

Danube Geo Tour

Valorisation of geo-heritage for sustainable and innovative tourism development of Danube Geoparks

Pilot geoCulture and geoOutdoor products tested

Output Code: 4.3.

“Project co-funded by the European Union”

Programme: Interreg Danube Transnational Programme
PA2: Environment and culture responsible Danube region
Project Duration 01/2017 to 06/2019

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Date: 27.11.2018
Version: 1.0



Project co-funded by European Union funds (ERDF, IPA)
www.interreg-danube.eu/danube-geotour

List of Abbreviations

DTP	Danube Transnational Programme
JS	Joint Secretariat
LP	Lead Partner
PP	Project Partner
WP	Work Package
EGN	European Geoparks Network
GGN	Global Geoparks Network
UGG	UNESCO Global Geopark
TIC	Tourism Information Centre



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1. Introduction

1.1. Background information

Danube GeoTour project aims to “improve management capacities and strategies and to develop practical solutions for the activation of geodiversity/geoheritage and to seize positive market trends for sustainable tourism development in 8 Geoparks of the Danube region”¹. In order to achieve this, one of the challenges is to “seize the potential of Geopark values and brand for socio-economic development while inspiring local residents and small businesses to develop new, sustainable and innovative geoproducts along the defined Danube GeoTour”²

The objective of WP4 is “to increase the capacities of participating Geoparks in creating unique sustainable tourism products and services based on a Geopark’s specific heritage, the involvement of local SMEs, new gamification tools and visitor engagement with a focus that is in line with the strategy on management tourism pressures and the carrying capacity of each individual territory.”³ Thus, the new geoproducts developed are key elements for the success of the entire project.

This document shows how the pilot geoproducts were tested and what results were reached both qualitative and quantitative. The pilot geoproducts were developed and tested in the WP4 in connexion to all other WPs. The basic criteria, the first step in testing the geoproducts were developed in WP3. It also uses the work from WP5, especially in defining “innovative” as mainly a question of interpretation and also in describing the methods of emphasizing the products connexion to Earth. The promotion component of a geoproduct will be developed in correlation with WP6 recommendations. In its turn, these guidelines will be used in implementing the project further by almost all the WPs.

Testing the geoproducts shows a snapshot of a particular new geoproduct in this moment of its development. However, all the tools described and used here are available on the on-line platform in a gamification form. Thus, any time from now, the geopark staff, the partners, SMEs or any other producer may use the assessment tools available on-line to test a geoproduct. This is also helpful for education and training purposes, for any discussion involving the concept of geoproduct.

Each of the Geoparks created and tested a unique product by designing a concept, by engaging, training local providers and/or by developing missing highlights in the geoproduct. Different GeoCulture and GeoOutdoor products were introduced in participating geoparks. Lessons learned are documented, evaluated and made available as models for others in this document and on the on-line platform.

The geoproduct developed by Geopark Djerdap is called “GeoHiking”. The idea is to develop new innovative geoprogram for potential tourists. This product is designed for tourists of all ages and physical shape.

¹ Danube GeoTour Application Form

² Danube GeoTour Application Form

³ Danube GeoTour Application Form

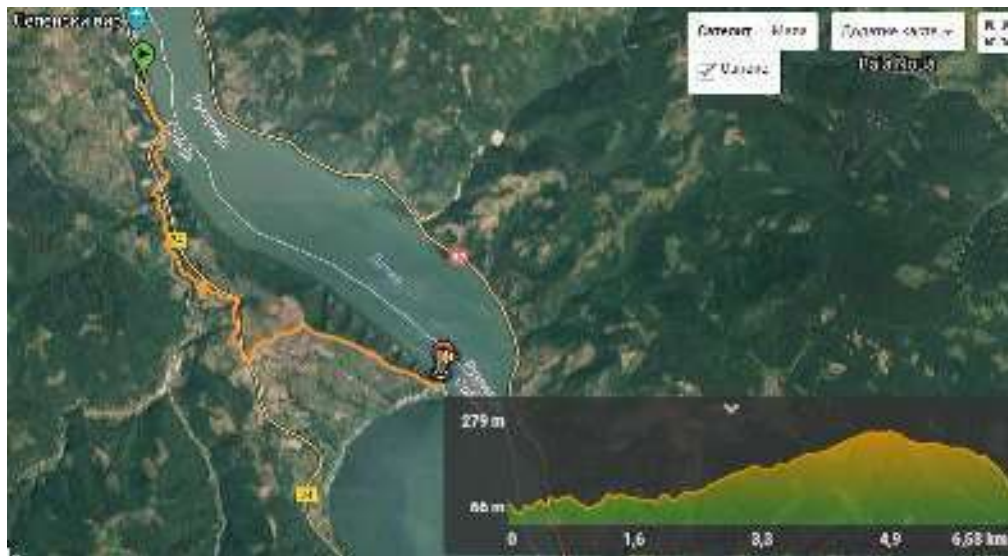


What is characteristic for this site are exceptional geo-morphological forms as well as the site of Mesozoic fossil fauna. This site is rich with remarkable cliffs, canyons and in wider setting with beautiful karst formations, shingles and sandstone. Also, there is to mention existence of silver linden trees, maple and beech forest, lilac and ash tree, so the location is more than attractive for hiking. Geoproduct "GeoHiking" combines many geologically important sites that will be presented in their best form.

Elements of geoproduct "GeoHiking" are: GeoGrebenHike, GeoPloceHike and GeoTekija Center. Geo heritage in site Reef / Canyon of the Boljetin River / Lepenski vir and in site Ploce/ Djerdap gorge are the ground sources for the development of "GeoHiking" in this area. We offer to the visitors:

- Experience one of the miraculous places of geo-morphology and also flora and fauna in Serbia
- Wander along the trails by the Danube river and enjoy in beautiful landscapes, untouched nature and canyon-cliff valleys
- Introduce yourself with Iron Gates gorge – unique natural phenomenon, and its complex network of cliffs, canyons and deep bays. Nature lovers must discover the walls with shingles, limestone and sandstone domination
- Visit Greben (the Ridge), which is a significant geological profile and viewpoint but also "The most beautiful hill in Balkan" as was called on the Geological Congress in Budapest in 1900. From the Ridge you can enjoy the view on gorge "Gospodjin Vir", archeological site "Lepenski Vir", mythological "Treskavac" in Romania and the basin "Donjomilanovacka kotlina"
- Take pleasure in view on the canyon of Boljetin River which owns exceptional geo-morphological forms and also rich biodiversity
- Revel in astounding viewpoint on top of the mountain Miroc, called Veliki Strbac, from which you can see Danube in its narrowest parts. You can also survey unique karst formations all over the place
- Discover how canyon valleys are used in the limestone of the southern Carpathians
- Explore untouched wilderness and nature of the National Park Djerdap. This area is rich in vivid landscapes that you can gaze at
- Enjoy the view on absence of human influence left the geo-morphology and wildlife in this area
- Experience beautiful and unforgettable scenery of the Carpathian mountains- this area is full of stunning places which will delight you





