that the existence of the national parks is seen as a construction of power. The operation of national parks is not a local initiative. “*Others are pointing out that it’s worth something.*” (I4). One leader traced the reason for this back to decades of party-state dictatorship: “*In the period of socialism, man is accustomed to everything belonging to the state, so he does not realise that this is a national value. The cave belongs to the state in the consciousness of the people.*” (I9). One mayor said of protected birds: “*They are like fairy-tale dragons. The national park only guesses them, but no one has seen one yet.*” (I2).

The locals distance themselves from the caves and barely visit them. Even mayors only go there for representation purposes.

They mentioned the caves in the interviews only if the question is specifically about the caves. They do not see them as their own, they are not bound by them, and they see in them the property of the state. *“Many of the seniors haven’t even been to the cave yet. The former miners don’t really appreciate it.”* (I7), *“As a teacher, it was my duty to go to the caves with the kids. As mayor, I don’t go with guests. I have no guests who are interested in this. I don’t brag about the national park.”* (I2), *“For locals, the national park is the cave.”* (I8). One of the mayors listed the values of the area at length and then concluded: *“the caves may be additional values”* (I9), *“It is not the cave that is first, but the other values of the national park that can be marvelled at every day.”* (I4).

The surface landscape is an integral part of life. Locals talk about it as their own. The picturesque backgrounds of the positive home image and the basis of their economic activities. *“The limestone, the karst waters, the forest, including old stone roads that connected this region to Košice.”* (I10). The beauty and treasure of the landscape is the primary source of attachment. *“I don’t tie the natural environment, the mountains, the waters, the forests, the wildlife to the national park, because I grew up in the woods, I played in the stream.”* (I5), *“Values here are mountains, trees, heights, waters (springs), flora and fauna. One of the most beautiful places in Hungary and in the world (I’ve been to a couple of places; I’ve seen a lot). It is also a value from a health point of view (such as karst water).”* (I9), *“The wilderness is a value. Locals used to live better with nature. It was much better in terms of health. Now our world is shrinking. Today, children are also frightened by the boundless nature. We need good professionals who show nature in an experiential way, for both children and adults.”* (I1).

Recreational interpretation of the national park is essential in local communities. *“Beauty alone is not enough, it could be better utilised, filled with content”* (I6), *“For a long time, it was all about Aggtelek and Jósvalfő, but it’s already opening up so that tourists can stay as long as possible.”* (I8). The importance of tourism is also related to the situation of settlements, which is presented in the next chapter.

Life in the “shadow” of the national park – the social assessment of the situation of the settlements

The possibility of preserving untouched nature is possible in landscapes that provide less favourable conditions for human activities (GLENDINNING, M. 2003; WEST, P. et al. 2006; FROST, W. and HALL, M. 2009; KŐSZEGI, M. et al. 2019). Thus, only small communities are connected to national parks. Communities that are far from urban centres emerging through modernisation. They do not offer the economic potential to deploy an economic activity that involves significant environmental transformation. Careful transformations, on the other hand, lag people’s demands. The world of the city and its level of comfort is becoming more attractive. This is reinforced by the labour requirements of the centres. Local communities are lagging behind the demand levels of the rising generations, and emigration is intensifying.

“The most important issue is population. Only 4–5 children are born each year.” (I1), *“There are few children, the village is ageing, the elder are already 50 percent.”* (I3), *“Demographic situation is serious.”* (I4), *“Ageing is a big problem, within 10 years, if no miracle happens, three families will live in the village”* (I9). There was no town leader who did not mention the problem of population.

The reason for the population decline is seen as a lack of job opportunities. *“Jobs are rare locally and nearby.”* (I3), *“Young people do not stay here due to lack of work. They migrate to the surrounding larger cities (mainly Miskolc).”* (I8), *“There are few job opportunities in the area. In addition, it requires underpaid and unskilled labour.”* (I1), *“1990 was a break. The limestone quarry was closed, where 200 people worked (skilled workers, managers, clerks). Producer cooperatives have been wound up (some 200 people have also been affected).”* (I2), *“The mine has been operating for a long time, unemployment began a generation later.”* (I5), *“Young migrants don’t necessarily go to nearby cities. If so, towards Kazincbarcika and Miskolc.”* (I7). In Slovakia, Košice and the capital, Bratislava, have absorbed the rising generations. *“There*

is no regular salary, people are migrating from the area to the capital city and even abroad." (I4).

Local infrastructure and related public services are considered satisfactory by local leaders and are not cited as a reason for youth emigration. In addition to the school and the doctor's office, pharmacies and general stores were highlighted. In some settlements, sewerage is waiting for public services. The development of telecommunications infrastructure is considered an important task for the future everywhere (the stagnant internet service in mountainous areas could be eliminated by using more modern technologies, but due to the small population, service providers are not interested in making costly developments).

Traditional farming methods are disappearing. "There are about ten farmers, the others have already given up. But families still keep animals (10–15 families deal with it). They prefer pigs, less poultry, but the former cattle and sheep herds are missing. The national park first drew boundaries, but now it would support animal husbandry, but there is no one to deal with it anymore." (I1), "We are starting to urbanise; animal smells and sounds disturb your neighbours. There is confusion in the heads; they only keep dogs. The dog walk has started, it is the beginning of the end in the village. There are no cattle, there are three or four goats. People mow the grass, but there is nothing to eat it." (I2), "The situation is not lucky from an agricultural point of view, but it is very good wildlife management." (I3), "Animal husbandry is fashionable again. Not in the backyard, but on a large scale. It would be important because it should be an integral part of rural life." (I9), "The plant should not be grown on karst because the soil is not good. Ruminants should be grazed here. You don't have to cut the grass, you have to graze the animals." (I4).

Most of the local workers are public employees who are employed by either the municipality or the national park. "Most people are employees of the municipality and state institutions." (I5), "The main employer is the municipality." (I7). "Many people work at the national park. That's why we're glad the national park is here." (I3), "The national park is also a state-owned company. They have a headcount; they can't employ

more people and their budgets are tight." (I8), "There are two restaurants that employ at least 10 people, two shops, a national tobacco shop, a pub, a post office. All because of the national park, which is positive." (I3), "There are entrepreneurs, mainly in services (e.g. shops)." (I10), "There is a lack of a suitably qualified workforce." (I2), "Other job opportunities are public utilities and logging." (I1), "The church is also an employer here locally." (I5).

Those who do not provide a local service work as commuters nationwide. The primary destinations of the commuters are Ózd, Kazincbarcika, Miskolc and Košice. "People also go abroad to work as construction workers." (I2), "There are a lot of commuters: seasonal male workers who work abroad, those who work three shifts in Miskolc, and those who work in smaller businesses in neighbouring settlements. Even agricultural work is typical." (I9), "The entrepreneurs of Košice also come for the workforce." (I5).

There are also newcomers to the settlements (in recent decades) who are primarily attached to the national park. However, among those working in the national park, there are several who have moved out after a few years. Another characteristic is that urban dwellers try to adapt to the rural way of life as a farmer but give up after a few years. Real estate acquisitions are also common, but this does not necessarily mean population growth. "Non-locals buy local properties as holiday homes." (I2). The slowly depopulating Tornakápolna is in a special situation, where there has been a significant increase in recent years due to the previously low population. Along with the mayor and his family moving to the village, another family arrived and took a job in the national park. They were followed by a few more families. They are private entrepreneurs who have a job in the city but have settled down because of the quiet village and the beauty of the landscape.

Synthesis of the symbolic role and practical aspects: the importance of tourism

Every local leader wants to stop and reverse the decades-long declining trend in popula-

tion. The solution is seen in tourism. This requires infrastructural developments, the costs of which cannot be extracted by local communities. They are waiting for help from the national park, which represents the state, but are not exactly interested in the investments involved in the environmental transformation. At the same time, increasing the number of visitors is also in the interest of the national park and the local population, but the implementation poses difficult dilemmas for society.

Services would also address job shortages. *“The key to the future in the workplace, improving working conditions, developing tourism. The old traditions should be supplemented with something else.”* (I10), *“The number of tourists is increasing. It also helps the locals indirectly: they bring benefits, they provide jobs.”* (I3), *“We hope that people will come here to rest.”* (I8), *“Tourism is the future. It has no tradition, the livelihood was different, and the locals do not perceive the beauty and attractions of the place. This requires a change of attitude, which is only just beginning. Quality tourism needs to be developed, there is much to be done”* (I5), There are also sceptical voices: *“There is nothing to do. No one in the country has been interested in the countryside for decades, and the change of regime has not helped either.”* (I2).

Mayors see potential in tourism. *“Tourism is developing more and more. The cars fit last year. Parking is already a problem this year.”* (I3). However, they also express their doubts about this. A more diversified supply of jobs is seen as an ideal state. In addition to organic farming and food processing to meet urban needs, assembly plants would also be set up. These provide a livelihood for the low-skilled workforce. However, this is not compatible with the threefold system of objectives of the national park, so they can only think of the only economic sector that does not harm the symbolic principles and related rules. Local and national (and international) interests can meet in tourism and catering.

In tourism related to the national park, locals see opportunities primarily in accommodation. *“It can be felt that accommodation is running out at certain events. There is always movement at the accommodation on the weekends.”* (I1).

Municipalities also see it as a source of revenue. They are trying to use their properties to increase accommodation. The capacity of small settlements is characterised by the following answer: *“10–15 families can make a living from it, but there are some families that specialise in providing the widest possible range of tourists.”* (I8).

However, barriers were indicated in all settlements. *“The national park is best suited for active tourism, but it’s declining, people prefer comfort.”* (I5). According to the mayors, the national park is not attractive enough. There are not enough tourists according to the special features of the place. *“It would be nice if more people came.”* (I4). Visitors are only in the caves. There are no attractions that can still be attractive to them. *“Tourists just go to the cave, the rest is negligible.”* (I7), *“Tourism is present, there are a lot of visitors on the weekends, mostly by car, but they only stop for a short time.”* (I10).

According to the mayors, investments would be needed that would encourage visitors to stay and spend more time. *“Investments could keep people here for several days.”* (I8). The different ideas do not necessarily agree with the principles of the national park. *“We wanted an adventure park, but the national park didn’t allow it because it didn’t fit in.”* (I3), *“It should be developed to spend more days here. Not with accommodation, but with a program. For example, you need wellness accommodation because it’s an extra service.”* (I1). The development of the spa and water tourism was mentioned as potential by all mayors. This is where they see the greatest opportunity to attract tourists. The need for cooperation was also expressed. *“There aren’t many accommodations, but the guest doesn’t even stay local. The programs should be given priority, and this would require cooperation, even across the border (Betlér, Košice).”* (I10), *“There should be more festivals, events, the attraction is still missing; cooperation between villages is needed.”* (I5).

In addition to larger investments, they would also build on local specificities. *“To present local specialties. Garden, backyard, walking in the forest. To build on quiet village life. Local products, interactive country house. Local market and local product. Local gastronomy,*

typical dishes. Beekeepers' good quality honey. Preservation of traditions." (I10).

The costs of the plans would be passed on to the state. In return for restricting the lives of locals with a set of rules related to the national park. „I need government help. Call for a state tender for the development of an amusement park." (I3), „There is no room for improvement. We would try to strive for it, but they say we would rather not submit to the tenders." (I2).

Coexistence with the national park

How does the national park appear in the everyday lives of the locals? Not as their own. Rather as the "other", whose presence must be endured. They must live with it because there is no other choice. The organisation of national parks is separate from the local administration. There is no overlap in budget or staff. The national park directorate, which operates the national park, is present as a foreign body in the lives of the locals.

Leaders say the population disapproves of the practical existence of the national park. "People don't see the benefits of the national park. People who live here experience it more as a negative." (I5), "Those who live here and haven't worked at the national park say it's not good." (I1), "Locals see that national park workers are not using the things at their disposal wisely. For example, workers go to the same place in a separate car." (I3), "National park workers don't necessarily do what they advise people who live here. Their negligence is often observed." (I2). In addition, the workers in the national park often come from elsewhere and are not locals, so they are seen as strangers.

The lack and inadequacy of contacts is mostly revealed by local leaders. "Residents of the settlement have no connection with the national park" (I10), "When the last director was appointed, there was no introduction for local leaders. There is no live connection." (I9), "We live on the edge of the national park (in fact, a piece of it is in the village), but we have no experience with it. It is neutral for us here." (I2), "I need a personal network. As a local mayor, I don't

even get to know what programs the national park organises." (I5), "In the first cycles, the leaders of the national park withdrew. That is changing now. They have to adapt to the people who live here. A common goal would be for the countryside to flourish, so the national park should also be helped (as a public institution)." (I3), "At first, they didn't even want to talk to the locals. For example, for the barn I wanted to fix, I got the answer that it wasn't mine, nor the national park workers. Don't worry about it if it collapses." (I1).

As a positive factor in the direct existence of the national park, leaders highlight the job-creating effect. "It would be positive if more people could be employed in the national park, but at normal wages." (I7), "They don't pay anything to the town, but it allows for a visit and gives a lot of people a job." (I1).

The sources of revenue for the national park are often growing to the detriment of local communities. "Entrepreneurs at the bazaar pay the national park for the right to sell." (I3). The national park is in contact with non-local entrepreneurs to carry out site-related works.

Acting as an authority is a sensitive issue for the local population. „The workers of the national park practice punishment by the local inhabitants" (I7), „They are abusive to farmers. They show that they are the national park workers." (I8), "There are conflicts with park rangers who want to punish immediately, are unwilling to compromise, to cooperate." (I3), „Behind the tension between the countryman and the park rangers is the pride of the national park. Everything is seen as a controversy between distracted villagers and educated national park workers." (I1).

The main source of conflict with the national park is the strict regulation of farming. "Locals can't get dry wood out of the woods to ignite it. Bugs are more likely to eat." (I7), "The pines in the office yard had to be cut down because of the wires. As they were cut down, the guardian of the national park appeared, and reported the new mayor for the felling." (I1), "The farming was regulated, but at first they took official action, only later did they come to explain the rules to the people living here, to understand how to cooperate with them." (I2), "Locals had previously laid a stone wall on the side of the creek to

protect against flooding. But this is not allowed now. There is nothing to do with the stream, the properties of the people living here are endangered by the flood.” (I3).

The rules often seem ill-considered in the eyes of the locals. “The locals feel the rules for mowing are unnecessary because they give mowing dates randomly, not on a regular basis.” (I8), “Protecting the birds would be more effective without the rules. If farmers mowed in May, the bird would not go to the meadow to brood. It is nesting in pristine grass right now. A week later we already have a permit to mow in the nesting area.” (I9).

At the same time, it has been expressed as a general trend that attitudes on the part of the national park are changing. They are less reluctant that local leaders are very happy about. “It’s a good thing they’ve let go off the austerity, now it’s better to live together.” (I5)

Only two cases were positive about cohabitation. “The national park is an advantage, there are professionals out there who protect the world. They have a say in everyday life, but it is important that there are places like this. At least in these places, the values to be protected remain.” (I6), „It preserves the natural values in our environment. Opportunity for municipalities to get involved in tourism. The landscape is one, like the endowments, it ensures the survival of the small village as well.” (I4).

Discussion and conclusions

How do national parks appear in the daily lives of the communities? What is the assessment of national parks? Do locals perceive the beneficial effects of national parks, which we assume? In our research, we sought answers to these questions in connection with the Aggtelek National Park and the Slovak Karst National Park. We chose a karst landscape that is divided into two countries, but in both countries, a national park has been established in its territory. The responses got during the structured interviews with the leaders of the local settlements confirmed the preliminary assumptions we made based on the literature.

The interviews revealed an ambivalent network of contacts (ANFIELD, J. 1993; WALLSTEN, P. 2003; SZALAI, K. and SZILÁGYI, Zs. 2007; PUHAKKA, R. 2008; ARNBERGER, A. et al. 2018, 2019; KIM, M. and JAKUS, P.M. 2019; WARCHALSKA-TROLL, A. 2019). The symbolic significance of the national park and the coexistence in everyday life are separated. In practical experience, the focus is on the strict set of rules that provide a framework for the activities of those who live here. In addition to the difficult coexistence with the rules, there is also a lack of trust in the state (SCHWARTZ, K.Z.S. 2006; NIEDZIAKOWSKI, K. et al. 2014). The state is represented locally by the national park in the eyes of those who live here. Locals perceive the presence of the national park and the activities of those who work there as foreign bodies. Mayors lack closer cooperation. Everyday problems obscure the threefold system of objectives of the national parks.

From a practical point of view, the recreational interpretation is the most important for the locals because it can give them a livelihood by receiving guests coming to the national park (MAYER, M. 2010; BYSTRÖM, J. and MÜLLER, D.K. 2014; BOLLOBANI, E. and URUÇI, R. 2019; DOLLMA, M. 2019; TELBISZ, T. et al. 2020). Due to the regulations, this is almost the only job opportunity, in other economic sectors, they cannot think about the threefold goal system of the national parks. In the 21st century, due to limited opportunities, the biggest problem for settlements is emigration. According to local leaders, the process cannot be stopped due to the national park. The presence of national parks strengthens emigration, the process of depopulation of rural areas. It can be interpreted as a post-socialist peculiarity that the entrepreneurial attitude and the opportunities inherent in services and tourism are not perceived by the communities or they cannot live with them (SCHWARTZ, K.Z.S. 2006; NIEDZIAKOWSKI, K. et al. 2014).

At the same time, every local leader states that with a change of attitude, this process can be reversed (REPKA, P. and ŠVECOVÁ, M.

2012). People need to be made aware of the value that is present in the national park's triple target system. For this, however, it is essential that the national park approaches the locals: there should be an overlap in both local and national park regulations, as well as in staffing (CARRUTHERS, J. 1989; ARNBERGER, A. and SCHOISSENGEIER, R. 2012; YAKUSHEVA, N. 2019; ARPIN, I. and COSSON, A. 2021; FIENITZ, M. et al. 2022). It would therefore be important for locals to feel the symbolic significance of the national park and to do so in their daily lives.

The results of our present work reveal how the target system of national parks can get into the crossfire of different social interests and how the protection of values can be relativised in everyday life. The practical implementation of the social/national interest may involve conflicts. All actors involved have an essential role to play in resolving this.

Acknowledgement: The article was produced as part of the project K-124497 with the support of the National Research, Development, and Innovation Office (NKFIH).

REFERENCES

- AAGESEN, D. 2000. Rights to land and resources in Argentina's Alerces National Park. *Bulletin of Latin American Research* 19. (4): 547–569.
- ANDERSON, M.K. and BARBOUR, M.G. 2003. Simulated indigenous management: A new model for ecological restoration in national parks. *Ecological Restoration* 21. (4): 269–277.
- ANFIELD, J. 1993. Sustainable tourism in the nature and national parks of Europe. *The George Wright Forum* 10. (4): 87–94.
- ARNBERGER, A., EDER, R., ALLEX, B., STERL, P. and BURNS, R.C. 2012. Relationship between national-park affinity and attitudes towards protected area management of visitors to the Gesäuse National Park, Austria. *Forest Policy and Economics* 19. 48–55.
- ARNBERGER, A., EDER, R., ALLEX, B., PREISEL, H., EDENBERGER, M. and HUSSLEIN, M. 2018. Trade-offs between wind energy, recreational, and bark-beetle impacts on visual preferences of national park visitors. *Land Use Policy* 76. 166–177.
- ARNBERGER, A., EDER, R., ALLEX, B., PREISEL, H. and HUSSLEIN, M. 2019. National park affinity segments of overnight tourists differ in satisfaction with, attitudes towards, and specialisation in, national parks: Results from the Bavarian Forest National Park. *Journal for Nature Conservation* 47. 93–102.
- ARNBERGER, A. and SCHOISSENGEIER, R. 2012. The other side of the border: Austrian local residents' attitudes towards the neighbouring Czech Šumava National Park. *Journal of Nature Conservation* 20. 135–143.
- ARPIN, I. and COSSON, A. 2021. Seeking legitimacy in European biodiversity conservation policies: The case of French national parks. *Environmental Science and Policy* 116. 181–187.
- BEATTY, R.O. 1952. The conservation movement. *The Annals of the American Academy of Political and Social Science* 281. 10–19.
- BELL, J. and STOCKDALE, A. 2015. Evolving national park models: The emergence of an economic imperative and its effect on the contested nature of the 'national' park concept in Northern Ireland. *Land Use Policy* 49. 213–226.
- BISHOP, K., DUDLEY, N., PHILLIPS, A. and STOLTON, S. 2004. *Speaking a Common Language. The uses and performance of the IUCN System of Management Categories for Protected Areas*. Cardiff, Cardiff University, IUCN – The World Conservation Union and UNEP – World Conservation Monitoring Centre.
- BOLLOBANI, E. and URUÇI, R. 2019. Geotourism potentials of the National Park „Mali i Tomorrit”. *International Journal of Geoheritage and Parks* 1. 15–23.
- BÖHN, D. 2021. National park in Germany: Let nature be nature – But which nature? *International Journal of Geoheritage and Parks* 9. 30–35.
- BYSTRÖM, J. and MÜLLER, D.K. 2014. Tourism labor market impacts of national parks. The case of Swedish Lapland. *Zeitschrift für Wirtschaftsgeographie* 58. (2–3): 115–126.
- CATLIN, G. 1844. *Letters and Notes on the Manners, Customs, and Condition of the North American Indians*. New York, Wiley and Putnam.
- CARRUTHERS, J. 1989. Creating a national park, 1910 to 1926. *Journal of Southern African Studies* 15. (2): 188–216.
- COHN, J.P. 1992. Central and Eastern Europe aim to protect their ecological backbone. *BioScience* 42. (11): 810–814.
- COMSTOCK, T.B. 1874. The Yellowstone National Park. *The American Naturalist* 8. (2): 65–79.
- CRONON, W. 1995. The trouble with wilderness; or getting back to the wrong nature. In *Uncertain Ground: Rethinking the Human Place in Nature*. Ed.: CRONON, W., New York, W.W. Norton & Co., 69–90.
- DAIM, M.S., BAKRI, A.F., KAMARUDIN, H. and ZAKARIA, S.A. 2011. Being neighbour to a national park: Are we ready for community participation? *Procedia – Social and Behavioral Sciences* 36. 211–220.
- DEXLER, Sz., HORVÁTH, G. and KARANCSI, Z. 2003. Turizmus, természetvédelem és tájhasznosítás kapcsolata egy nógrádi kistájrézlet példáján (The connection between tourism, nature conservation and landscape utilisation demonstrated on the example

