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THE GEOHERITAGE OBJECTS ALONG CORRIDOR 10 IN THE REPUBLIC OF MACEDONIA AS AN EXAMPLE IN THE ADDITIONAL EDUCATIONAL PROCESS OF GEOGRAPHY

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ABSTRACT

The objects of the geoheritage with their representativeness, authenticity and diversity, as well as their way of genesis can have an educational purpose. This paper will present ten objects of geoheritage that are located in the immediate vicinity of Corridor 10 on the territory of the Republic of Macedonia, and they can serve as an example in the additional educational process in the teaching of geography. Objects of geoheritage can be a very important resource in the geo-educational process.

Key words: objects of geoheritage, corridor 10 in the Republic of Macedonia, educational purpose

INTRODUCTION

In the course of geography education, that is, in the part where physical geography is studied, the geological, geomorphologic, hydrological, climatic, soil and biogeographical processes and phenomena are also studied. As a result of that, the characteristic or specific features of the objects of geoheritage are being emphasized. Geoheritage encompasses global, national, state-wide, and local features of geology. This includes all intrinsically important sites or culturally important sites offering information or insights into the evolution of the Earth; or in the history of science, or that can be used for research, teaching, or reference. As geoheritage focuses on features that are geological, the scope and scale of what constitutes Geology, such as its igneous, metamorphic, sedimentary, stratigraphic, structural, geochemical, palaeontologic, geomorphic, pedologic, and hydrologic attributes, needs to be defined. Hence, all that is covered by this discipline will be involved in geoheritage, and potentially, geoconservation. Geoconservation is the conservation of Earth Science features for the purposes of heritage, science, or education (Brocx & Semeniuk, 2007). Objects of geoheritage can be: minerals, rocks, ores, fossils, layers of fossils, geological profiles, soil profiles (especially relict, non-type or soils with fossil character), various geomorphological forms, including underground (caves, cave decorations), specific sources, mineral and thermo-mineral springs, swamps and lake basins (tectonic, glacial), etc. (Kolčakovski, 2000). Geoheritage includes the evidence for the Earth's formation, of meteorite impacts, of the start and evolution of life, of plate movements and mountain building, rock and mineral formation,

and of how desert formation, glaciations and sea-level changes have through time shaped and re-shaped the globe. Geoheritage is an applied scientific discipline which focuses on unique, special and representative geosites, supporting the science of geology and its place in modern culture (ProGeo, 2011).

The objects of geoheritage that are distinguished by their representativeness, authenticity, typology and diversity have certain values. Geoheritage may have esthetic values; economic values; functional values (such as soils and ecosystem functions) and research and education values. The geological record has a great research value, but it also has a role in education and training. Students and teachers need sites and areas that they can use to demonstrate geological principles and processes in the field. Trained geologists, geomorphologists and pedologists are needed to locate and utilize mineral resources, predict natural hazards and ensure the sustainable use of land. Rock exposures, fossil sites, landforms, soil sections and active processes play a valuable role in the education of children, the training of the next generation of geologists, and amateurs with an interest in their environment and geological history of the planet. We should not let them be destroyed (Gray, 2004). By applying their values they can have a scientific, educational and recreational purpose. They may be suitable for scientific research on natural conditions or processes, to be used in educational institutions where they serve as an example of an occurrence or phenomenon and be used as a picnic or resting place (Hadzi Pecova et al., 1999). The objects of geoheritage that are distinguished by their importance can be presented in scientific-professional publications such as journals, proceedings and monographs, and for the general public to receive specific information, for certain natural objects and areas it is necessary to be informed from various media, lectures and web pages. While for pupils and students, information can be obtained through school textbooks (Dangič, 1998).

