ACTA FACULTATIS STUDIORUM HUMANITATIS ET NATURAE
UNIVERSITATIS PREŠOVIENSIS

PRÍRODNÉ VEDY

FOLIA GEOGRAPHICA 14

Ročník XLIX

Prešov 2009

ACTA FACULTATIS STUDIORUM HUMANITATIS ET NATURAE UNIVERSITATIS PREŠOVIENSIS, Prírodné vedy, XLIX., Folia Geographica 14, FHPV PU Prešov, 2009.

ISSN 1336-6149 (Acta Facultatis Studiorum Humanitatis et Naturae Universitatis Prešoviensis, Prírodné vedy)

ISSN 1336-6157 (Folia Geographica)

SPECIAL ISSUE FOR THE 2TH
EUGEO CONGRESS, BRATISLAVA 2009

VYDAVATELSTVO
PREŠOVSKEJ
UNIVERZITY

Dedicated to memory of prof. RNDr. JÁN DRDOŠ, DrSc.

(6th January 1934, Vígľaš – 27th May 2009, Bratislava)

OBSAH

SIX DECADES OF ACADEMIC GEOGRAPHIC EDUCATION AND RESEARCH IN PREŠOV 7
René MATLOVIČ – Eva MICHAELI

POPULATION DYNAMICS AND POPULATION POTENTIAL IN THE KOŠICE (1999-2005) 22
Slavomir BUCHER

IMPORTANCE AND VALUE OF SOIL ENVIRONMENTAL FUNCTIONS 40
Radoslav BUJNOVSKÝ, Martin VILČEK

LANDSCAPE RESEARCH IN TOPIC AND CHORIC DIMENSION FROM THE GEOGRAPHICAL POINT OF VIEW 46
Vladimír ČECH

COMPLEX SITE ANALYSIS AND SYNTHESIS ON A GEOGRAPHICAL SITE AS A METHOD IN THE GEOECOLOGICAL RESEARCH 53
Vladimír ČECH

THE INTRODUCTION TO THE ISSUE OF THE SPECIALISED HIKING TRACES AT THE BACKGROUND OF THE MOUNTAIN BIKING PROGRESS IN THE WORLD AND IN SLOVAKIA 60
Peter ČUKA

THE DEMOGRAPHIC SITUATION OF THE ROMA MINORITY IN THE MICRO-REGION "STRÁŽE" 74
Zuzana DOLNÁ

MEASUREMENT OF PLACE MARKETING ORIENTATION 83
Magdalena FLOREK

MIĘDZYMORZE AS A POLISH GEOPOLITICAL CONCEPT 89
Robert IŠTOK, Tomáš KOZIAK

LANDSCAPE STRUCTURE CHANGES IN MODEL VILLAGE OF HLINNÉ, VYŠNÝ ŽIPOV AND ZLATNÍK 98
Eva MICHAELI, Monika IVANOVÁ, Jana JUHAŠČIKOVÁ

GEOGRAPHY AND SOLAR ENERGY UTILIZATION 110
Ján KAŇUK

REGIONAL DISPARITIES IN PREŠOV REGION ACCORDING TO THE STRUCTURE OF INDUSTRY 121
Radoslav KLAMÁR, Martin ROSIČ

ASSESSMENT OF GULLY EROSION ACCORDING TO ADMINISTRATIVE UNITS OF SLOVAKIA 155
Štefan KOCO

WHAT IS THE COLOUR OF PREŠOV?
AN ANALYSIS OF COLOUR ASSOCIATIONS IN THE POPULATION EVOKED BY A GEOGRAPHICAL AREA AS THE FUNDAMENT FOR CREATING AN ACCEPTABLE CITY BRAND 167
Kvetoslava MATLOVIČOVÁ

GEOECOLOGICAL STRUCTURE OF THE DUMP OF TECHNOLOGICAL WASTE (FE – CONCENTRATE) AT SEREĎ 180
Eva MICHAELI, Martin BOLTIŽIAR, Monika IVANOVÁ

SKI TOURISM IN THE POLISH CARPATHIANS – PRESENT STATE AND ISSUES OF DEVELOPMENT 198
Mirosław MIKA

THE POPULATION DEVELOPMENT OF VEĽKÝ ŠARIŠ IN THE CONTEXT OF SUBURBAN PROCESSES IN 1991 – 2006 209
Barbora NÉMETHYOVÁ

TOURISM POTENTIAL AND POSSIBILITIES OF ITS EXPLOITATION IN THE SUBCARPATHIAN (PODKARPACKIE) VOIVEDESHIP 223
Robert PAWLUSINSKI, Bartosz PIZIAK

THE INFLUENCE OF THE POPULATION AGE STRUCTURE AND SIZE CATEGORY OF SETTLEMENTS ON THE ELECTORAL PREFERENCES OF POLITICAL PARTIES IN THE NATIONAL COUNCIL ELECTION IN 2006 IN PREŠOV DISTRICT 238
Beáta PUSTÁ

THE POTENTIAL OF TOURISM IN THE PREŠOV COUNTY REGIONS 249
Martin ROSIČ, Radoslav KLAMÁR

WINTER WHEAT GROWING POTENTIAL IN SLOVAK RURAL LANDSCAPE. *(Triticum aestivum* **L.***)* 271
Jozef VILČEK

SIX DECADES OF ACADEMIC GEOGRAPHIC EDUCATION AND RESEARCH IN PREŠOV

René MATLOVIČ – Eva MICHAELI[1]