- of a small landscape unit of Nógrád county). *Földrajzi Közlemények* 127. (1–4): 45–62.
- DOLLMA, M. 2019. Geotourism of Thethi National Park. *International Journal of Geoh Heritage and Parks* 7. 85–90.
- DUNLAP, T.R. 1999. *Nature and the English Diaspora: Environment and History in the United States, Canada, Australia, and New Zealand*. Cambridge, Cambridge University Press.
- EAGLES, P.F.J. 2002. Trends in park tourism: Economics, finance and management. *Journal of Sustainable Tourism* 10. (2): 132–153.
- ESFANDIAR, K., DOWLING, R., PEARCE, J. and GOH, E. 2021. What a load of rubbish! The efficiency of theory of planned behaviour and norm activation model in predicting visitors' binning behaviour in national parks. *Journal of Hospitality and Tourism Management* 46. 304–315.
- FIENTZ, M., BUSSE, M., FIENTZ, M. and HEILAND, S. 2022. Analysing the impact of communication and public participation on the acceptability of Germany's Black Forest National Park. *Journal for Nature Conservation* 67. 1–15.
- FINE, K. 1988. The politics of „interpretation” at Mesa Verde National Park. *Anthropological Quarterly* 61. (4): 177–186.
- FROST, W. and HALL, M. 2009. Reinterpreting the creation myth: Yellowstone National Park. In *Tourism and National Parks*. Eds.: FROST, W. and HALL, M., London–New York, Routledge, 16–29.
- GÁLOSI KOVÁCS, B. and HORVÁTH, G. 2018. Határokön átnyúló természetvédelmi területek lehetőségei és problémái (Perspectives and problems of transboundary protected areas). *Földrajzi Közlemények* 142. (4): 309–327.
- GAYNOR, A. 2017. Entangled nature: The Stirling Range National Park. *RCC Perspectives* 2. 81–88.
- GERASZIMOV, I.P. 1978. Ökológiai válságok a természet és az emberiség történetében (Ecological crises in the history of the nature and mankind). *Földrajzi Közlemények* 102. (1): 29–39.
- GESSERT, A., NESTOROVÁ-DICKÁ, J. and SNIŇČÁK, I. 2018. The dynamics of tourist excursion ratios in Slovakia show caves from 2000 to 2014. *Geografisk Tidsskrift / Danish Journal of Geography* 118. 173–183.
- GETZNER, M. and ŠVAJDA J. 2015. Preferences of tourists with regard to changes of the landscape of the Tatra National Park in Slovakia. *Land Use Policy* 48. 107–119.
- GISSIBL, B., HÖHLER, S. and KUPPER, B. (eds.) 2012. *Civilizing Nature: National Parks in Global Historical Perspective*. New York, Berghahn.
- GLENDINNING, M. 2003. The conservation movement. A cult of the modern age. *Transactions of the Royal Historical Society* 13. 359–376.
- HABECK, M. 2004. Eastern Europe's environmental challenge. *Frontiers in Ecology and Environment* 2. 4. 172.
- HALL, M.C. and FROST, W. 2009. Introduction. The making of the national parks concept. In *Tourism and National Parks*. Eds.: FROST, W. and HALL, M., London–New York, Routledge, 3–15.
- HIDLE, K. 2019. How national parks change a rural municipality's development strategies – The Skjåk case, Norway. *Journal of Rural Studies* 72. 174–185.
- HILL, M.A. and PRESS, A.J. 1993. Kakadu National Park: An experiment in partnership. *The Australian Quarterly* 65. (4): 23–33.
- HORVÁTH, I., MAHUNKA, S., SIMON, T. and SZUJKÓNÉ LACZA, J. 1979. Nemzeti parkok kutatása – természetvédelem – tájrekonstrukció (Research of national parks – nature conservation – landscape reconstruction). *MTA Biológiai Osztály Közleményei* 22. 337–350.
- JAKÁL, J. 1975. Az emberi tevékenység negatív hatásai és annak megjelenésformái a karsztvidéken (Negative effects of human activity and its various forms on karst region). *Földrajzi Közlemények* 99. (1). 19–24.
- JUUTINEN, A., MITANI, Y., MÁNTIMAA, E., SHOJI, Y., SIKAMÄKI, P. and SVENTO, R. 2011. Combining ecological and recreational aspects in national park management: A choice experiment application. *Ecological Economics* 70. (6): 1231–1239.
- KIM, M. and JAKUS, P.M. 2019. Wildfire, national park visitation, and changes in regional economic activity. *Journal of Outdoor Recreation and Tourism* 26. 34–42.
- KŐSZEGI, M., BOTTLIK, Zs., TELBISZ, T. and MARI, L. 2015. Human-environment relationships in modern and postmodern geography. *Hungarian Geographical Bulletin* 64. (2): 87–99.
- KŐSZEGI, M., BOTTLIK, Zs., TELBISZ, T. and MARI, L. 2019. A „nemzeti park” koncepció tér és időbeli változásai (Spatial and temporal changes in the concept of “national park”). *Földrajzi Közlemények* 143. (4): 308–323.
- MARCEL, G. 2013. National parks in Europe. *Studia Universitatis “Vasile Goldiş”, Seria Ştiinţele Vietii*. 23. (1): 91–94.
- MATEUSZ, R. 2021. A method to analyse variability and seasonality the visitors in mountain national park in period 2017–2020 (Stołowe Mountains National Park, Poland). *Journal of Outdoor Recreation and Tourism* 35. 100407.
- MAYER, M., MÜLLER, M., WOLTERING, M., ARNEGGER, J. and JOB, H. 2010. The economic impact of tourism in six German national park. *Landscape and Urban Planning* 97. 73–82.
- MCCONNELL, G. 1954. The conservation movement. Past and present. *The Western Political Quarterly* 7. (3): 463–478.
- MUKHERJEE, A. 2009. Conflict and coexistence in a national park. *Economic and Political Weekly* 44. (23): 52–59.
- NASH, R. 2014. *Wilderness and the American Mind*. 5th Edition. New Haven–London, Yale University Press.
- NIEDZIAŁKOWSKI, K., Blicharska, M., Mikusinski, G. and Jedrzejewska, B. 2014. Why is it difficult to enlarge a protected area? Ecosystem services perspective on the conflict around the extension of the Białowieża National Park in Poland. *Land Use Policy* 38. 314–329.
- NOLTE, B. 2004. Sustainable tourism in biosphere reserves of east central European countries – Case studies from Slovakia, Hungary and the Czech Republic. *Policies,*

- Methods and Tools for Visitor Management* MMV2. 349–356.
- PETROVA, S., BOUZAROVSKI, S. and MARTIN, Č. 2009. Conservationist or fashionista?: Urban dwellers' expectations from national parks in the Republic of Macedonia. *Urbani Izzi* 20. (2): 128–135.
- PIETRZYK-KASZYŃSKA, A., CENT, J., GRODZIŃSKA-JURCZAK, M. and SZYMAŃSKA, M. 2012. Factors influencing perception of protected areas – The case of Natura 2000 in Polish Carpathian communities. *Journal of Nature Conservation* 20. 284–292.
- POTTER, R.B. and BEYNON, B. 2000. National parks in Hungary: Developments post 1990. *Geography* 85. (3): 274–279.
- PUHAKKA, R. 2008. Increasing role of tourism in Finnish national parks. *Fennia* 186. (1): 47–58.
- REPKA, P. and ŠVECOVÁ, M. 2012. Environmental education in conditions of National Parks of Slovak Republic. *Procedia – Social and Behavioral Sciences* 55. 628–634.
- SABO, H.M. 2012. Ecotourism in Rodna Mountains National Park. *Research Journal of Agricultural Science* 44. (2): 226–232.
- SCHAMEL, J. and JOB, H. 2017. National parks and demographic change – Modelling the effects of ageing hikers on mountain landscape intra-area accessibility. *Landscape and Urban Planning* 163. 32–43.
- SCHWARTZ, K.Z.S. 2006. „Masters in our native place”: The politics of Latvian national parks on the road from communism to „Europe”. *Political Geography* 25. 42–71.
- SELBY, A., PETÄJISTÖ, L. and HUHTALA, M. 2011. The realisation of tourism business opportunities adjacent to three national parks in southern Finland: entrepreneurs and local decision-makers matter. *Forest Policy and Economics* 13. 446–455.
- STEMBERK, J., DOLEJS, J., MARESOVA, P. and KUČA, K. 2018. Factors affecting the number of visitors in national parks in the Czech Republic, Germany and Austria. *ISPRS International Journal of Geo-Information* 7. 124–133.
- SZALAI, K. and SZILÁGYI, Zs. 2007. A táj a turizmus fókuszában (Landscape with focus on tourism). *Földrajzi Közlemények* 131. (3): 147–156.
- SZVOBODA, L. 1998. A természetvédelem múltja, az Aggteleki Nemzeti Park jelene és jövője (The past of the nature conservation, present and future of the Aggtelek National Park). In *Az Aggteleki Nemzeti Park*. Ed.: BAROSS, G., Budapest, Mezőgazda Kiadó, 12–17.
- TELBISZ, T., BOTTLIK, Zs., MARI, L., PETRVALSKÁ, A., KŐSZEGI, M. and SZALKAI, G. 2014. Természeti tényezők hatása a népesség területi eloszlására a Gömör-Tornai-karszt és környezet példáján (The impact of physical environment on the spatial distribution of population – a case study of Gömör–Torna Karst and its surroundings). *Földrajzi Közlemények* 138. (4): 277–292.
- TELBISZ, T., BOTTLIK, Zs., MARI, L. and PETRVALSKÁ, A. 2015. Exploring relationships between karst terrains and social features by the example of Gömör-Torna Karst (Hungary-Slovakia). *Acta Carsologica* 44. 121–137.
- TELBISZ, T., IMECS, Z., MARI, L. and BOTTLIK, Zs. 2016. Changing human-environment interactions in medium mountains: the Apuseni Mts (Romania) as a case study. *Journal of Mountain Science* 13. 1675–1687.
- TELBISZ, T., GRUBER, P., MARI, L., KŐSZEGI, M., BOTTLIK, Zs. and STANDOVÁR, T. 2020. Geological heritage, geotourism and local development in Aggtelek National Park (NE Hungary). *Geoheritage* 12. 5.
- TELBISZ, T. and MARI, L. 2020. The significance of karst areas in European national parks and geoparks. *Open Geoscience* 12. 117–132.
- TRAKOLIS, D. 2001. Perceptions, preferences, and reactions of local inhabitants in Vikos-Aoos National Park, Greece. *Environmental Management* 28. 665–676.
- TÓZSA, I. 1996. Az Aggteleki-karszt idegenforgalmi potenciálja (Touristic potential of the Aggtelek karst region). *Földrajzi Értésítő / Hungarian Geographical Bulletin* 45. (3–4.): 299–312.
- TURNER, R.W. 2000. Managing multiple activities in a national park. *Land Economics* 76. (3): 474–485.
- VAN BEECK CALKOEN, S.T.S., MÜHLBAUER, L., ANDRÉN, H., APOLLONIO, M., BALČIAUSKAS, L. et al. 2020. Ungulate management in European national parks: Why more integrated European policy is needed. *Journal of Environmental Management* 260. 1–11.
- VERESS, M. and UNGER, Z. 2015. Baradla-Domica: large cave system on the Hungarian-Slovak border. In *Landscapes and Landforms of Hungary*. Ed.: Lóczy, D., World Geomorphological Landscapes, Springer International Publishing, 167–175.
- WALLSTEN, P. 2003. The “inside-out” process: A key approach for establishing Fulufjället National Park in Sweden. *Mountain Research and Development* 23. (3): 227–229.
- WARCHALSKA-TROLL, A. 2019. Do economic opportunities offered by national parks affect social perceptions of parks? A study from the Polish Carpathians. *Mountain Research and Development* 39. 1. R37–R46.
- WAUGH, F.A. 1918. A national park policy. *The Scientific Monthly* 6. (4): 305–318.
- WEST, P., IGOE, J. and BROCKINGTON, D. 2006. Parks and peoples: The social impact of protected areas. *Annual Review of Anthropology* 35. 251–277.
- WHATMORE, S. 2006. Materialist returns: practising cultural geography in and for a more-than-human world. *Cultural Geographies* 13. (4): 600–609.
- WIDAWSKY, K. and JARY, Z. 2019. Mass tourism in protected areas – underestimated threat? Polish National Parks case study. *Open Geoscience* 11. 1046–1060.
- YAKUSHEVA, N. 2019. Managing protected areas in Central Eastern Europe: Between path dependence and Europeanisation. *Land Use Policy* 87. 104036.
- ZGŁOBICKI, W. and BARAN-ZGŁOBICKA, B. 2013. Geomorphological heritage as a tourist attraction. A case study in Lubelskie Province, SE Poland. *Geoheritage* 5. 137–149.

Public knowledge on karst and protected areas: A case study of Tara National Park, Serbia

JELENA KOVAČEVIĆ-MAJKIĆ¹, JELENA ČALIĆ¹, JASNA MICIĆ¹, JOVANA BRANKOV²,
RANKO MILANOVIĆ³ and TAMÁS TELBISZ⁴

Abstract

The aim of this paper is to present the results of our research on the knowledge and awareness of visitors and residents about karst and protected areas (PAs). The research was carried out in the Tara National Park (NP) in western Serbia, which includes karst landscapes. By conducting surveys with visitors, local population, and National Park employees, as well as interviews with local key persons, NP key persons and external experts, we got a deeper understanding of the issues related to knowledge on karst and PAs. We also investigated whether local people or visitors knew the values of karst landscapes in general and how they were informed or learned about the Tara NP. In addition, we also analysed the content of these topics in school curricula and textbooks in Serbia. We concluded that the awareness about the researched topics is unsatisfactory at present thus it should be raised to a higher level, both in the case of local people and in the case of visitors. One of the most significant ways to improve the current level is through formal, non-formal, and informal education.

Keywords: karst, protected areas, knowledge, education, questionnaire, Tara National Park, Serbia

Received February 2022, accepted May 2022.

Introduction

Karst areas are usually considered to have harsh living conditions due to scarcity of arable land, low level of terrain possibility, general lack of surface waters, and uneven spatial and temporal availability of groundwaters (Cvijić, J. 1925). For all these reasons, population density is relatively low and depopulation processes are intensive on karsts of almost the whole Europe (Habič, P. 1993; Ciglič, R. *et al.* 2012; Telbisz, T. *et al.* 2015, 2019, 2020; Lukić-Tanović, M. *et al.* 2019) as well as in Asia (e.g. Han, Z. and Song, W.

2019, 2020). However, for prehistoric people karst caves were significant shelters or temporary habitats and sacred locations, which altogether subsequently provided priceless data on human evolution to the present scientists (e.g. Mihailović, D. *et al.* 2022). Historically, many karst areas, as being relatively isolated from major communication directions, had been inhabited as people's refuges from conquerors (De Waele, J. 2009; Day, M. 2010). In former communist countries, in times of forced industrialisation, emigration from villages had a particularly high extent in karst (Cocean, P. 2001). In recent times,

¹ Geographical Institute „Jovan Cvijić“ Serbian Academy of Sciences and Arts, Đure Jakšića 9/III, 11000 Belgrade, Serbia. E-mails: j.kovacevic@gi.sanu.ac.rs, j.calic@gi.sanu.ac.rs, j.micic@gi.sanu.ac.rs

² Geographical Institute „Jovan Cvijić“ Serbian Academy of Sciences and Arts, Đure Jakšića 9/III, 11000 Belgrade, Serbia; South Ural State University, Institute of Sports, Tourism and Service, Chelyabinsk, Russia. E-mail: j.brankov@gi.sanu.ac.rs

³ Public Enterprise “Tara National Park”, Milenka Topalovića 3, 31250 Bajina Bašta, Serbia. E-mail: ranko.milanovic@nptara.rs

⁴ Department of Physical Geography, Faculty of Science, ELTE Eötvös Loránd University, Pázmány Péter sétány 1/C, 1117 Budapest, Hungary. E-mail: tamas.telbisz@ttk.elte.hu

karst depopulation generally continues, but there are also several opposite examples – scarce and therefore worth mentioning, such as in the Moravian Karst in the Czech Republic (VAISHAR, A. *et al.* 2018). However, in developing countries, especially in Asia, population growth poses certain risks on karst areas (TUYET, D. 2001; WANG, L.C. *et al.* 2004). People who live on karst are usually aware of both its advantages and limitations – their main resource is knowledge on their environment.

On the other hand, the general global population increase has led to the overuse of natural resources, making them endangered and triggering the need for their protection (EAGLES, P.F.J. and McCOOL, S.F. 2002). At the same time, the importance of the human dimension of conservation is emphasised, in order to create productive policies and achieve effective results and actions (GÖSSLING, S. 2002; SANDBROOK, C. *et al.* 2013; BENNETT, N.J. *et al.* 2017). Necessary legal instruments are being enacted, defining the criteria and categories of PAs. The sensitivity of karst is very high in terms of possible groundwater pollution. The capacity of self-purification of this system is extremely low. This requires high ecological awareness and strict protection rules. To be protected, an area needs to be studied in detail by scientists and nature conservation professionals. In other words, it is the knowledge that triggers the actions and increases the awareness of the significance of these areas. Subsequently, this leads us to evaluate the role of education in understanding our environment (Figure 1). The loop of knowledge indicates that the process continues.

The importance of knowledge and education process was considered by many experts in different fields of science and from numerous aspects. The key role of formal education in relation to other forms of education (non-formal and informal) in the context of natural disasters was pointed out by many authors (WISNER, B. 2006; KOMAC, B. *et al.* 2010; ČALIĆ, J. *et al.* 2015). All the arguments in favour of formal education discussed in the mentioned papers are valid in general (majority of the

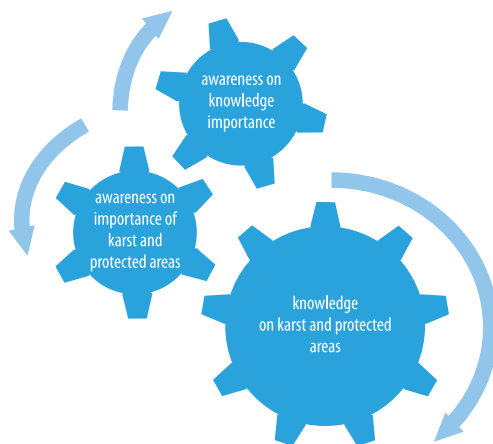


Fig. 1. The driving mechanism of knowledge related to karst and protected areas

population acquire this type of education, it is the easiest way to organise knowledge transfer, the learning process requires sufficient time, the content is reliable). The important place and role of other forms of education is not disputable. There are examples that the efforts related to the education of the visitors of the PAs effectively alter visitors' behaviour in a positive direction (MARION, J.L. and REID, S.E. 2007).

In the system presented in Figure 2, relations between the selected components are

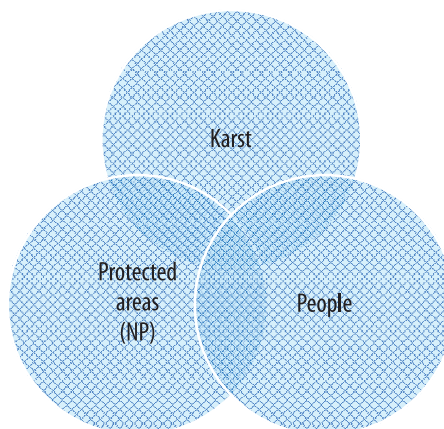


Fig. 2. Selected components of the nature-human system

complex and can be observed from many aspects. In this paper, we deal only with a part of these relations in the context of the process presented in *Figure 1*.

The NKFH project K124497 deals exactly with karst areas which are under protection. The aim of the project is to identify and analyse national parks (NPs), while the main aim of this paper is to show the high significance of public knowledge about these areas. The case study used in this paper for the analysis was Tara National Park in western Serbia, covering an area of 250 km², out of which approximately 53 percent is karstic, developed on pure Triassic limestone (*Figure 3*). The mountainous area is mostly forested, has high biodiversity, but is also rich in geological

values (gorges, cliffs, dolines, etc.). We also note that the natural conditions are modified by the Drina-Lim hydropower plant, which is located just next to the NP boundary and is in close hydrological relation with the area of the NP. It is the most important economic stronghold of the area, but the large water reservoir, which stretches into the Drina river canyon also plays a significant role in tourism as well.

Our research includes the following modules: (1) degree of public knowledge on karst and PAs among the local population, NP visitors, NP key persons, NP employees, local key persons, and external experts; and (2) official educational Curricula contents related to karst and PAs.

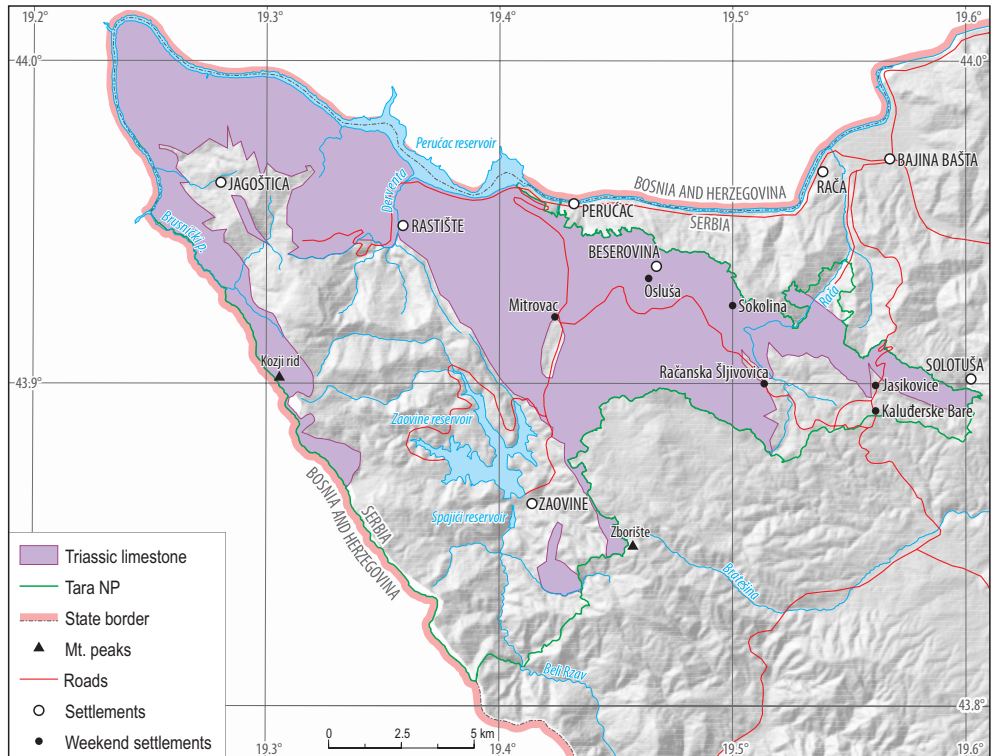


Fig. 3. Karstic areas in the area of the Tara National Park

Methodology

Data and participants

The level of the knowledge on karst and PAs is examined within the survey of 433 participants who were classified into several groups (local population 197, visitors 208, NP employees 28), as well as through interviews conducted with 20 respondents (NP key persons 5, local key persons 10, external experts 5). The sample of local population in relation to the total population number in the Tara NP is hard to estimate since the data on population is published on the level of settlements. There are ten settlements which are totally or partly within the Tara NP borders with 3,630 residents (Population Census, 2011). The real number is smaller, so we assume that we have a sample of 7–10 percent. As reported by the Head of the NP Sector of Presentation and Tourism Information in Tara NP, the number of registered visitors varies between 70,000 and 80,000 a year, and it encompasses those staying in the hotels on the Tara Mt. and the hotels in Bajina Bašta and without those who use private accommodation. As for the locals and visitors, the same sample of participants was used as in the paper of TELBISZ, T. *et al.* (2021), given that its size is considered sufficient for the application of different statistical techniques (PALLANT, J. 2010).

We applied a broad range of modes in the survey procedures, such as self-administrated questionnaire filling (locals at their homes, visitors in visitor centres, and NP employees in the building of the Public Enterprise (PE) Tara NP), face-to-face questioning (locals at their homes), and online surveys set on the Tara NP website, and also sent to appropriate organisations, institutions, and personal contacts (visitors). The surveys were completely anonymous. The questionnaires comprised open-ended and close-ended questions with multiple-choice answers. The questions were grouped into three segments related to: (a) knowledge on karst, (b) PAs, and (c) the importance of knowledge and education. Each group of respondents, including those inter-

viewed, was asked about these mentioned issues. Interviews with NP key persons were done in the building of the PE Tara NP and with the local key persons and external experts in their offices. In this paper, we have analysed only selected questions and answers related to our topic. They are presented in *Table 1*.

