

TOURISTIFICATION OF LOESS SEQUENCES IN VOJVODINA

VALORIFICAREA TURISTICĂ A DEPOZITELOR DE LOESS DIN VOIVODINA

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Abstract: Geodiversity on our planet has been integrated into tourism as a special form of tourism: geotourism. In focus research are of loess sequences in Vojvodina (Serbia), as geoscience product and potential tourism resources. Loess sequences spread out on the 60% of the territory of Vojvodina. Analytical method and observation method was shown, the degree of geological research of loess sequences in Vojvodina (13 loess profiles), (1st goal of research). Scientifically researched loess sequences are located on the banks of rivers Danube and rivers Tisza. Applying the model of touristification the proposed steps and actions in the transformation of loess geosciences products into loess tourism product (2th goal of research).

Key-words: *geotourism, loess sequences, Vojvodina, touristification*
Cuvinte cheie: *geoturism, strat de loess, Voivodina, turistification*

I. INTRODUCTION

Geodiversity on our planet has been increasingly integrating into the tourism system as a special form of tourism – geotourism. “Geodiversity: the natural range (diversity) of geological (rocks, minerals, fossils), geomorphological (land forms and processes) and soil features. It includes their assemblages, relationships, properties, interpretations and systems” (Murray, 2004).

“The subject of geotourism is growing rapidly with travel to and appreciation of natural landscapes and geological phenomena continuing to grow as a niche area of the global tourism industry” (Newsome&Dowling, 2010).

Rich geodiversity in Serbia is an important tourism potential, but insufficiently integrated into the tourism. In the document Strategy Tourism of the Republic of Serbia geotourism is recognized among the tourism products listed under the title: „special interests”.

The Pannonian Plain and the mountains in Vojvodina: Fruška gora and the Vršac Mountains, have a complex geological structure as a result of a complex geological history. The rich geoheritage of Vojvodina represents a significant potential for tourism. The focus of this paper is the analysis of loess sequences in Vojvodina, as a significant tourist potential.

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II. DATA AND METHODS

The goals of this paper are: (1) to highlight the importance of loess sequences in Vojvodina for geotourism, (2) to present the outcome of the study concerning the touristification of loess sequences, (3) a proposal to apply this model touristification and all other types of tourism.

In preparation of this paper have been used combined methods of research:

- Analytical method: domestic and foreign literature has been consulted with regard to the paper topic. The author was faced with the fact that in the scientific literature there are conflicting definitions of the term, ``geotourism, which are cited in the paper.

- Method of personal observations: was used to find out, what is the level of tourism activation of loess sequences.

- Method of tourism valorisation: this method was implemented on the basis of scientific information on research of loess sequences and personal observation of loess sequences, on-site.

- Synthetical method: by using this method established the correlation between the characteristics of geo loess science product in Vojvodina and the level of their tourism activation. This method is explained process touristification of loess sequences in Vojvodina and prepared the conclusions.

III. RESULTS AND DISCUSSIONS

3.1. Definition of geotourism

Historical aspect of “geotourism” definitions is found in the works of David Newsome and Ross K. Dowling who pointed out that the definition of geotourism was firstly introduced by Hose (1995, 1996, 2000) and later Dowling and Newsome (2006 and 2010) also wrote about it. Compliance to Dowling and Newsome (2010) “Geotourism is a form of natural area of tourism that specifically focuses on geology and landscape. It promotes tourism to geosites and the conservation of geo-diversity and an understanding of earth sciences through appreciation and learning. This is achieved through independent visits to geological features, use of geo-trails and viewpoints, guided tours, geo-activities and patronage of geosite visitor centres” (Dowling&Newsome, 2010).

National Geographic definition, geotourism as: "tourism that sustains or enhances the geographical character of a place - its environment, culture, aesthetics, heritage, and the well-being of its residents” (Centre for Sustainable Destinations, Mission Programme, The Geotourism Charter, www.nationalgeographic.com/travel/sustainable). The definition was further discussed by Dowling and Newsome: “We do not support the view of National Geographic that geotourism is “geographic” tourism. From our extensive travels around the world attending geotourism and/or geopark conferences and observation in the field it is clearly evident to us that geotourism is universally understood as “geological” in nature and not “geographically” oriented” (Dowling&Newsome, 2010). We want to point out that the tourism system is very complex and that there are different theoretical approaches in the interpretation of tourist practices. It is

very important to know the precise a definition of each of the forms of tourism, especially at this current time when the tourism "astronomy" speed diversify.