GeoGreibenHike

Figure 1. Map of GeoGreibenHike



Figure 2. Road to the ridge



Figure 3. View from the Ridge



Figure 4. Appearance of Boljetin River



Figure 5. The beginning of the canyon of Boljetin river

GeoPloceHike



Figure 6. Map of GeoPloceHike



Figure 7. View from viewpoint Ploce



Figure 8. View from Veliki Strbac



GeoTekija Center

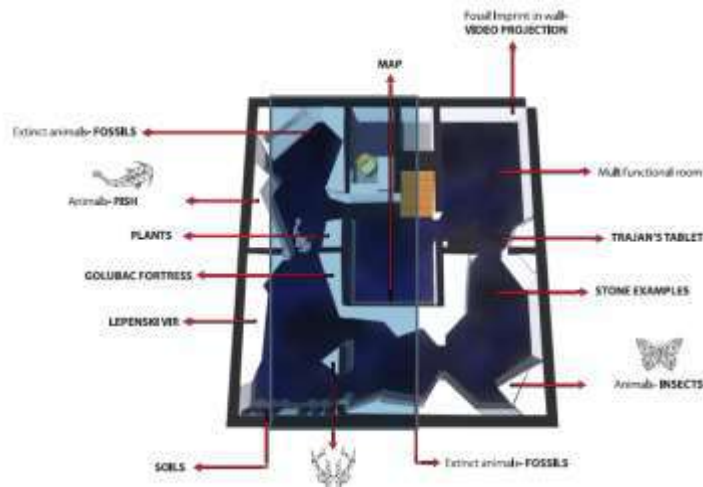


Figure 9. Conceptual design of GeoTekija Center



Figure 10. Conceptual design of equipped GeoTekija Center

The idea of geoproduct "GeoHiking" is to give information about Geopark Djerdap and to make something fresh, innovative and interesting to attract new tourists.

1.2. Methodology

This material was developed using data provided by the partners in the project and by other geoparks in the European Geoparks Network. Most of the data for defining the geoproducts was developed for Output 4.1. *Guideline for development of innovative GeoProducts.*

Other data derives from experiences and lessons learned from ASP and other members of EGN and GGN, the skills and expertise of the geopark managers present in the project as well as all the partners direct contact with local entrepreneurs in tourism, food art and crafts.



For the specific geoproduct tested here “GeoHiking” in Geopark Djerdap the data used was collected directly by experts in the field of tourism, geoheritage and hiking. All data was completed by discussions with the Geopark management and experts. Also, Geopark Djerdap, within the regular consultation process of National Park Djerdap with partner associations and stakeholders, discussed the development of “GeoHiking”. In order to achieve high quality of the geoproduct Aspirin Geopark Djerdap contracted external expert to support development and testing of the geoproduct.

1.3. Summary

The idea of geoproduct “GeoHiking” is to use all the possibilities that beauty of this area offers. “GeoHiking” is innovation for geopark Djerdap which can provide new tourists and useful content.

People can find information tables, and then decide which path they want to go, or which activity do they want to experience. There are focused guideline cards for the visitors about what can be seen and explored.

Main idea is to offer hiking through probably the most beautiful area along the Danube River, the Iron Gates gorge. This is unique natural phenomenon and with many interesting geomorphological forms. Iron Gates gorge consists of complex network of cliffs, canyons and deep bays. The gorge stretches from the rock Babakaj who rises from the Danube close to the Golubac fortress, to the Hydro-power dam close to the town of Kladovo. Iron Gates gorge consists of four smaller gorges and three basins: Golubac gorge, Ljupkovska basin, gorge Gospodjin Vir, basin “Donjomilanovacka kotlina”, the gorge Kazan, the Orsava basin and the Sip gorge, which present extraordinary place to explore. Visitors can discover remarkable landscapes from Greben (the Ridge), from the top of mountain Miroc and by wandering along the trails by the Danube river. Hikers can introduce themselves with canyon-cliff valley and also with interesting karst formations, limestone and sandstone domination. The offer is based on visitors experiencing unforgettable scenery of the untouched nature and absence of human influence based the geo-morphology and wildlife. As tourists follow path in the woods, they can experience highest peaks and beautiful viewpoints on canyon valley, karst formations and caves. Also there is to mention that National Park Djerdap is currently preparing a building in Tekija, which will be geo interpretative center. In this geo interpretative center materials and other information about our geoproduct will be at disposal to the visitors.

“GeoHiking” is something new, attractive and interesting for existing tourists as well as for the potential tourists. This geoproduct is in final phase of preparation. Since hiking is conditioned with seasons, our first offer will take place on spring 2019. Aspiring Geopark Djerdap is in contact with hiking organizations and travel agents offering hiking services and there is a possibility to integrate “GeoHiking” into new offers.

We expect several new partners to get involved.



2. Basic criteria

2.1. Description

Geoproduct is a product that presents the characteristics of a geopark on the market. At the same time a geoproduct can have additional values from nature conservation. In this case, a geoproduct must comply with the principles and standards of conservation of the geological heritage and its promotion in order to improve awareness about the importance of conservation of our GEO heritage. The geological heritage should be recognized through the geoproduct as the geopark's essential element.

The Strategy on Management of Tourism Pressures in Geoparks (shortly Strategy) provides a tool which enables all target groups (visitors, residents, geopark managers and investors) to better plan their activities, understand different impacts of these activities and alternatives which can be used to avoid or reduce negative impacts. The Strategy has to be included to clarify the aspect of nature protection as well as the aspect to contribute to the holistic concept of protection, education, public awareness and socio-economic benefits for sustainable local development. In order to carry out integrated evaluation of geoproducts we had to firstly create the relevant framework and then a methodology for the assessment of impacts of recreational activities on natural heritage.

The framework developed in WP3 can be used as a first and basic qualifier in the first steps of the decision process, which tells us if the product can be defined as a geoproduct. The Strategy also provides a common framework which enables all geopark managers as well as visitors, residents and investors to better plan their activities, understand different impacts of each activity and to be aware of available alternatives which can be used to avoid or reduce negative impacts. The information from the Strategy can be also used to increase awareness of investors and it can help to change their behaviour towards more sustainable patterns in geoproducts. As such it leads to better conservation of natural and cultural heritage and it supports the achievement of the programme specific objective "Foster sustainable use of natural and cultural heritage and resources".