In terms of missing data, only a small number of respondents chose not to answer certain questions. In the tourist group the mean value of missing data was 1.9 percent with a maximum of 7.7 percent in the case of the question on the meaning of the word “karst”. In the NP employees group, the mean value of missing data was 5.0 percent with a maximum of 7.1 percent (i.e. 2 of 28 answers).

Curricula and school textbooks analyses were a way to determine whether there is enough content about karst and PAs and whether that content has the appropriate quality and is purposeful (Regulations on the Plans and Curricula, 2018–2021).

Research procedure

After data collection, we examined whether there was a problem in the education system and we proposed measures to solve the existing problems. The conceptual framework and methodological procedure of the research are presented in *Figure 4*.

The descriptive statistics and bivariate analysis (t-tests and ANOVA) were performed using SPSS 20.0 for Windows to recognise factors that affect the particular outcome. In the case when the type of data did not meet the assumptions on which the classic ANOVA is based, Welch’s ANOVA was used instead. The interpretation of the effect size was made according to COHEN, J.W. (1988).

Results and discussion

Demographic characteristics

The demographic characteristics of the respondents show that the gender structure

Table 1. Selected questions and answers related to the current analysis, thematically grouped*

	Questions	L	V	NP e	L kp	NP kp	E
Karst	Do you know the meaning of the word „karst“ („krs“, „kras“)?		+				
	What do you think the values of this landscape are? (analysed answers: viewpoints, cliffs)		+	+	+	+	+
	Did you visit some viewpoints?		+		+	+	+
	Why did you personally choose this site? (analysed answer: to visit viewpoints)		+				
Protected areas	What is the level of nature protection of the area?	+					
	Was it important to you that Tara is a National Park? (analysed answers: not at all / slightly / yes, very important)		+				
	Are there any advantages thanks to the national park for local people? If yes, what are these advantages?	+			+	+	+
	Are there any drawbacks (restrictions) due to the Tara National Park for local people? If yes, what are these restrictions?	+			+	+	+
	Was there any economic change due to the declaration of Tara National Park?	+			+	+	+
	Do you think of Tara National Park as a part of our national heritage that we can be proud of?	+			+	+	+
Importance of knowledge and education	How did you get information about Tara National Park? (analysed answers: school studies / books)?		+				
	If there are children in the family: do they „meet“ the national park by school programs?	+					
	How much are you satisfied with the following possibilities on Tara? (analysed answers: visit for information, inscriptions, sights, brochures)		+				
	How much are educational trails important to you? (analysed answers: not at all / slightly / yes, very important)		+		+	+	+
	What kind of tourist development would you think important for Tara NP? (analysed answers: creation of new education trails and tourist paths, building of new viewpoints) According to you, how important should the following tasks be in the Tara NP? (1-5 scale; 1 = not important; 5 = the most important) (analysed answers: preservation of the geological values: viewpoints, cliffs; scientific research; education)	+	+		+	+	+

*Except from the full questionnaire list. Codes: L = survey with the local population; V = survey with visitors; NP e = survey with NP employees; L kp = interviews with local key persons; NP kp = interviews with NP key persons; E = interviews with external experts.

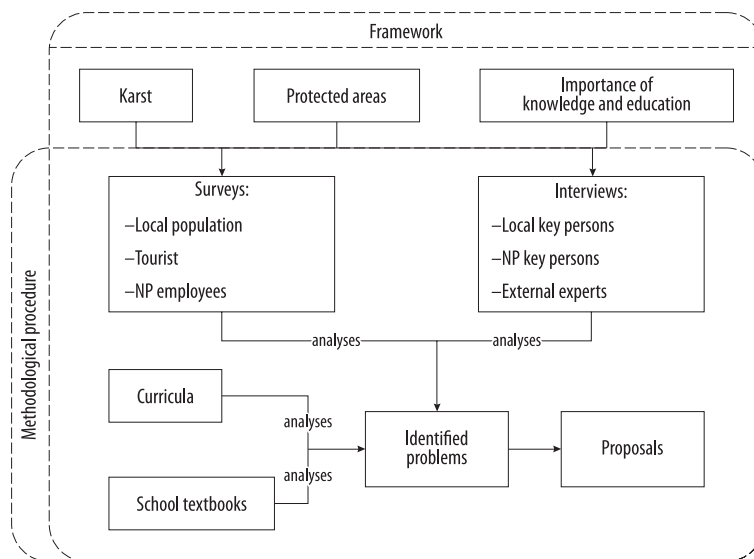


Fig. 4. Conceptual framework and methodological procedure

is balanced; respondents were 14 years and above, while the age structure is normally distributed with the most frequent age group of 31–50. Considering the education level, among the local population, participants with secondary school predominate, while among visitors, NP employees, local key persons, NP key persons, and external experts those with higher education predominate.

All of the local people reported live in the settlements of Bajina Bašta and Užice municipality. Tara NP extends on the area of these two municipalities. NP employees and key persons, as well as local key persons reported in this survey, reside exclusively in the settlements of Bajina Bašta municipality. The majority of visitors are from Serbia (93.0%), while foreigners (3.5%) came from Croatia, Russia, and North America, and 3.5 percent of the respondents did not provide that information. Considering visitors from Serbia, half of them are from Belgrade (the capital), 10.0 percent are residents from the municipalities of Bajina Bašta and Užice, while the rest (one-third of the respondents) are from the other parts of Serbia.

Knowledge on karst

This issue was examined by asking the visitors several questions. First, the meaning of the words “karst”, “krš” or “kras” was asked. These are the various terms used in Serbia for the same phenomenon. The results show that almost 70 percent of respondents answered that they knew the meaning of that word, but analysing the related open-ended answers, it is concluded that about 40 percent of the respondents gave a very general answer, and a quarter of them gave a partly correct answer, another quarter gave a largely correct description, and only 10 percent of them gave the perfect answer (for details, see TELBISZ, T. et al. 2021). Although the local people was not asked about karst terminology, the external expert who is a retired scientific researcher in geography, told an interesting story about how well the local people know the area they live in. Namely, there is a saying among the villagers that cattle are grazed on “white stone” (limestone), but watered on “black stone” (serpentinite and diabase). It clearly demonstrates that although local peo-

ple do not necessarily know how limestone is dissolved, but they do know that streams flow only on the black rocks. This example indicates that functional knowledge is important. Another question for visitors and NP employees was if they see viewpoints and cliffs as the values of the landscape. In *Figure 5*, it can be seen that a pretty large number of visitors (76.4% of them) see viewpoints as a value, and 43.8 percent see cliffs as a value of this landscape. NP employees (82.0%) also marked viewpoints as a value and 43.0 percent of them also see cliffs as a value. In addition, respondents were asked if they visited viewpoints during their staying in Tara NP. 82.3 percent of visitors and 100 percent of NP key persons, local key persons and experts answered positively, while one-third of visitors chose Tara to visit viewpoints.

As for the geological values, the external experts confirmed in the interviews that karsts were “useful” terrains during wars because caves, gorges and canyons were suitable for hiding. They also agreed that such terrains are harsh for life and that depopulation is an inevitable process today. On the contrary, there are nature-lovers who promote sustainable development and life on the karst. These opinions are often related to hiking, which is in turn supported by projects such as “Via Dinarica” (www.viadinarica.com).

In the questionnaires, all of the respondents were asked to rate the importance of the preservation of the geological values

(viewpoints, cliffs) on a 5-point Likert-type rating scale (1 = ‘not important at all’, 2 = ‘not important’, 3 = ‘neutral’, 4 = ‘important’, 5 = ‘most important’). In each group of respondents, the geological values were rated as ‘most important’ with the highest frequency, which means that people in each group are aware of the geological values and see them as an important task in the Tara NP management. In order to illustrate the different perceptions of biological and geological values, the president of the “Tara” Mountain Club pointed out that although the bear is an excellent trademark for Tara NP, it is also a problem in certain situations because bears sometimes cause damage, while the viewpoints “do not ask for anything”. He also outlined that the small rock protruding from the Drina River with the hut on it, captured and made famous as a National Geographic photo, is also a geological value.

Welch’s ANOVA was used to compare the average results of the observed attitudes in specific independent categories of respondents. Statistically significant differences in attitudes about the preservation of geological values were identified among investigated groups, with a small effect size registered. Post hoc procedure, using the Games-Howell test, revealed differences in the opinions of visitors and the local population, with the former valuing the priorities of the NP significantly higher than the latter (*Table 2*).

We also examined the influence of socio-demographic factors on the respondents’ opinions. The total sample was subject to t-tests and one-way analysis of variance (ANOVA) in order to examine the relationship between socio-demographic variables (gender, age, education) and the opinion on development priorities of NP in the future.

In the case of gender and age, no statistically significant differences in attitudes were found among members of different groups. However, when it comes to the level of education, the series of t-tests confirmed that those with a higher level of education consider the protection of geological values more important compared to the respondents with

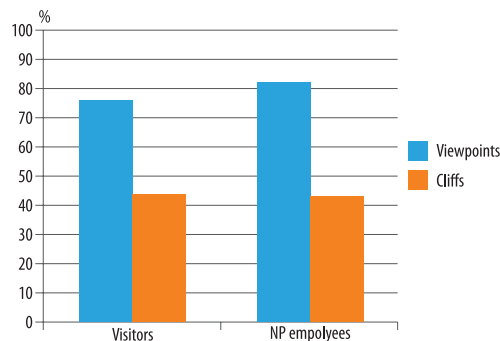


Fig. 5. Viewpoints and cliffs as a value of landscape in Tara National Park

Table 2. Differences in the attitudes on the importance of the preservation of the geological values*

Variables		Average value	Values	Significance (p)	Effect size (est. ω^2)
Group of respondents	Visitors	4.68	F-value 3.68	0.018	0.03
	Local population	4.34			
	NP employees	4.62			
	NP key persons	4.80			
	Local key persons	4.44			
	External experts	4.60			
Level of education	Primary/secondary	4.35	t-value -3.18	0.002	0.02
	Higher education	4.62			

*Importance values on a 5-point Likert-type rating scale. p = probability of occurrence ($p < 0.05$)

a lower level of education. However, the obtained effect size is small.

Analysing the Plans and Curricula for the primary and secondary schools, we found that in the primary school, which lasts eight years in Serbia (ages 7–15), through the subject of geography, the pupils learn about karst and the relief of the Earth within two topics: in “Relief formation by water” (dissolving rocks) and “Man and relief” (positive and negative influences) during the fifth year. Later in the seventh and eighth years, they learn about karst areas on the examples of regional and national geography. In secondary schools, there are the same topics and pupils expand their knowledge on karst landforms. In the first year of the gymnasium there is a topic on the geomorphological and hydrological characteristics of karst, while in the third year, national karst areas are presented. In vocational secondary schools, pupils learn national geography only in the first year.

The content of the Geography textbooks is determined by the Curricula. In Geography textbooks, considering a relatively large number of publishers and authors, the karst topic is treated at very different detail levels. Thus, as for the many other subjects, the role of the teacher is crucial (Kovačević-Majkić, J. et al. 2014; Čalić, J. et al. 2015). The formal handicap of geography teaching is that there is only one class per week in the 5th year of primary school.

We conclude that even if the topic of karst is represented in curricula, the visitors’ knowledge on karst is unsatisfactory.

Since the visitors are mostly from Serbia, they studied according to the mentioned Plans and Curricula. On the other hand, the knowledge of the local population is functional because it is based on both education and experience. The solution may be to improve teaching in terms of enhanced practical learning for those who do not live on karst terrains and also more classes to learn about karst because the process of learning implies iterations. An example of the non-formal education on karst is the brochure published within the initiative International Year of Caves and Karst – Serbia (Čalić, J. 2021). In the centre of Tara NP at Mitrovac, there is one of the most visited resorts for school children that is suitable for education in the nature. In addition, the NP also organises the *Junior Ranger Camp*, where children can get to know the life in the NP, which is the best way to learn.

Knowledge on protected areas

The local people were asked about the level of nature protection of the area they live in. We expected a large number of answers to be correct, which was justified because almost 92 percent of respondents answered that they knew that it is a NP. Eight percent of respondents gave an incorrect answer, including three people with higher education. Since the Tara NP was proclaimed in 1981, it was not expected that they do not know that fact.

The local people were asked to comment on the advantages and drawbacks related to the NP. The numbers of those who see advantages and those who do not see advantages are almost equal (47% versus 53%, respectively). Of those who see advantages, only 6 percent answered this way because they consider the protection of nature as an advantage. Such a small percentage indicates that there is a low level of awareness about the importance of nature protection. The majority of the local population considers tourism development as the main advantage related to the NP, but this topic is discussed in a different paper. When it comes to drawbacks, almost 2/3 of respondents do not see them, and 1/3 mostly state different types of restrictions as drawbacks. One answer in a negative context was “everything is protected”. In addition, one-third of the local population feels that there has been an economic change due to the declaration of the NP, but they mentioned it both positively and negatively. Only one answer emphasised the fact that the area of forests has enlarged since the foundation of the NP.

All respondents except visitors were asked whether it is important for them that “the NP is part of our national heritage and we can be proud of it”. Of the local population 58 percent answered “yes”, 32 percent answered “partially” and 10 percent answered “no”. This can be partly explained by the fact that there

is an opinion among some locals that the establishment and existence of NP Tara do not have any essential influence on the life of the local population. This is in accordance with the previously mentioned fact that 53 percent of locals do not see any advantages of the NP. The process of depopulation and the decrease of agricultural activities and grazing would happen even if the NP were not there. Details on stakeholders’ attitudes toward Tara NP were elaborated by BRANKOV, J. et al. (2022). Of NP employees, 89 percent responded positively, 11 percent answered “partially”, and none responded negatively. Among the interviewees each person spoke positively, which can be explained by their higher education and subsequently higher awareness on the importance of nature protection (Figure 6). Head of the Sector of Planning, Design, Protection, and Arrangement in Tara NP, reminded that one of the most successful telecommunication companies in Serbia is successfully conducting an advertising campaign using the name of the Serbian spruce (*Picea Omorika*) for one of its service packages. This example demonstrates that *Omorika* is related to positive attitudes, thus, it is used for marketing (within the “business sphere”). Another positive example was mentioned by the Assistant Director for the General and Legal Affairs in Tara NP, who points out that on the billboards at the border crossings to

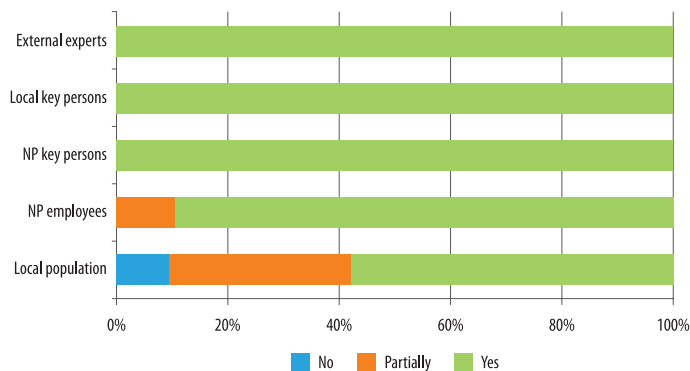


Fig. 6. The respondents’ answers to the question “Do you think of NP as a part of our national heritage that we can be proud of?”

Serbia is a photograph of the Banjska Stena, the most popular viewpoint of Tara NP. This example presents a case, when a viewpoint image is used to market “itself”, also to suggest a positive country image.

Visitors were asked if it is important to them that Tara is a NP. We used three-point response format (1 = ‘not at all’, 2 = ‘slightly’, 3 = ‘yes, very important’). Among the respondents, 43 percent answered that is important for them that Tara is a NP, 39 percent were neutral, and 18 percent responded that for them, the protected status of the area is not important at all. Nonetheless, a relatively small number of positive answers does not necessarily mean that the protection of the landscape is not important for the respondent, but it may also mean that it is not crucial when it comes to motivations for travel. On the other hand, the interviewees, although mostly consider tourism as a desirable branch of the economy that needs to be developed, also mentioned that a large number of visitors leads to increased waste and greater pollution, higher water consumption, and so on.

Considering nature protection, there is a further conflict when it comes to building facilities. Many respondents are aware of the problem of illegal construction. The neces-

sity of cooperation in the field of nature protection is confirmed by the example of Tara NP. For example, waste disposal is an issue that several institutions are dealing with (the municipality, the NP, and the Drina-Lim hydropower plant). Interviewees from the hydropower plant stated that their institution takes out the garbage two times a week in the tourist season and once a week out of season from certain settlements (Mitrovac, Zaovine, and Perućac). That is 50–60 m³ of garbage per tour. They also give money for floating waste removal (plastic bottles, other plastic waste, stumps, and branches) from the Drina reservoirs. They constructed a chain system, which removes 8–10 × 10³ m³ of waste per year. The waste is transported to a landfill, whereas the stumps and branches are used for pellet production. The hydropower plant also performs anti-erosion works (there are gabion dams that retain erosion material).

As for schools, PAs are included in the curricula within several subjects in primary and secondary schools. An overview of the subject and related topics, which is taught in the upper years of primary school and in secondary school, is presented in *Table 3*. Besides the content presented in *Table 3*, in the lower years of primary school within the subjects

*Table 3. Content related to PAs in Plans and Curricula of primary and secondary schools**

Subjects		Topics
Primary school	Geography	Biogeography (vulnerability and protection of the species) Natural and cultural heritage Economy (the concept of sustainable development) National geography (examples from Serbia)
	Biology	Life in the ecosystem (the protection of species and environment, endangered species, sustainable development, rare and endangered species in Serbia)
	Nature keepers	“Let’s help them to survive” (endangered species) “I save the nature” (natural resources, protected natural values)
	Let’s save our planet	Biodiversity and geodiversity (nature protection and PAs)
Secondary school	Biology	Ecological and environmental aspect appears in many topics
	Geography	Biosphere (biodiversity protection) Geoheritage (geoheritage protection, spatial aspect – PAs in Serbia)
	Education for sustainable development	Laws and standards on sustainable development

*After Regulations on the Plans and Curricula in the reference list.

World around us and *Nature and society*, children are also able to develop knowledge and awareness on environmental protection and human-nature relations.

It can be seen that there are horizontal connections between the subjects. Vertical connections are temporal and imply the connection within one subject and through all years.

The contents of the textbooks related to PAs follow the Curricula, but differences depend on the publisher and the authors. It is concluded that relative to the topic of karst, the topic of PAs is more represented.

We can conclude that although the issue of PAs is present in Curricula and school textbooks, the survey results show that the local population has only a partially affirmative attitude towards the Tara NP. Of all the respondent groups, local residents have the most negative and the least number of positive answers to the question related to "Tara NP as part of our national heritage". However, it is difficult to conclude how much the local people care about nature protection. That is a sensitive issue, and certainly, the problems and conflicts that exist between the local population and the NP should be approached carefully because

they are also widespread in other types of PAs in Serbia (JOJIĆ GLAVONJIĆ, T. et al. 2021). Improving attitudes towards nature protection is a process that involves the cooperation of all stakeholders in the area.

The importance of knowledge and education

It is an issue we examined through questions on the source of knowledge and information about the NP, and through the opinion of respondents on the importance of educational trails, viewpoints, as well as research activities and education in general.

The tourist group was asked where they got information about Tara NP. Out of them, 47 percent answered "in school", i.e. through formal education, and 20 percent "from books". The rest stated that TV/radio, internet, and personal contacts were their main source of information (Figure 7, a). In order to assess the importance of formal education for PAs, we asked the local population whether their children got to know the NP through school programs. 52 percent gave a positive answer, 36 percent a negative answer, and 12 percent left this question without an answer (Figure 7, b). This example also

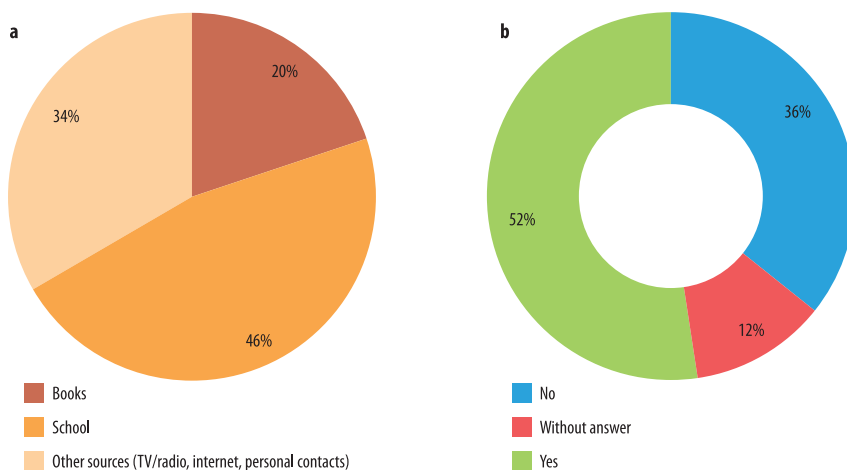


Fig. 7. Sources of information about Tara NP for visitors (a), and answers by the local population to the question "If there are children in the family: Do they »meet« the NP by school programs?" (b)

shows that to the topic of nature protection is less significant for the local population.

Considering the opinion about the importance of educational trails, 58 percent of visitors rated them as “*very important*” and 40 percent as “*slightly important*”. In another question related to satisfaction with tourist information, about 70 percent stated they were “*satisfied*” or “*perfectly satisfied*”. Furthermore, the majority of visitors would support the development of new educational trails (88%) and viewpoints (82%). These opinions match with the aims of the NP authorities, who, with the “Tara” Mountain Club arranged and marked 290 km of walking trails in the recent years (President of the “Tara” Mountain Club and Head of the NP Sector of Presentation and Tourism Information in Tara NP). Keeping in mind the above-mentioned difficulties of life on karst and depopulation, the maintenance of these trails is a more serious challenge than their creation. This is confirmed by the example of the path leading towards the Lađevac spring from the Rača Monastery that is endangered by a landslide, as reported by the Prior of the Rača Monastery and the Head of the NP Sector of Presentation and Tourism Information in Tara NP.

A high percent of affirmative attitudes towards education trails and visitor information indicate that there is a good basis for improving knowledge on karst and nature protection. As most of the respondents are adults who are no longer involved in school education, the solution for increasing knowledge is in non-formal and informal education. In fact, the educational activities offered by Tara NP are comprehensive. Education trails and exhibitions in visitor centres are the dominant informative and interpretation tools (techniques) in a sense set by PUCZKÓ, L. and RÁTZ, T. (2000). As Tara NP was previously oriented to biodiversity protection, the content of educational trails and exhibitions mainly present biology-related information, but there are also parts with geo contents. Writing about geotourism as a new aspect of tourism on Tara Mountain, BANJAC, N. and RUNDIĆ, Lj. (2006) pointed out that geotouristic paths are one of the directions in which geotourism can be developed. They also proposed a first potential geotouristic path. In TELBISZ, T. et al. (2021), new thematic educational paths for Tara NP are also suggested (*Photo 1*).