3.2. Loess sequences in Vojvodina as geo-scientific products

Vojvodina is the northern province of the Republic of Serbia, covering the area of 21,506 sqkm (25 % of the total territory). Vojvodina is a macro unit within Pannonian and Danube region. Within the specific geomorphological profile of Vojvodina, loess sequences and loess sediments spread out on the 60% of the territory of Vojvodina (Marković et al., 2008) (Fig. 1). "Loess is one of the most widespread formations of the ice age; it has been suggested that it covers perhaps 10% of continental surfaces (Pecsi, 1990) (Smalley et al., 2010). Typical loess is found on six discontinuous plateau uplands between alluvial plains of the Danube, Tisa, Sava and Tamis rivers" (Marković et al., 2007).

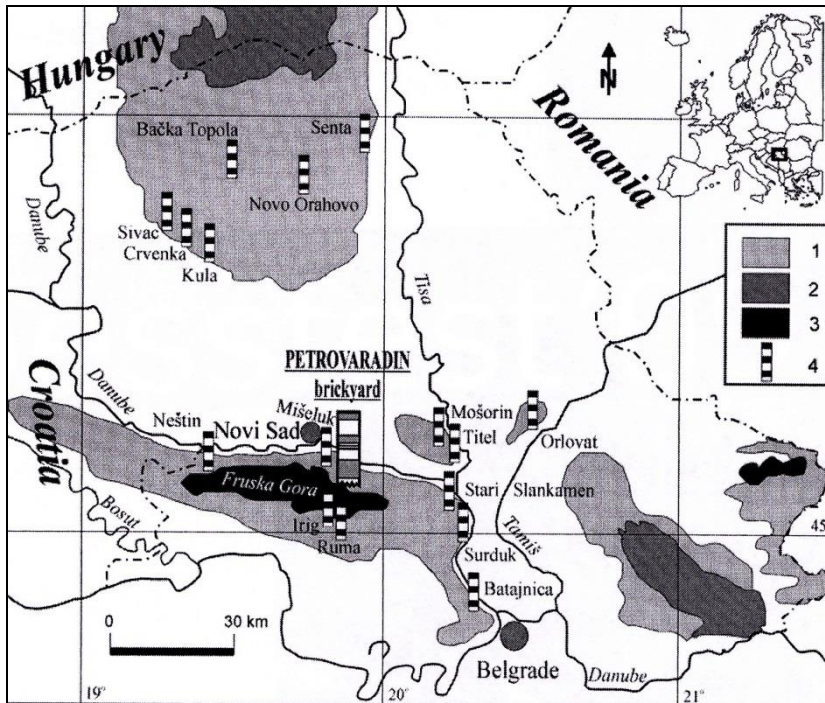


Fig. 1. The location of loess sequences in Vojvodina

1. Loess plateau; 2. Sandy area; 3. Mountain; 4. Main loess sections
(Source: Marković et al., 2005)

"Thick sequences of interstratified loess-palaeosol sequences from the region of Vojvodina (Northern Serbia) intensively investigated in recent years provide one of the most complete and most sensitive European terrestrial records of climatic and environmental changes during the Middle and Late Pleistocene" (Marković et al., 2008, Marković, 2009, Fuch et al., 2008). Loess sequences in Vojvodina are the most important geological sites for loess research in Europe (Jovanović, 2009).

Substantial impact on the process of activation of loess sequences for tourism purposes is observed in the level of their geomorphologic and geological exploration. Compliance to previous research results of loess sequences in Vojvodina, the author of this paper divided into two groups:

- The First group: Geologically investigated loess sequences, which already represent loess tourism resources as primary motives for tourism.
- The Second group: Unexplored loess sequences, which represent potential tourism resources and can be complementary motives for tourism at this point.

The First group: Geologically investigated loess sequences, which have already represented loess tourism resources as primary motives for tourism, are divided by location (Fig. 1):

- Loess sequences, on the right bank of the river Danube – in the Danube basin of Fruška gora (Vidić, 2007), in the sector from Susek to Batajnica: Susek, Mišeluk, Petrovaradin, Stari Slankamen - Čot, Surduk, Batajnica.
- Loess sequences are also located on the Srem Loess Terrace.
- Loess sequences on the right bank of the river Tisa: the Titel loess Plateau and Mošorin.
- Loess sequences on the right bank of the Tamiš – Tamiš Plateau.