In order to observe certain geological, geomorphological, hydrological, and soil phenomena and processes and to analyze their genesis, it is best to see them on the site. For easier, clearer and more detailed understanding the students and pupils need to understand certain phenomena and objects of the geoheritage, their genesis and their formation by doing field teaching outside in natural environments. The term “field teaching” means every expertly and purposely well-organized and realized form of teaching and research done outside the classroom and the school / faculty / by the teacher and the students /the pupils in order to directly check the knowledge and objectively contact nature, places, objects and phenomena (Dimitrov, 2009). Field teaching, as well as geographical excursions, point to a comprehensive introduction of space and represent the best logical path for explaining and resolving the phenomena, problems, processes or built objects in the space. It is also the best method for connecting theoretical with practical knowledge (Pavlovski, 1995). Teaching in nature should contribute to convincing the students or pupils that the problem of rational use of natural heritage and environmental protection can be solved only by insighting the principles of close interconnection and interdependence of all components of the geographical environment in a single territorial complex (Rakičevič, 1979). Student excursions, outings and visits as organizational forms of the school represent the perfect method in the scientific-educational process and are irreplaceable in achieving the school educational goals. Student excursions, visits, and various field teaching are an essential part of the educational work and commitment of every school (Danev, 1989).

This paper presents ten objects of geoheritage that are located in the close vicinity of Corridor 10 at a distance to 22 km in the Republic of Macedonia. The Pan-European International Corridor 10 is selected because it represents the most frequent traffic line in the Republic of Macedonia. In the Republic of Macedonia, it starts at the Tabanovce border crossing point at the Macedonian-Serbian border, runs along the valley of the river Vardar and ends at the border crossing Bogorodica at the Macedonian-Greek border. As part of Corridor 10 is the international route E-75, i.e. the highway A 1.

Through direct contact and observation of objects and phenomena of geoheritage, students and pupils will have an idea about their formation and their significance in nature. As a result, students and pupils can perceive, analyze and synthesize the phenomena and processes in nature. For this purpose, the best approach is to use a demonstration method or demonstrating objects in nature.

GEOHERITAGE OBJECTS ALONG CORRIDOR 10 OF THE TERRITORY OF THE REPUBLIC OF MACEDONIA

Organized field teaching along Corridor 10 on the territory of the Republic of Macedonia will be performed in the north-south direction, and thus the ten proposed objects of the geoheritage will be visited.

As the first object of geoheritage is the site called **Basalt plateaus**. It is located in the northeastern part of the Republic of Macedonia, in the area of the village of Mlado Nagoričane. It is located 10 km away from Corridor 10. It represents a series of 8 plateaus with a height of 50-80 m with a meridian stretching path (Klinčarov & Anastasovski, 1998). The plateaus are composed of chunky blackish basalt, and in some of them there are red layers of a very light sponge mass of lava (Cvijič, 1906). The age of this volcanic activity is at the border of Oligocene and Miocene. Volcanic eruptions were not accompanied by strong explosions, but rather by slow outpouring of lava. As a result, the lava was consolidated on the Earth's surface and formed a single plateau. Neotectonic movements and erosion affected the separation of the single plateau. This resulted in decoupling of the only plateau and forming many smaller plateaus (Boev, 2006). This site belongs to the Kumanovo-Sveti Nikole volcanic area and represents a very interesting geological form. This object is a typical representative of the fossil shield volcano form and gives us a clear picture of the formation and decay of the volcanic basalt plateau.

The Bader Gorge (Prnar 489 m) is an epigenetic gorge in the lower course of the Pchinja River. The gorge extends between the village of Bader in the Skopje Valley to the inflow of Pchinja into the river Vardar with a total length of 9.5 km. Corridor 10 passes through the entire length of the gorge. The gorge is embedded in Paleozoic shale between the Kamenica hills (479 m) and Shtur (508 m) to the east, Mramor (418 m) and Prnar (489 m) to the west. The maximum height of the sides is up to 385 m (Stojmilov, 2011). The gorge is actually an epigenetic gorge. As a result of the selective erosion, the terrain in the soft sediments gradually becomes lower than the height of the upper edges of the valley enclosed in the granite rocks. The valleys created in this way are called epigenetic. This facility can serve as a school example of the formation of a fluvial relief, that is, of the formation of an epigenetic gorge.