The PE NP specifies the set of goals and leads the protection and development program of the NP through various activities



Photo 1. Examples of the visitors' information: info-board along an education path (left), visitor's centre in Bajina Bašta (right). (Photos taken by the authors.)

defined by the Law on NP (Law on National Parks, 2015, 2018), such as the implementation of protection zones, management of forests, hunting and fishing, the controlling of the construction works (by permits), monitoring of flora and fauna, the promotion of the NP and its resources. One set of activities refers to the interaction with the local population, education and conducting scientific research and participation in international projects. In this regard, all of the respondents were asked to rate the importance of scientific research and education (Figure 8). We used a five-point Likert-type rating scale from 1 = 'not important at all', to 5 = 'most important'. In each group of respondents, education was rated as "most important (5)" with the highest frequency, but considering the scientific research, the exception was the group of the local population where the answer "important (4)" predominated (last row in Figure 8 – local people L-Sci).

Like in the case of geological values, Welch's ANOVA was used to compare the average results of the observed attitudes on the importance of scientific research (Table 4) and education (Table 5) among specific independent categories of respondents. In both cases, statistically significant differences be-

tween the examined groups were confirmed, with a small effect size for the education variable and medium effect size for the scientific research variable. The post hoc procedure confirmed that the opinions of visitors and the local population differ significantly on the importance of scientific research and that the visitors attribute higher priority to scientific research than local residents (see Table 4). When it comes to the importance of education, it was found that local key persons value this priority much higher than the members of the local population (see Table 5).

Regarding the influence of socio-demographic factors on the opinions of the respondents, neither gender nor age proved to be a predictor of the opinions in any of these two analysed priorities. In contrast, the level of education proved to be a significant predictor of attitudes on the importance of scientific research, with the series of t-tests confirming that those with a higher level of education gave higher marks to this priority compared to the respondents with a lower level of education. The calculated effect size is small (see Table 4). No statistical significance was found between the level of education of the respondents and the opinion on the importance of education as a priority.

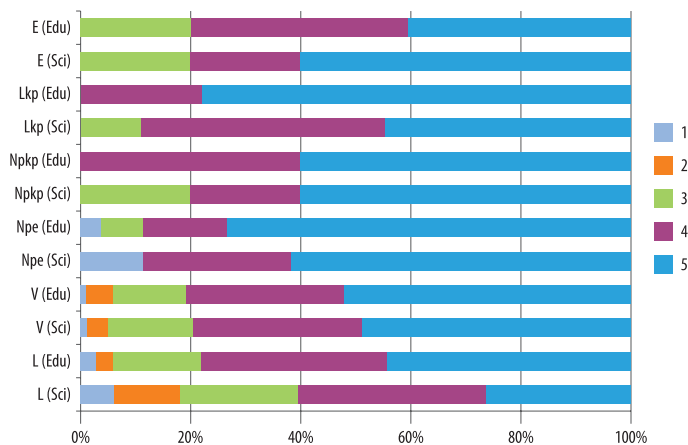


Fig. 8. Evaluation of the importance of scientific research (Sci) and education (Edu) as a NP task by local people (L), visitors (V), NP employees (NP e), local key persons (L kp), NP key persons (NP kp), and external experts (E). 1 = not important at all, 5 = most important.

Table 4. Differences in the attitudes on the importance of the scientific research*

Variables		Average value	Values	Significance (p)	Effect size (est. ω ²)
Group of respondents	Visitors	4.22	F-value 6.28	0.001	0.06
	Local population	3.62			
	NP employees	4.27			
	NP key persons	4.40			
	Local key persons	4.33			
	External experts	4.40			
Level of education	Primary/secondary	3.78	t-value -2.68	0.008	0.02
	Higher education	4.07			

*Importance values on a 5-point Likert-type rating scale. p = probability of occurrence (p < 0.05)

Table 5. Differences in attitudes on the importance of education*

Variables		Average value	F-value	Significance (p)	Effect size (est. ω ²)
Group of respondents	Visitors	4.26	3.44	0.022	0.03
	Local population	4.13			
	NP employees	4.54			
	NP key persons	4.60			
	Local key persons	4.78			
	External experts	4.20			

*Importance values on a 5-point Likert-type rating scale. p = probability of occurrence (p < 0.05)

Figure 9 shows a comparison of the answers of all respondents related to all priorities. It is obvious that scientific research and education are also rated as high priorities (with dominant grades 5 and 4), but in

comparison to other values of the NP (such as the preservation of the biological, cultural and landscape values), scientific research and education are lower-rated.

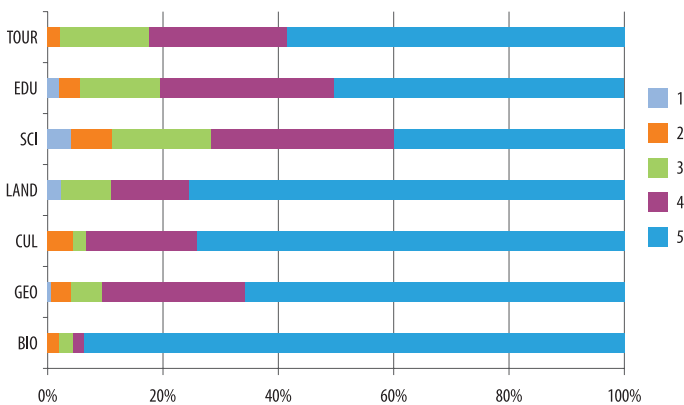


Fig. 9. Evaluation of Tara NP priorities as rated by all respondents. TOUR = tourism, EDU = education, SCI = scientific research, LAND = landscape preservation, CUL = cultural heritage preservation, GEO = geoheritage preservation, BIO = biological preservation. 1 = not important at all, 5 = most important.

Conclusions

All the presented results and facts prove that although the knowledge on karst and PAs is unsatisfactory at present, and the awareness on the importance of the karst and PAs needs to be improved, the belief in the importance of knowledge is strong enough that the process presented in *Figure 1* has a potential to move on. It is claimed that education has a key role in this process.

The results on the issues related to *knowledge on karst* show that visitors have some knowledge on recognising karst landforms, and they estimate their natural values, but it is more difficult for them to give exact definitions or to interpret the karst processes. The local residents have a certain practical knowledge, as they live on karst terrain. As for schools, the karst topic is presented in the Plans and Curricula, as well as in the textbooks, but in order to improve the level of karst knowledge, it is necessary to learn iteratively and in the field.

Considering the results related to *knowledge on PAs* we can conclude that the local people have ambivalent opinions about the importance of the NP status and experience both the advantages and drawbacks of the NP. Only a small per cent of them see the protection of nature as an advantage brought by the NP, which indicates that there is a low level of awareness about the significance of nature protection. One-third of the local people reported different types of restrictions as drawbacks. Considering the NP as a part of the national heritage, the results indicate that this attitude depends on the level of education of the respondents and that those who are highly educated have increased awareness on the importance of nature protection. All interviewees agreed that the protection of nature is important and that mutual cooperation of stakeholders is necessary. The topic of PAs is more represented in the Curricula and school textbooks than the topic of karst. The fact that the local population has only a partially affirmative attitude towards the Tara NP is not satisfactory. The problems and conflicts that exist between the local people and the NP should be approached

carefully with gradually improving the attitudes and finding the common goals.

The awareness on the importance of knowledge and education is reflected in the results related to the respondents' opinion on the importance of educational trails and other visitor information. The results showed that about half of the local population remembered that they had learnt about PAs in school textbooks, and half of the visitors had got information about Tara NP during formal education. It means that there is a good basis to improve knowledge about karst and PAs through formal, but also other forms of education such as non-formal and informal education. Although scientific research and education are rated as priorities, these got lower scores in comparison to other values of the NP (the preservation of the biological, cultural, landscapes, and geological values).

This research confirmed that the process of acquiring of knowledge on karst and PAs is alive despite all the existing barriers. Thanks to the potentials of natural resources (in this case, protected karst areas) and people who live there or go for visits, there are reasons to believe that the development of knowledge will contribute to the general development of the area.

Acknowledgements: The paper is a result of the project funded by the Research, Development and Innovation Office Hungary (NKFIH) K124497 and supported by the Ministry of Education, Science, and Technological Development, the Republic of Serbia. We thank all respondents who participated in the survey, as well as the Tara NP authorities (management) and Nikola Tomić for logistical support. Also we thank the reviewers for helping us to improve the paper.

REFERENCES

- BANJAC, N. and RUNDIĆ, Lj. 2006. Geotourism – new aspect of tourism at Tara Mt. In *Proceedings of the Conference "Touristic Valorisation of Tara Mountain"*. Eds.: JOVIĆ, V. and MISAILOVIĆ, I., Belgrade, Geographical Institute "Jovan Cvijić" SASA, 379–390.
- BENNETT, N.J., ROTH, R., KLAIN, S., CHAN, K., CHRISTIE, P. et al. 2017. Conservation social science: Understanding and integrating human dimensions to improve conservation. *Biological Conservation* 205. 93–108.

- BRANKOV, J., MICIĆ, J., ČALIĆ, J., KOVAČEVIĆ-MAJKIĆ, J., MILANOVIĆ, R. and TELBISZ, T. 2022. Stakeholders' attitudes toward protected areas: The case of Tara National Park (Serbia). *Land* 11. (4): 468. Available at <https://doi.org/10.3390/land11040468>
- ČALIĆ, J., KOVAČEVIĆ-MAJKIĆ, J., PANIĆ, M., MILOŠEVIĆ, M.V. and MILJANOVIĆ, D. 2015. *Non-systematic inclusion of DRR concepts and practices in the compulsory education network, prior to formal inclusion into school curricula – Case study of Serbia*. Input Paper Prepared for the Global Assessment Report on Disaster Risk Reduction 2015. UNISDR, Belgrade, Geographical Institute "Jovan Cvijić" of the Serbian Academy of Sciences and Arts.
- ČALIĆ, J. (ed.) 2021. *International Year of Caves and Karst*. Belgrade, Serbian Society of Geomorphologists. (in Serbian)
- CIGLIĆ, R., HRVATIN, M., KOMAC, B. and PERKO, D. 2012. Karst as a criterion for defining areas less suitable for agriculture. *Acta Geographica Slovenica* 52. (1): 61–82. Doi: 10.3986/AGS52103
- COCEAN, P. 2001. Environment threats in Romanian karst. In *Proceedings of the 13th International Congress of Speleology*. Brasilia, UIS, 613–617.
- COHEN, J.W. 1988. *Statistical Power Analysis for the Behavioural Sciences*. Hillsdale, New York, Lawrence Erlbaum Associates.
- CVJIĆ, J. 1925. Karst i čovek (Karst and man). *Glasnik Geografskog društva / Bulletin of the Geographical Society* 11. 1–11.
- DAY, M. 2010. Human interaction with Caribbean karst landscapes: Past, present and future. *Acta Carsologica* 39. (1): 137–146. Available at <https://doi.org/10.3986/ac.v39i1.119>
- DE WAELE, J. 2009. Evaluating disturbance on Mediterranean karst areas: The example of Sardinia (Italy). *Environmental Geology* 58. 239–255. Doi: 10.1007/s00254-008-1600-x
- EAGLES, P.F.J. and MCCOOL, S.F. (eds.) 2002. *Tourism in National Parks and Protected Areas: Planning and Management*. Wallingford UK, CAB International.
- GÖSSLING, S. 2002. Human–environmental relations with tourism. *Annals of Tourism Research* 29. 539–556.
- HABIĆ, P. 1993. Karst and karst in Slovenia. *Naše Jame / Our Caves* 35. (1): 5–13.
- HAN, Z. and SONG, W. 2019. Spatiotemporal variations in cropland abandonment in the Guizhou–Guangxi karst mountain area, China. *Journal of Cleaner Production* 238. 177888.
- HAN, Z. and SONG, W. 2020. Abandoned cropland: Patterns and determinants within the Guangxi karst mountainous area, China. *Applied Geography* 122. 102245.
- MARION, J.L. and REID, S.E. 2007. Minimising visitor impacts top protected areas: The efficacy of low impact education programmes. *Journal of Sustainable Tourism* 15. (1): 5–27. Doi: 10.2167/jost593.0
- JOJIĆ GLAVONJIĆ, T., KOKOTOVIĆ KANAZIR, V. and LJAKOSKA, M. 2021. Local population analysis in the function of the protected area sustainable development. *Journal of the Geographical Institute "Jovan Cvijić" SASA* 71. (3): 265–281.
- KOMAC, B., CIGLIĆ, R., ERHARTIČ, B., GAŠPERIČ, P., KOZINA, J. et al. 2010. *Risk Education and Natural Hazards*. CapHaz-Net WP6 Report. Ljubljana, Anton-Melik Geographical Institute of the Scientific Research Centre of the Slovenian Academy of Sciences and Arts.
- KOVAČEVIĆ-MAJKIĆ, J., MILOŠEVIĆ, M.V., PANIĆ, M., MILJANOVIĆ, D. and ČALIĆ, J. 2014. Risk education in Serbia; Ljubljana, Slovenia. *Acta Geographica Slovenica* 54. (1): 163–178. Doi: 10.3986/AGS54305
- Law on National Parks, 2015, 2018. "Official Gazette" of the RS No. 84/2015, 95/2018.
- LUKIĆ-TANOVIĆ, M., GOLIJANIN, J. and ŠUŠNJAR, S. 2019. Impact of population on the karst of East Sarajevo (Bosnia and Herzegovina). *Journal of the Geographical Institute "Jovan Cvijić" SASA* 69. (2): 95–107.
- MIHAILOVIĆ, D., MILOŠEVIĆ, S., BLACKWELL, B.A.B., MERCIER, N., MENTZER, S.M. et al. 2022. Neanderthal settlement of the Central Balkans during MIS 5: Evidence from Pešturina Cave, Serbia. *Quaternary International* 610. 1–19. Available at <https://doi.org/10.1016/j.quaint.2021.09.003>
- PALLANT, J. 2010. *SPSS Survival Manual: A Step by Step Guide to Data Analysis Using SPSS*. Berkshire UK, McGraw-Hill Education.
- Population Census 2011. Belgrade, Statistical Office of the Republic of Serbia.
- PUCZKÓ, L. and RÁTZ, T. 2000. *Az attrakciótól az élményig – A látogatómenedzsment módszerei* (From attraction to experience – Methods of visitor management). Geomédia Szakkönyvek, Budapest, Akadémiai Kiadó.
- Regulation on the Plan and the Curricula for the 5th and the 6th grade of primary education: Official Gazette – *Educational Gazette* 15/2018-77, 18/2018-1, 3/2019-83, 3/2020-3, 6/2020-94, 17/2021-1.
- Regulation on the Curriculum for the 7th grade of primary education: Official Gazette – *Educational Gazette* 5/2019-61, 1/2020-60, 6/2020-99, 8/2020-597, 5/2021-4, 17/2021-42.
- Regulation on the Curriculum for the 8th grade of primary education: Official Gazette – *Educational Gazette* 11/2019-61, 2/2020-6, 6/2020-118, 5/2021-8, 17/2021-58.
- Regulation on the Plan and the Curriculum for the gymnasium: Official Gazette – *Educational Gazette* 4/2020-1, 12/2020-1, 15/2020-1, 1/2021-1, 3/2021-1, 7/2021-1.
- SANDBROOK, C., ADAMS, W.M., BÜSCHER, B. and VIRA, B. 2013. Social research and biodiversity conservation. *Conservation Biology* 27. 1487–1490.
- TELBISZ, T., BOTTLIK, Zs., MARI, L. and PETRVALSKÁ, A. 2015. Exploring relationships between karst terrains

- and social features by the example of Gömör-Torna Karst (Hungary-Slovakia). *Acta Carsologica* 44. (1): 121–137.
- TELBIŠZ, T., STERGIU, C.L., MINDSZENTY, A. and CHATZIPETROS, A. 2019. Karst features and related social processes in the region of the Vikos Gorge and Tymphi Mountain (Northern Pindos National Park, Greece). *Acta Carsologica* 48. (1): 29–42. Available at <https://doi.org/10.3986/ac.v48i1.6806>
- TELBIŠZ, T., BRANKOV, J. and ČALIĆ, J. 2020. Topographic and lithologic controls behind mountain depopulation in Zlatibor District (Western Serbia). *Journal of Mountain Science* 17. (2): 271–288. Available at <https://doi.org/10.1007/s11629-019-5861-5>
- TELBIŠZ, T., ČALIĆ, J., KOVAČEVIĆ-MAJKIĆ, J., MILANOVIĆ, R., BRANKOV, J. and MIČIĆ, J. 2021. Karst geoheritage of Tara National Park (Serbia) and its geotouristic potential. *Geoheritage* 13. 88. Available at <https://doi.org/10.1007/s12371-021-00612-5>
- TUYET, D. 2001. Characteristics of karst ecosystems of Vietnam and their vulnerability to human impact. *Acta Geologica Sinica – English Edition* 75. (3): 325–329.
- VAISHAR, A., ZAPLETALOVÁ, J., DVOŘÁK, P., STEFANOVA, D. and TCHERKEZOVA, E. 2018. Recent population development in sensitive karst areas: Case studies Moravian Karst (Czech Republic) and Devetaki Plateau (Republic of Bulgaria). *Problems of Geography* 3–4. 88–111.
- WANG, L.C., LEE, D.W., ZUO, P., ZHOU, Y.K. and XU, Y.P. 2004. Karst environment and eco-poverty in South-western China: A case study of Guizhou Province. *Chinese Geographical Science* 14. (1): 21–27.
- WISNER, B. 2006. *Let Our Children Teach Us!: A Review of the Role of Education and Knowledge in Disaster Risk Reduction*. Bonn, UN Office for Disaster Risk Reduction.

A new ecosystem services approach to enable identification of pro-biodiversity businesses of protected karst areas in Central and South-Eastern Europe

SAŠO GORJANC^{1,2}, TINA SIMONČIČ¹, ALEŠ POLJANEC¹, BÉLA KUSLITS^{3,4}, ILDIKÓ ARANY³, ESZTER TANÁCS³, ÁGNES VÁRI³, RÉKA ASZALÓS³, ANGHEL DRASOVEAN⁵, ALIN MOS⁵, LAURA MAESO VELASCO⁶, ANDREA REUTER⁶ and UDO GATTENLOHNER⁶

Abstract

Protected areas are a leading conservation tool for preserving biodiversity. However, the restrictions on human uses often engender resistance of local communities to the idea of living in protected environment. This paper describes the preparation of Biodiversity Investment Opportunities (BIO) maps for seven case areas in Central and South-Eastern Europe, using participatory methods. BIO maps have been further developed with the involvement of local stakeholders to define areas that can support economic activities while achieving a no net loss or even benefits for nature. The BIO maps can then be used to foster the development of Pro-Biodiversity Businesses (PBBs). PBBs are enterprises that generate financial returns without compromising the natural environments they depend on. PBBs were found to be a viable solution, effective in changing the perceptions of both the park managers and the local people towards the protected areas. Moreover, these enterprises can improve the local livelihoods, as well as actively protect nature and biodiversity. Therefore, the approach presented in this paper can be adopted as a model for managing any protected area and conserving cultural landscapes.

Keywords: biodiversity, conservation, pro-biodiversity business, ecosystem services, protected areas, cultural landscapes, local populations

Received January 2022, accepted May 2022.

Introduction

Global biodiversity loss remains one of the leading environmental challenges, not only for the environment but also for human societies worldwide (World Economic Forum 2022). The conservation of nature often requires the protection of vast areas of land. These protected areas (PAs) have been made

part of numerous international and EU policies, such as the Convention on Biological Diversity (CBD), as well as EU Birds and Habitats Directives (Natura 2000 Directives), among others. It is undisputed that nature provides a wide array of ecosystem services indispensable to humanity's survival. Yet, nature conservation is often seen as a hindrance to economic development (HOUDET, J. *et al.*

¹ Slovenia Forest Service, Central Office, Večna pot 2, 1001 Ljubljana, Slovenia. Corresponding author's e-mail: tina.simoncic@zgs.si

² University of St Andrews, School of Geography and Sustainable Development, Irvine Building, North Street, St. Andrews, KY16 9AL United Kingdom.

³ Centre for Ecological Research, Institute of Ecology and Botany, Karolina út 29. H-1113 Budapest, Hungary.

⁴ Institute of Geography, Geoeconomy and Sustainable Development, Corvinus University of Budapest, Fővám tér 8. H-1093 Budapest, Hungary.

⁵ RNP Romsilva – Apuseni Nature Park Administration R.A., Loc. Sudrigiu, nr 136. Comuna Rieni, Jud. Bihor, 417419 Romania.

⁶ Global Nature Fund Fritz-Reichle-Ring 4. 78315 Radolfzell am Bodensee, Germany.

2012). Particularly, PAs are often perceived as severely limiting human economic growth and wellbeing, thus creating a potent sectoral conflict (MARIKI, S.B. *et al.* 2015). Additionally, the history of PAs is often associated with mistreatment of local inhabitants (HAN, F. 2008; DUFFY, R. 2014), lacking stakeholder involvement, and consequently mistrust of local inhabitants towards nature conservation, thus introducing further challenges for PA managers.

Different approaches exist to conserve biodiversity: setting aside PAs (i.e. land sparing) or integrating nature conservation and economic development (i.e. land sharing, FISCHER, J. *et al.* 2013). While land sparing (large PAs, entirely devoid of human activities) is often seen as being more effective in terms of biodiversity benefits (PHALAN, B. *et al.* 2011; NAGEL, T.A. *et al.* 2017), such an approach also leads to substantial social and economic drawbacks and has been linked to humanitarian disasters (DUFFY, R. 2014). Additionally, some of the most recent literature points towards utilising a matrix of land sparing and sharing approaches to produce the greatest benefits (GRASS, I. *et al.* 2019; BATÁRY, P. *et al.* 2020). Moreover, in European contexts, land sparing is even more challenging to implement due to thousands of years of human alterations of the natural environments and high population density (FISCHER, J. *et al.* 2013). The European Environment Agency (EEA) reports that Europe is one of the places where such cultural landscapes are widely protected, both through the EU Natura 2000 network and national designations (EEA 2019, 2020). It is therefore imperative to find solutions that reconcile local economic development, needs of local inhabitants, and nature conservation.

Recently, farmland and especially traditional land-use practices are increasingly disappearing in Europe. A gradient within Europe can be observed; towards the East and South-East of the continent, remnants of the traditional land management persist, while in the Western parts they have almost completely disappeared (FILHO, W.L. *et al.*

2016; VAN DER ZANDEN, E.H. *et al.* 2017). This gradient has considerable environmental, socio-economic, and landscape implications (LASANTA, T. *et al.* 2017). Significant biodiversity loss and reduced populations of adapted species have also been observed in abandoned agricultural areas, as well as in areas experiencing agricultural intensification (GUERRERO, I. *et al.* 2012). It is therefore urgent to find ways to protect biodiversity and revive traditional agricultural landscapes (MUNROE, D.K. *et al.* 2013).

European environmental policies and regulations often clash with both local communities and other sectoral policies, due to the complex and sometimes contradictory nature of the legislation used to manage and protect the environment (EEA 2019). Despite the concerted efforts of European states, the biodiversity targets on land and sea were not met by 2020 (European Commission 2020). Additionally, the new EU Biodiversity Strategy 2030 sets the EU Member States on the road to still increase the PAs until they cover 30 percent of the EU (European Commission 2020). This will likely introduce further tensions in the social and economic realms.