The scientific merit of all the results of geological research of loess sequences, in Vojvodina belonging the researchers to the Group for the Quaternary Research Centre - Cathedre of Physical Geography - Department of Geography, Tourism and Hotel Management, Faculty of Sciences, University of Novi Sad in cooperation with their colleagues from abroad.

„Our multidisciplinary approach consists of detailed investigations of litho- and pedostratigraphy, low-field magnetic susceptibility (MS), grain size (GS) and carbonate content (CC) variations, amino acid racemisation (AAR) measurements in fossil mollusk shells and fossil mollusk assemblages “ (Marković et al., 2007) (Table no. 1).

Extremely important scientific results achieved in research of loess sequences in Vojvodina are geoscience product and the basis for a specific profile of tourism - geotourism - loess geotourism.

Loess sequences in Vojvodina are specific landscape and that may become attractive tourism resources, because:

- Loess sequences are 1 million years old, widespread, with open profiles and easily accessible.

Table no. 1. Characteristics of geo loess scientific product

A) The Danube River, on its right banks (Fig. 1)	
<i>Loess profile Susek</i>	- profile height 7.5 m, age about 140,000 years, - loess horizons, characteristic by their strong hydromorphic post, depositional influence (no shells found (Marković et al., 2006b).
<i>Loess profile Mišeluk</i>	- at 7 m, a powerful profile, established shifts of dry and moist periods,

	<ul style="list-style-type: none"> -one of the first profiles in Vojvodina which has been well researched, -profile turned into an illegal depot.(Marković et al., 2005b).
<i>Loess profile Ciglana, Petrovaradin</i>	<ul style="list-style-type: none"> - mostly inactive surface mine covering about 20ha, - there are conditions for an outdoor classroom, - open profile thickness 8m, penultimate and last glacial and interglacial cycles (Jovanović, 2009).
<i>Loess profile Stari Slankamen-Čot</i>	<ul style="list-style-type: none"> - profile thickness 40m formed during the last million years (Jovanović, 2009, Vojvodine, marked "V"), - promotional billboards on tourism development in the settlement by the year 2015, - billboards for future Loess Museum – Loessland, - the remains of the Roman fortress and the settlement Acuminicum (Marković et al., 2003).
<i>Loess profile Surduk -Stari and Novi Slankamen</i>	<ul style="list-style-type: none"> - loess-palaeosoil sequences of the last glacial /interglacial examined in detail, thickness up to 20m, - in the vicinity there is a loess cave, with the entrance 8.15 m high, length 3.7m, and width 3.4m (Jovanović, 2009), - in 1975 proclaimed a natural monument, - “magnetic susceptibility (MS) record shows values varying between ca 10 in...the total organic carbon record can be divided in five parts showing very good agreement with the main stratigraphical boundaries”(Pierre, 2009), - archaeological value, excavated remains of a paved road from the Roman period (Fig. 5)
<i>Loess profile Batajnica</i>	<ul style="list-style-type: none"> - on the right bank of the Danube, from Novi Banovci to the outskirts of Zemun, there are loess bluffs 10km long, and up to 40m high (Marković et al., 2009), - well examined palaeosol-loess sequences of extraordinary importance and high attraction values (Fig. 3), - there are recent geomorphological processes: erosion, landslide, vertical cracking; - near the sequences certain faculties give lectures (Marković et al., 2009).
B) The Tisa River (Fig. 1)	
<i>Titel loess plateau</i>	<ul style="list-style-type: none"> - isolated ellipsoid loess island at the mouth of the Tisa into the Danube (Fig. 1) , dominating the Pannonian plain (Fig. 4); with 128.7 m of altitude, covering the area of 89.6km, at the contour line of 80 altitude, - unique geodiversity from the Middle and Upper Pleistocene, loess thickness between 35m to 55m, with five pedoclimatic glacial and interglacial layers, formed during the last 600,000 years (Marković&Jovanović, 2009), - completed “absolute dating of loess-palaeosol sequences by