In this way, the Strategy also serve as a framework for the development of joint geoproducts (as a part of WP4).

Nature conservation definitively has to be incorporated to the geoproduct as its intangible value. The evaluation of the geoproduct from the point of nature conservation is essential. The geoproduct has to comply with the principles and standards of conservation of the geological heritage and its promotion in order to increase the visibility of the importance of protecting the geoheritage.

Geoproducts may include various geoheritage and nature conservation aspects, which can be displayed in several ways. Finally a geoproduct may be included/integrated directly as a tangible (mineral raw materials, agricultural product) or intangible (cultural, historical, ethnological) content. Geoproducts can be recognized as an activity or a final market object, available indoor or outdoor.

Four different groups of geoproducts can be distinguished:

- Market objects (souvenirs, food)



- Outdoor activities (guiding for groups/individuals in nature; rafting, biking, hiking, riding, water activities, mines and caves visiting, camp schools)
- Indoor activities (indoor programs in museums, info centres, restaurants, tourist farms)
- Small interpretation infrastructure dedicated to specific local heritage items (houses, dinostops, geotrails) developed and managed in partnership with local partners.

2.2. Application

Question 1: Is a geoproduct developed according to the actual legislative framework and it does not cause any damage to nature?

If the answer is YES:

→ follow the assessment. The product:

1. has strong tangible connection to local geodiversity or **geological heritage** (geosites, fossils, minerals, rocks, mines, quarries, caves, geologic processes or phenomena...) YES/NO
2. has strong intangible connection (historical, ethnological, cultural) connection to local geodiversity or **geological heritage** YES/NO
3. increases awareness of users about the importance of protecting geological heritage. YES/NO
4. encourages and helps the user to engage/involve in nature conservation. YES/NO
5. is produced in a sustainable way, it is made from recycled or/and local materials. YES/NO

If the answer is NO:

→ contact to your geopark or follow the *Recommendations for residents, visitors and investors on behaviour and sustainable use of geodiversity in Geopark*

In the case of the geoproduct “GeoHiking” the answer is yes, it follows the legislative framework and it does not cause any damage to nature

1. **YES** it has strong tangible connection to local geodiversity and **geological heritage** It is connecting various geosites in the area of the Geopark Djerdap and is presenting the huge geodiversity and geological heritage of site. Hiking paths leads through different areas - from the valley of the Danube river to the top of the mountains. Passing through those paths visitors can discover many geo heritage objects.
2. **YES** it has strong intangible connection (historical, ethnological, cultural) connection to local **geodiversity** by showing how canyons, ridge and valley changed through thousands of years. It can be seen in karst formations which are consequence of the liquid and atmospheric water on the walls. Looking at



the Treskavac peak, 7000 years old settlements of Mesolithic people were inspired to settle here.

3. *YES it increases awareness of users about the importance of protecting geological heritage and the importance of geodiversity. Geoproduct "GeoHiking" leads visitors through most beautiful places of the site, presenting all information about formation and development. The information centres and guides provide information on the importance of protecting the geological area, so that remains as it is.*
4. *YES it encourages and helps the user to engage/involve in nature conservation. "GeoHiking" provides awareness rising on environmental protection and also encourages users to an active engagement in nature conservation. It is a part of our guided tours to make people aware of taking care for nature conservation and be an active part of it.*
5. *YES it is produced in a sustainable way, local resources/materials were used. Geoproduct is produced in a sustainable way by using existing paths and local resources and consulting different sectors.*

3. Qualitative assessment

3.1. Description

Geoproduct is a new term appeared along with the geopark philosophy. It is usually used in the context of a geopark's socioeconomic involvement along with geotourism and geodiversity. Its understanding varies from a broad perspective to one of the most concrete result of the geopark concept implementation.

In the most extensive definition, the geoproduct is considered a potential geotourism focus point⁴, usually a geological attraction. The more focused definitions mention a geopark connexion and include local, manmade products as well as the dialogue between tourists and local heritage. For example, Farsani et al. (2012) define geoproduct as:

Local products related to geopark activities and symbols of geological and geomorphological heritage of the geopark. Geoproducts which are made based on geological elements of geoparks not only introduce the local products and the local handicrafts as cultural components to tourists, but also increase the public knowledge of tourists about geology.⁵

If we discuss the main attributes of a product⁶, then we have to consider three aspects which the geoproduct must comprise in order to be a product:

- It has to respond to a need,
- It has to be created, constructed through a production process,

⁴ **Complova, M.**, 2010, *The identification of geoproducts in the village of Jakubany as a basis for geotourism development*, Acta Geoturistica, volume 1, number 1, 51 – 56

⁵ **Farsani, T., Coelho, C., Costa, C., Carvalho, C.**, 2012, *Geoparks and Geotourism. New approaches to sustainability for the 21st century*, BrownWalker Press, Boca Raton

⁶ <https://www.merriam-webster.com/dictionary/product>



- It has to be marketable and sold.

These characteristics bring the term geoproduct closely to a practical and economical approach, it defines it more clearly and focuses on its necessity as a tool for socioeconomic development through geoparks. This perspective underlines the role of geoparks in achieving social, economic and cultural sustainability and in coping with pressure from the sociocultural impact of tourism.

On the other hand, a geoproduct is not simply another product sold in a geopark. A geoproduct comes with a deep connexion to Earth on a local level and with a strong sense of identity. Each geoproduct is unique in its construction with a story about people and the place they inhabit.

As a result, we find that the philosophy of a geoproduct takes into account three axes: identity, management and production. If we see it as a graphic model, then the geoproduct finds itself at the intersection of these three axes (Fig. 1).