Some areas in Europe, particularly in South-Eastern Europe, which are recovering from recent civil unrest and war, are classified by the World Bank as developing countries (The World Bank 2020). Economic development is particularly important in those countries since most of the population cannot afford comfortable living (GOLUSIN, M. *et al.* 2011). This is also one of the reasons the care for the surrounding environment cannot yet be prioritised, therefore the natural environment is often overexploited. Incidentally, it is also in this part of Europe where karst phenomena are widespread, which due to their surface and underground phenomena produce unique, rich, and often very fragile biodiversity, which needs to be protected (GOLUSIN, M. *et al.* 2011; TANÁCS, E. 2016). Therefore, the development of local economies that take advantage of the natural features and preserve them and improve their status at the same time is even more important in these regions (LEONE, F. and ZOPPI, C.

2019). These challenges introduce a number of problems for PA managers (DEFRIES, R. and NAGENDRA, H. 2017). If PAs are seen as social-ecological systems, integrating both ecosystem resilience and the social systems which have evolved in the same areas (CUMMING, G. and ALLEN, R. 2017) and they are to be managed effectively, it is vital to overcome the conflicts between nature conservation and development. The increasing complexity of the PA management situations has often led to widening the gap between the managers, experts, public authorities, and the local populations (ANDRADE, G.S.M. and RHODES, J.R. 2012).

The ecosystem services (ES) concept has been developed as an approach to reconcile human aspects with nature conservation (MEA 2005). The ES concept aims to represent the multi-faceted interdependence of ecological and socio-economic systems in a simplified way (HAINES-YOUNG, R. and POTSCHIN, M. 2010). As such ES have often been used to quantify the benefits that ecosystems provide in monetary terms in order to generate a wider and economic rationale for their protection (HOUDET, T. *et al.* 2012). However, the financial evaluations of nature have not been perfected yet and the ways of how to integrate economic valuation into nature conservation remain problematic and often serve as a basis for distrust towards the whole ES approach (ELLIS, E.C. *et al.* 2019, VÁRI, Á. *et al.* 2022). Additionally, the ES approach is usually used by managers, public authorities in decision-making and for communication of conservation or sustainable development rationales; however, it has been rarely employed in order to foster better cooperation between the PAs and their local stakeholders.

In this paper, we present a new way to reconcile seemingly contradictory targets of development by using the ES mapping concept as a basis for the creation of pro-biodiversity businesses (PBBs) in PAs. The approach was developed within ECO KARST Interreg project (2017–2019) that aimed to contribute to the protection and sustainable development of karst bio-regions in the Danube region based on their valued ecosystem services. A

PBB is an enterprise that generates financial returns and at the same time makes a positive contribution to preserving biodiversity, such as for example eco-tourism (HOUDET, T. *et al.* 2012). While the concept of a PBB is not new (KEESSTRA, S. *et al.* 2018), PBBs have mainly been utilised within the context of solely green entrepreneurship. This paper presents a way to develop PBBs based on ES that PAs provide in a particular area. This is a novel approach, which sidesteps the often critiqued monetary evaluations of ES, and uses the entire ES approach to build connections with PAs' local communities and directly identifies possibilities for biodiversity-friendly business and development opportunities. Thus, PBBs contribute to both the preservation of biodiversity and improvement of living standards of local people and are fully in line with regulations of the PAs (LINDSEY, P.A. *et al.* 2005). Moreover, since the proposed approach closely follows the principles of adaptive and participatory management, local stakeholders, PA managers, and experts are all equally involved in the process of identifying both the ES and PBBs. Although even PBBs can have unknown effects on the environment or can become damaging if not appropriately controlled (e.g. LESCUYER, G. *et al.* 2016), we argue that PBBs that are based on the ES maps generate good opportunities to provide benefits for people and protect nature. We demonstrate on the example of Central and South-Eastern European Karst PAs (1) how ES maps can be used in a participatory approach to create Biodiversity Investment Opportunity (BIO) maps; (2) how to use ES and BIO maps to identify opportunities for the development of PBBs; (3) which ES are most commonly used by the local communities for the creation of PBBs.

Study area

The study area included seven karst PAs in the Danube region in seven countries (Figure 1). Karst means the terrain with distinctive landforms and underground drain-

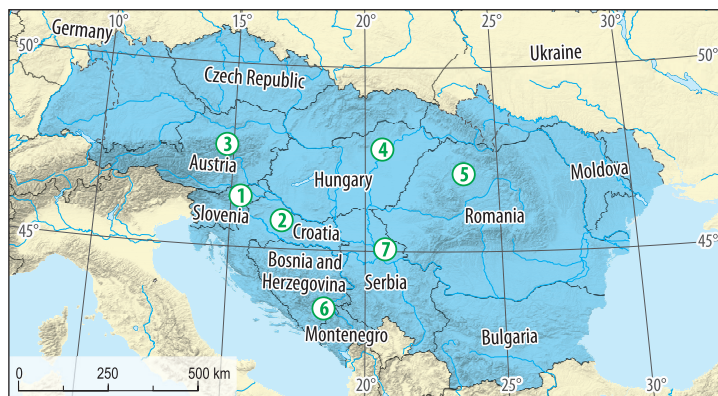


Fig. 1. Map of pilot PAs. 1 = Notranjska Regional Park (Slovenia); 2 = Žumberak-Samoborsko gorje Nature Park (Croatia); 3 = Kalkalpen National Park (Austria); 4 = Bükk National Park (Hungary); 5 = Apuseni Nature Park (Romania); 6 = Bijambare Protected Landscape (Bosnia and Herzegovina); 7 = Tara National Park (Serbia)

age systems that form as a consequence of the solubility of certain rock types, particularly limestone, in water (SIMMS, M.J. 2005). The selected PAs, despite having different socio-economic backgrounds, were chosen due to their karstic nature, similar nature conservation challenges, and the prevalence of traditional land uses. The selection ensured that a wide variety of societal concerns and different protection regimes could be considered. The PAs were also selected for their diversity of designations, protected habitats, and different management regimes. The selected countries, despite some weaker social indicators, score quite highly in the 2019 United Nations Development Programme's (UNDP) Human Development Index Rankings, ranging from 20th place (Austria, 0.914) to 75th place (Bosnia and Herzegovina, 0.769) out of 189 countries assessed (UNDP, 2019). All selected PAs have designated managements, however the level of detail in their management plans, as well as the capacity of individual PA managers varied.

All the pilot PAs are characterised by karst features. One of the areas (Kalkalpen National Park) lies in the Alps, four in the Dinarides (Notranjska Regional Park, Žumberak-Samoborsko gorje Nature Park,

Bijambare Protected Landscape, and Tara National Park), and two in the Carpathian Mountain Range (Bükk National Park and Apuseni Nature Park). All of the pilot PAs are also part of Natura 2000 or the Natura 2000 equivalent Emerald networks, attesting to their high and varied biodiversity and European importance, as defined by Habitats and Birds Directives and the Bern Convention.

Materials and methods

In each pilot area, ES were identified, mapped, and used to produce local action plans that incorporated both nature protection and its use, as well as ideas for PBBs. The entire process was done in constant collaboration between ES experts, sectorial experts (e.g. foresters, nature conservationists, water management experts), park managers, and local stakeholders.

Ecosystem services mapping

ES mapping was carried out in line with the European Commission's methodologi-

cal guidance on how to map and assess ES, as required by Action 5 of the EU Biodiversity Strategy to 2020. These guidelines were elaborated in comprehensive European cooperation projects such as the ESMERALDA project (BURKHARD, B. *et al.* 2018). For each pilot PA, precise boundaries were delineated to define the area to be considered when mapping ES (see below). In cases of strictly protected PAs, the mapped areas were extended to the surrounding buffer zones with local villages to represent more of the relevant social-ecological system. The boundaries of buffer zones were set in collaboration between the PA managers and local stakeholders. They were based on the criteria of either people living there who can influence the conditions within the specific pilot area, or people using the proximity of a PA as a marketing strategy for their businesses.

After the delineation of the pilot areas, the ES mapping started with the identification of ecosystem types and creation of ecosystem type maps. These maps provide the spatial units and basic input necessary for the ES assessment and mapping. We used the EUNIS (European Nature Information System) habitat classification (DAVIES, C.E. *et al.* 2004) as standard, mainly relying on level 3. The EUNIS-based ecosystem type map was produced by compiling and transforming already existing datasets (e.g. vegetation/habitat maps). Some of these original maps used local classification systems, others the CORINE (Coordination of Information on the Environment) Biotope and Palaearctic habitat classifications, or Annex I of the Habitats Directive. These were converted into EUNIS categories and maps with the use of crosswalks. In some cases, the underlying data only allowed the use of EUNIS level 2 categories. In others, a few customised categories had to be included to adapt to the regional and geological (karst) specificities of the selected pilot areas.

The ES mapping started by overviewing the scientific literature to identify karst-specific and potentially important ES. At the same time, a series of semi-structured

interviews were held with experts from each pilot area. The Common International Classification for Ecosystem Services (CICES v5.1, www.cices.eu, HAINES-YOUNG, R. and POTSCHIN, M. 2013) was used as a foundation for the identification of ES categories and for establishing the conceptual basis of the work with ES. Based on this, an adjusted list of ES was provided (*Supplement*), which were subsequently mapped in each pilot PA.

For the actual mapping of ES, we mainly used rule-based extended matrix models (Tier 2 models, see also ARANY, I. *et al.* 2019). The mapping process followed four general steps (*Figure 2*):

1. Customising the ecosystem typology and creating an appropriate ecosystem type map;
2. Creating a simple matrix model by assigning base scores (relative values) to the ecosystem types based on expert decision (with the participation of locals and other experts, through stakeholder workshops, see the next chapter on stakeholder involvement);

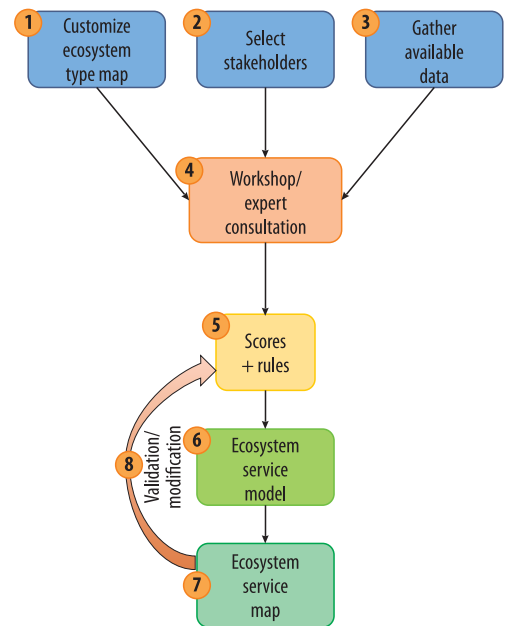


Fig. 2. Workflow of modelling and mapping of ecosystem services

3. Extending the model: identifying additional spatial variables relevant for the ES and integrating these into the ES model in the form of rules that modify the base scores;

4. Validating the draft maps at the next stakeholder workshop.

Besides the ecosystem type and the maps of ESs, the assessment process included the mapping of ecosystem condition. Data availability was a crucial point throughout the process, as the existing databases and data quality varied widely between participating areas.

Stakeholder identification and involvement

A series of three workshops for the elaboration of ES and BIO maps were carried out in each pilot area. Each workshop aimed to involve the highest possible diversity of stakeholders, which were identified using various databases, partnerships and NGO networks, supplemented with a survey among local stakeholders. Involved land users were categorised according to their influence and dependence on ES (FELIPE-LUCIA, M.R. *et al.* 2015). This approach enabled park managers to take into account not just various strategies of land use, but also power relations, which play a crucial role in decision-making on every level. Three positions needed special attention in the participatory process (see also KUSLITS, B. *et al.* 2021): (1) Administration: usually high power and low dependence on ES. These actors usually make decisions in themselves, while their connection with the landscape is rather abstract. (2) Major land users: forestry, water management authorities etc. These stakeholders usually control significant ESs, which highly influence the whole landscape. Given their high leverage in decision-making and direct impact both on the regulatory and the ecological level, these players sometimes tend to ignore other smaller players. (3) Small-scale farmers: this was a diverse group with high dependence on ES while having virtually no formal decision-making power. They had the highest stakes in the participatory process but limited chances to enforce their will. During Stakeholder Net-

work Analysis), four main steps of data collection and analysis were followed:

A. Identifying stakeholder groups during a participatory workshop. Following the framework of FELIPE-LUCIA, M.R. *et al.* (2015), stakeholders were categorised into groups based on their decision-making power and dependence on ESs (*Figure 3*).

B. Designing a questionnaire survey to reveal relationships within and among stakeholder groups. As recommended by PRELL, C. *et al.* (2011), we used predefined groups in the questionnaire and set a limit in the number of possible answers in each section. Example: "Who do you communicate with regularly from restaurant owners in the study."

D. Data collection was done partly in person with paper-based surveys and partly online. Paper-based surveys provide higher quality responses, especially in communities where the basic idea of SNA may be strange or suspicious for respondents. Online surveys, on the other hand, make data analysis much easier, while also hiding misunderstandings, as questions and options may be more easily misunderstood.

Analysis. SNA has a broad literature focusing on cases and methodologies (e.g. BODIN, O. and PRELL, C. 2011). In our case, analysis was done at an individual level: looking at positions, such as centrality measures. In a communication network, the in-degree of a node may indicate its power in the network or the trust in his views. Betweenness centrality may highlight players with a high ability to connect distant others, bridging groups in case of conflicts etc. Besides analysing individual nodes in the network, the structure as a whole can be analysed as well. Subgroups, strength of connections between groups, and external factors influencing the likelihood of a connection (such as the role of geographical or ecological features) can be all indications of interesting features both for research and policy-making. The analysis was done by Gephi, an open-source software.

The resulting networks were used in identifying and involving the right stakeholders at every workshop (see *Figure 3*).

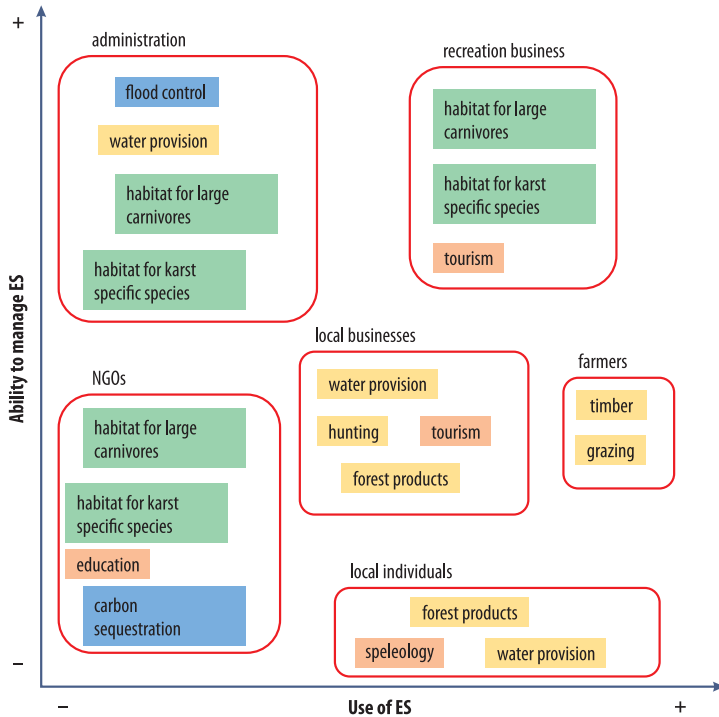


Fig. 3. Example for identification of major stakeholder groups and the most important ESs they interact with

Each pilot PA carried out three workshops, thus totaling 21 workshops across the region. The first workshops focussed on validation of ES maps, the second ones on preparation and validation of BIO maps, and the last series of workshops focussed on PBB identification and preparation of inputs for local action plans. The workshops altogether involved 277 people representing a variety of different interests (*see Supplement*), with numerous participants engaging repeatedly and attending numerous workshops (these have been counted only once).

Creation of BIO maps

Based on the finalised ES maps, an additional workshop with local stakeholders was organised in each pilot area. The participants (PA managers, experts and local stakeholders) dis-

cussed which ES were available to them, which ones they already utilise, and where they see the potential for future development. The BIO maps were then created as future development potential of the area, by using the ES maps and delineating areas where nature-friendly businesses – PBBs – could be implemented. These newly delineated areas were later digitised, and in this manner, the BIO maps were produced. The experts were present at these workshops and ensured that the future developments proposed by the local stakeholders remained within the recognised carrying capacity of the area and that they would not endanger the long-term and sustainable provision of ES. For delineating areas for PBBs, the zonation of PAs was taken into account, as well as special features/species needed to be protected, as well as vulnerability as assessed by the experts and some aspects of business suitability (e.g. closeness to settlements).

Creation of local action plans and identification of PBBs

Taking into account the produced ES and BIO maps, inputs from stakeholders, and knowledge of experts, as well as pilot area managers, local action plans for every pilot area were prepared by PA managers and then finalised with their local stakeholders. These action plans included a list of measures and activities each PA and its stakeholders could implement, in addition to their existing management plans. A number of PBBs were identified by the PA managers and their stakeholders through the above-mentioned workshops, as well as through the process of additional gap analyses. These were included in the action plans.

Results

All seven PAs considered touristic attractiveness and hay production as important ES (Figure 4). Timber production was also recognised as essential in all but one PA, where all logging activities are prohibited. Given that all areas are situated on limestone and dolomite substrate, it is not surprising that most water-related ES were not recognised as important, apart from water quality regulation and pollutant removal (57%).

Figure 5 demonstrates a set of BIO maps created for Apuseni Nature Park, Romania. The maps show the areas where the use of the identified ES would be both profitable and not harmful to nature. Special PAs or most sensitive areas were not considered for any kind of economic development.

Among the PBBs (Figure 6), the development of eco-tourism products was identified in all PAs as important, thus creating a bridge between park management and local stakeholders. While not a PBB on its own, it has been widely recognised that the branding and marketing of any local product need to be improved (86%) in all but one park area. Since all of the PAs in this study are predominantly forested, it is not surprising that sustainable forestry practices (71%) and wood processing (43%) were often found to be viable economic options for PBB development. Similarly, most PAs (57%) identified honey production and the development of various agribusinesses as important sustainable development options.

Figure 7 shows the proportions of individual local action plans devoted to particular topics. The largest parts of the action plans were devoted to measures encouraging touristic activities, which followed the sustainable tourism guidelines (43.0%). Measures linked to sustainable forestry and agricul-

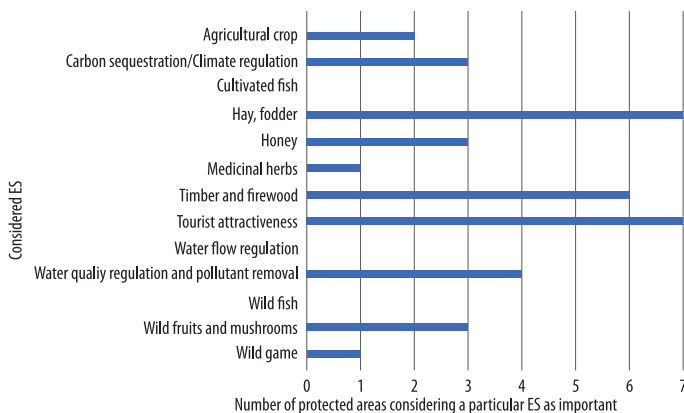


Fig. 4. Number of pilot areas where a particular ES was selected from the suggested list and mapped

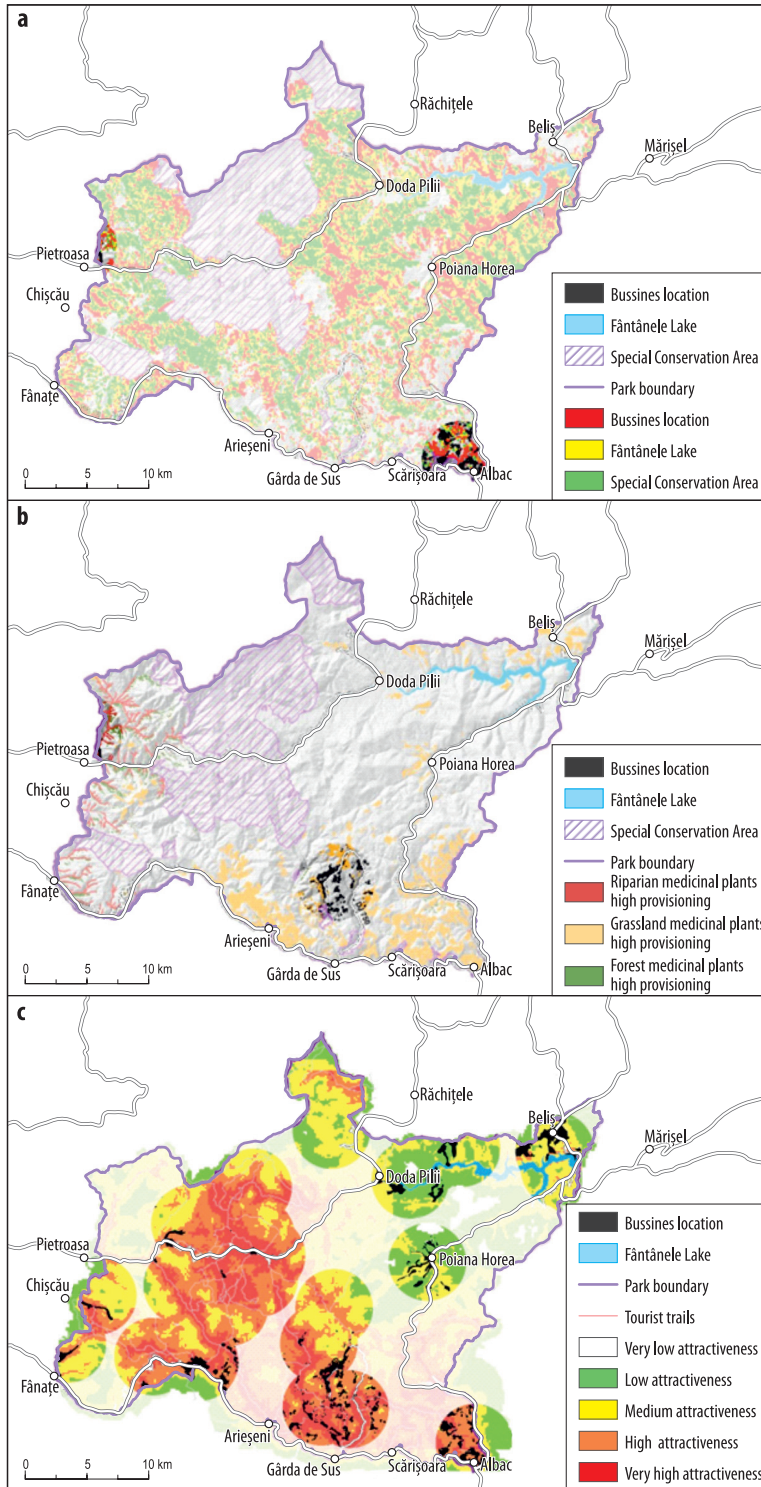


Fig. 5. BIO maps from Apuseni Nature Park, Romania, showing the areas' potential for provisioning timber (a), medicinal plants (b) and their touristic attractiveness (c) together with the areas available for developing business without harming conservation goals (featuring in the legend as business location). Intense colours: available/accessible areas of high potential; faded colours: areas with potential ES (according to colour scale in legends), but not PBB-compatible

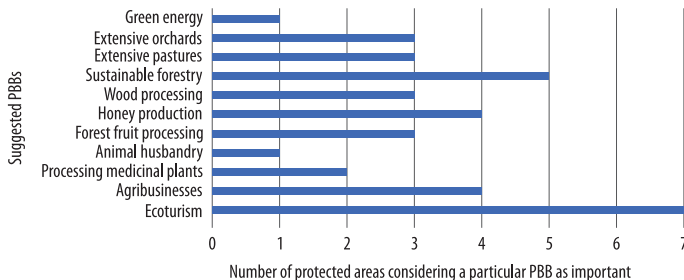


Fig. 6. Most commonly identified PBBs in seven pilot PAs

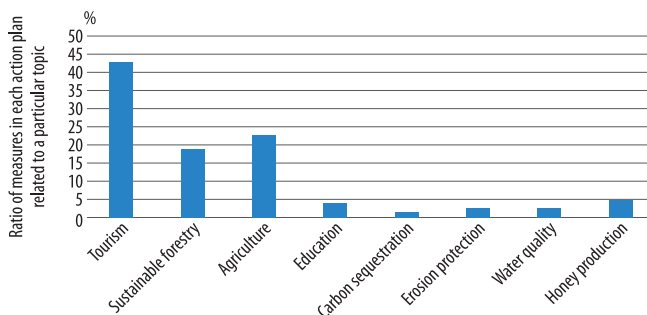


Fig. 7. Average proportion of measures including in the individual local action plans from all pilot PAs related to a particular topic

tural activities followed with 19.0 percent and 22.7 percent of action plans devoted to them, respectively. One PA focused most of their action plan on agricultural activities, in order to reverse depopulation trends, while the others focused more on nature conservation aspects. To better illustrate the types of measures included in the local action plans, *Table 1* presents examples of the measures for the three most commonly addressed themes.