	<p>application of optically stimulated luminescence method (OSL), (Jovanović, 2009),</p> <ul style="list-style-type: none"> - there is a pseudokarstic relief: <i>sinkholes</i> covering the area from 13.4m to 1sqkm and radius from several to several hundred meters, and the depth from 3m to 5m, - at steep profiles, there are escarps, loess caves, loess pyramids, loess wells, loess faults, fans, - on the top of the loess sequence Feudvar, loess thickness about 40m (Fig. 1), there is an archaeological locality from the Mycenaean period (Fig. 6), - loess profile Dukatar, at the Titel plateau (Fig. 1), loess thickness 40m the most complex series of loess-palaeosol sequences at the Titel plateau, - loess profile Kalvarija near Titela (Fig. 7), loess bluff 30 m, - the most powerful accumulation of Aeolian material during the last glacial, - at the top of the profile there is an archaeological site from the Neolithic period, - there are catering facilities at the locality (Marković et al., 2009).
<i>Loess profile Veliki Surduk, Mošorin</i>	<ul style="list-style-type: none"> - the length of the escarp is about 880 m, potency of Palaeozoic sequences about 30 m, - "the most instructive geological profile of Pleistocene in Serbia" (Jovanović, 2009), - undisturbed loess palaeosol horizons.
C) The Tamiš River (Fig. 1)	
<i>Tamiš loess plateau</i>	<ul style="list-style-type: none"> - the smallest loess sequence in (Fig. 1), - profile near Orlovat above 99 m altitude, suitable for exploration of lithologic layers, - profile height from 13 m to 16 m above the sea level (Jovanović, 2009).
D) South of Fruška gora-Srem's loess plateau (Fig. 1)	
<i>Loess profile Ciglana in Irig</i>	<ul style="list-style-type: none"> - situated 1.7 km south from the settlement, stretching for about 240 m, open profile of thickness 8 m, comprising the total glacial/interglacial cycles (Jovanović et al., 2009).
<i>Loess profile Ciglana in Ruma</i>	<ul style="list-style-type: none"> - open profile 1.5 km, thickness 20 m, - sequences important for exploration of paleoclimatic features during the younger period of the Middle and Upper Pleistocene, - for further research purposes, the proposal of geologists is to stop its exploitation (Marković et al., 2006).

- They are situated on extraordinary attractive localities for tourism purposes (Fig. 1),

- There is a high level of their geological exploration (Photo no. 1, 2, 3, 4, 5). The researches are conducted by young renowned researchers from the Group of Quaternary Research Centre - Cathedre of Physical Geography - Department of Geography, Tourism and Hotel Management, Faculty of Sciences, University of Novi Sad in cooperation with their colleagues from abroad.

- They are exceptional and unique geo landscapes (Photo no. 1, 2, 3, 5), with pseudokarstic relief, loess sinkholes, loess small valleys, loess caves, then hanging loess valleys, and escarps, (2), (Jovanović, 2009). In stratigraphic nomenclature of loess-palaeosol sequences the mark “V” was introduced for loess palaeosol sequences in Vojvodina (Jovanović, 2009: 9). Significant archaeological sites from the period of Mycenaean culture (Medović, 2003) (Photo no. 4).

Loess sequences in Vojvodina are of exceptional importance for geological and geomorphologic research in Europe, with regard to their attractiveness, there have been numerous initiatives for their tourism activation, i.e. touristification.



Photo no. 1. Loess profile of Batajnica on the right bank of the Danube river
(Photo: Dragoljub Zamurović, downloaded: 31.3.2011)



Photo no. 2. Titel loess plateau

(Source: <http://www.google.rs/imgres?imgurl=http://www.ravnica.info>)

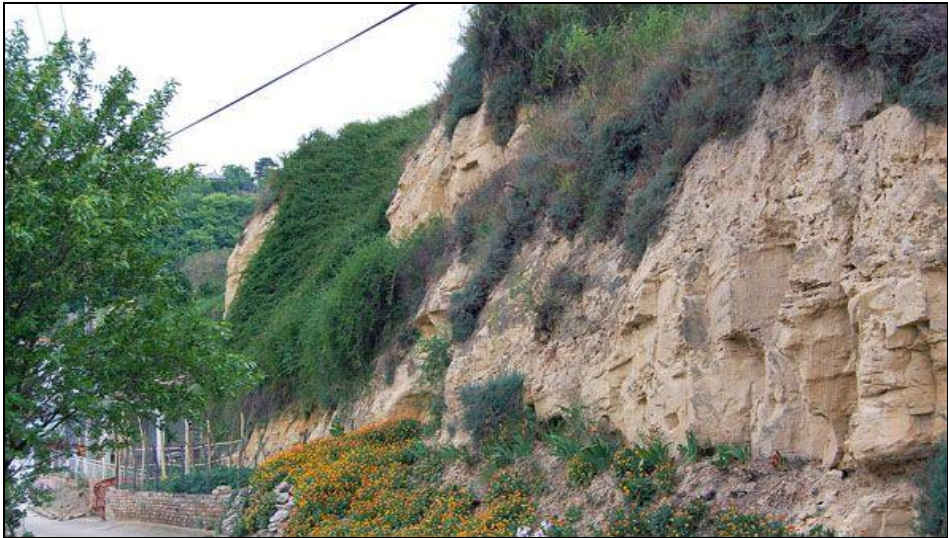


Photo no. 3. Loess profile in Stari Slankamen

(Source: <http://www.travel.rs/sr/wp-content/uploads/lesni-profil.jpg>)