Abstract: *The admission of the Slovak Geographical Society into the EUGEO in 2007 was in particular important events that influenced the life of the Slovak geographical community in the last years. The forthcoming 2th congress of the EUGEO, which will be held in Bratislava in this year is very good opportunity to reflect the history and the present stay of the geographic education and research at the University of Prešov. Thereat we have an ambition to present a brief profile of the Prešov´s geographical community with emphasis on its institutional development, legislative position, and problems of geographical research and education.*

Key words: *geographical institutions, geography, geographical education, geographical research, Prešov, University of Prešov.*

INTRODUCTION

Tradition of geographic education at the university level in Prešov has traced as far back to 1667, when the first lectures from geography were introduced at the Evangelic college by Michal Pancratius. In the following period there were many famous people in the roles of students and professors that participated in the field of geographic research, education and propagation. The most famous students studying at the college were e.g. Ján Adam Rayman, Ján Matej Korabinský, Pavol Rebery, Samuel Augustíni ab Hortis, Ján Hunfalvy, Ján Pettko, Jozef Jekelfalussy, Alfréd Grósz a Juraj Janoška. From the college professors we can mention Fridrich Hazslinszký, Ján Csinka, Jozef Koreň, Ladislav Urbánek and Mirko Trnovský. In the 19th century some geographically oriented figures acted also at the Roman Catholic royal grammar school. One of the famous and very active people in publishing was Jan Nepomuk Woldřich. In 1918 the Evangelic college lost its character of university and in 1945 the last institute of Prešov college – The college grammar school – was closed, too. However, in the second half of 20th century some new educational institutions were established. They continued in rich traditions of Prešov education and they brought the development of university geographic education and research in eastern Slovakia.

1 **Prof. RNDr. René Matlovič, PhD., prof. RNDr. Eva Michaeli, PhD.,**
Department of Geography and Regional Development, Faculty of Humanities and Natural Sciences, University of Prešov, ul. 17. novembra 1, 081 16 Prešov, Slovakia, e-mail: matlren@unipo.sk, michaeli@unipo.sk.

INSTITUTIONAL INCORPORATION OF GEOGRAPHIC EDUCATION AND RESEARCH IN PREŠOV

Permanent lack of teachers in eastern Slovakia caused establishing of tutorial centres for the distance studies of teachers in Košice (1946) and in Prešov (1947). In 1949 Faculty of Education of Slovak University in Košice started to continue in their activities, establishing The Institute of Geography. It became the first Slovak academic place situated outside Bratislava. In 1952 the institution moved to Prešov. The Institute of Geography was the part of department of natural sciences that merged also the institutions of botany, zoology, chemistry and geology. One year later an organizational reform of teachers` education took place in Slovakia. On the basis of one of the pedagogic faculty branches, The Higher pedagogic school for teachers from 6th to 8th grades of elementary schools was established in Prešov. In 1954 first 20 teachers of geography left the school. They continued in spatial and personal development of the institute, which was located in the building of former Evangelic college grammar school situated at Námestie legionárov (Legionar square). In 1959 the system of academic preparation of teachers was reorganized again. New pedagogic institutes were formed in Prešov and Košice. Year 1961 was an important milestone in institutional development of the department. The Institute of Geography was detached from the Department of Natural Environment, declaring an autonomous Department of geography. In 1964 Education Institute in Prešov changed to Faculty of Education, which was incorporated into University of Pavol Jozef Šafárik (UPJŠ) located in Košice as its fourth faculty. The tuition of Geography as a field of study then moved to the university level increasing prestige and quality of the department and its academicians. At that time there were 8 pedagogic- research workers employed at the department. On the basis of scientific college of geology and geography of Slovak Academy of Sciences` recommendations we established a research station called The Cabinet for research of Nature Environment, later renamed as The Cabinet for Landscape Research. Its function was to intensify the research activity in the field of geography in the region of eastern Slovakia. It was the only research workplace acting at Faculty of Education, University of P. J. Šafárik in Prešov. In its beginnings the Cabinet consisted of three researchers and two technical workers.

At the beginnings of seventies the department was unfavourably influenced by communist normalization under soviet pressure. Ján Karniš, who was managing the department to become one of the prominent workplaces in Slovakia, was deprived of his supervision, furthermore he was compelled to leave the department. However, a very well cooperative team of the department successfully continued in accomplishing its educational and research activities henceforward. In 1977 the department started to cooperate with detached workplace of Geography Institute of the Slovak Academy of Sciences in Košice. In seventies another significant change took place in organization of university preparation of teachers. Since 1977 Faculty of Education UPJŠ started to prepare the teachers of geography not only for the second degree of elementary schools, but also for high schools. The study was lengthened from four to five years. Due to the new law about the universities The Cabinet for Landscape Research was closed in 1981 and his workers became the research workers of The Department of Geography. Material and spatial conditions of education and research work changed significantly, too. In 1984 the department moved to new university campus that was built on 17, November

Street. Except for the offices, the department received also some auditoriums, a geology laboratory, a library and a study hall.

In the nineties of 20th century, the department was suddenly in new social-economical conditions. From the point of view of technical equipment we started to build our laboratory of geographical information systems. Abolition of detached workplace of Geography Institute Slovak Academy of Sciences in Košice in 1991 supported the personal basis of the department by moving most of its employees to Prešov. New tendencies in geographic education with the emphasis on protection and creation of environment were reflected by means of changes in a study program and enhancement of research study on the department. As a result of these changes in 1996 the department was renamed to Department of Geography and Geoecology. In 1997 there was a significant change in the institutional incorporation of the department. Separate Prešov University was formed out of the original Prešov faculties of P. J. Šafárik University. Faculty of Education also split up and The Department of Geography and Geoecology became the part of Faculty of Humanities and Natural Sciences, Prešov University. In 2004 it was renamed into The Department of Geography and Regional development. Traditionally it is one of the best geography departments in Slovakia furthermore most of its workers` activities gained international appreciation. This status was reached mainly due to the merit of people that were in its managing positions and since 1961 as the leaders of the department: Matej Papík (1949-1952), Ján Karniš (1952-1970), Ján Šišák (1971-1981), Martin Mihály (1981-1986), Rudolf Novodomec (1986-1994), Ján Harčár (1994-1997) a Eva Michaeli (since 1997).