Discussion

Ecosystem services for supporting development of PBBs

We suggested and tested a method to combine ES maps with BIO maps and develop a

set of PBBs together with local communities in karst PAs in Central and South-Eastern Europe. These maps and planned measures make the first step towards reconciling two aspects that often collide: regional (economic) development and nature conservation. Involving stakeholders and putting together the plans on a basis that shows potential ES delivery of the areas in a spatially explicit way enhances the understanding and commitment to keep economic development within a sustainable range (Wood, S.L.R. et al. 2018).

Our results demonstrate that the managers of the karst PAs and the local communities value their natural environments for a diversity of ES they obtain from nature. It seems that they recognise that the intactness of these natural areas holds significant touristic attractiveness and potential for develop-

Table 1. Examples of planned measures from each of the pilot protected areas for the three most common themes covered by the local action plans

Name of protected area	Tourism	Sustainable forestry	Agriculture
Notranjska Regional Park (Slovenia)	Establishment of a new nature-friendly glamping site	Designation of forest reserves (on state-owned land plots)	Establishment of a network of local producers of (seasonal) food and products with restaurants and tourism sector
Žumberak-Samoborsko gorje Nature Park (Croatia)	Establishment of an eco-camping site	N/A (Not considered a relevant activity)	Production of cosmetic and medicinal products
Kalkalpen National Park (Austria)	Create new signpost concept and infrastructure to improve visitors experience	N/A (Any forestry interventions are prohibited within the park)	Establish a wooded pasture with larch
Bükk National Park (Hungary)	Establish the Bükk Region Geopark (nomination and ratification of the geopark status by UNESCO)	Initiate the adjustment of logging in the protected area forests (by introducing continuous cover forestry)	Monitor the interest of the locals for the PBB development (e.g. mowing, herb collection or link to tourism)
Apuseni Nature Park (Romania)	Create three bicycle trails (one per county)	Support foresters to obtain FSC certificate	Establish local collection centres for milk and meat
Bijambare Protected Landscape (Bosnia and Herzegovina)	Creation of an educational-recreational eco-camp	Establishment of an association for better representation on the market	Establishment of a local “producers’ cluster or a cooperative
Tara National Park (Serbia)	Establish destination management for the wider area of the NP Tara	Effective management with forests and primary and final production of timber	Increasing the funds for supporting of extensive pastures

ment. This is clearly reflected in the fact that the PA managers decided to map touristic attractiveness as part of ES, and that they dedicated the largest proportions of their local action plans to this topic. New eco-tourism products and different agri-businesses, linked with touristic offers, are amongst the most prospective PBBs to be developed in these areas. However, while the development of eco-tourism can provide significant economic returns, and if planned correctly, it can have a minimal footprint on nature, extreme caution still has to be exerted (HAN, F.L. and LI, C.T. 2019). Overcrowding, even in well managed PAs, is particularly dangerous (STRONZA, A.L. et al. 2019). This is why local action plans following sustainable tourism guidelines and coordination of activities between park management and local stakeholders can more effectively address this issue, than if tourism management is left to develop sporadically and by individual stakeholders living within the parks.

The hay and fodder production ES was also considered important in all PAs. Given that the meadows are of anthropogenic nature in most of Europe, conserving this ES will require continued human management in terms of mowing or pasturing. However, due to rural depopulation and abandonment trends in Europe (LASANTA, T. et al. 2017), the habitat mosaics typical for traditional extensive land use are gradually disappearing, with their outstanding, valuable biodiversity (BABAI, D. and MOLNÁR, Z. 2014). The conservation of open meadows in the Alps (LASEN, C. et al. 2018), as well as dry karst meadows, has gained prominence in recent years and encouraging hay production in these areas has the potential to both conserve biodiversity and generate some economic benefits (LASANTA, T. et al. 2015; AKEROYD, J. and PAGE, N. 2020). However, these benefits were not widely recognised by the local stakeholders, as extensive agricultural land uses did not feature so prominently within the suggested PBBs.

Carbon sequestration was also not recognised as highly important. Given that a

number of pilot areas are in a developing part of Europe, the action on the climate crisis might not have been prioritised yet. Additionally, there could be a widespread perception that local action has little meaning when addressing global threats. Our results also show that apart from the most-developed (Austrian) PA, none of the others included any measures related to carbon sequestration in their action plans. Carbon sequestration is not one of the ES that can be exploited directly by the local population, and therefore it was expected that PBBs linked to it would be few and the interest low. However, it is more troubling that the PA managers and other national or regional-level stakeholders (who were expected to have a more extensive overview) that took part in these activities did not discuss it in more depth.

The vast forests that cover much of the Dinarides, the Carpathians and the Alps offer large quantities of timber, which can generate significant profits. All but two PAs in this study recognised forestry to be one of the topics that they have to address with their action plans. In Croatia, Hungary, and Romania many forests are still managed in a conventional rotation system, often even in the protected parts. As clear-cutting has a temporal but strong impact on the local provision of the other ESs and the ecological condition of the forests, this is a major source of conflict between sectors (e.g. between forestry and nature conservation). Close to nature forest management seems to be the most appropriate way to support biodiversity conservation goals and the multi-purpose use of forests in karst PAs. Close to nature forest management emphasises minimal altering of natural processes, while the financial profitability and ecological suitability of forest management are maintained or even increased through other ES (DIACI, J. 2006; BONČINA, A. 2011). That enables the preservation of the forest as a natural ecosystem with all its diverse life forms and the relations between them. This is particularly true for karstic PAs where forests have important protective functions (see e.g. TANÁCS, E. 2016) and provide a number

of other ES and marketable products beyond timber and firewood.

More focus should also be directed to the use of non-timber forest products, forest fruits, and mushrooms, as well as medicinal plants. The results suggest that while the potential is somewhat recognised in some PAs, there is more that could be done, particularly at a time when consumers are demanding more organic, wild, local, and seasonal products (VÁRLI, Á. *et al.* 2017, 2020; KEESSTRA, S. *et al.* 2018). For example, the production of more organic forest honey, the sustainable use of wild vegetables and wild fruits such as berries, chestnuts, mushrooms would all contribute to the better coexistence of nature and people, while minimising the anthropogenic disturbance of natural processes in the forests (SIMONČIČ, T. and MATIJAŠIČ, D. 2013; SHACKLETON, C.M. *et al.* 2015; AFFANDI, O. *et al.* 2017). The boutique production of wooden products especially from more exclusive/minority tree species could be also an important PBB. On the other hand, if PAs wish to conserve and strictly protect larger parts of their areas, a firm strategy of concentrating gathering activities, similar to the visitor management for eco-touristic use is needed.

Conclusions

Due to the increasing pressure to preserve natural environment, tools that would allow both nature and people to thrive together are urgently needed. While the approach in this paper was applied in karst PAs in Central and South-Eastern Europe, the ES mapping and subsequent PBB identification can be used more widely in any protected area that provides diverse ES. The presented approach has been shown to be useful in a variety of different PAs with different stakeholder profiles. Through the proposed procedure, it is possible, in a participatory and open manner, to protect nature, generate economic returns (through PBBs), and support effective participation of local communities in the conservation efforts, increasing their

effectiveness. Therefore, this method could be widely used in developing countries, as well as developed countries to improve the status of biodiversity and foster local, sustainable, and nature-friendly development endorsed by local people.

Acknowledgement: This study was completed in the frame of the project ECO KARST – Ecosystem services of karst protected areas – driving force of local sustainable development, funded by Interreg Danube Transnational Programme.

REFERENCES

- AFFANDI, O., ZAITUNAH, A. and BATUBARA, R. 2017. Potential economic and development prospects of non timber forest products in community agroforestry land around Sibolangit Tourism Park. *Forest and Society* 1. 68–77.
- AKERROYD, J. and PAGE, N. 2020. Beef cattle as grassland management tool and economic resource in Transylvania, Romania. *Oryx* 54. (1): 9–10.
- ANDRADE, G.S.M. and RHODES, J.R. 2012. Protected areas and local communities: an inevitable partnership towards successful conservation strategies? *Ecology and Society* 17. (4): 14.
- ARANY, I., VÁRI, Á., KALÓCZKAI, Á., ASZALÓS, R., BLIK, P. et al. 2019. Diversity of flower rich habitats can provide persistent source of healthy diet for honey bees. *European Journal of Geography* 10. (2): 89–106.
- BABAI, D. and MOLNÁR, Z. 2014. Small-scale traditional management of highly species-rich grasslands in the Carpathians. *Agriculture, Ecosystems & Environment* 182. 123–130.
- BATÁRY, P., BÁLDI, A., EKROOS, J., GALLÉ, R., GRASS, I. and TSCHARNTKE, T. 2020. Biologia futura: landscape perspectives on farmland biodiversity conservation. *Biologia Futura* 71. 9–18.
- BODIN, O. and PRELL, C. 2011. *Social Networks and Natural Resource Management*. Cambridge, Cambridge University Press.
- BONČINA, A. 2011. History, current status and future prospects of uneven-aged forest management in the Dinaric region: an overview. *Forestry* 84. (5): 467–478.
- BURKHARD, B., MAES, J., POTSCHEIN-YOUNG, M., SANTOS-MARTÍN, F., GENELETTI, D. et al. 2018. Mapping and assessing ecosystem services in the EU. Lessons learned from the ESMEALDA approach of integration. *One Ecosystem* 3. Doi:10.3897/oneeco.3.e29153
- CUMMING, G. and ALLEN, R. 2017. Protected areas as social-ecological systems: perspectives from resilience and social-ecological systems theory. *Ecological Applications* 27. (6): 1709–1717.
- DAVIES, C.E., MOSS, D. and HILL, M.O. 2004. *EUNIS Habitat Classification Revised 2004*. Report to: European Environment Agency-European Topic Centre on Nature Protection and Biodiversity. Available at <https://www.eea.europa.eu/data-and-maps/data/eunis-habitat-classification-1/documentation/eunis-2004-report.pdf>
- DEFRIES, R. and NAGENDRA, H. 2017. Ecosystem management as a wicked problem. *Science* 356. 265–270.
- DIACI, J. 2006. *Nature-based Forestry in Central Europe: Alternatives to Industrial Forestry and Strict Preservation*. Ljubljana, Biotechnical Faculty, University of Ljubljana.
- DUFFY, R. 2014. Waging a war to save biodiversity: the rise of militarized conservation. *International Affairs* 90. (4): 819–834.
- ELLIS, E.C., PASCUAL, U. and MERTZ, O. 2019. Ecosystem services and nature's contribution to people: negotiating diverse values and trade-offs in land systems. *Current Opinions in Environmental Sustainability* 38. 86–94.
- EEA 2019. *The European Environment: State and Outlook 2020: Knowledge for Transition to a Sustainable Europe*. European Environmental Agency. Luxembourg, Publications Office of the European Union.
- EEA 2020. *State of Nature in the EU: Results from Reporting Under the Nature Directives 2013–2018*. European Environmental Agency. Luxembourg, Publications Office of the European Union.
- European Commission 2020. *Communication from the Commission to the European Parliament, the Council, the Economic and Social Committee and the Committee of the Regions*. EU Biodiversity Strategy for 2030. Bringing nature back into our lives. European Commission. Available at https://ec.europa.eu/environment/strategy/biodiversity-strategy-2030_en
- FELIPE-LUCIA, M.R., MARTÍN-LÓPEZ, B., LAVOREL, S., BERRAQUERO-DÍAZ, L., ESCALERA-REYES, J. and COMÍN, F.A. 2015. Ecosystem services flows: Why 'stakeholders' power relationships matter. *PLoS One* 10. 1–21.
- FILHO, W.L., MANDEL, M., AL-AMIN, A.Q., FEHER, A. and CHIAPPETTA JABBOUR, C.J. 2016. Review: An assessment of the causes and consequences of agricultural land abandonment in Europe. *International Journal of Sustainable Development & World Ecology* 24. (6): 554–560.
- FISCHER, J., ABSON, D.J., BUTSIC, V., CHAPPELL, M.J., EKROSS, J. et al. 2013. Land sparing versus land sharing: moving forward. *Conservation Letters* 7. (3): 149–157.
- GOLUSIN, M., MUNITLAK IVANOVIC, O. and TEODOROVIC, N. 2011. The review of the achieved degree of sustainable development in South Eastern Europe – The use of linear regression method. *Renewable and Sustainable Energy Reviews* 15. (1): 766–772.

- GRASS, I., LOOS, J., BAENSCH, S., BATÁRY, P., LIBRÁN-EMBI, F. et al. 2019. Land-sharing/-sparing connectivity landscapes for ecosystem services and biodiversity conservation. *People and Nature* 1. (2): 262–272.
- GUERRERO, I., MORALES, M.B., OÑATE, J.J., GEIGER, F., BERENDESE, F. et al. 2012. Response of ground-nesting farmland birds to agricultural intensification across Europe: Landscape and field level management factors. *Biological Conservation* 152. 74–80.
- HAINES-YOUNG, R. and POTSCHIN, M. 2010. The links between biodiversity, ecosystem services and human well-being. In *Ecosystem Ecology*. Eds.: RAFFAELLI, D.G. and FRID, C.L.J., Cambridge, Cambridge University Press, 110–139.
- HAINES-YOUNG, R. and POTSCHIN, M. 2013. *Common International Classification of Ecosystem Services (CICES), Version 4.3*. Report to the European Environment Agency EEA/BSS/07/007. Retrieved from: www.cices.eu.
- HAN, F. 2008. Cross-cultural confusion: Application of World Heritage concepts in scenic and historic interest areas of China. In *The Great Wilderness Debate Rages On: Continuing the Great New Wilderness Debate*. Eds.: NELSON, M.P. and CALLICOTT, J.B., Athens–London, The University of Georgia Press, 252–263.
- HAN, F.L. and LI, C.T. 2019. Environmental impact of tourism activities on ecological nature reserves. *Applied Ecology and Environmental Research* 17. (4): 9483–9492.
- HOUDET, J., TROMMETTER, M. and WEBER, J. 2012. Understanding changes in business strategies regarding biodiversity and ecosystem services. *Ecological Economics* 73. 37–46.
- KEESSTRA, S., NUNES, J., NOVARA, A., FINGER, D., AVELAR, D., KALANTARI, Z. and CERDÀ, A. 2018. The superior effect of nature based solutions in land management for enhancing ecosystem services. *Science of the Total Environment* 610. 997–1009.
- KUSLITS, B., VÁRI, Á., TANÁCS, E., ASZALÓS, R., DRASOVEAN, A. et al. 2021. Ecosystem services becoming political: How ecological processes shape local resource-management networks. *Frontiers in Ecology and Evolution* 9. Available at <https://doi.org/10.3389/fevo.2021.635988>
- LASANTA, T., NADAL-ROMERO, E. and ARNÁEZ, J. 2015. Managing abandoned farmland to control the impact of re-vegetation on the environment. The state of the art in Europe. *Environmental Science & Policy* 52. 99–109.
- LASANTA, T., ARNÁEZ, J., PASCUAL, N., RUIZ-FLAÑO, P., ERREA, M.P. and LANA-RENAULT, N. 2017. Space-time process and drivers of land abandonment in Europe. *Catena* 149. 810–823.
- LASEN, C., TOMASELLI, M., SCARIOT, A., GARLATO, A. and CARBOGNANI, M. 2018. Floristic composition, site conditions and diversity of poet's daffodil (*Narcissus radiiflorus* Salisb.) hay meadows in the Venetian Pre-Alps and outer Dolomites (N-Italy): Implications for conservation and restoration. *Plant Biosystems – An Interational Journal Dealing with all Aspects of Plant Biology* 152. (6): 1236–1247.
- LEONE, F. and ZOPPI, C. 2019. Local development and protection of nature in coastal zones: A planning study for the Sulcis area (Sardinia, Italy). *Sustainability* 11. (18): 5095.
- LESCUYER, G., NGOUHOUBO POUFOUN, J., DEFO, L., BASTIN, D. and SCHOLTE, P. 2016. Does trophy hunting remain a profitable business model for conserving biodiversity in Cameroon? *International Forestry Review* 18. (1): 108–118.
- LINDSEY, P.A., ALEXANDER, R.R., DU TOIT, J.T. and MILLS, M.G.L. 2005. The potential contribution of ecotourism to African wild dog *Lycaon pictus* conservation in South Africa. *Biological Conservation* 123. (3): 339–348.
- MARIKI, S.B., SVARSTAD, H. and BENJAMINSEN, T.A. 2015. Elephants over the cliff: explaining wildlife killings in Tanzania. *Land Use Policy* 44. 19–30.
- MEA 2005. *Ecosystems & Human Well-Being: Synthesis* (Millennium Ecosystem Assessment). Washington DC, Island Press.
- MUNROE, D.K., VAN BERKEL, D.B., VERBURG, P.H. and OLSON, J.L. 2013. Alternative trajectories of land abandonment: causes, consequences and research challenges. *Current Opinion in Environmental Sustainability* 5. (5): 471–476.
- NAGEL, T.A., FIRM, D., MIHELIC, T., HLADNIK, D., DE GROOT, M. and ROZENBERGAR, D. 2017. Evaluating the influence of integrative forest management on old-growth habitat structures in a temperate forest region. *Biological Conservation* 216. 101–107.
- PHALAN, B., ONIAL, M., BALMFORD, A. and GREEN, R.E. 2011. Reconciling food production and biodiversity conservation: land sharing and land sparing compared. *Science* 333. 1289–1291.
- PRELL, C., REED, M.S. and HUBACEK, K. 2011. Social network analysis for stakeholder selection and the links to social learning and adaptive co-management. In *Social Networks and Natural Resource Management*. Eds.: BODIN, Ö. and PRELL, C., Cambridge, Cambridge University Press, 95–118.
- SHACKLETON, C.M., PANDEY, A.K. and TICKTIN, T. (eds.) 2015. *Ecological Sustainability for Non-Timber Forest Products: Dynamics and Case Studies of Harvesting*. London, Routledge.
- SIMMS, M.J. 2005. Sedimentary processes, karst and palaeokarst. In *Encyclopedia of Geology*. Eds.: SELLEY, R.C., COCKS, L.R.M. and PLIMER, I.R., Oxford UK, Elsevier Academic Press, 678–687.
- SIMONČIČ, T. and MATIJAŠIČ, D. (eds.) 2013. *Green Book on Payment for Environmental Services from Mediterranean Forests*. Ljubljana, Slovenia Forest Service.
- STRONZA, A.L., HUNT, C.A. and FITZGERALD, L.A. 2019. Ecotourism for conservation? *Annual Review of Environment and Resources* 44. 229–253.

- TANÁCS, E. 2016. Modern resource use and its impact in karst areas—agriculture, forestry and grazing. *Zeitschrift für Geomorphologie, Supplementary Issues* 60. (2): 175–198.
- The World Bank 2020. World Bank Country and Lending Groups. Available at <https://datahelpdesk.worldbank.org/knowledgebase/articles/906519-world-bank-country-and-lending-groups>
- UNDP 2019. *United Nations Development Programme. Human Development Report 2019. Beyond Income, beyond Averages, beyond Today: Inequalities in Human Development in the 21st Century*. New York, United Nations Development Programme.
- VAN DER ZANDEN, E.H., VERBURG, P.H., SCHULP, C.J.E. and VERKERK, P.J. 2017. Trade-offs of European agricultural abandonment. *Land Use Policy* 62. 290–301.
- VÁRI, Á., ARANY, I., ASZALÓS, R., BÓNÉ, G., BLIK, P. et al. 2017. Mapping and modelling ecosystem services in the Niraj- Târnava Mică region. In *Mapping and assessing ecosystem services in Natura 2000 sites of the Niraj-Târnava Mică region*. Eds.: VÁRI, Á., CZÚCZ, B. and KELEMEN, K., Tirgu Mures, Romania, Milvus Group; MTA Ökológiai Kutatóközpont; CEEweb, 85–126.
- VÁRI, Á., ARANY, I., KALÓCZKAI, Á., KELEMEN, K., PAPP, J. and CZÚCZ, B. 2020. Berries, greens, and medicinal herbs – mapping and assessing wild plants as an ecosystem service in Transylvania (Romania). *Journal of Ethnobiology and Ethnomedicine* 16. (1): 13.
- VÁRI, Á., PODSCHUN, S.A., ERŐS, T., HEIN, T., PATAKI, B. et al. 2022. Freshwater systems and ecosystem services: Challenges and chances for cross-fertilization of disciplines. *Ambio* 51. (1): 135–151.
- WOOD, S.L.R., JONES, S.K., JOHNSON, J.A., BRAUMAN, K.A., CHAPLIN-KRAMER, R. et al. 2018. Distilling the role of ecosystem services in the sustainable development goals. *Ecosystem Services* 29. (A): 70–82.
- World Economic Forum 2022. *The Global Risks Report 2022*. 17th Edition. World Economic Forum.

BOOK REVIEW SECTION

Andersen, D.J. and Prokkola, E.-K. (eds.): Borderlands Resilience: Transitions, Adaptation and Resistance at Borders. Abingdon and New York, Routledge, 2021. 210 p.