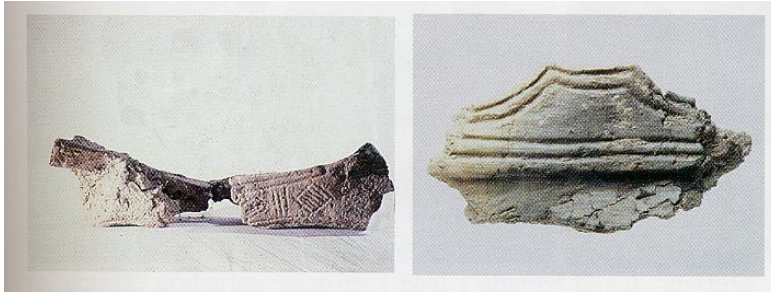


Photo no. 4. Capitals and plaster decoration/Mycenaean culture, from the archaeological site Feudvar Loess profile in Stari Slankamen
(Source: Medović, 2003)



Photo no. 5. Loess profile Kalvarija, on the Titel plateau, the beach on the right bank of the Tisa river
(Source: www.panoramio.com)

Initiatives

Geologists from the Group of Quaternary Research Centre-Cathedre of Physical Geography- Department of Geography, Tourism and Hotel Management, Faculty of Sciences, initiated the activities for transformation of loess geo-scientific product into loess geo-tourism product such as:

- Initiative to declare Geopark on the area of the Titel plateau (Markovic et al., 2005a).
- Proposals for protection of the Titel plateau and declare of Nature Reserve with protection zones: Level 1, rigid protection; Level 2, restricted utilisation and Level 3, selective restricted utilisation.
- Proposals for including loess sequences: Stari Slankamen, Batajnica, the Titel loess plateau, Ruma brickyard, into the list of geo heritage objects in Serbia (Vasiljević et al., 2010).
- Proposals for thematic interactive dynamics WEB maps of the Titel loess plateau and its surrounding area and the Promotion of the Titel loess plateau (Vojvodina, Serbia) as a Potential Geotourism site (Vasiljević et. al., 2009).

- Building of Loess Museum – Loessland in Stari Slankamen.
- Tourist signalisation (billboards and signposts) of the loess profile in Surduk in Stari Slankamen.

Implementation of the initiative depends on a number of factors, among which are the most important: political, human and financial (Fig. 10).

Tourism valorization of loess sequences in Vojvodina

In the tourism valorisation of loess sequences, we applied the method of tourism valorisation according to indicators the UNWTO (Fig. 8). This method has been applied so as analyzed qualitative internal factors (X) and external factors (Y) and then to given quantitative values (Fig. 8).

X. Internal factors

A) Assessment of urbanization (construction of facilities within the national park)

All loess sequences are located in areas of high urbanization. A number of loess sequences are referred to the villages at the neighborhood: Loess profile Surduk is near the settlement Surduk Loess profile Batajnica, near settlement Batajnica (Fig. 1), Loess profile Stari Slankamen, near settlement Stari Slankamen (Fig. 1), etc. Value is 8.

B) Assessment of infrastructure

Loess sequences, have not built the infrastructure in the function of the tourism. Value is 1.

C) Assessment of equipment and services

The space, which is a tourism equipped - furnished can increase the overall value of tourism resources. Unfortunately, loess profiles and loess plateaus in Vojvodina is not equipment. There are not any tourism services, information boards, parking, signage, accommodation and infrastructure. It is only in Stari Slankamen there are three information boards and one billboard with an announcement for the future tourism project for the loess profile: Loessland. This is the first project for the touristification of loess sequences in Vojvodina, which will establish the Museum Loessland, camping area and leisure facilities. However, the realization of this project is still uncertain. Value is 2.

D) Assessment of the inherent characteristics (attractive mountain area with numerous and diverse geomorphological, hydrographic, climatic, landscape, flora, fauna, cultural and historical values).