PERSONAL DEVELOPMENT OF GEOGRAPHIC EDUCATION AND RESEARCH IN PREŠOV

Personal occupancy of geographic education and research was very scarce in its beginnings. The first external employee of The Institute of Geography was Matej Papík in 1949. Since 1951 he became an internal employee. In the fifties of 20th century the department employed another three creative workers (table 1). In sixties the personal development continued and in 1963 four new employees moved from the abolished Institute of Education to Prešov. The newly found Cabinet for Landscape Research proposed three workplaces. By the end of sixties there were 3 associated professors, 1 assistant professors with PhD. degree, 3 assistants professor without PhD. degree, 2 research workers, 5 technical workers and 1 secretary working on the department and in the cabinet.

Tab. 1: *Development of the number of employees at the department according to qualification categories in 1949-2009*

year	Full professors	Associated professors	Assistants professors with PhD. degree	Assistants professors without PhD. degree	Full time PhD. students
1949	0	0	0	1	0
1958	0	0	0	4	0
1964	0	2	0	6	0
1970	0	3	1	5	0

1975	0	3	1	5	0
1981	1	3	2	6	0
1984	1	5	2	4	0
1989	0	3	2	6	0
1995	1	4	0	7	0
2000	2	2	4	4	2
2009	4	2	7	1	8

In the seventies of 20th century there were 3 new employees employed and another person came from the attenuating Department of Geology, Biology and bases of agricultural production. In 1978 Ján Harčár left the place, becoming a leader of newly formed detached workplace of The Institute of Geography Slovak Academy of Sciences in Košice. In the first half of eighties the department had really favourable qualification structure. There was 1 full professor, 5 associated professors, 2 assistants professor with PhD. Degree, 4. researchers and 4 assistants professor without PhD. degree.

Personal development was highly influenced by the abolition of detached workplace of The Institute of Geography Slovak Academy of Sciences in Košice in 1991. Most of its former employees moved to our department. On the other side, some of the long-term employees left for the retirement (table 1 and 2).

The arrival of one of the most significant representatives of Slovak geography – prof. Ján Drdoš, who became a guarantee of the development of geoecology, environmental research and education, meant a considerable reinforcement of the department. As a result of qualification promotions of our employees, we were authorized to provide PhD. studies for our students, habilitations and nomination procedures of professors. Since 2000 there were 19 internal PhD. students at the department (table 3). It has the best qualification structure in its history. At present there are 4 full professors, 2 associated professors, 7 assistant professors with PhD. degree, 1 assistant professor without PhD. degree, 8 full time PhD. students and 3 members of the administrative-technical staff.

Tab. 2: *List of academic staff working at the department in 1949-2009*

Surname and name	Period of the stay at the department	Prof.	DrSc.	Doc.	PhD.	RNDr./ PaedDr	Mgr./ Ing.
Čech Vladimír	2003-				2004	2006	2000
Čuka Peter	2008-			2007	1998	1989	1989
Čurný Ján	1963-1965						X
Danko Jozef	1961-1963						X
Drdoš Ján	1998-2005	1994	1981	1993	1967	1967	1958
Dzurovčin Ladislav	1997-2003				1991	1984	1982
Gašpar Gregor	1962-1966						1956
Harčár Ján	1967-1978, 1991-2005	1999		1994	1976	1968	1958
Hochmuth Zdenko	1974-1999			1989	1984	1975	1974
Hofierka Jaroslav	2001-			2004	1998		1992
Hrinda Ján	1978-1984			1975	1972	1969	1960

Ištok Robert	1981-	2008		2001	1997	1983	1981
Ivanová Monika	2006-				2007	2006	2003
Kancír Ján	1984-2003			2002	1998	1985	1980
Kandráčová Viktória	1979-2005					1981	1978
Karniš Ján	1952-1972			1962	1961	1952	1950
Klamár Radoslav	2001-				2005	2001	1998
Košťálik Ján	1966-1995	1993	1992	1966	1961	1966	1953
Krenický Sergej	1962-1965						X
Lehotský Karol	1963-1964						X
Leššová Oľga	1978-1982					1981	1978
Lukáčová Alena	2007-				2007	2006	2004
Madziková Alena	1986-				2003	1986	1986
Matlovič René	1990-	2007		2000	1997	1990	1990
Matlovičová Kvetoslava	2008-				2008	2007	1994
Mihalčín Juraj	1981-1984						X
Mihály Martin	1954-1991			1977	1972	1968	1952
Michaeli Eva	1966 -	2002		1992	1979	1976	1965
Mintálová Tatiana	2004 -2008				2006	2006	2001
Mitríková Jana	2005-				2007	2006	2002
Nižnanský Branislav	1988-2001				1998	1983	1980
Novodomec Rudolf	1967-1998			1982	1977	1975	1965
Olejár František	1987-1987			1974	1964		X
Papík Matej	1951-1959, 1963-1986			1960		1968	1946
Popjaková Dagmar	1992-2001				2001	1987	1987
Rosič Martin	2005-					2001	1998
Sabol Anton	1967-1968						X
Šišák Ján	1963-1986	1981		1973	1969	1971	1961
Štecová Ľudmila	1958-1991					1981	1958
Vilček Jozef	2005-	2005		2003	1998		1981
Zverková Martina	1998-				2007		1996
Zlacká Adriana	2003 -2005						1998