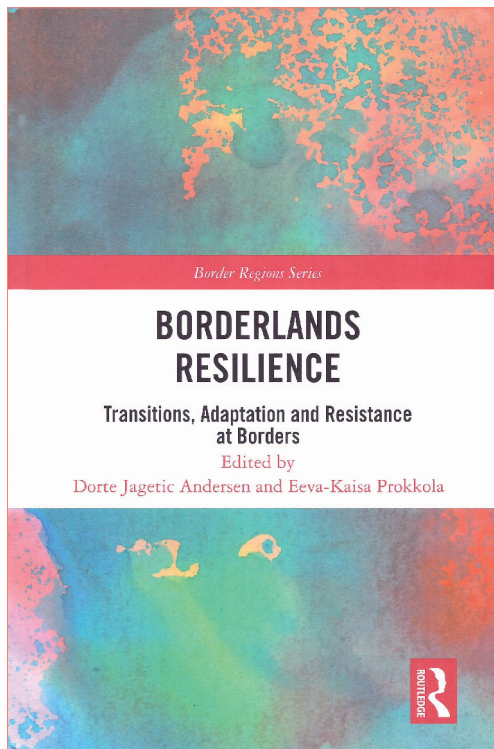
Among the distinctive features of borderlands is their high vulnerability to changes in international relations (both interstate and cross-border), along with various external shocks and geopolitical tensions. The recent past has provided a range of evidence in support of this. Border regions were particularly affected during the economic crisis in 2008. Western sanctions in response to the Russian annexation of Crimea and the outbreak of conflict in Ukraine's eastern regions in 2014 further sealed the EU's eastern external border. The migration crisis of 2015 and the series of terrorist attacks in Western Europe from 2015 to 2017 brought about the partial reintroduction of internal EU border controls. Brexit and the issue of reintroducing customs borders became another challenge. Finally, the COVID-19 pandemic resulted in

the almost universal reintroduction of border controls and travel restrictions. Currently, Europe is experiencing an unprecedented humanitarian crisis related to the Russian aggression against Ukraine, which has resulted in the opening of the EU's external borders to almost 6 million Ukrainian refugees, as well as in further restrictions on citizens and businesses from Russia and Belarus. These events have caused borders and borderlands in Europe – where the naive, utopian vision of a borderless world seemed to be closest to becoming a reality – to undergo profound changes away from a policy of open borders.

From the center's perspective, strengthened border securitization is seen as a remedy ensuring state security vis-à-vis emerging external threats. However, the dynamic re-bordering processes, with the construction of border walls and fences in its extreme form, constitute additional challenges for border regions and the people who live there. In the body of literature, it is generally expected that borderlands “are less able to respond positively to shocks and to undergo transformative processes” (PASCARIU, G.C., KOURTIT, K. and TIGANASU, R. 2020, p. 750). However, it is the border communities, facing constant instability and uncertainty, that must cope with external disturbances in their daily life.

This is what makes the book edited by Dorte Jagetic ANDERSEN and Eeva-Kaisa PROKKOLA particularly topical and relevant. Its objective is to examine “how different groups of people whose lives are always-already entangled with borders and border crossings maintain well-being and adaptive capacities in the face of border transitions, including reinforced securitization as well as new openings” (p. 2). The volume offers a broad, conceptually and empirically nuanced study of how different societies experience, adapt, and resist border reconfigurations and the related uncertainties. Following WANDJI, G. (2019), the collection adopts a broad understanding of resilience, and by treating it within the highly complex context of borders and borderlands, a new, innovative conceptualization is developed over the subsequent portions of the book.

The volume consists of ten chapters that bring together case studies of different borders and borderlands. Empirical chapters are preceded by an introduction (Chapter 1) and followed by an epilogue (Chapter 12), the body being divided into three sections. Thus, borderlands resilience has been presented and discussed in differing contexts, and this



clarifies the overall argument, makes it more readable, and highlights the main issues.

In the introductory chapter (*Introduction: Embedding borderlands resilience*) ANDERSEN and PROKKOLA conceptualize the notion of *borderlands resilience*, referring to the varied definitions of resilience across disciplines and the different meanings of the term ‘borderland.’ Taking the concept of *social resilience* as a starting point for further consideration directs the editors to explore the adaptive strategies, changes, and resistance of social groups to various stresses, what they have termed ‘*peoples resilience*.’ The editors recognize the uniqueness and diversity of borderlands and the human communities that inhabit them and therefore take a situational approach that analyzes “resilience processes in their historical, political and cultural contexts” (p. 4). Finally, they debate the role played by identities and identity-formation processes in borderlands resilience, by considering the self-identification of people as an important asset and resource that facilitate dealing with geopolitical changes. The introduction provides an appropriate point of reference for the presentation of the individual case studies, adequately defining the thematic, theoretical, and conceptual framework for further studies.

Part I provides theoretical and empirical insights into borderlands resilience by examining what roles borders play in resilience in ‘exceptional circumstances’ like the implications of the Crimean Crisis, the influx of migrants, Brexit, and the COVID-19-related border closures.

In Chapter 2, Eeva-Kaisa PROKKOLA continues the discussion initiated in the *Introduction* on the complexity of the relationship between national borders and processes of resilience. She analyzes the imaginary risks in the context of alternative processes of de-bordering and re-bordering and the differentiated nature of boundaries on the hard-soft continuum. In doing so the chapter highlights the role of the top-down politics of resilience in relation to ambivalent approaches to border management and security perceptions. The chapter then shifts the focus to three recent resilience processes in three different border policy contexts: the EU neighborhood policy, the response to the immobility shock at the Finnish-Russian border in the aftermath of the Crimean Crisis in 2014, and the disruption at the Finnish-Swedish border in Tornio Valley as a consequence of the influx of asylum-seekers and during the COVID-19 pandemics. These cases have been used to illustrate and prove that borderlands resilience is highly context-dependent.

Chapter 3 by Katharina KOCH approaches resilience from the perspective of mobility by examining the impact of Brexit on Irish/Northern Irish university cross-border cooperation. This study points to the various joint efforts, policies, and negotiations undertaken, ones resulting in the development of contingency plans and mitigation strategies for various

post-Brexit scenarios – and creating new perspectives for cooperation in a transforming cross-border environment. In this way, the chapter highlights “the relational aspect of resilience, meaning that borderland resilience does not only stem from a bounded region or territory but can also be fostered through cross-border institutional interactions” (p. 47).

In Chapter 4, María LOIS, Heriberto CAIRO and Mariano GARCÍA DE LAS HERAS explore borderlands resilience in relation to the borders at different scales, comparing the imaginations and practices about borders used by the central state and communities in borderlands in the context of the COVID-19 pandemic. The authors suggest that, while from the perspective of the state, the border is widely used as a tool applicable to the control of the insecurity generated from outside, the borderlanders imagine and practice the border as ‘enabling’ through “constant negotiation of the meaning of borders for everyday life, related to memories and experience in the borderland” (p. 65). This indicates the possible existence of different border-related resiliencies at different scales, which may sometimes be contradictory.

The next part (Part II) entitled ‘*Tracing space: Social relations and movement as resilience*’ broadens our understanding of resilience by focusing on the consequences of border transitions from the perspective of different communities living in the borderlands. The following three chapters trace how these groups adapt to ongoing change and renew themselves or resist in often ordinary, mundane situations. Chapter 5, authored by Sara SVENSSON and Péter BALOGH, gives a relatively broad overview of the social resilience practices of three cross-border communities in Hungarian borderlands in response to border closure practices. First, it describes the process of including the ‘other side’ in what is considered local by using the example of cross-border food producers and customers, for here food becomes a link between people in territories spanning borders. Second, the chapter addresses cross-border commuting that secures livelihoods in thriving agglomerations and neglected peripheries. Thirdly, the chapter discusses the activities of the action group MigSzol, which has resisted the practice of closed borders by providing humanitarian assistance to refugees. This example suggests that borderlands resilience may be “understood differently depending on ideological orientation” (p. 85). The first and third cases are of utmost importance as they cover two understudied and, thus, particularly interesting topics. All these considerations have been presented against the background of an excellently outlined socio-economic context, often characteristic for other Central and Eastern European countries as well.

In Chapter 6, Olga HANNONEN analyzes Russian cross-border second-home mobilities to Finland under changing mobility regulations since 2013. The author examines the capacity for adaptation to the changes using an analytical tool based on the open-closed con-

tinuum in which the open end gives space for resilient solutions, whereas a closed-end does not offer such possibility. In light of the presented findings, changes in visa regime, mobility restrictions, bank policies, and new regulations on property purchases in Finland forced Russian second-home owners to develop various personalized solutions to meet the changed circumstances. It demonstrates how situational and contextual the resilient practices of borderlanders are.

The final chapter in Part II (Chapter 7 by Md Azmeary FERDOUSH) provides the only insight into borderlands resilience from outside Europe in the book. It outlines the history of a transnational movement of a group of stateless residents of the former border enclaves of Bangladesh and India. Through seeking to exchange enclaves between the two states, the movement became an *act of refusal* that can be located in the analysis of the resilience of border populations. The chapter proves that even stateless border populations who are not granted citizenship rights can act to change a disadvantaged status quo.

The last part of the volume (Part III), consisting of four chapters, further explores issues of borderlands resilience through identity formation and cultural representations in historically developing border and diaspora communities. In Chapter 8, Steen Bo FRANSEN discusses borderlands resilience from the border region perspective. Using the case of Schleswig, the author scrutinizes the historical process of transformation of a land-in-between into the national borderland of Denmark and Germany. The chapter suggests that borderlands resilience remains strongly linked to historical memory and the desire to preserve identity, which includes also countering the influence of another national ideology.

Chapter 9 by Juha RIDANPÄÄ contributes to the studies on borderlands resilience by discussing language resilience as manifested in a bottom-up approach in which decision-making concerning the revitalization of endangered languages is given to local groups. Drawing on the example of the Meänkieli language, an endangered minority language from the Swedish-Finnish borderland, the author argues that resilience refers to “recognizing and accepting the irreversible development of language loss and still being able to live with it” (p. 148).

The following chapter (Chapter 10) by Christian LAMOUR and Paul BLANCHEMANCHE offers inspiring insights into the cultural dimension of spatial resilience across state borders through investigation of the evolving use of space by diasporas. The authors explore the role of the Italian Villerupt film festival in the resilience of a translocality of the Italian community within a changing cross-border metropolitan environment. The chapter underscores the role of ritualized practices in space, allowing for a better understanding of the importance of culture and identity in resilience.

The book’s final chapter, authored by Dorte Jagetic ANDERSEN, investigates the everyday life of people living in Istria facing the constant redrawing of borders through geopolitical decisions. This context leads the inhabitants of the peninsula not to see new border closures as problematic, but as a challenge that should be overcome. Indeed, in the case of Istrians, boundary changes translate into everyday practices, becoming a manifestation of differentiation in space.

The collective volume ends with an erudite Epilogue written by JUSSI LAINE. In his text, the author confronts the widespread visions of risks, dangers, and threats to which border securitization seems to be the only appropriate response. The chapter demystifies the unreliability of such practices, suggesting that they are not a solution, but rather a typical source of additional problems. At the same time, it exposes the illusory perception of challenges to borderland communities as something purely external, pointing out that resilience refers to both domestic and international concerns. He concludes his contribution by arguing that “border communities tend to be resilient essentially in terms of adaptation as a form of continuity rather than change,” while a resilient world “necessitates the transcending of boundaries and the binaries of which they are markers” (p. 188).

The book *Borderlands Resilience: Transitions, Adaptation and Resistance at Borders* is an excellent contribution to the study of resilience proving that this concept holds great potential in relation to borders and borderlands. It is the first study of this kind to offer such a coherent and comprehensive overview of the diverse contexts of borderlands resilience. The conceptual framework has allowed the editors and contributing authors to go beyond simple schemes as the volume covers not only resilience towards external threats but also internal stressors and resilience vis-à-vis both ‘fast stress events’ and slow crises. The individual chapters reveal the different faces of borderlands resilience, but still follow the uniform theoretical framework outlined in the introduction. The book of course has some minor weaknesses. I appreciate the authors’ ambition to recognize the political and social “components of resilience, easily overlooked in a field dominated by economic approaches” (SVENSSON, S. and BALOGH, P. 2021, p. 74), although the volume unfortunately goes on to largely neglect the economic dimension. Also, there is some European bias in the empirical studies. However, the chosen cases focus on somewhat less frequently studied, sometimes peripheral borderlands that require more research attention, and this should be considered a significant advantage.

In conclusion, this volume is by all means highly recommended. The book encourages the reader to rethink the concept of resilience in light of the complex social processes that characterize borderlands and it provides an opening for a discussion of the

various forms of these processes. I am convinced that this timely, valuable, necessary, and fascinating work will become a source of inspiration for numerous researchers dealing with issues of borders and borderlands.

ANDRZEJ JAKUBOWSKI¹

REFERENCES

- PASCARIU, G.C., KOURTIT, K. and TIGANASU, R. 2020. Regional development, spatial resilience and geographical borders. *Regional Science Policy & Practice* 12. (5): 749–754.
- SVENSSON, S. and BALOGH, P. 2021. Resilience at Hungary's borders. In *Borderlands Resilience*. Eds.: ANDERSEN, D.J. and PROKKOLA, E.-K., London, Routledge, 73–89.
- WANDJI, D. 2019. Rethinking the time and space of resilience beyond the West: An example of the post-colonial border. *Resilience* 7. (3): 288–303.

¹ Maria Curie-Skłodowska University, Institute of Social and Economic Geography and Spatial Management, Lublin, Poland.
E-mail: andrzej.jakubowski@umcs.pl

Demeter, G. and Bottlik, Zs.: Maps in the Service of the Nation: The Role of Ethnic Mapping in Nation-Building and Its Influence on Political Decision-Making Across the Balkan Peninsula (1840–1914). Berlin, Frank & Timme, 2021. 310 p.

This concise study by Gábor DEMETER and Zsolt BOTTLIK (with contributions from Krisztián CSAPLÁR-DEGOVICS) is a rather rare example of a genuinely critical history of a discipline written by the representatives of the discipline. Contrary to recent publications by Steven SEEGEL (SEEGEL, S. 2018) or Vedran DUANČIĆ (DUANČIĆ, V. 2020), the book by DEMETER and BOTTLIK is a voice of geographers on geography's past. This characteristic feature springs to one's mind immediately; not only is the authors' focus centered upon cartographic techniques rather than the biographies of main actors, or academic milieus of their time, but the narrative is intercepted by numerous tables and maps. The book is furthermore amended with over fifty carefully designed maps aiming at an alternative presentation of historical data. There are, however, no historical maps reproduced in the volume, as they are mostly known to specialists in the field. All of them have been made accessible on a dedicated website (<https://balkanethnicmaps.hu/originalmaps.html>), although their resolution is not always satisfying. The outspoken goal of the authors is to identify the methods of manipulation with data

and cartographic visualizations on the one hand, and producing a more reliable representation of the Balkan's ethnic structure on the other hand.

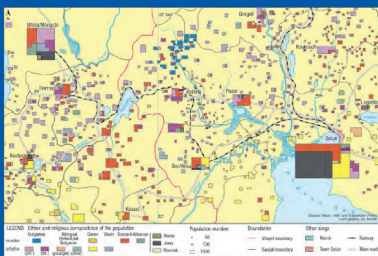
The book is divided into four chapters. Chapter 1 offers a general introduction into the history of ethnic mapping and political history of the Balkans. Chapter 2 is a history of Balkan cartography divided into three main phases: (i) the early maps in the first half of the 19th century, mostly authored by specialists in Slavic studies; (ii) increasingly politicized cartography of the latter part of the century; and (iii) propaganda cartography generated by all sides of the conflict in the context of the First World War. Chapter 3 discusses methodological problems of mapmaking and the Balkan censuses while Chapter 4 consists of the aforementioned modern maps produced by the authors. The book is amended with lists of maps, tables and figures, and a Bibliography.

As it becomes clear from the construction of the narrative, *Maps in the Service of the Nation* consists of two elements that rarely coexist within one book. The first is the history of Southeastern Europe seen from the perspective of ethnic cartography. The authors offer a convincingly rich outline of a complicated reality, discussing dozens of maps in their historical contexts. Their knowledge of relevant sources is impressive and they skillfully, if sparingly, make use of the critical literature on the topic (studies by Justin MCCARTHY and Ipek YOSMAOĞLU in the first place).

The second building block of the narrative is a re-evaluation of ethnic (i. e. linguistic, denominational or combined) statistics. Authors confront 19th century patch maps with rarely used Ottoman registers and censuses. Their modus operandi is to compare their own maps based on the existing statistical data with historical cartographic material in hope that, even though numbers rarely match, similar proportions of ethnic groups would help to identify the most reliable among the historical maps. Such an approach partly exonerates cartographers of the past who, biased as they mostly had been, still occasionally succeeded in producing at least partly proper representations of reality.

Is such an ambitious approach destined to be a failure? The answer depends on the perspective. There can be no doubt that an adequate, even large scale picture of the ethnic composition in the Balkans during the 19th century cannot be achieved. Leaving aside the plethora of historical maps and mutually exclusive interpretations, the lack of consistent data from any longer period of time makes such an undertaking unrealistic. Authors frequently refer to the Ottoman statistics but they perfectly realize that ethnic and other categories used in them cannot be translated into modern terms, nor do they cover any region systematically.

DIGIOST



Maps in the Service of the Nation

The Role of Ethnic Mapping in Nation-Building and Its Influence on Political Decision-Making Across the Balkan Peninsula (1840–1914)

Gábor Demeter / Zsolt Bottlik

Beyond that, mass migrations and border changes significantly influenced realities on the ground. In sum, the reader of this book will not necessarily feel that his/her knowledge of the ethnic structure of Southeastern Europe grew significantly higher.

In lieu of such an unfulfilled dream of accuracy BOTTLIK and DEMETER offer a couple of consolation prizes of considerable value. Methodological considerations is surely one of them. The authors do not dismiss all historical data altogether. In their eyes, through the combination of various sources at minimum some general idea of ethnic or religious divisions can be achieved. The precondition for future historians of Southeastern Europe would be, to follow BOTTLIK's and DEMETER's advice, not to "fell into the trap of considering one of the sources only as primary and reliable" (p. 230). In the case discussed Ottoman censuses had been such a dismissed source. Acknowledging their (be it limited) credibility opens the way for a comparison with other statistics. The combination of such data results in a considerably improved ethnic map. Not an exact one, but meticulously following all available data.

Cartography and, especially, cartographic techniques are another 'winner' of the history told in the book. Most of the historical maps that have been discussed by the authors (without, however, being reproduced in the book) were simple patch maps. Their main value, that is their simplicity, was at the same time their main vice. Incapable of illustrating complicated relations they proved completely useless when confronted with the Balkan mix of ethnic and religious groups. Deficiencies of patch maps had been noticed, even though not seriously challenged, by the 19th and 20th century cartographers themselves. Some of them, to mention Jovan CVIJIĆ whose oeuvre gets a fair but, at times, caustic treatment, excelled in generating new mixed ethno-religious categories (such as 'Albanised Serbs') designed to more precisely express local identities. DEMETER and BOTTLIK see this cartographic technique as inadequate and highly susceptible to propagandistic manipulations. Their alternative is various forms of pie chart maps. Their main asset is that they allow to reliably illustrate data variability. Given doubts surrounding most (or all) of Balkan ethnic statistics such a possibility allows cartographers to achieve a considerable level of clarity and credibility.

While the concept of the book and the approach of the authors are fascinating in their combination of critical history of (politicized) science on the one hand, and cognitive optimism on the other hand, *Maps in the Service of the Nation* offers no easy reading. The history of Balkan cartography is narrated in an extremely condensed fashion, while the decision to exclude historical cartography does not help to visualize the problems discussed therein. It is also a pattern throughout the book that meaningful informa-

tion that should be integrated into the text gets transferred into the footnotes. Imminently, such a style occasionally leads to oversimplifications: at times the authors squeeze sophisticated realities into short formulas; a procedure that not always brings fruits. So, for example, the references to 'Slavophilia' of some of the cartographers of the 19th century offer rather little substance given the vagueness of the term. In this case BOTTLIK and DEMETER seem to fell victim to their own oversimplification as they struggle to interpret František ZACH's approach to the region's ethnic divisions (apparently without knowledge of the latter's links to Prince CZARTORYSKI's 'diplomatic service' in the Balkans – pp. 64–65). There are instances, too, where the authors seem to follow the language of their sources too closely; hence mention of a map that "mutilated North Albania" (p. 95). A more relaxed, less condensed narrative would perhaps help to avoid such awkward formulations.

Yet another problem related to the concise narrative is weak contextualization. History of cartography in general is embedded in the political history, cultural history and history of science. Balkan cartography requires even more attention and a larger surplus of information in order to be properly understood. To name but one example: wavering international sympathies and antipathies in Western Europe (pro-Greek, pro-Bulgarian etc.) occasionally get a mention in the narrative but nowhere do they expand beyond very short notes.

These deficiencies of the narrative result in the authors' stepping over the major problem of a complex relation between cartography and propaganda. The latter seems to be personalized by CVIJIĆ, whose flexible handling of ethnic identities clearly (and understandably) frustrates the authors. Yet, besides being politically motivated, CVIJIĆ has been widely acknowledged the best Balkan geographer of all times. The challenge faced by historians of geography is not necessarily to dethrone the Serbian scholar, nor to unmask him as a skillful manipulator, but rather to explain how science and propaganda could coexist within single high quality cartographic work, how they intermingled and influenced each other. Such an attempt is absent.

All aforementioned weak sides of the book leave the reader not fully satisfied, but not disappointed either. The authors deserve credit for their impressive knowledge while they not always succeed in making this knowledge accessible to the reader. Still, there are many wise and thought-provoking fragments worth scanning through the whole narrative. Such as this short explanation of the meaning of the chosen ethnic category for a cartographic representation of the region:

"In fact, it was the category of Muslim Slavs who were able to shift the balance: if they were counted as Muslims, a relative Muslim majority was observable

in the Empire; if they were considered Slavs, a Slavic majority was the result. As not only the result, but the approach was different (one a religious categorization, the other linguistic), the results were incomparable and from a certain point of view are equally reasonable (or unreasonable). This is the paradox of Balkan ethnic mapping” (p. 157).

MACIEJ GÓRNY¹

REFERENCES

- DUANČIĆ, V. 2020. *Geography and Nationalist Visions of Interwar Yugoslavia*. Cham, Palgrave Macmillan.
- SEEGEL, S. 2018. *Map Men: Transnational Lives and Deaths of Geographers in the Making of East Central Europe*. Chicago, The University of Chicago Press.

¹ Polish Academy of Sciences, Tadeusz Manteuffel Institute of History, Warsaw, Poland.
E-mail: mgorny@ihpan.edu.pl

Schelhaas, B., Ferretti, F., Novaes, A.R. and Schmidt di Friedberg, M. (eds.): *Decolonising and Internationalising Geography: Essays in the History of Contested Science*. Cham, Springer, 2020. 140 p.

Geography as a scientific discipline, as well as the production and consumption of geographical knowledge, have their spatialities or 'geography.' Scholars are working at specific locations where a specific scientific milieu surrounds them; they have to consider specific norms, they need to cooperate with specific actors, and they are exposed to specific social, economic, and political conditions and interests. Even the very meaning of scientific knowledge "takes shape in response to spatial forces at every scale of analysis – from the macro-political geography of national regions to the microsocial geography of local cultures" (LIVINGSTONE, D.N. 2003, p. 4). These considerations led to the emergence of a new domain of scientific research, which is hallmarked by the notions of 'historical geography of science' (LIVINGSTONE, D.N. 1995), 'geographies of science/scientific knowledge' (LIVINGSTONE, D.N. 2003; MEUSBURGER, P. *et al.* 2010; MAYHEW, R.J. and WITHERS, C.W.J. 2020), 'landscapes of knowledge' (LIVINGSTONE, D.N. 2010), and 'mobilities of knowledge' (JÖNS, H. *et al.* 2017), to name but a few.