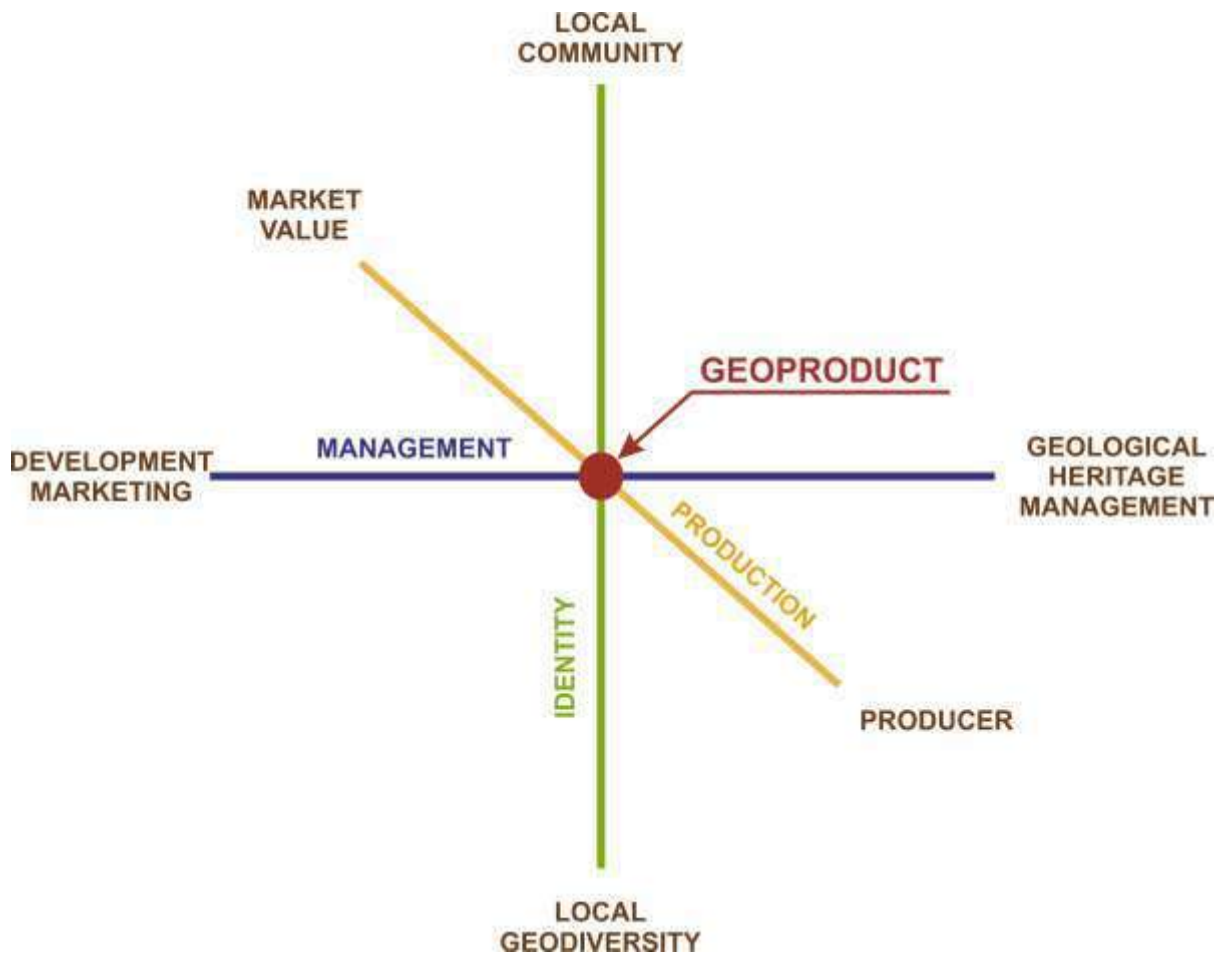


Figure 11. The philosophy of the geoproduct

Identity Axis

A geopark territory is a complex structure made of ecological, socio-economic and cultural realities, shaped by its geodiversity, biodiversity and historic evolution. The sum of them is generating the local identity made of tangible and intangible heritage. The tangible



heritage is mainly related to local geodiversity like raw materials, relief, mineral resources and soils. Intangible Cultural Heritage, as defined by UNESCO, 2003⁷ means:

...the practices, representations, expressions, knowledge, skills – as well as the instruments, objects, artefacts and cultural spaces associated therewith – that communities, groups and, in some cases, individuals recognize as part of their cultural heritage. This intangible cultural heritage, transmitted from generation to generation, is constantly recreated by communities and groups in response to their environment, their interaction with nature and their history, and provides them with a sense of identity and continuity, thus promoting respect for cultural diversity and human creativity.

One of the key requirements² for a UNESCO Global Geopark is to have sites and landscapes of international geological significance managed with a holistic concept of protection, education and sustainable development. A UNESCO Global Geopark uses its geological heritage, in connection with all other aspects of the area's natural and cultural heritage, to enhance awareness and understanding of key issues facing society, such as using our Earth's resources sustainably, mitigating the effects of climate change and reducing the impact of natural disasters. By raising awareness of the importance of the area's geological heritage in history and society today, UNESCO Global Geoparks give local people a sense of pride in their region and strengthen their identification with the area. The creation of innovative local enterprises, new jobs and high quality training courses is stimulated as new sources of revenue are generated through geotourism, while the geological resources of the area are protected.

The Identity axis expresses local cultural and historical identity generated during centuries or millennia by the continuous interaction between local community and natural environment. On the other hand, this axis is revealing one of the main goals of a geopark to cooperate with communities and to identify innovative approaches in order to re-appropriate tangible and intangible heritage values and to revive and strengthen the local cultural identity, in respect to sustainable development principles.

The identity axis is the axis of product development. Is the way a producer is using directly or indirectly local geodiversity components, local knowledge and market needs in the geopark context. This process is part of the cooperation between geopark team and local entities which could be associations, companies, private persons, artists, freelancers, museums, schools, etc.

Management Axis

The management axis is the way to transform a geoproduct in a market good, a product to be sold directly or indirectly and to generate benefits. The benefits are both direct incomes and indirect and induced ones that contribute to geopark promotion, strengthen of local identity and socio-economic development.

Each Global Geopark is using the UNESCO Global Geoparks logo which is one of the most powerful brands in the world in order to develop a local brand of quality for its territory. The management axis is reflecting the way a geoproduct is using the geopark brand to increase its value and also the role each new geoproduct is playing in strengthening the geopark brand. The management axis is expressing the cooperation between the geopark team and the producer of a new geoproduct. In some cases the producer is the geopark team. The management axis is reflecting the main philosophy of Global Geoparks: *Celebrating Earth Heritage, Sustaining local Communities*. Each

⁷ UNESCO, 2003. *Intangible Cultural Heritage*

geoproduct is embedding a part of local geodiversity or geoheritage and in the same time is contributing to local socio-economic development.

Production Axis

This vector represents the organisational aspect of a geoproduct. The Geopark has to encourage entrepreneurship of local partners and to provide to them the context presented by the other two axis. The production axes starts with a producer, an entity able to provide a service or create a product in a legal way and in close cooperation with the Geopark. The direction of the axis is the actual profit from the products and services. In the case of the Geopark being also the producer of a geoproduct, the benefits can be other than financial: awareness, promotion, community involvement etc.

The philosophy of the geoproducts uses axes to show the whole concept as a process. The Geopark team has to manage the process and evaluate its position on each of the axis. The partners (SMEs, NGOs and others) base their business in geoproducts on the identity and management axis and contribute to the development of the production axis.