Katlanovo Spa and the **Katlanovo Hill** are located in the vicinity of the city of Skopje. They are located about 2 km from Corridor 10. Katlanovo Spa is a typical example of a post-volcanic

phenomenon, i.e. a thermo-mineral bath from which hot water springs arise. The Katlanovo Hill is made of Jurassic limestone, with a tectonic crack that is 350 meters long and has a meridian stretching direction. Its opening is up to 20 cm wide, some parts narrow up to 5 cm, and somewhere it is completely closed (Manakovič & Andonovski, 1976). From the Katlanovo Hill almost all thermo-mineral and mineral springs emerge on which Katlanovo Spa is built. The water from all sources erupts by means of a pulsation containing gas (hydrogen, chlorine, sulfur and coal) which are considered to be of a juvenile (volcanic) origin (Stojmilov, 1969).



Figure 1: Basalt plateaus at the village of Mlado Nagoričane
(photo by Todorova, 2015).



Figure 2: The Katlanovo Hill (photo by Todorova, 2015).

The site **Karaslari** is located in the central part of the Republic of Macedonia, that is, in the area of the village Karaslari. It is located about 700 m from Corridor 10. It is a paleontological site due to the pickerman fauna remains that were found at this location because of the

breakthrough of the Bašino Selo-Karaslari highway. The following are the fossils found on the site: a three-finger horse (Hipparion proboscideum; De Christol, 1832), (Hipparion Prostylum Gervais; De Christol, 1832), (Hipparion gracile; De Christol, 1832), (Hipparion matthewi Abel; De Christol, 1832), (Hipparion Verae, Gabunia), a goat-like mammal (Ancylotherium pentelicum; Gaudry & Lartet 1856), a panda (fam. Ailuridae; Gray,1843) - (Simocyon primigenius; Roth & Wagner, 1854), a monkey (Mesopithecus pentelici), a rhinoceros that has two horns of the nasal bone (Dicerorhinus orientalis, Schlosser), a rhinoceros that does not have horns on the forehead and nasal bones (Aceratherium incisivum, Kaup, 1832), elephant (Bunolophodon Tetralophodon longirostris, Kaup, 1832), giraffe (Heladoterium duvernoyi, Gaudry), a gazelle (Gazella brevicornis, Gaudry), wild boar (Microstonyx major Gervais), saber tooth tiger (Machairodus orientalis) and others (Forsten & Garevski, 1989), (Spassov & Geraads, 2011), (Garevski, 1956). The age of the fossil belongs to the upper Miocene (Garevski, 1985). The fossils reveal that twenty million years ago the climate in this region was tropical and the territory of the Republic of Macedonia abounded with many lakes that do not exist today. Many mammals, similar to today's African mammals, lived in these areas many centuries ago. Such mammals are: elephants, hyenas, antelopes, rhinos, monkeys and other species. These mammals were fed by the great abundance of grass surrounding the lakes. Today the fossil remains are exhibited in the Natural Science Museum of Macedonia in Skopje.

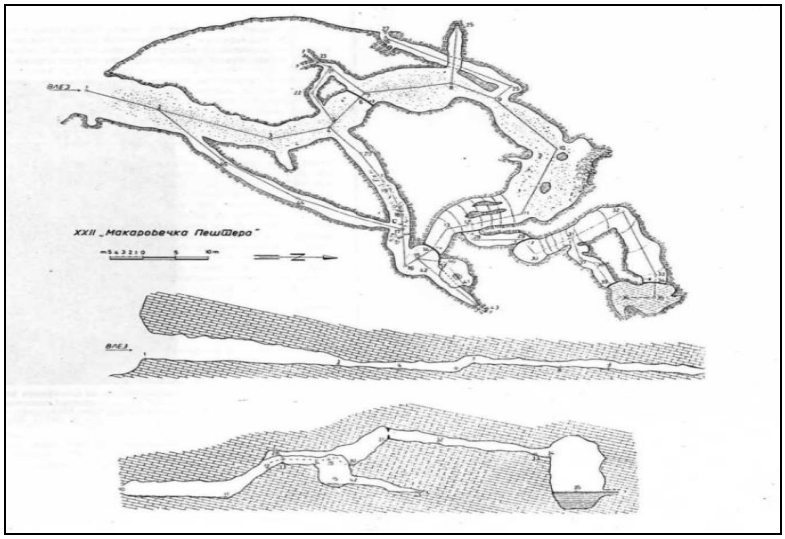


Figure 3: Plan and profile of "Cave Makarovec" (according to Manakovič, 1966).