Loess sequences in the Vojvodina are located in attractive landscape with high aesthetic value (Fig. 1):

- Geomorphological: Fruška gora the mountain slopes, loess terraces and loess plains,
- Hidrological: loess sequences are located on the banks of the rivers Danube, Tisa and Tamis and near Vrdnik and Spa Stari Slankamen;
- Biogeographical with diverse flora and fauna. Fruška Gora is national park.
- Climate, with mild temperate continental climate makes travel movement can take place throughout the year,

- Anthropogenical: loess sequence located near cultural touristic resources, with international significance, such as: Petrovaradin Fortress; Feudvar archaeological site, on the loess plateau Titelski (Fig. 1); monasteries: Beočin and Rakovac; Sremski Karlovac, who made the city museum (Vidic, 2010, Vidic, 2011). Value is 10.

Conclusion: The total value of the internal factors of tourist valorization of loess sequences in the Vojvodina (X) is value: 21, from a possible 40.

Y External factors

E) Assessment of accessibility

All loess sequences have good accessibility: located at the frequency auto roads and have an attractive geographical and touristic position.

The most favourable tourism and geographic position is extremely important element for the tourism activation and presentation of every tourism resource, including loess sequences. Loess sequences located along the tourism corridors have the most favourable tourism and geographic position: Corridor VII - the river Danube (the Titel loess Plateau, Novi and Stari Slankamen); Corridor X, in Danube basin along Mountain Fruška gora (Mišeluk, Petrovaradin); the river Tisa valley (Fig. 1). Loess sequences along the Srem loess plateau have have a less favorable position: to the south of Fruška gora (Fig. 1). The value is 9.

F) Assessment of specific resources

Loess sequences in Vojvodina are characterized in most of the cases by preserved authenticity. This loess geoscience product represents an extremely unique and authentic geotourism product especially for tourists with special interests and affinities – geotourists, as well as for tourist (overnight visitors, semi-day visitors) of other profiles and interests.

Results of geological researches of loess sequence in Vojvodina are important for loess geotourism because loess geoscience product is basis for geo tourism product on the geotourism market and general tourism market. Loess geosciences product for tourism market contains data and scientific facts and information on the features of loess and palaeosol sequences: morphometric features, open profiles, the height of profiles, lithostratigraphic features, and geochemical features, their genesis, age. The value is 10.

G) Assessment of the proximity of emitting centers

Loess sequences in the Vojvodina, near urban centers of generating. Their potential tourism contraction zone could be divided into several concentric circles, according to the criteria of distance from the emitting centers. These are: first contraction zone, the distance to 10 km.

She is entitled to all the villages in the vicinity of the loess sequences and urban center of Novi Sad, Sremski Karlovci Petrovaradin, Titel, Stari Slankamen. Second kontraktivnoj zone, up to 100 km, belonging to, rural settlements in the area and the urban centers: Belgrade, India, Ruma, Irig, Zrenjanin (Fig. 1). Kontraktivnoj third area, entitled to all the villages and urban centers emissive and outside the country, in: Romania, Hungary, the Republic Hvataskoj, Serbian

Republic of Bosnia and Hercegovini. Četvrtoj kontraktivnoj zone belong emissive areas, outside the third zone of contraction. Values is 9.

H) Assessment of the importance of resources

Loess sequences in Vojvodina have great scientific importance and can become a very attractive tourism resource, because:

- Exceptional landscape attractiveness, uniqueness, specificity, scientific proučenosti, extraordinary tourist office, natural environment, cultural heritage in their vicinity. Value is 10.

Conclusion: the sum of the values internal factors and external factors of tourism valorisation of loess sequences in Vojvodina have a value 38, from maximum value 40 (Table no. 2).

According to the evaluation conducted in tourism in Vojvodina loess sequences, the total value of internal and externih factor is 59, out of a possible 80. Such a low level value of the total tourist valorization of loess sequences in Vojvodona, resulted from the low values of internal indicators of tourism valorization (Table no. 2). This results in a low level of tourism affirmation of loess sequences in Vojvodina. In order to faster tourism activities of loess profiles, must be establish the application the model of touristification (Vidic, 2011).