In conclusion, figure 1 shows a geoproduct at the intersection of the three axis. The identity axis is expressing the innovative way in sustainable use of local resources, the management axis reflecting the capacity of a geopark team to support geoproducts development and sale in the benefit of producer and local communities and the production axis shows the process of constructing the offer by a geopark partner.

In the creation and development of geoproducts, geopark managers and local entrepreneurs must start from the philosophy described in the previous chapter. Then they must follow the most important three requirements of a geoproduct (Fig. 2):

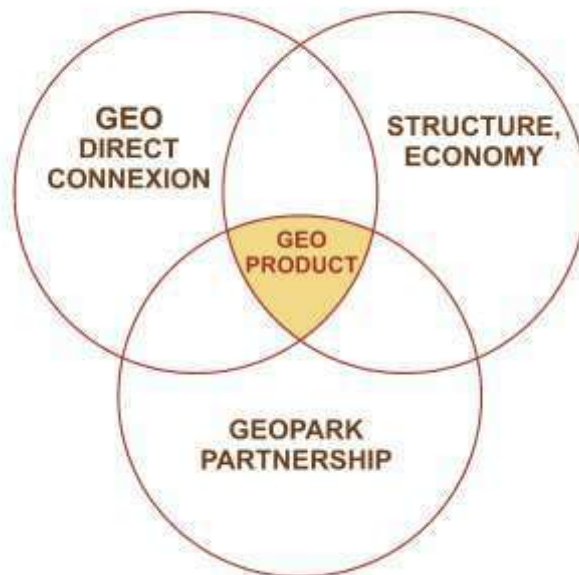


Figure 12. The requirements of the geoproduct



In addition to the main three requirements, the newly developed geoproducts have to respect sustainable standards and communicate these values to their users, visitors and thus help raise awareness on the importance of protecting and valorising the area's geodiversity, natural and cultural heritage in a sustainable way.

Geoproducts creation and development will also consider and respect specific needs of people with disabilities or elderly people and thus increase potential for these groups to have access to geoheritage. The design of these products and their management have to reflect equal chances and inclusion of all categories.

3.2. Application

Geo direct connexion

“Geo” (Gaia / Gaea in Greek) is the personification of Earth. Represents natural characteristics of a territory, whether is the local geodiversity, or biodiversity. Cultural values or tangible and intangible heritage being the human appreciation and use of these characteristics. Geo direct connexion requirement assures that the product is not only a geographical designation – “produced in the geopark” – but it has a deep meaning and an interpretation. The geoproduct must be a sentence in the dialogue between Man and Earth. Sometimes this connexion is only a matter of interpretation. Many products developed today in geoparks can be transformed into geoproducts with ease, if the proper interpretation of their connexion with geology or local identity is added.

A good example for this requirement is the GeoFood label⁸. This designation, managed by Magma UGG, is more than just another ecolabel.

GEOfood products must have strong connection with the local Geological Heritage, specific brief information concerning this connection must be provided in the food products and in the GEOfood restaurant menus through written information (ex: potatoes or vegetables that grown in fertile sandstones which were formed by glacier movement during the last Ice Age; olive oil produced from olives grown in Jurassic marls that were deposited in the ancient Sea of Tethys, salt from the ancient Sea, bread from grain growing in the Geopark soil due to special geological phenomena, etc.).

Geoproduct “GeoHiking” fulfils this requirement by interpreting one geologic process that led to the formation of the Iron Gates gorge, and by interpreting many geologically important sites which surround it, presented in an interesting form. There are exceptional geo-morphological forms, the site of Mesozoic fossil fauna, various forests and plants. The geoproduct “GeoHiking” has strong geo direct connection because main content of hiking includes presenting geodiversity and Geo sites of the area: karst formations are in many specific places, geomorphological forms and caves which include beautiful cave decorations-stalactites and stalagmites, fossils, rocks, landscapes, geomorphological diversity as well as biodiversity and cultural sites. Path for hiking leads tourists through important natural and cultural site. All important facts about geological, cultural and natural features are at disposal to the visitors.

⁸ <https://www.geofood.no/>



The idea is based on presenting Iron Gates gorge, which is formed as Danube river flows through South Carpatians, in the area between Pannonian plain and Vlach-Pontic plain on east. South side belongs to Serbia and the north side belongs to Romania. The gorge stretches from the Babakaj rock, rising from the Danube in the direction of the Golubac fortress, to the Hydro-power dam close to the town of Kladovo. It actually consists of four smaller gorges and three basins: the Golubac gorge, the Ljupkovska basin, the gorge Gospodjin Vir, the basin "Donjomilanovacka kotlina", the gorge Kazan, the Orsava basin and the Sip gorge, which present extraordinary place to explore. Therefore, Iron gates gorge consists of complex network of cliffs, canyons and deep bays. The gorge is also polygonal, polyphase, transverse, deep and partly canyon. The upper part of the gorge used to be the lake of the Pannonian Sea, which had reached the Pontian Sea. The lower parts of the gorge are the result of the Danube erosion. In the Golubac gorge, from the bottom of the Danube River, rocky parts are rising. Viewpoints that can be visited allow visitors to discover how canyon valleys are used in the limestone of the southern Carpathians. "GeoHiking" allows tourists to enjoy nature beauty of Boljetinska River Canyon which is significant as geoheritage object, because it reflects a complete geological history of this part of Europe, from Paleozoic to Cenozoic. Also, there are Veliki and Mali Strbac to be mentioned, as the highest peaks of mountain Miroc, from which there is view on Danube river in its narrowest parts.

Structure and economic viability

Structure and economic viability means that the geoproduct has to live up to its "product" part of the term. It has to be constructed ("produced") as a marketable product meant to be sold. Of course that in some cases the geoproducts are not sold per say, instead they belong to the geopark administration's educational offer, or they are provided along with other services. In order to be a geoproduct, the object or service doesn't have to be actually sold, but to have the construction and economic viability which allow it the possibility to be sold. For example, an educational program from the educational offer of a geopark can be considered as fulfilling this requirement by asking the question: would this program be viable if it were to be sold by someone to tourists?

The viability is the health assurance of the geoproduct – it can only exist if it is bought. This means it has to be adapted to market demands, it has to continuously address the needs of the buyers and it has to have the adaptability to focus on new trends and requirements.

The geoproduct "GeoHiking" in the Aspiring Geopark Djerdap has strong geo direct connection and it is created as a very good selling product. As part of marketing strategy there were info cards made. Flyers and other information will be at disposal in geo interpretative center in Tekija. There are guidelines on use and development of the geoproduct, and the website also provides all information about program tours, prices and reservations. Visitors will find a wide variety of descriptions in the infocentres and at the different info points, on the geoapps, or on written records (leaflets, interpretation panels), and on Facebook page Geopark Djerdap.