The **Pešti Gorge** is located in the central part of the Republic of Macedonia, south of the city of Veles. It lies near the connection of the Babuna River to Vardar. It is located 5.5 km from Corridor 10. This gorge is a typical example of the formation of a fluvial erosive relief form - gorge. The river's water deeply cuts the thick layers of the Mesozoic limestones with Cretaceous age, from which the Pešti gorge was later formed. The graduation took place gradually, depending on the lowering of the level of the river Vardar. The Pešti Gorge is about 500 m long (Kostovski, 1956). With the chemical decomposition of the limestone rocks there is a karst process (karstification) and as a result, underground and surface karst relief forms are

formed. The underground karst relief forms are mostly represented by caves. In the gorge itself there are many caves that differ in size, complexity of channels, accessibility, paleontological findings, etc. Distinctive caves are: Makarovec cave, Cetiri vrati caves, Ponor cave, Crkviče cave and others. The most striking is the Makarovec cave which is located on the right valley side of the river Babuna. Inside the cave various artifacts of the prehistoric man were discovered (artifacts resemble buttons, scraper and various blades) (Manakovič, 1966) and fossils from cave animals in the wide hall that are of Pleistocene age. The Pešti Gorge got its name from the fact that there are many caves spread on both sides of the gorge which represent more characteristic and almost unique karstic underground forms in this area.

The site with stone formation with the ball and plate-shaped-Ulanci is located east-northeast of the village of Ulanci. It is located about 4 km from Corridor 10. This site is presented with interesting denudation micro-relief forms with the appearance of regular stone balls-shaped, egg-shaped forms and stone plates-shaped. They are caused by the secretion of paleogenic flysch sediments created by lapores and sandstones. The stone plates-shaped are found in a slightly eroded downhill northeast of the village, and the stone balls-shaped are located east of the village of Ulanci (Kolčakovski, 2011). What is interesting about these sandy-laporish shapes in the form of plates are their crack north-south, east-west. These stone plates-shaped have a diameter of 70-75 cm as well as 100-102 cm.



Figure 4: Stone formation with plates and balls-shaped at the village of Ulanci (photo by Todorova, 2011).

Mokliško Lake is located 9 km south from the city of Kavadarci, and south of the village Mokliště. It is also at a distance of about 22 km from Corridor 10. According to its origin, this lake is considered to be a natural landslide lake. This lake was made as a result of destroying or sliding the ground above the hill "Gradot" as a result of the underground waters in the sandstones. The sandstones are permeable rocks and if there is a possibility the water goes through them and goes from one to another inflow. The ruins have enclosed the river flow of the river Bunar and formed a natural dam from which Lake Mokliško was created (Manakovič, 1960). This lake represents an interesting geomorphologic-hydrological phenomenon.

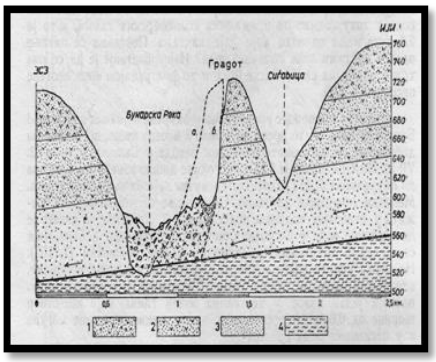


Figure 5: Crossing profile of the landslide Gradot-Kavadarci (Manaković, 1960).



Figure 6: The hill "Gradot" (photo by Todorova, 2013).

Moving in the direction north-south, quite interesting and attractive is **the gorge of Demir Kapija**, which can serve as a school example of the formation of fluvial erosive relief forms, that is, the formation of a gorge and a small canyon. It is the fourth of gorges on the river Vardar. It is settled in the belt of limestones and eruptive rocks with the length of 19.5 km, from the mouth of the river Bošava to the village Udovo. Corridor 10 passes through the gorge. Especially impressive is its entrance which is a small canyon with a length of 900 m. In the middle of the limestone complex on the left side Iberliska (Čelevechka River) it contained the limestone and formed a small canyon with a length of 750 m. Deeply cut valleys that have steep sides are called gorges, while if the length of the gorges is relatively short they are called small canyons (Kolčakovski, 2006). The canyon is a densely incised, steep-sided river valley (Goudie, 2014). The Bela Voda caves (955 m) are the most known from the underground karst relief forms. This is the longest cave in the gorge and the cave Goren Zmejovec which has numerous interesting cave decorations (Manakovič, 1957). The caves are underground karst forms extending in the interior of the carbonate mass in the form of more or less bent slopes or horizontal channels and corridors (Petrovič, 1977). The gorge Demir Kapija is one of the richest ornithological reserves in Europe according to the presence of rare birds of prey.