X - nondetected

Tab. 3: *List of internal PhD. students at the department in 1949-2009*

	Period of the stay at the department
Bucher Slavomír	2008-
Čech Vladimír	2000-2003
Dolná Zuzana	2007-

Ivanová, rod. Škrabuľáková Monika	2003-2006
Kaňuk Ján	2006-
Koco Štefan	2006-
Kozáková Katarína	2005-2008
Krokusová, rod. Francová Juliana	2003-2006
Kunáková Lucia	2008-
Lovacká Stela	2004-2007
Lukáčová, rod. Sedláková Alena	2004-2007
Matlovičová Kvetoslava	2005-2008
Mintálová Tatiana	2001-2004
Mitríková, rod. Fertaľová Jana	2002-2005
Némethyová Barbora	2008-
Potocký Peter	2004-2007
Pustá Beáta	2008-
Solár Vladimír	2008-
Zlacká Adriana	2000-2003

EDUCATIONAL ACTIVITIES

In the first period of its development (1949 – 1977) The Institute of Geography and then since 1961 The Department of Geography provided education of teachers for the II. degree of elementary schools. In that time the study was realized in double major and triple major fields of study. In the sixties of 20th century it was possible to combine the study of Geography with the study of the I. degree of elementary schools. Totally 873 teachers of Geography gained their qualification for the II. degree of elementary schools at Prešov department in internal as well as external form of study in the period between 1954 – 1980.

In 1977 department started to prepare teachers in the field of study 76-12-8 Teaching of academic subjects with the qualification for the II. degree of elementary schools as well as high schools. The study was extended to 5 years and it was realized in combinations with Mathematics, Russian language, Pedagogy and Physical Education. Department also provided the education for students of supplementary study and post-gradual study with the aim to extend the qualification of the teachers that accomplished their studies before 1982 to be able to teach at grammar schools and high schools. They also tried to provide the basis for partial specialization of some of the geographical disciplines.

Except for internal and external studies of teachers of Geography, the department ensured the education of new aspirants. In the eighties of 20th century it was the educational institute in the field theory and methodology of geography teaching. Special form of pedagogic work, especially with the talented students, was the Course of student scientific and research activity, established in 1974. Students` works were one of the best in the nationwide competitions of students (SVOČ) out of the students from Prague, Brno and Bratislava.

Formation of new social-economical conditions in the nineties of 20th century was accompanied with higher initiative of the department workers in pedagogic field. They started to participate in teaching of geographic disciplines on other faculties, mainly at their

new educational fields. The department started to provide the education of Geography with methodology for the students of the field of study: teaching of the I. degree of elementary schools. Most of its academicians are teaching at Faculty of Arts (Political geography, Historic geography and Demography), Faculty of Management (geographic disciplines) and Faculty of Mining, Ecology, Process control and Geotechnology, Technical University in Košice (geographic disciplines). The department took part at the development and realization of the new field of study "Management of public administration and regional development" that started to develop at Faculty of humanities and natural sciences, University of Prešov since 1998.

Since 2003 the department realizes the education in two fields of study of the first and second degree: Geography in regional development in the field of study 4.1.35. Geography (guarantee for the bachelor degree is doc. Mgr. Jaroslav Hofierka, PhD., guarantee for the master degree is prof. RNDr. René Matlovič, PhD.), and Geography teaching in the field of study 1.1.1. Academic subjects teaching (guarantee - prof. RNDr. Robert Ištok, PhD.) Within aforesaid study programs, the department proposes wide scale of study program units. Nowadays there are 468 students (including 8 full and 18 part-time PhD. students) studying at The Department of geography and regional development. During their studies they gain several competences and skills that ensure them flexible positions at labor market: teaching competences at elementary schools and high schools (physical-geographical, human-geographical and regional-geographical disciplines, pedagogic-psychological disciplines, methodology of geography, other social sciences); competences of the geographer – analyst for the needs of territorial and regional development, research analyses processing, landscape planning, territorial planning, territorial system of ecological stability, evaluation of influences on environment, statistical and demographical analyses and projections; competences of projects and prognosis creator in terms of the European Union`s structural politics; digital competences (the ability to use ICTs- information and communication technology, GIS – geographical information systems and GPS – global position system, the ability to create the maps and other graphical outputs); language competences (the English language by word and writing, possibility to study other languages); manager competences (economic, law studies, project management, territorial marketing, project management of the EU projects and alike). For educational needs, the department is equipped with special classrooms, GIS laboratory and geologic laboratory. Significant part of teaching process is realised in terrain. Department academicians give the lectures of various geographic disciplines on most of the faculties at University of Prešov.

Since 1999 department gained the accreditation for PhD. study in the field of study Physical geography and geoecology. It was approved by the Ministry of Education on the basis of Slovak Accreditation commission references. Prof. RNDr. Ján Drdoš, DrSc. became the main guarantee of study program, the other guarantees and tutors were prof. RNDr. Ján Harčár, CSc. and prof. RNDr. Eva Michaeli, PhD., who is also a member of PhD. study commission in the field of study physical geography and geoecology. Totally there were three dissertation theses from the field of study physical geography and geoecology accomplished in 2000-2008 (V. Čech, M. Zverková, P. Chrastina). In 2000 the department was allowed to realize habilitation and nomination procedures of full professors in the field of study physical geography and geoecology. In the period 2001-2005, under the

guidance of commissions leaded by prof. RNDr. Ján Drdoš, DrSc. and prof. RNDr. Eva Michaeli, PhD., there were 4 inauguration procedures (E. Michaeli, J. Vilček, M. Huba, J. Oťaheľ) and 5 habilitation procedures (A. Gajdoš, P. Michal, J. Vilček, J. Oťaheľ, J. Hofierka).