As for the economic viability, it is observed the development of this program from the aspect of effectiveness and efficiency. Business effectiveness implies achieving the market goal (to offer a service for which there exists need), and geoproduct "GeoHiking" is high qualified for that. Hiking is core offer in this site, and there is high



request for existence of such offer. Efficiency means achieving maximum results with minimal investment (doing things in the right way), and “GeoHiking” also fulfilled this request. Hiking tours are carefully designed, which can be seen through fact that Geopark management also offers guided tours, with special skilled hiking guide. The costs of engagement of the guide will be fully justified by the income generated by each hiking tour.

According to research, retained profits representing an increase in engaged capital will be very satisfactory.

We have also examined the competitive efficiency of this product, and according to our indicators, this product has the potential not only to parry, but also to outstrip the offer of similar geoparks, owing to unusual geomorphology of this area.

Geopark partnership

The geological connexion and the economic viability would describe only a good business idea without the active role of the geopark. This is the reason why the third important requirement for geoproducts is to have the geopark partnership. Of course, this applies when the geopark is not itself the provider of the geoproduct.

The geopark’s role as a partner of the geoproduct provider is to assure the quality of the geoproduct and the conditions in which the selling process takes place. This will eliminate opportunistic initiatives of low quality products made to look like geoproducts. It will also make sure that the production process is made with care for the heritage and environment and that it respects the culture and needs of all people, especially vulnerable groups.

In the design of new geoproduct GeoHiking in the geopark Djerdap, the Geopark management, Geopark partners and external experts were involved. As the Aspiring geopark Djerdap was managed by the National Park Djerdap, the existing Park Partnership Platform was used. The existing cooperation platform includes hiking associations and tourist organizations.

4. Quantitative evaluation

4.1. Description

The evaluation process starts from the basic idea that a geoproduct is representing the tool a geopark has to develop in order to contribute to the holistic concept of protection, education, public awareness and socio-economic benefits for sustainable local development.

Testing and evaluation are connecting four key elements defining a geoproduct: Earth resources, Geopark management, Local community, Geoproduct development.



The questionnaire has five sections from A to E, each section with a set of elements to be self-evaluated on a scale from 1 to 5. The values are: 1 – low degree; 2 – quite low; 3 – medium; 4 – quite high; 5 – high degree. According to the Logic Matrix:

LOCAL COMMUNITY	Contribute to social entrepreneurship approach of the geopark	Documented relation geo-bio-cultural	Tells a story about local community	Enhances local cultural heritage	GEOPRODUCT DEVELOPMENT AND MARKETING
New local products strongly related to geopark territory				Integration in geopark's marketing strategy	Connects to the marketing strategy
Connects to geodiversity and geoheritage interpretation			Quality assurance by geopark labeling		Involves the geopark in the product process
Integrates into geopark's promotional strategy		Common advantages based on a partnership agreement			Contribution to the promotion of the geopark values
Results from geopark's involvement in the community (trainings, seminars, programs)	Assures novelty and innovation				Impact evaluation
GEOLOGICAL HERITAGE MANAGEMENT	Contribute to Geodiversity Action Plan Development	Identify all potential values of geoheritage	Tangible and intangible themes	Assessment of local geodiversity	LOCAL GEODIVERSITY

Table 1. Logical matrix in development and assessment of a geoproduct

4.2. Application

Section A - Any geoproduct has to be connected to local geodiversity / geological heritage and to have a geological story (in a broad sense). Local geological assets are identified and



defined based on scientific research and a coherent management plan guides the conservation and interpretation of geological features. It sets the geological scene, looks in detail at the geological heritage in the geopark territory, details opportunities to explore and celebrate the local Earth history.

A1. How well are the geological assets / subjects related to the geoproduct documented from the scientific point of view?

1 – not documented; 5 – Very well documented

5, they are very well documented, because there were included experts from Institute for Nature Conservation and Ministry of Environment.

A2. In what degree the geoproduct contains both tangible and intangible components of the geological asset/s?

1 – not having both elements; 5 – Very well integrating the two elements

5, The integration of both tangible and intangible components are on high level because geopark Djerdap has very rich local heritage, and because here the main potential is precisely this tangible and intangible heritage

A3. Does the geoproduct tell all the possible stories on the specific geological asset?

1 – very few stories; 5 – the whole story

5, It says the full story which is taken from scientific resources/fields and adopted for the tourism and promotional usage.

A4. In what degree are those geologic assets part of a geodiversity action plan / geoconservation plan developed by a Geopark?

1 – they are not in a plan; 5 – all of the assets are part of a clear plan

4, Geoconservation is at high level within the Geopark Djerdap and it is integrated in our yearly and multi-year planning documents

Section B - A geoproduct has to incorporate a story of local people and could contribute to connect geological heritage with local community.

B1. In what degree is the geoproduct created and developed by a local company / person / producer?

1 – not a local company; 2 – most parts of the geoproduct are not created/developed by a local company/producer; 4 – most parts of the geoproduct are created/developed by a local company/producer 5 – totally created and develop by a local company

4, Idea for development of our geoproduct came from local community and initial steps were discussed within the local stakeholders. For the extensive development of the geoproduct we had support from expert association who is working in the area of geopark Djerdap

B2. In what degree the connections between the identified geologic asset/s and natural and cultural heritage are documented?

1 – not documented; 5 – Very well documented



5, The area is extremely rich with natural and cultural heritage and is inseparable part of any tourism offer here. And since we based our product on geological assets, connection with natural and cultural heritage is inevitable

B3. Does the geoproduct tell more than a geological story?

1 – only the geological story; 5 – many other stories connected to geology

4, Yes, the geoproduct tells much more than just a geological story. There are local beliefs about the founding of certain places within the geopark. Our geoproduct implies the involvement of a guide who will tell the visitors these stories

B4. In what degree is the geoproduct directly connected to a specific community / person/s?

1 – not directly connected; 5 – Very well connected

4, Yes, the interaction between border regions from Romania and Serbia permitted to create a characteristic community in the geopark Djerdap. Many stories are developed about the history of these community and their direct contact with the Gorge and life in it.

Section C - A geoproduct has to have a practical and economical approach, as a tool for socioeconomic development inspired and supported by the geopark development.

C1. In what degree is the geoproduct new and innovative?

1 – not new; 5 – totally new and innovative

5, There are no geoparks in Serbia nor in the vicinity, and any offer regarding this geotour is innovative

C2. How detailed and clear has the geopark identified different types of partnerships in geoproduct development (e.g. produced by the geopark, supported by, produced in the territory of the..., etc ?