The site called **Pillow Lava** is located in the southwest of the settlement of Miravci. Corridor 10 is 7 km away. At the inflow of the Stara River into Petruška River at the very point of contact, the two rivers have built small gorges with canyon characteristics which are 13 m high. In the course of the river Stara, with its unequal vertical movement, a stream, three cascades, two waterfalls and two plunge pools were formed at a distance of 500 m. Plunge pool is a depression formed on the base of a waterfall as a result of the hydraulic impact of the descending water and its sediment load (Goudie, 2014). Plunge pools can also be called well-like depressions formed in rocky riverbeds. They usually form at the bottom of waterfalls, and alongside rocky bottoms of riverbeds. They are formed in places where water and the material it carries exert strong whirlpool-like pressure. Plunge pools can appear in various dimensions. Their walls are smooth, almost polished, while the bottoms are made of gravel and other larger rocks (Petrovič, 1977). This is where the appearance of the Pillow Lava or magmatites (spilits), which as a result of the Triassic–Jurassic magmatism are cast in the aquatic environment, and due to the fluvial erosion of Stara River and Petruška River, these phenomena begin to be visible on the surface of the terrain (Kolčakovski, 2011). Pillow lava is a lava in the form of an

agglomeration of rounded, pillow-shaped masses, (http://www.dictionary.com/browse/pillow-lava) the result of subaqueous or subglacial volcanic eruption.



Figure 7: Plunge pool on Stara River (photo by Todorova, 2015).

The location **Vardar Hill** is located in the south-southeastern part of the Republic of Macedonia, close to Gevgelija. The river Vardar with its evolutional development had first cut its valley into soft sediments, and then the cut had continued into the hard diabased solid bar and the epigenetic valley was formed. The Vardar Hill represents an epigenetic valley (Kolčakovski, 2004).

DISCUSSION AND CONCLUSION

The proposed examples of the formation of certain relief forms and the presentation of the geological history of the territory of the Republic of Macedonia presented through the objects of the geoheritage can serve as a school example in the additional educational instruction for geography. By means of field teaching and insight into the current state of the objects from the inheritance, the student or pupil can get a clearer picture of the formation of a certain type of relief form. As a result, it will become acquainted with the natural treasures and beauties of many places and areas in the Republic of Macedonia and will thus develop the love for nature and its uncompromising keepsake.

As a result of all the proposed, the objects of the inheritance can be adapted and included into the educational geographical content and thus make the students or pupils gain valuable and lasting knowledge. The education for the objects of the geoheritage (characteristics, values, threats, endangerment, protection, promotion) can be promoted through the learning programs in schools and the universities.

In the textbooks for elementary education, that is, in the textbooks for the 6th and the 7th grade, it is studied about the earth's genesis, the formation of the relief forms, and the natural-geographic and socioeconomic characteristics of the Republic of Macedonia. At a high school level of education, in I and II year the aspect of study is about the genesis of the relief forms of

the Earth and for the relief forms of the Republic of Macedonia. In the secondary vocational education (catering and tourism profession) in the first year the aspect of study is the study is on the natural and geographical potentials for the development of tourism in the Republic of Macedonia. When studying geography, part of the physical geography explains the geological, geomorphological, hydrological, climatic and soil phenomena and processes. The proposed objects of geoheritage can be used in order for students and pupils to better and easily understand the teaching content related to the processes, phenomena and origin of the Earth. The most appropriate way to do that is field teaching, with the help of which students and pupils will be able to study in details the various phenomena and processes and their genesis. Besides the rich scientific values, the geological records and the processes of forming the relief forms have a significant role in the educational practice.