In 2003 the department gained the accreditation for PhD. study in study program Regional geography and regional development in the field of study 4.1.38 Regional geography. At present the main guarantee of the study is prof. RNDr. René Matlovič, PhD. And its co-guarantees are prof. RNDr. Robert Ištok, PhD. and doc. Mgr. Jaroslav Hofierka, PhD. In the period between 2003-2008 there were 12 dissertation theses successfully accomplished in the field of study Regional geography (T. Mintálová, J. Fertaľová, M. Ivanová, J. Krokusová, A. Sedláková, S. Lovacká, P. Potocký, D. Oremusová, K. Matlovičová, O. Slobodníková, J. Jakubík). In 2005 the department was the first in Slovakia that was allowed to realize habilitation and nomination procedures of professors in the field of study 4.1.35 Geography. In 2005-2008 there were 4 inauguration procedures (R. Matlovič, R. Ištok, V. Lauko a V. Baar) and 11 habilitation procedures (P. Čuka, J. Marenčáková, Z. Szczyrba, V. Ira, J. Lacika, J. Dokoupil, D. Popjaková, A. Krogman, M. Boltižiar, L. Jeleček, I. Smolová).

SCIENTIFIC-RESEARCH ACTIVITIES

Scientific-research activity was not so intensive at its beginnings. Only some of the members of the department took part in the scholastic activity due to insufficient financial, technical and personal support. This activity was realized by means of individual personal initiatives that were not coordinated. In the fifties and in the first half of the sixties we examined soil issues of the eastern Slovakia territories, issues of work attendance and economic development of the backwoods regions and issues of geography teaching theory.

In the first half of the sixties there was a significant qualitative improvement in the scientific-research activity of the department. The main impulse was the establishment of The Cabinet for Landscape Research in 1966. In 1967 some of the department and cabinet workers participated in the national research task called "Geographical regionalization of Czechoslovakia", coordinated by the Institute of Geography Slovak Academy of Sciences (SAS) in Bratislava. Within this task, our workplace solved physical-geographical characteristics of Pieniny, related to the establishment of Pieninský national park.

In the first half of the seventies of 20th century we examined "Geomorphologic analysis of flysch territories of eastern Slovakia" as a part of a national research task. It was a remarkably difficult research, realizing geomorphologic mapping of territories on the area of 2869 km^2. In the second half of the seventies the research activity of Prešov department was widely extended. Within the national task "Landscape as a territorial system and its potential", coordinated by The Institute of Geography SAS, the department solved two partial research tasks: "Geography of Prešov district" and "Flysch areas of eastern Slovakia – physical-geographical analysis and synthesis." In 1978 The Cabinet for the landscape research was involved into a research task within Intercosmos program. It was a study of morphostructures and recent tectonic movements by means of cosmic information in several geomorphologic parts of eastern Slovakia. A kind of different issue was the task of geography teaching theory, where we aimed on the influence of educational content and methods on the personality formation of students at elementary schools.

In the first half of the eighties of 20th century the department researchers solved two issues of national plan of basic research. The essential part of the team participated at the task "The structure of landscape in selected flysch areas of eastern Slovakia and possibilities of its economical use". So, the eighties meant significant shift in scientific-research direction of the department. Along with a physical-geographical and geomorphologic research there was a penetration of human-geographical research due to the change in personal constitution of the department. In the field of didactic research the workplace retained its continuity. In the first half of the eighties we solved the resort task "Scholastic organization of educational process at universities", where we aimed at efficiency increase of methodology teaching by means of stimulation of creativity and independence of students. In the second half of the eighties we dealt with the task of "Evaluation of landscape elements and their function in the environment – model area of Vranov nad Topľou district". New orientation of research reflecting the need for solutions of the tasks of environment protection and formation can be observed in this period. Geologically oriented was also a practical expertise suggesting functional structure of landscape in the area of a potential nuclear power station in Kecerovce. Specific orientation of the department in Slovak context was proved by several complex micro-geographic studies of rural regions (Medzany, Šarišské Michaľany, Drienovská Nová Ves), establishing tradition of micro-geographic research and education at the department. In the didactic field the emphasis was on the efficiency of forms, methods and resources in teaching basic knowledge about the earth and space.

The nineties of the 20th century brought a change also into the organization of the research activity. System of national research tasks was replaced by more demanding system, in which research projects apply for financial support of grant agencies. Simultaneously there are research projects supported by various foundations or international projects, too. At the beginning of nineties the department despite the high competition gained a grant on the project "Geomorphologic processes, their manifestation in the surface of selected geomorphologic structures of Western Carpathians and their cartographic interpretation".

The other project was aimed on the study of geographic structure of selected regions from the aspect of their rational exploitation, environmental protection and quality of life. The success of the department continued in the nineties of 20th century, too. The following two grant projects were solved: "Transformation of spatial structure of urban landscape in Prešov as a result of social changes in the last decade" (E. Michaeli) and "The influence of endogenous and exogenous processes on the landscape formation and morpho-structural plan of čergov – beskydian flysch" (J. Harčár).