1 – not a single partnership; 5 – clear and detailed partnerships

4, Local stakeholders in tourism and nature conservation were consulted during the preparation phase of the geoproduct. As the geopark Djerdap was managed by the National Park Djerdap, the existing Park Partnership Platform was used

C3. Did you use the geopark's geoproduct development criteria defined by the Geopark in the geoproduct development?

1 – not defined/used; 5 – Very well defined/used

3, The criteria are in preparation since the Djerdap has not yet been declared as a geopark. However, we have used the criteria that were available to us from other geoparks

C4. Is the geoproduct sold in regular events (geo-fairs) organized by the geopark dedicated/integrating local geoproducts?

1 – no; 5 – frequent events clearly targeted

4, National Park Djerdap as manager of geopark has its regular visits to certain fairs. In 2018 the draft version of geoproduct was presented in tourism fair in Novi Sad. As well,



geoproduct was presented at two local festivals where National park Djerdap was part of the organization

Section D - A geoproduct is not simply another product sold in a geopark. A geoproduct comes with a deep connexion to Earth on a local level and has to generate interest and respect for the Earth pro-cesses that generated local geodiversity

D1. In what degree local producer/s are inspired by the local geodiversity / geoheritage in developing new products?

1 – very low; 5 – very high

5, They were fully inspired by the local geoheritage, because innovation of the geoHike has a chance of success on the market. This product represents the potential of the area in the right way

D2. In what degree the geoproduct/s are connected or supported by the interpretation infrastructure of the geopark (taking into consideration geological and cultural components of the geopark territory)?

1 – not connected or supported; 5 – Very well connected and support-ed

5, Geoproduct is connected and supported by the interpretation infrastructure of geopark in fully manner, since geoproduct is at highest level of tourism development in National Park Djerdap. National Park Djerdap is adapting a part of the building in Tekija to act as geo interpretation center and here geoproduct will be highlighted.

D3. In what degree the new geoproduct/s are promoted by the geopark?

1 – very low; 5 – very high

4, There are existing promotional cards with information for visitors, and also geoproduct was presented on tourism fair. National Park Djerdap has a tourism department where the promotion of geopark is integrated in annual plans

D4. In what degree were the producers involved in training courses and/or regular meetings as part of the geopark activity plans?

1 – not at all; 5 – they are very much involved

3, We had consultation process with local stakeholders on the regular meetings of National Park Djerdap

Section E – A geoproduct is a combination of market opportunities generated by the geopark activities in tourism development and the ability to generate emotions of visitors to be interested to buy new products related to local Earth and people stories.

E1. Is the developed geoproduct connected to the geopark marketing strategy?

1 – very low connection; 5 – very high connection

3, Geoproduct development is integrated in promotional plans of National Park Djerdap

E2. In what degree is the geopark involved in development, marketing and selling of the geoproduct?

1 – very low; 5 – very high

4, The geopark is highly involved in development, marketing and selling of the geoproduct. National Park Djerdap coordinated development and marketing and had consultations with business sector about selling of geoproduct

E3. Does the geoproduct contribute to the promotion of the geopark values?

1 – very low contribution; 5 – very high contribution

5, Geoproduct interprets the geological values of the park by putting them on use to visitors when using the geoproduct

E4. Is there any established mechanism to evaluate the geoproduct impact (financial, appreciation, satisfaction, recognition, etc.)?

1 – no; 5 – a very well developed mechanism

2, The mechanism is under creation, it is planned for the next year to be operational

LOCAL COMMUNITY	B1 - 4/5	B2 - 5/5	B3 - 4/5	B4 - 4/5	GEOPRODUCT DEVELOPMENT AND MARKETING
E1 - 3/5				C4 - 4/5	D1 - 5/5
E2 - 4/5			C3 - 3/5		D2 - 5/5
E3 - 5/5		C2 - 4/5			D3 - 4/5
E4 - 2/5	C1 - 5/5				D4 - 3/5
GEOLOGICAL HERITAGE MANAGEMENT	A4 - 4/5	A3 - 5/5	A2 - 5/5	A1 - 5/5	LOCAL GEODIVERSITY

TOTAL = 83/ 100

Table 2. Logical matrix used for the “GeoHiking”



5. Customer satisfaction

We had organized testing tour on new geoproduct "GeoHiking". Participants were teachers and students from school of tourism. After testing tour, we got first positive impression about our geoproduct. They were impressed by stories heard from guide related to history and development of this site. Also we got positive feedback on appearance of the area and pleasure that stay in this area can provide. Visitors were very happy to interact directly with features, and they were very happy about how this geoproduct is convenient for people of any age or level of learning. This is a very good opportunity to raise awareness and knowledge about geological and other natural connected features of the Geopark Djerdap.

As for negative remarks, some of the visitors complained about lack of toilets and lack of water during hiking.

6. Conclusions and recommendations

6.1. Conclusions

On the basis of the guidelines developed through the project Danube GeoTour, we developed a new geoproduct named "GeoHiking" in the Geopark Djerdap. This new product will contribute to the further development of tourist offer, and also economic development of the area. Our offer is attractive because it promotes geological, cultural and natural heritage. The geoproduct we presented fulfils basic requirements for geoproducts-strong and direct connection with local geodiversity and local cultural heritage. "GeoHiking" presents many geologically important and interesting sites in a very good form.

Our geoproduct was created because it was not only needed, but also requested by tourists who are nature lovers and who also want to have full tour with guides. Guides are willing to share information about specific places and explain interesting facts of development and changing in relief through the history. Main content of hiking includes presenting visitors geo diversity and geo site of the area: karst formations, geo-morphological forms, caves which include beautiful cave decorations, fossils, stones. "GeoHiking" can be a single tourism package or can be merged with other offers in Geopark Djerdap.

Geoproduct "GeoHiking" is not only a market oriented, but also presents local culture and cultural heritage. It was tested and got positive feedback, with very fewer negative comments.

We are happy that we made this an actual selling product, to the satisfaction of both visitors and developers of the product.



6.2. Recommendations

- Integrate geoproduct concept in the geopark's strategies
- Integrate the developed geoproducts in all promotion tools and materials of the geoparks
- Have geoproduct tested and get feedback
- Adjust and improve geoproduct
- Permanent cooperation between Geopark management team, external experts and partners
- Have a strong regional partner
- Make guideline of next steps and goals
- Update the promotion of the geoproduct every once in a while

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8. Annexes



GEOHIKING Đerdap



Geopark Đerdap se nalazi u jugoistočnoj Evropi, tj. u severno-istočnom delu Republike Srbije, na samoj granici sa Rumunijom.

Geopark se prostire na površini od 1330 km², što je 692 km² više od površine Nacionalnog parka Đerdap.