Properly selected content help improve the development of personality both thoughtfully and from an educational, aesthetic and ethical aspect. Geographic knowledge acquired in primary and secondary level of education will serve as a solid basis for acquainting and studying more complex geographic processes that are a subject of study in higher education. The observations of natural-geographical elements are most often related to fieldwork. The teaching of Geography is most obvious if done on site, that is, in nature, which is considered a geographical laboratory (Semlani & Andonovski, 1999).

These objects of geoheritage are interesting by its appearance and according to their representativeness and rarity, some are protected by law, and some are proposed to be protected by appropriate legal regulations. In this way, students can easily notice the governing laws among men and nature and the dependence of mutual existence, and through the logical conclusion, they come to an understanding of the exploitative relationship that man performs on nature and its riches (Pavlovski, 1995).

Geoeducation plays an important role in promoting geoheritage values, in order to gain support for the implementation of geoconservation objectives and to ensure effective practical management of geoheritage. Georesources has important research and educational values. Geological features illustrate the huge periods of time they took to form the natural resources on which today's society depends. They are rich in evidence of changing climates, shifting the boundaries between continents and oceans and extinction events. Rock exposures, landforms and soils, all they can provide in situ polygons for training of new generations of geologists, geomorphologists, pedologists, amateurs and children (Maran, 2015).

The benefits of doing field teaching depending on its duration, pupils and students for a short period of time can see various relief forms with geological, geomorphological and hydrological characteristics. The advantage of the proposed objects of the geoheritage is that they are easily accessible, but they need greater affirmation. Their disadvantage is that they are not properly marked and arranged for visitors. It is necessary to set traffic and tourist signs for each object of the geoheritage and to be properly arranged for tourism. By placing information boards, the characteristics and the appearance of the objects of the geoheritage will be explained, and along with the graphic presentation (illustrations, photographs and maps) they will be used for obtaining information not only for the pupils and students by performing the field teaching, but also for the rest of the visitors which pass through the corridor 10. All this will affect the passengers to visit these objects of the geoheritage along the corridor 10 because it is the most frequent traffic line in the Republic of Macedonia, and not only to be used as a transit zone. For their greater affirmation, they can be registered in the tourist routes

along the Corridor 10 in the Republic of Macedonia, and thus to make their own web site. Every object of the geoheritage is in a particularly vulnerable category depending on its composition and origin. With each visit by pupils, the students and other visitors, the objects of the geoheritage may be endangered because they can be degraded and destroyed, and thus lose their meaning. As a result, measures need to be taken and appropriately protected. Some of the proposed objects of geoheritage are protected by law in the appropriate category, but for other objects of geoheritage it is necessary to initiate the initiative in order to be more quickly protected in the appropriate categorization. Researches are the work from which a person receives information about the history of our planet, geological processes, the way climate change and the evolution of wildlife through time. Therefore, physical evidence for further research needs to be protected so that pupils, students, visitors and geo-experts can have the opportunity to inform, educate and explore them further on in the future. The objects of the geoheritage in a popular, interesting and attractive manner can be presented through the general public by organizing visits to the sites where the various processes and events related to the geoheritage will be explained by an expertly educated person or through the information boards. This form of organized visits is called geotourism.

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ОБЈЕКТИТЕ ОД ГЕОНАСЛЕДСТВОТО ДОЛЖ КОРИДОРОТ 10 ВО РЕПУБЛИКА МАКЕДОНИЈА КАКО ПРИМЕР ВО ДОПОЛНИТЕЛНИОТ ЕДУКАТИВЕН ПРОЦЕС ВО НАСТАВАТА ПО ГЕОГРАФИЈА