At the break through of centuries and in the first decade of 21st century the number and structure of projects was diversified. This diversification included except for the thematic character of projects, also the structure of grant schemes. The most significant change was internationalization of scientific activities. As an example we can mention research activities of J. Harčár in cooperation with polish archeologists and geologists that examined the first farmers and shepherds in Nízke Beskydy Mountains (Low Beskyds) and old-pheasant settlement in Nízke Beskydy Mountains (Low Beskyds). The other international project (leaded by R. Matlovič) was aimed on comparative study of intra-urban structures` transformation and their perception in four post-communist cities (Praha, Bratislava, Olomouc, Prešov). Since 2007 the department is participating on

the 6th framework program of European Union "*Management and Exploitation of Solar Resource"*, FP6 -2005 – TREN-4 (leaded by J. Hofierka). APVV COST project called "Urban landscape in Slovakia – regionalization, protection and planning" (leaded by J. Hofierka) has an international dimension, too. Another project COST "Understanding pre-industrial structures in rural and mining landscapes" (lead. J. Hofierka) has interdisciplinary character.

In the field of physical-geographical research we continued in solid traditions of geomorphologic exploration. The study was aimed on the influence of endogenous and exogenous processes on surface formation and morpho-structural plan of dukla-bukovian flysch, analysis of abiotic complexes of Beskydian foothills. In the last period we solved national grant projects (VEGA, APVV) aimed at the potential of renewable energy sources, geoecological evaluation of urban landscape changes in particular mountainous regions of Slovakia, pedogeographic aspects of multi-functional usage of agricultural land, regional specifics of protection and use of soils in agricultural land (leaded by Vilček, J., Michaeli E., Hofierka, J.)

In the field of human-geographic research there is traditionally strong orientation on the issues of cities and rural areas, regional development and political-geographical research. Thematic topics of projects (VEGA, KEGA, AV) are continuously penetrating also into other spheres of geography. In the last periods the department dealt with the issue of development tendencies of regional complexes in eastern Slovakia in the period of globalization and transformation of Slovak society and their potential for the next development, the issue of quality of life as a suitable frame of complex geographic interpretation of intra-urban structures, the issue of transformation of political-spatial systems and systems of democracy in the context of globalization, the study of ethnic specifics of gypsies from demographic and urban-social view, theoretic bases and educational applications of geopolitics issues, globalization and international politics. Actually we participate on the solution of theoretical-methodological frame and applications of place concept in regional geography and territorial marketing, questions of specific position of eastern Slovakia region in the context of regional disparities in Slovakia and potential of tourism of central Slovakia in geographic models (leaded by R. Matlovič, R. Klamár, R. Ištok, P. Čuka). P. Čuka is participating on the solution of institutional grant at Lodž University in Poland, aimed at the research of functions of spa cities in Slovakia and Poland.

The department is still improving research in the field of geography didactics and methodology. In the last period we solved the issue of geographic education innovation with the aim on local region in the context of further education of teachers on elementary schools and high schools (leaded by Madziková, A.).

EDITORIAL ACTIVITY

Results of research activity were published in the Proceedings of Higher pedagogic school in Prešov in 1959 and in the Proceedings of The Institute of Education in Prešov and in Košice I. and II. in 1962 and 1963. These publications started the edition of scientific articles that became known in 1966 – 1991 as "*Zborník Pedagogickej fakulty v Prešove UPJŠ v Košiciach*" *("Proceedings of Faculty of Education in Prešov, UPJŠ Košice")*, and geographic contributions were published within the series of Natural Sciences in the issues no. 5/1966, 7/1968, 8/1973, 10/1973, 13/1976, 16/1980, 18/1981, 19/1982, 20/1983,

21/1985, 22/1987, 23/1991, 26/1995 and 28/1997. Altogether there were 67 scientific works from geography published in these proceedings. Some contributions from the didactics of geography were published within the series of Social Sciences. In 1995 these scripts were published under the title *Acta Facultatis Paedagogicae Universitatis Šafarikanae*. The last issue (Volume 28) from 1997 reflects institutional changes and was published under the title *Acta Facultatis Studiorum Humanitatis et Naturae Universitatis Prešoviensis*. In 1998 separate geographic editorial series of scientific scripts were detached having the title *Folia geographica*. There were 13 volumes published so far. Along with these scientific works, The Cabinet for landscape research started to edit the series of "*Geographic works*". The edition contains mainly the works of monographic character. In 1970-1978 it provided 6 monographs. Later, after the abolition of the Cabinet, the edition of these volumes was stopped and renewed only in 1996. Since that time, there were 7 monographs published and there are some waiting for the edition, too: *Geomorphologic character of central part of Revúcka highland and adjacent parts of Rimavská fold and Slovak carst* (Z. Hochmuth), *A state on the political map of the world – political-geographical and geopolitical aspects* (R. Ištok), *Geography of spatial structure of Prešov* (R. Matlovič), *Transformation of industry in Šariš region* (D. Popjaková) *The surface of Hornádska fold* (E. Michaeli) and *Strategic planning of Ptava micro-region development* (R. Klamár), *Cultural landscape in Slovakia* (J. Hofierka). These editorial activities contribute to positive presentation of the research activity in Prešov department and at the same time they enable to gain valuable foreign literature on the basis of reciprocal change.

Department participated significantly in edition of Spravodaj Východoslovenskej pobočky Slovenskej geografickej spoločnosti (Report of eastern Slovakia branch of Slovak geographic society). The branch was established at the department in 1959 and the first issue of report was published in 1961. Totally there were 29 volumes of this periodical (some of them were double volumes) edited in the period in1961-1990.