This kind of scholarship has stimulated a critical investigation of uneven power relations in global

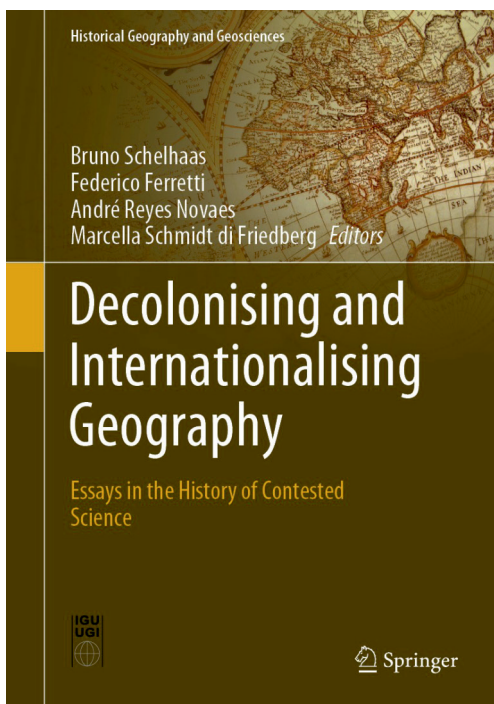
science, including international geography. For example, the hegemony of the English language, as well as the dominance of Anglo-American and British authors, institutions, publication platforms, and even scientific theories have been discussed in many studies (e.g., TIMÁR, J. 2004; PAASI, A. 2015; MÜLLER, M. 2021). Hence, more and more scholars started to argue for internationalizing, 'worlding' (MÜLLER, M. 2021), and decolonizing geography (JAZEEL, T. 2017; LEGG, S. 2017; RADCLIFFE, S.A. 2022), which include involving previously "subalternised and silenced knowledge" (p. vii) and a reconsideration of authors and sources from outside the global core regions of scientific knowledge production.

In recent years, attempts to internationalize and decolonize geography and even the history of geography have resulted in several projects that aim to explore from an internationally comparative perspective the history of a specific geographical approach, e.g., radical geography (BARNES, T.J. and SHEPPARD, E. 2019), critical geography (BERG, L.D. *et al.* 2022), and geography's mid-20th-century 'quantitative revolution' (GYURIS, F. *et al.* 2022). Furthermore, decolonizing and internationalizing the history of geography have been central notions in the latest progress reports in *Progress in Human Geography* (FERRETTI, F. 2020, 2021, 2022).

The current volume can be seen as an essential step in the same process, for it presents 11 papers from the international symposium of the IGU Commission History of Geography, which took place in July 2017 in Rio de Janeiro. As the four international editors make clear in the *Introduction*, their edited book is a programmatic one: "the problem is not merely to analyse internationality or decoloniality in geography; what we want is to internationalise and decolonise our discipline, with all the possible challenges and contradictions annexed" (p. v.). I appreciate the editors' brave devotion, and in line with it, I will not simply review the book's chapters but also refer to their relevance for potential research projects in Hungary.

The chapters of the volume reflect the diversity of papers at the 2017 conference in Rio de Janeiro and make up a colourful collection of mosaics instead of following a linear logic. In order to avoid thematic jumps, I will review the chapters not according to their actual order in the book but in three thematic groups. I will start with chapters telling the stories of specific *scholars*. Then, I will focus on chapters reporting about the history of *institutions* aimed at producing and disseminating geographical knowledge. Finally, I will scrutinize the chapters on the history of *geographical imagination*.

In Chapter 1, André Reyes NOVAES from the State University of Rio de Janeiro (UERJ) investigates the



works of the leftist Portuguese scholar Jaime CORTESÃO (1884–1960), who was exiled from Portugal in 1926 and left Europe to Brazil in 1940. CORTESÃO intensively scrutinized the history of Brazilian mapmaking and the essential role indigenous knowledge gained from indigenous people played in the exploration and mapping of vast territories of Brazil, especially from the 16th to 18th centuries, by explorers representing the Portuguese and the Brazilian colonial elites. NOVAES illuminates that “exploration maps as co-produced and hybrid artefacts” (p. 1), and even the writings of CORTESÃO and similarly minded authors in and before the mid-20th century may be exciting research subjects for contemporary scholars of the history of geography. From a Hungarian perspective, the approach of NOVAES’s chapter could be applied to analyze the role of indigenous knowledge in late 19th and early 20th-century Hungarian expeditions to Africa, Asia, and especially the Balkans, which progressively became a target of Austro-Hungarian imperial realms. Besides, the increasing literature on foreign (predominantly ‘Western’) travellers’ and researchers’ journeys to Hungary in the 18th and 19th centuries, as well as on large-scale mapping projects of the Habsburg elites about their empire, including Hungary, could be enriched by investigating the role of local knowledge stemming from people living in then Hungary.

Larissa ALVES DE LIRA from the Federal University of Minas Gerais in Belo Horizonte writes about the French geographer Pierre MONBEIG (1908–1987) in Chapter 9. MONBEIG was a professor of geography in São Paulo from 1935 to 1946 when he returned to France. Strongly influenced by Paul VIDAL DE LA BLACHE’s geographical and Fernand BRAUDEL’s historical approach, MONBEIG developed a ‘geohistory’ approach and focused in his research on the long-term social transformation and territorial development of Brazil, embedding the process in the global development of capitalism, and stressing its cyclical nature (e.g., due to the depletion of tropical soils). As ALVES DE LIRA presents, not only did MONBEIG’s “French geographical epistemology” (p. 97) impact how he framed his studies and findings on Brazil. Instead, his experience with Brazil, especially with the country’s territoriality, tropicality, and peripheral position in global capitalism, also actively shaped his ‘geohistory’ approach and his understanding of late capitalism in more developed countries. From a Hungarian point of view, it would be tempting to analyse in similar ways how foreign scholars, who paid at least more extended research visits to Hungary and investigated its social and spatial realities, integrated Hungary-related findings into their general scholarly way of seeing. Likewise, Hungarian scholars’ changing understanding of their country’s social and spatial dynamics in light of longer stays abroad would be a promising research topic in the history of Hungarian geography.

In Chapter 2, María Verónica IBARRA GARCÍA (National Autonomous University of Mexico, UNAM, Mexico City) and Edgar TALLEDOS Sánchez (College of San Luis, San Luis Potosí) report about early leftist geographical traditions in Brazil and Cuba. They focus on Josué DE CASTRO (1908–1973), a professor of geography in São Paulo, and the Cuban geographer Nuñez JIMÉNEZ (1923–1998). The chapter provides an interesting comparison of two individual careers through their seminal books, *The Geography of Hunger* (1946) and *Geopolitics of Hunger* (1951) by DE CASTRO and *Geography of Cuba* (1954) by JIMÉNEZ. Both authors criticized plantation agriculture, monocultures, the concentration of land in the hands of a few, and the poverty of a large part of society. In addition, they rejected environmental determinist approaches in geography, which interpreted these problems as unavoidable consequences of natural conditions, and instead stressed the impact of capitalistic property relations, European colonization, and US imperialism. DE CASTRO’s 1946 book was translated into 24 languages, whereas JIMÉNEZ became a leading geographer of Cuba after the communist revolution led by Fidel Castro. As a remarkable contribution, the chapter highlights that genuine critical works had been present in Latin American geographies even before the influence of the Anglophone ‘critical turn.’ However, it seems to imply that all previous geographical approaches, except for anarchistic ones, were environmentally deterministic. That is a popular claim in many Marxist works, but it cannot be justified in this form for some ‘classical’ traditions (e.g., the Vidalian one) also rejected determinism – which does not decrease the merits of pioneering critical geographers. It should also be discussed what the term ‘critical’ means in the case of scholars who started as the critics of capitalism, colonization, and nationalist autocracies or dictatorships but ended up uncritically supporting communist dictatorships. That is a conceptual and ethical question with clear relevance for those interested in the history of geography in (former) communist countries.

Several chapters of the book focus on the history of *institutions* producing and disseminating geographical knowledge. One of them is Chapter 7, where Maximilian GEORG and Ute WARDENGA from Leibniz Institute for Regional Geography in Leipzig present a large-scale research project that is taking place under their coordination. The project aims to compose a ‘transnational’ history of geographical societies between 1821 and 1914, which were the leading organizational units of academic geography in those decades. Based on an in-depth analysis of 34 societies from all continents and in 14 languages, standardized methods, and meticulous analysis of their journals’ content, this truly pioneering enterprise promises to go beyond methodological nationalism and the predominantly capital city-centric approach of many previous studies. The authors’ goal is to illustrate the potential and challenges of their ongoing project.

However, they provide many conceptual and methodological ideas that can be efficiently employed in any study focusing on geographical societies, even concerning more contemporary times.

Whereas Chapter 7 deals with geographical societies, Chapter 10 by Mariana LAMEGO at the State University of Rio de Janeiro (UERJ) concentrates on geographical congresses. LAMEGO historicizes contemporary debates on the dominance of the English language in international geography in genuinely fascinating ways and investigates the 1956 International Geographical Congress in Rio de Janeiro – ever since the first and last such congress in South America and the last truly multilingual one, with papers in 6 languages. LAMEGO contextualizes the congress as “a geopolitical event” (p. 115) and scrutinizes the complex network of post-WWII geopolitical interests due to which Rio de Janeiro got the chance to host the event. She painstakingly analyses which countries were represented and which presenter used which language. She concludes that the congress’s multilingual, even “babel tower nature” (p. 124) challenged efficient communication in several cases. Nevertheless, the negative consequences of the congress’s multilingualism have mainly been emphasized – and the positive outcomes de-emphasized – later by “those who already occupy privileged positions” (p. 124) in contemporary English-language-centric academia. Moreover, these negative consequences, such as “the almost exclusively sub-group intercommunication” (p. 123), resulted from a complex set of sociological factors, not just multilingualism and the limited language proficiency of the participants. Hence, they have been “not a rare phenomenon at international congresses of geography until nowadays” (p. 123), despite the emergence of English as a hegemonic language. In addition to its remarkable argumentation, LAMEGO’s chapter can serve as a great starting point for the analysis of conferences in future projects on the history of geography.

The archives of the International Geographical Union are the focus of Chapter 11 by Bruno SCHELHAAS and Stephan M. PIETSCH from Leibniz Institute for Regional Geography in Leipzig. This study traces the organizational development and geographical location of the IGU Archive (eventually some parts of it) from the foundation of the International Geographical Union in 1922 through places like Winchester, London, Florence, Paris, Louvain, Berlin, New York, London again and Rome to the Leibniz Institute for Regional Geography in Leipzig, which has hosted the materials since 2013. SCHELHAAS and PIETSCH also give an overview of the diversity of documents handled by the archive. In addition to being a tempting ‘appetizer’ for everyone considering doing research in the IGU Archive in Leipzig, the chapter gives precious ideas for future projects about the history of geographical archives.

The third group of studies comprises book chapters on *imaginative geographies* and their transformations

throughout the last two centuries. Toshiyuki SHIMAZU from Wakayama University takes a landscape-as-text approach and scrutinizes two locations in late 19th century Paris: *Les Quatre Parties du Monde* from 1874, which comprises four female bronze statues representing Europe, America, Africa, and Asia, and *Les Six Continents* from 1878, a group of six female statues representing the continents. SHIMAZU reveals how the allegorical presentation of female bodies in a patriarchal society promoted “hegemonic internationalism” (p. 93), the notion of “a linear progress from the primitive to the civilized” (p. 89), and a Eurocentric and even imperial Paris-centric imaginative geography.

Akio ONJO from Kyushu University in Fukuoka presents in Chapter 3 the controversial impact of the 1894–1895 Sino-Japanese War and the 1904–1905 Russo-Japanese war on Japanese national identity. As he underscores, the wars “boosted the imperial consciousness and geographical imagination of the [Japanese] people as a ‘first-rank nation state’” (p. 31). However, this imagination was intertwined with “a normalized body form” (p. 29), which the impaired bodies of the roughly 150,000 wounded soldiers did not fit. Furthermore, the Hospital for Disabled Veterans, which the national government established in 1906, separated veterans from other people and confined them to a closed space. Hence, they were not visible to the rest of society and were soon forgotten. Alternative local initiatives aimed at providing a meaningful and socially valuable job for the veterans, who could thus sustain everyday communication with non-impaired people, proved much more efficient in enhancing the social recognition of veterans. In my view, similar studies would have much relevance in many countries. For example, in Hungary, research on the geographies of disability has just started recently (FABULA, Sz. and TIMÁR, J. 2018). These studies could be historicized in valuable ways, such as in the case of impaired veterans and civilians after the two world wars.

In Chapter 5, Pascal CLERC from CY Cergy Paris University scrutinizes and deconstructs the concept of the ‘North/South’ divide and the ways it is being used in contemporary discourses. He presents how an intellectual construction, initially introduced to avoid the stigmatization intrinsic to the previously used terms of ‘developed’ and ‘underdeveloped’ countries, gradually has become a discriminating concept, reinforcing neo-colonial imaginations. Moreover, as CLERC highlights, “the question of development can be thought [of] as a possibility of change,” but “the location in the world does not change.” Hence, the ‘North/South’ divide as a concept “establishes a spatial hierarchy” that is “impossible to change” (p. 53) and creates “a vision of the world as immutable even against the facts” (p. 47). CLERC emphasizes that his analysis has been made from a French point of view. In-depth critical deconstructions of the ‘North/South’

divide have also been provided in the last decade by scholars in post-communist Central and Eastern Europe, even in English (e.g., SOLARZ, M.W. 2014, 2018). Integrating their findings into scholarly discourses in Western Europe could further enhance the internationalization of geography.

Marcella SCHMIDT DI FRIEDBERG and Stefano MALATESTA from the University of Milano-Bicocca focus on the geopolitical aspects of geographical imagination in Chapter 4. They scrutinize how the Chagos Islands and the Maldives as “unsinkable aircraft carriers” (p. 37) gradually transformed from geopolitically significant archipelagos of the British Empire to a critical element of US military control over the region, especially in the light of the current rivalry between India, China, and the United States. They also present how a renewed competition between these three powers, or “triangular condominium” (p. 39), for the Indian Ocean Region made “ocean space ... the central object in the construction of the geographical region” (p. 41).

Last but not least, Verónica C. HOLLMANN from the University of Buenos Aires turns in Chapter 6 towards drone photography and the complex ways it is “reshaping the geographical imaginations of nature” (p. 57). She underscores that the most widely circulated award-winning drone images tend to “depict highly transformed or produced natures” instead of “pristine nature” (p. 62). Their visual composition is usually dominated by eye-catching colours and extraordinary shapes, which are further accentuated through digital image processing technologies to maximize their ‘beauty,’ at least in terms of what ‘landscape beauty’ means in consumption-centric contemporary Western societies. Hence, these images popularize false imaginations of nature and its relations to society. After reading this thought-provoking chapter, an embarrassing yet critical question is whether digitized drone photography’s obsession with ‘produced natures’ may even contribute to the (further) devaluation of ‘pristine nature’ in many people’s eyes. If it does, it can increase the general social acceptance of projects with a devastating impact on nature. That is a dilemma geographers all around the world should take seriously.

In sum, the volume is a precious piece of reading for everyone interested in the history of geography. Moreover, given that it was written by an international group of scholars from non-Anglophone countries and includes lots of references to academic works published in languages other than English, it provides a unique insight into several national geographical traditions from South America to East Asia, including French, German, Japanese, Portuguese and Spanish-language ones. Hence, the book is an essential step toward decolonizing and internationalizing geography and its histories, which gives precious ideas and exciting directions for future research.

Acknowledgement: The research has been supported by the János Bolyai Research Scholarship of the Hungarian Academy of Sciences.

FERENC GYURIS¹

REFERENCES

- BARNES, T.J. and SHEPPARD, E. (eds.) 2019. *Spatial Histories of Radical Geography: North America and Beyond*. Hoboken–Chichester, Wiley.
- BERG, L.D., BEST, U., GILMARTIN, M. and LARSEN, H.G. (eds.) 2022. *Placing Critical Geography: Historical Geographies of Critical Geography*. Abingdon–New York, Routledge.
- FABULA, SZ. and TIMÁR, J. 2018. Violations of the right to the city for women with disabilities in peripheral rural communities in Hungary. *Cities* 76. 52–57.
- FERRETTI, F. 2020. History and philosophy of geography I: Decolonising the discipline, diversifying archives and historicising radicalism. *Progress in Human Geography* 44. (6): 1161–1171.
- FERRETTI, F. 2021. History and philosophy of geography II: Rediscovering individuals, fostering interdisciplinarity and renegotiating the ‘margins.’ *Progress in Human Geography* 45. (4): 890–901.
- FERRETTI, F. 2022. History and philosophy of geography III: Global histories of geography, statues that must fall and a radical and multilingual turn. *Progress in Human Geography* 46. (2): 716–725.
- GYURIS, F., MICHEL, B. and PAULUS, K. (eds.) 2022. *Recalibrating the Quantitative Revolution in Geography: Travels, Networks, Translations*. Abingdon–New York, Routledge.
- JAZEEL, T. 2017. Mainstreaming geography’s decolonial imperative. *Transactions of the Institute of British Geographers* 42. (3): 334–337.
- JÖNS, H., MEUSBURGER, P. and HEFFERNAN, M. (eds.) 2017. *Mobilities of Knowledge*. Cham, Springer.
- LEGG, S. 2017. Decolonialism. *Transactions of the Institute of British Geographers* 42. (3): 345–348.
- LIVINGSTONE, D.N. 1995. The spaces of knowledge: Contributions towards a historical geography of science. *Environment and Planning D: Society and Space* 13. (1): 5–34.
- LIVINGSTONE, D.N. 2003. *Putting Science in Its Place: Geographies of Scientific Knowledge*. Chicago, The University of Chicago Press.
- LIVINGSTONE, D.N. 2010. Landscapes of knowledge. In *Geographies of Science*. Eds.: MEUSBURGER, P.,

¹ ELTE Eötvös Loránd University, Institute of Geography and Earth Sciences, Department of Social and Economic Geography, Budapest, Hungary. E-mail: ferenc.gyuris@tk.elte.hu

- LIVINGSTONE, D.N. and JÖNS, H., Dordrecht, Springer, 3–22.
- MAYHEW, R.J. and WITHERS, C.W.J. (eds.) 2020. *Geographies of Knowledge: Science, Scale, and Spatiality in the Nineteenth Century*. Baltimore, Johns Hopkins University Press.
- MEUSBURGER, P., LIVINGSTONE, D.N. and JÖNS, H. (eds.) 2010. *Geographies of Science*. Dordrecht, Springer.
- MÜLLER, M. 2021. Worlding geography: From linguistic privilege to decolonial anywhere. *Progress in Human Geography* 45. (6): 1440–1466.
- PAASI, A. 2015. “Hot-spots, dark-side dots, tin pots”: The uneven internationalism of the global academic market. In *Geographies of Knowledge and Power*. Eds.: MEUSBURGER, P., GREGORY, D. and SUARSANA, L., Dordrecht, Springer, 247–262.
- RADCLIFFE, S.A. 2022. *Decolonizing Geography: An Introduction*. Cambridge, Polity Press.
- SOLARZ, M.W. 2014. *The Language of Global Development: A Misleading Geography*. Abingdon–New York, Routledge.
- SOLARZ, M.W. 2018. Many worlds, one planet: Ambiguous geographies of the contemporary international community. In *New Geographies of the Globalized World*. Ed.: SOLARZ, M.W., Abingdon–New York, Routledge, 54–76.
- TIMÁR, J. 2004. More than ‘Anglo-American’, it is ‘Western’: hegemony in geography from a Hungarian perspective. *Geoforum* 35. (5): 533–538.

GUIDELINES FOR AUTHORS

Hungarian Geographical Bulletin (formerly Földrajzi Értesítő) is a double-blind peer-reviewed English-language quarterly journal publishing open access **original scientific works** in the field of physical and human geography, methodology and analyses in geography, GIS, environmental assessment, regional studies, geographical research in Hungary and Central Europe. In the regular and special issues also discussion papers, chronicles and book reviews can be published.

Manuscript requirements

We accept most word processing formats, but MSWord files are preferred. Submissions should be single spaced and use 12pt font, and any track changes must be removed. The paper completed with abstract, keywords, text, figures, tables and references should not exceed **7,000 words**.

The Cover Page of the article should only include the following information: title; author names; a footnote with the affiliations, postal and e-mail addresses of the authors in the correct order; a list of 4 to 8 keywords; any acknowledgements.

An abstract of up to **300 words** must be included in the submitted manuscript. It should state briefly and clearly the purpose and setting of the research, methodological backgrounds, the principal findings and major conclusions.

Figures and tables

Submit each illustration as a separate file. Figures and tables should be referred in the text. Numbering of figures and tables should be consecutively in accordance with their appearance in the text. Lettering and sizing of original artwork should be uniform. Convert the images to TIF or JPEG with an appropriate resolution: for colour or grayscale photographs or vector drawings (min. 300 dpi); bitmapped line drawings (min.1000 dpi); combinations bitmapped line/photographs (min. 500 dpi). Please do not supply files that are optimised for screen use (e.g., GIF, BMP, PICT, WPG). Size the illustrations close to the desired dimensions of the printed version. Be sparing in the use of tables and ensure that the data presented in tables do not duplicate results described elsewhere in the article.

REFERENCES

Please ensure that every reference cited in the text is also present in the reference list (and vice versa).

Reference style

Text: In the text refer to the author's name (small capitals with initials) and year of publication. References should be arranged first chronologically and then further sorted alphabetically if necessary. More than one reference from the same author(s) in the same year must be identified by the letters 'a', 'b', placed after the year of publication.

Examples: (RIDGEWELL, A.J. 2002; MAHER, B.A. *et al.* 2010) or RIDGEWELL, A.J. (2002); MAHER, B.A. *et al.* (2010).

Journal papers:

AAGAARD, T., ORFORD, J. and MURRAY, A.S. 2007. Environmental controls on coastal dune formation; Skallingen Spit, Denmark. *Geomorphology* 83. (1): 29–47.

Books:

PYE, K. 1987. *Aeolian Dust and Dust Deposits*. London, Academic Press.

Book chapters:

KOVÁCS, J. and VARGA, Gy. 2013. Loess. In *Encyclopedia of Natural Hazards*. Ed.: BOBROWSKY, P., Frankfurt, Springer, 637–638.

Book reviews

Book reviews should be between 2,000 and 3,000 words (including references).

Submission

Submission to this journal occurs online. Please submit your article via <http://ojs3.mtak.hu/index.php/hungeobull/about/submissions>

All correspondence, including notification of the Editor's decision and requests for revision, takes place by e-mail.

Publisher:

Research Centre for Astronomy and Earth Sciences
1121 Budapest, Konkoly Thege Miklós út 15–17., Hungary

Editorial office:

Geographical Institute, Research Centre for Astronomy and Earth Sciences
1112 Budapest, Budaörsi út 45., Hungary

Phone, fax: +36 1 309 2628

E-mail: geobull@mtafki.hu, kovacs.zoltan@csfk.org

Distribution: GABRIELLA PETZ, petz.gabriella@csfk.org

Full text is available at <https://ojs3.mtak.hu/index.php/hungeobull>

Typography: ESZTER GARAI-ÉDLER

Technical staff: FANNI KOCZÓ, ANIKÓ KOVÁCS, GÁSPÁR MEZEI

Cover design: ANNA REDL

Printed by: Premier Nyomda Kft.

HU ISSN 2064–5031

HU E-ISSN 2064–5147

**Distributed by the Geographical Institute, Research Centre for Astronomy and
Earth Sciences**

Subscription directly at the Geographical Institute, Research Centre for Astronomy and Earth Sciences (H-1112 Budapest, Budaörsi út 45), by postal order or transfer to the account IBAN: HU24 10032000-01730841-00000000. Individual copies can be purchased in the library of the Institute at the above address.