Table no. 2. Tourism valorisation of loess sequence in Vojvodina, according to UNWTO indicators

X	Factors	Values										Total
		1	2	4	5	6	7	8	9	10		
A	Assessment of urbanization (construction of facilities within the national park)							*				8
B	Evaluation of infrastructure	*										1
C	Assessment of equipment and services		*									2
D	Assessment of the inherent characteristics (attractive mountain area with numerous and diverse geomorphological, hydrographic, climatic, landscape, floral ,fauna, cultural and historical values									*		10
<i>Total X = A + B + C + D</i>												21
Y	<i>External</i>	values										
E	Assessment of accessibility								*			9
F	Assessment of specific resources									*		10
G	Assessment of the proximity of emitting centers								*			9
H	Assessment of the importance of resources									*		10
<i>Total Y = E + F + G + H (38)</i>												
<i>Total = X + Y (59)</i>												

Touristification of loess sequences in Vojvodina

"Geotourism is new occupational and business sector. The main tasks of geotourism are the transfer and communication of geoscientific knowledge and ideas to the general public" (Hewson, 2005). We should also bear in mind that "Geotourism is based on the interaction between: politics, geosciences, universities and the tourism industry" (Hewson, 2005).

"The geological record has huge 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 ..." (Gray, 2004).

Loess sequence in Vojvodina are very important geoscience product, that can be transformed into a geotourism product.

The presented results of scientific research of loess sequence in Vojvodina and their tourism valorisation are bases for their touristification (Fig. 2). Touristification is process the transformation of scientific products in the tourism product (Vidic, 2011). In this example, loess geo scientific product needs to transformed into loess geo tourism product (Fig. 2).

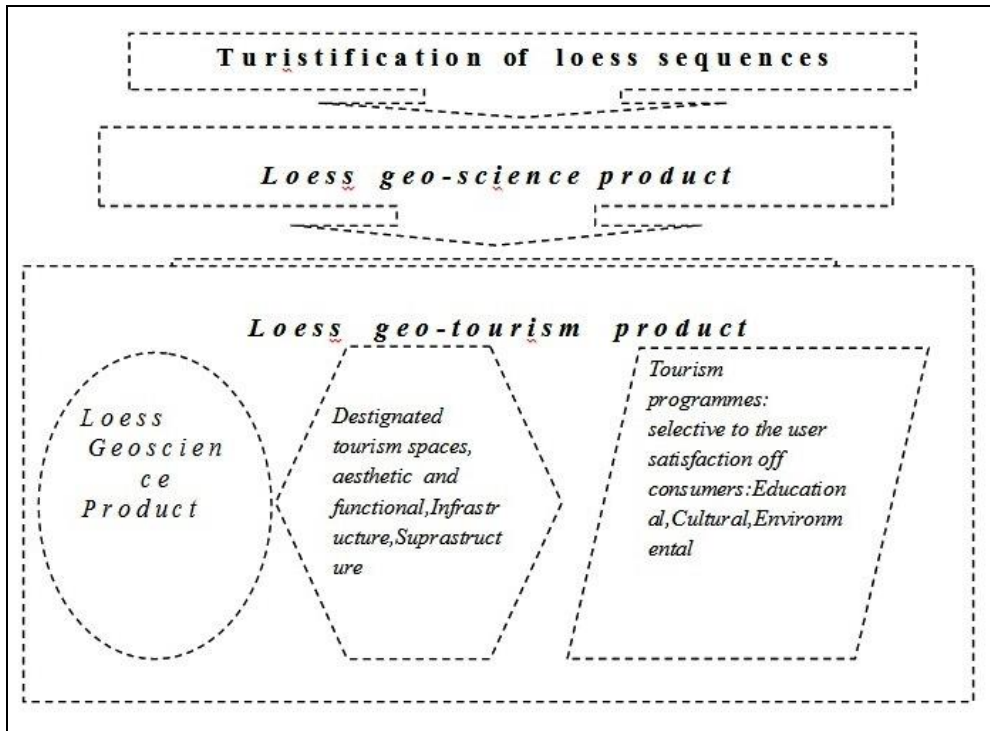


Fig. 2. Touristification of loess sequences of Vojvodina

Touristification process has three main components:

- The first component: Loess geo - science product.
- The second component: factors that influence on turistication.
- The third component: Loess geo - tourism product.

The first component. Loess geo science product contains in all the results researchs of loess sequences, which are synthetically described (Fig. 2) and described in detail in the cited publications of researchers from the Group of Quaternary Research Centre - Cathedre of Physical Geography-Department of Geography, Tourism and Hotel Management, Faculty of Sciences, University of Novi Sad (cited references and references at the end of this paper).

The second component. The many factors affect the turistification of loess sequences, but essential are: political factors, human factors and financial factors (Fig. 2). Only the harmonization of these factors can provide a successful turistification of loess sequences.