Except for the periodical publications there were several occasional proceedings from scientific conferences, scripts and other publications. One of the most successful among the geographic community was the proceedings from the theoretical-methodological seminar, organized in 2005 *Development, current state and perspectives of Slovak geography in 21st century* (lead. R. Matlovič and V. Ira). Another significant publication was the Proceedings *Urban and Landscape studies No.3*, published at the international conference "Urban development at the turn through of millenniums" in 2000 under the editorial of R. Matlovič.

New aims of the department after 1998 in educational field were demonstrated by several new monographs, university textbooks and educational scripts such as *Geography of religions – issue outline* (R. Matlovič), *Regional geography of Slovak republic* (E. Michaeli), *Political geography and geopolitics* (R. Ištok), *Population Geography of Slovakia with special attention to Roma minority* (R. Matlovič), *Geography of public administration* (R. Ištok, R. Matlovič, E. Michaeli), *Geographic information systems and remote sensing* (J. Hofierka), *Geoecology and environmentalistics* I. (J. Drdoš), *Geoecology and environmentalistics* II. (J. Drdoš, E. Michaeli, T. Hrnčiarová), *Didactics of geography* (J. Kancír, A. Madziková), *Mineral resources of Slovak republic* (E. Michaeli), *Geography for farmers and managers* (E. Michaeli, R. Matlovič, E. Dušecinová). Textbook *Regional development and regional politics for geographers* is in press.

INTERNATIONAL COOPERATION

Department cooperates with several geographic departments at the universities abroad, its students can participate on various mobility stays (CEEPUS, Erasmus programs). There are universities from Poland (Jagellonian University in Kraków, University of Łódź, Institute of Geography and Spatial Economy Polish Academy of Sciences in Warsaw), Czech Republic (Charles University in Prague, Palacky University in Olomouc, University of Ostrava), Great Britain (University of London), Spain (University of Girona), France (Université des Sciences et Technologies de Lille, Université Blaise Pascal in Clermont Ferrand), Slovenia (University of Maribor, Primorska University of Koper, University of Ljubljana), Hungary (University of Pécs, University of Debrecen, Karoly Eszterházy College in Eger), Croatia (University of Zagreb, University of Zadar), Serbia (University of Novi Sad), Austria (Karl Franzens University in Graz). We are also in contact with JRC in Ispra, Italy and Kentucky University in Lexington, USA. The most significant internal cooperation is with The Institute of Geography Slovak Academy of Sciences in Bratislava, Faculty of Sciences, Comenius University in Bratislava and with other geographic workplaces. Students, PhD. students and other researchers of the department participate on mobility stays and research stays abroad. The department was presented also by its active members on several top world undertakings – 30th Congress of IGU in Glasgow in 2004 (R. Matlovič), 1st European geographic Congress EUGEO in Amsterdam in 2007 (R. Matlovič, K. Matlovičová) and 31st Congress of IGU in Tunisia in 2008 (R. Matlovič, K. Matlovičová) and on many other famous international conferences (e.g. Colloque franco-polonais-slovaque v Clermont – Ferrand v roku 2008 - E. Michaeli, M. Ivanová, T. Mintálová).

OTHER SIGNIFICANT ACTIVITIES

The position of the department is reinforced also by some other activities. Since 1959 there is The East Slovak branch of Slovak Geographical Society by the department. Its aim is to popularize Geography among the teachers and students and it contributes to the improvement of education by maintaining the contacts with its academicians in practice. During its existence it organized 10th congress of Czechoslovakian geographical society in 1965 and 8th congress of Slovak geographical society in 1982. The most significant was the 10th congress having the attendance of many famous representatives of geographic science from abroad. Except the others, there were geographers such as prof. dr. H. Hubrich from German Democratic Republic, prof. dr. J. Kostrowicki from Poland, prof. dr. S. Láng from Hungary, prof. I. M. Majergojz from Soviet Union, prof. S. Massip from Cuba, dr. M. M. Sakamoto from Japan, prof. dr. W. Sperling and prof. dr. C. Troll from Federal Republic of Germany and Prof. dr. M. Vasovič from Yugoslavia. In 1998 department organized 12th Congress of Slovak Geographical Society. Nowadays the chairperson of the department is E. Michaeli.

The workers of geography department participated very actively on the organization of the university and faculty as a whole. Since 2007 R. Matlovič is a rector of the University of Prešov becoming the first geographer in Slovakia that reached such a high academician position. In the past Ján Karniš (1965-1969), Ján Košťálik (1990-1991), Zdenko Hochmuth (1991-1994) a Rudolf Novodomec (1994-1997) were in the function of dean. The positions of vicedeans in particular periods were represented by Z. Hochmuth (1990-1991, 1994-

1997), J. Karniš (1964-1965), J. Košťálik (1969-1970), R. Matlovič (2000-2007), R. Ištok (2007-2009), R. Novodomec (1991-1994), M. Papík (1964-1969) and J. Šišák (1972-1984). The chairperson of Academic Senate of faculty was Z. Hochmuth (1997-1998) and E. Michaeli (1999-2007). Several workers were the members of main committees of scientific societies, mainly of Slovak Geographic Society. R. Matlovič is the first president of Slovak Geographical Society (since 2006) coming from the region outside Bratislava. As a leader of Slovak delegation on EUGEO Congress in 2007, Amsterdam, he contributed to admission of Slovak Geographical Society to EUGEO – the Association of Geographic Societies of European Union countries and he contributed to the fact that Slovak Geographical Society will organize 2nd European Geographic Congress in Bratislava in 2009. Z. Hochmuth was the leader of Slovak speleological society. Some of the department members participated on the solutions of the environmental issues on local level. E. Michaeli was the representative of municipal representation in 1990-1994 and the deputy of the Commission of construction, transport, environment and regional planning in Prešov.