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ИЗВОД

Во наставата по географија, односно во делот каде што се изучува физичката геогарфија се изучуваат геолошките, геоморфолошките, хидролошките, климатските, педолошките и биогеографските процеси и појави. Како резултат на тоа се истакнуваат карактеристични или специфични по појава, објекти на геонаследството. Објектите од геонаследството кои се истакнуваат со својата репрезентативност, автентичност, типичност и разновидност имаат одредени вредности. Тие можат да бидат погодни во научни истражувања на природните состојби или процеси, да бидат искористени во воспитно-образовните установи каде што ќе служат како пример за некоја појава или феномен и да бидат искористени како излетничко место или место за одмор. Во овој труд се презентитани десет објекти од геонаследството кои се наоѓаат во непосредна близина на коридорот 10 на оддалеченост до 22 km во Република Македонија. Тие се: локалитет Базалтни плочи, Бадерска Клисура, Катлановска Бања и Катлановски Рид, локалиттетот Караслари, Клисурата Пешти, Камените топки и чинии кај село-Уланци, Моклишко Езеро, Демиркаписка Клисура, локалитетот Pillow lava и Вардарски Рид. Преку непосредниот контакт и набљудување на објектите и појавите од геонаследството, учениците и студентите можат да го увидат процесот за нивно формирање и нивното значење во природата. Како резултат на тоа учениците и студентите можат да ги перцепираат, анализираат и синтетизираат појавите и процесите во природата. За таа цел најдобар пристап е да се употреби демонстациона метода или демострирање на објектите во природата. Предложените примери за формирање на одредени релјефни форми и прикажувањето на геолошката историја на територијата на Република Македонија презентирани преку објектите од геонаследството, можат да послужат како школски пример во дополнителната едукатавна настава по геогарфија. Како резултат на сето предложено, објектите од геонаследството можат да се адаптираат и вклопат во наставните географски содржини и со тоа учениците и студентите да се здобијат со трајност на знаењето. Овие објекти од геонаследството се интересни по појава и според својата репрезентативност и раритетност, дел се заштитени со закон, а дел се предложени да бидат заштитени со соодветни законски регулативи. На тој начин учениците и студентите можат лесно да ги воочат законитостите што владеат помеѓу човекот и природата и зависноста на меѓусебното постоење, а преку логичното заклучување да дојдат до сознание на експлоаторскиот однос што го врши човекот врз природата и нејзините богатства. Придобивките со изведување на теренската настава зависно од нејзиното времетраење, учениците и студентите за краток временски период можат да видат ралични релјефни форми со геолошки, геоморфолошки и хидролошки карактеристики. Предноста на предложените објекти од геонаследството е тоа што се лесно достапни, но за нив потребна е поголема афирмација. Нивниот недостаток е тоа што не се соодветно означени и уредени за посетители. Неопходно е да се постават сообраќајни и туристички знаци за секој објект од геонаследството и соодветно туристички да се уредат. Со поставување на информативни табли ќе бидат објаснети карактеристиките и постанокот на објектите од геонаследството, а заедно со графичкиот приказ (илустрации, фотографии и карти) ќе послужат за добивање на информации не само за учениците и студентите со изведување на

теренската настава туку и за останатите посетители кои поминуваат низ коридорот 10. Сето ова ќе влијае патниците да ги посетат овие објекти долж коридорот 10 бидејќи е најфрекфрентна сообраќајна линија во Република Македонија, а не само да биде искористена како транзит зона. За поголема нивна афирмација можат да се впишат во туристичките рути по коридорот 10 во Република Македонија, а со тоа да се направи и нивна веб-стана. Секој објект од геонаследството е во посебна ранлива категорија во зависност од неговиот состав и постанок. Со секоја посета од страна на учениците, студентите и останатите посетители, објектите од геонаследството постои можност да бидат загрозени, бидејќи можат да бидат деградирани и уништени, а со тоа да го изгубат нивното значење. Како резултат на тоа потребно е да се превземат мерки и соодветно да се заштитат. Дел од предложените објекти од геонаследството се заштитени со закон во соодветна категорија, но за останатите објекти од геонаследството потребно е да се покрене иницијатива за да бидат побрзо заштитени во соодветната категоризација. Истражувањата се дела од којшто човекот добива информации за историјата на нашата планета, геолошките процеси, начинот како се менува климата и еволуција на живиот свет низ времето. Поради тоа физичките докази за понатамошното истражување потребно е да бидат заштитени за да можат во иднина учениците, студентите, посетителите и геонаучниците да имаат прилика да се информираат, образуваат и истражуваат од нив. Објектите од геонаследството на популарен, интересен и атрактивен начин можат да се претстават низ широката јавност со организирање на посети на локалитетите каде што со стручно образовано лице или преку информативните табли ќе се објаснат разните процеси и појави во врска со геонаследството. Овој облик на организирани посети се нарекува геотуризам.