Geopark Đerdap, prema istoimenoj klsuri Dunava preseca planinski venac Južnih Karata i povezuje Panonski i Vlaško-Pontijski basen. Naziva se i još Gvozdenim vratima, odnosno Gvozdenom kapljom. Naziv Đerdap takođe nosi i ime Nacionalnog parka osnovanog 1974. godine. Geopark Đerdap obuhvata sre područje, sa izraženijm geodiverzitetom i većim brojem objekata geonasleda u odnosu na Nacionalni park.

GEOHIKINGDJERDAP.RS

Đerdapska klsura (Gvozdena vrata)



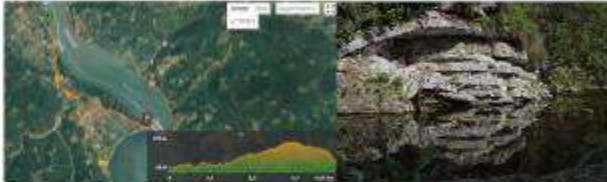
Đerdapska klsura predstavlja geomorfološku osovinu celog područja Đerdapa. Formirana je usecanjem Dunava kroz Južne Karate, na prostoru između Panonske nizije na zapadu i Vlaško-Pontijske nizije na istoku. Sa dužinom od preko 100 km, najduža je probojnica u Evropi. Njena južna strana pripada Srbiji, a severna Rumuniji. Klsura se proteže od stene Babakaj, koja štrči iz Dunava u pravcu srednjovekovne Golubačke tvrđave, do sela Gura Vaj u Rumuniji. Ona se zapravo sastoji od četiri manje klsure i tri kotline, u sledećem poretku: Golubačka klsura, Ljupkovska kotlina, klsura Gospodin vir, Donjomilanovačka kotlina, klsura Kazan, Oršavska kotlina i Sipska klsura.

Njen geološki sastav je raznovrstan, ali među stenama dominiraju škriljci, kračnjaci i peščari.

GeoGreben Hike

Geonasleđe na lokalitetu Greben / Kanjon Boljetinske reke / Lepenski vir.

Dužina: 2,4 km
Prosečan nagib: 5%
Težina: Laka staza



Greben je značajan geološki profil i vidikovac, odnosno „najlepše brdo na Balkanu“, kako ga je nazvao Jovan Žujovic još 1900. godine. Nalazi se na kraju Boljetinskog brda, duž obale Dunava, na nadmorskoj visini od 119 m. Kreće sa Đerdapske magistrale na Boljetinskom brdu na 230 m nadmorske visine, nastavlja šumskim putem sve do Grebena na 192 m nadmorske visine. Vidikovac Greben, nazvan „najlepšim bregom na Balkanu“ na Geološkom kongresu u Budimpešti 1900. godine, zbog svoje geološke vrednosti često se naziva i „bukvarom za geološku istoriju“ ovog dela Podunavlja. Sa Grebena se vidi klisura Gospođin vir, arheološki lokalitet Lepenski Vir, mitološki Treskavac u Rumuniji i Donjomilanovačka kotlina.

GEOHIKINGDJERDAP.RS



Lokalitet obuhvata klisuru Boljetinske reke neposredno pre ušća u Dunav, padine Vlasca i Boljetinskog brda. Iako nije veliki po površini, lokalitetu „Kanjon Boljetinske reke“ je od velikog naučnog značaja. Osim vegetacijskih vrednosti koje su gotovo istovetne lokalitetima „Lepenski vir“ i „Čoka Njolta“, ovaj lokalitet ima i izuzetne geološko-morfološke oblike, a predstavlja i bogato nalazište veoma značajne mezozojske fosilne faune.

Vegetacijski mozaik koji se može videti na Grebenu i u kanjonu Boljetinske reke, na prvom mestu, čine različite šumske zajednice sladuna, cara, grabica i dr. Na malim rastojanjima smenjuju se šume srebrne lipa sa različitim javorovim, zatim šume srebrne lipa sa bukvom i jorgovanom, zatim jaseu, kibrnjak, maklen i dr. Posebnu vrednost imaju šume koprivica – mediteranske vrste sa najsevernijim arealom rasprostranjena u Srbiji i erabom koji se nalaze na stazi prema arheološkom nalazištu Lepenski vir.

Na ovoj stazi prisutne su i druge retke vrste biljaka, od kojih su mnoge zaštićene.

Staze vodi pored starog puta i na njoj se pored navedenog mogu videti i objekti stare arhitekture i nasleđa, dok se sa krajnje tačke prostire izuzetan pogled na donjomilanovačku kotlinu.

GeoPloče Hike

Informacije o geonasledu na lokalitetima
Ploče/Đerdapska klisura

Dužina: 7,6 km
Prosečan nagib: 15%
Težina: Srednje teška staza



Kreće sa Đerdapske magistrale na mestu zvanom Pecka bara na 89 m nadmorske visine. Prolazi kroz naučno najinteresantniji i turistički najatraktivniji deo NP Đerdap, koji sjedinjuje veliki broj prirodnih retkosti i vrednosti. Završava na vidikovcu Veliki Štrbac na 768 m nadmorske visine, najvišem vrhu planine Miroč sa koga se pruža pogled na Dunav u njegovom najužem delu.

GEHIKINGOJERDAP.RS



Ovaj šumovito-kameniti kompleks Veliki i Mali Štrbac sa priobalnim delovima oko Dunava i prostorom oko kulturno-istorijskog oboještja „Trajanova tabla“ nalazi se na teritoriji opštine Klodovo, a stazom se iz područja opštine Majdanpek prelazi na lokalitet Ploče preko Alibagovog potoka. Predeo se karakteriše izuzetnom raznovrsnošću staništa biljnih zajednica koje su reliktnog tipa, bogatog i mešovitog sastava i vrlo složene strukture. U pogledu prirodnih lepota, ovi prostori čine jedinstvenu i neponovljivu celinu Đerdapske klisure. Raznovrsnost biljnih zajednica i staništa na ovom prostoru je veoma velika. Najzastupljenije i veoma dobro očuvane su šume sa mećmom leskom ali su prisutne i mnogo druge retke i endemične vrste kao što su tisa, koprivica, maiklan ruž, jorgovan i dr. Ovide se nalaze niske šume i šibljac, kao i visoka šuma bukve u čistom i mešovitom sastavu sa grabom i hrastom kitnjakom.

Sa ove staze prostiru se dva najlepša pogleda na Dunav koji je na ovom mestu najuži (170 m) i sa najvećom rečnom dubinom u Evropi (preko 100 metara).

Prvi pogled je sa oko 350 m nadmorske visine, dok se drugi nalazi na samom završetku staze - na Velikom Štrpcu, kao najvišem vrhu planine Miroč (768 mnv).