The third component. Loess geotourism product. Loess geotourism product is a complex tourism product, which consists of:

- Loess geo science product (Fig. 2).
- Organized spaces with a touristis function around of loess geo science product (Fig. 2).
- Creative tourism programmes, which are dedicated loess geo tourism product (Fig. 2).

Loess geotourism product, with such components, a motive for the loess geotourism in Vojvodina.

Finally, what is the essence of geotourism?

Geotourism is a type of tourism profiled on geoheritage as geo-scientific product with designated tourism space of highly aesthetic and functional values and creative tourism programmes.

Steps for turistification of loess sequences. In turistification of loess sequence in Vojvodina, believe the next step to be a priority:

- The first step: Urgent protection and conservation of loess sequences. “The objectives and methods of geo-conservation vary, depending on the element of geo-diversity that is being considered. For example, the formal protection of static geological and geomorphological sites needs to be supported by legislation, but geoconservation of landscapes, soils and physical processes in the wider landscape are best promoted through both, policy and partnership approaches” (Gray, 2008).

Global change ecology has become increasingly concerned with understanding how lineages between changes in biological diversity (henceforth, biodiversity) affect ecosystem functioning (Chapin et al., 2000; Loreau et al., 2001; Hooper et al., 2005; Canadeli et al., 2007).

“To achieve effective geoconservation, it is necessary to have a legal framework adapted to the needs of geological heritage. “(Carcavilla et al., 2009).

Initiatives for protection of geo loess sequences in Vojvodina are slowly realized. In that play a crucial role interacting factors: policy, human resources, finance (Fig. 2).

It is the degree of protection loess sequence will depend on their tourism planning and tourism activation in the future.

The second step: Establish a Management Organization for Loess GeoTourism – MOLT that would provide prestigious position of loess geo tourism product (Fig. 2) at the tourist market.

The function of MOLT seems similar to Centralized Dater Management – CDM: “CDM itself is not specific system designed to produce geotourism. Instead, it is an outline that describes a pathway to improve communication where the free flow of information plays a central role. This chapter describing the use of CDM should not be considered to be a step-by-step guidebook for developing geotourism using Information and Communication Technology (ICT). However, it can and could be utilized as a tool when data management, people and businesses are bound together with geology” (Brozinski, 2010; Newsome&Dowling, 2010).

“A requirement for the inclusion on the world Heritage list is that the sites are appropriately managed by national and/or local governments and organizations so that their outstanding International heritage values are retained and maintained for future generations” (Grey, 2010). In the touristification of loess sequences all the steps and activities need to be conducted with the prior assessment of the experts who created loess geoscientific product in Vojvodina: research team of Group of Quaternary Research Centre-Cathedre of Physical Geography-Department of Geography, Tourism and Hotel Management, Faculty of Sciences, University of Novi Sad.

Benefits for the local community. Touristification of all loess sequences will bring a lot of benefits to the local communities: the transformation of the area and in functional tourism, the market placement of local products as well as bringing a significant social dimension to the communication between local residents and tourists, boost employment of the local residents. Local people would have a direct market for domestic product. It is to encourage new economic activity: the new services, crafts. Local people should participate in the creation of geotourism and the overall promotion of their environment.

IV. CONCLUSIONS

The geological diversity in the future will be the basis for the profiling of new types of geotourism. The presence of loess is one of the peculiarities of geological structure in Vojvodina (Serbia). Research shows that loess sequences in Vojvodina:

- spread on 60% of the territory of Vojvodina,
- very well scientifically studied,
- have an outstanding geological values,
- for scientific research are a real challenge,
- the educational laboratories in the open space,
- are unique landscapes, natural estetekih high values,
- have medjunarionu tourist position,
- near of the important cultural heritage.

Loess sequences are very well researched scientifically and very are significant potential for profiling authentic geotourism product.

The research for this paper was conducted through the following stages: determining the level of scientific investigations of loess sequences, tourism valorisation of loess sequences and touristification of loess sequences.

Loess geoscience product in Vojvodina has not been transformed into loess tourism product. Touristification of loess sequences in Vojvodina has a good chance in the future. For a successful touristification loess sequences is necessary their protection and to establish of Management Organisation for Loess Geo Tourism.

After complete scientific research and the Second groups of loess sequences in Vojvodina, then it will be possible to begin the process of their turistification. The loess sequence, for now, they can be complementary tourist motives.

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