CONCLUSION

Department of Geography and Regional Development is a consolidated science-research and educational workplace with significant national reputation and international acceptation. Its position on education and research market is enhanced also by its symbiosis with other departments of faculty, which was according to assessment of Academician ranking and rating agency (2008) selected as the best out of all Faculties of humanities in Slovakia. Specific position of the department among other geographic workplaces is given by the fact that it tries to form a separate geographic school based on integrated version of geography. It includes the search for bridging between binary and idiographic-nomothetic version of geography. One of the possibilities how to overcome this duality can be the development of regional geography based on contextual holism. Geography is therefore understood as an integral, trans-disciplinary platform on one side trying to explain the processes structuring space and on the other side trying to understand the basis and identity of regional units of various taxonomic levels in the context of daily human experience.

References

MATLOVIČ, R. (1997): Prešovské evanjelické kolégium a rozvoj geovedného bádania a edukácie. In: Kónya, P.; Matlovič, R. (eds.): Prešovské evanjelické kolégium, jeho miesto a význam v kultúrnych dejinách strednej Európy. Acta Collegii Evangelici Prešoviensis, I., BÚ VD ECAV Prešov, 117-127.

MATLOVIČ, R. (1998): Katedra geografie a geoekológie Fakulty humanitných a prírodných vied Prešovskej univerzity v Prešove a jej pozícia v geografickej edukácii a výskume na konci druhého tisícročia. Acta Facultatis Studiorum Humaninatis et Naturae Universitatis Prešoviensis, Prírodné vedy, XXIX., Folia Geographica 1, 13-64.

MATLOVIČ, R. (2006a): Geografia – hľadanie tmelu (k otázke autonómie a jednoty geografie, jej externej pozície a inštitucionálneho začlenenia so zreteľom na slovenskú

situáciu). Acta Facultatis Studiorum Humanitatis et Naturae Universitatis Prešoviensis, Folia Geographica, 9, 6-43.
MATLOVIČ, R. (2006b): K problematike hľadania platformy symbiózy idiografického a nomotetického spôsobu produkcie geografických poznatkov. Geografická revue, 2, 25-39.
MATLOVIČ, R. (2007): Hybridná idiograficko-nomotetická povaha geografie a koncept miesta s dôrazom na humánnu geografiu. Geografický časopis, 59, 1, 3-23.

ŠESŤ DECÉNIÍ VYSOKOŠKOLSKEJ GEOGRAFICKEJ EDUKÁCIE A VÝSKUMU V PREŠOVE

Zhrnutie

Tradícia geografickej edukácie na vysokoškolskej úrovni v Prešove siaha do r. 1667, keď sa na Evanjelickom kolégiu zaviedli prednášky z geografie, ktoré viedol Michal Pancratius. V ďalších obdobiach na kolégiu v úlohe študentov a profesorov pôsobili viaceré osobnosti, ktoré sa výrazne presadili v oblasti geografického bádania, edukácie a propagácie. Evanjelické kolégium v r. 1918 stratilo charakter vysokej školy a v r. 1945 zanikol aj posledný ústav prešovského kolégia - kolegiálne gymnázium. V období 2. pol. 20. storočia však vznikli nové vzdelávacie inštitúcie, ktoré nadviazali na bohaté tradície prešovského školstva a priniesli aj rozvoj vysokoškolskej geografickej edukácie a bádania na východnom Slovensku. V r. 1949 sa začal budovať ústav geografie na novozriadenej pobočke Pedagogickej fakulty Slovenskej univerzity v Košiciach. Ústav sa stal prvým slovenským geografickým akademickým pracoviskom umiestneným mimo Bratislavy. V r. 1952 sa celé pracovisko presťahovalo do Prešova. O rok neskôr došlo k organizačnej reforme vzdelávania učiteľov na Slovensku. Na báze pobočky pedagogickej fakulty vznikla Vyššia pedagogická škola v Prešove, ktorá vychovávala učiteľov pre 6. - 8. ročník základných škôl. V r. 1954 opustilo školu prvých 20 absolventov učiteľstva zemepisu. V r. 1959 sa opäť reorganizoval systém vysokoškolskej prípravy učiteľov. Vznikli dva pedagogické inštitúty, ktorých sídlami sa stali Prešov a Košice.. V r. 1961 došlo k výraznému medzníku v inštitucionálnom vývine pracoviska. Ústav geografie sa vyčlenil z katedry prírodného prostredia, čím vznikla samostatná katedra geografie. V r. 1964 sa Pedagogický inštitút v Prešove pretvoril na pedagogickú fakultu, ktorá sa začlenila do zväzku Univerzity Pavla Jozefa Šafárika so sídlom v Košiciach ako jej štvrtá fakulta. Výuka odboru geografia sa takto dostala na univerzitnú pôdu, čím sa zvýšila i prestíž pracoviska a jeho absolventov. V r. 1996 katedra premenovala na katedru geografie a geoekológie. V r. 1997 došlo k významnej zmene v inštitucionálnom začlenení katedry. Pôvodné prešovské fakulty Univerzity P. J. Šafárika vytvorili samostatnú Prešovskú univerzitu. Pedagogická fakulta sa taktiež rozčlenila, pričom katedra geografie a geoekológie sa stala súčasťou Fakulty humanitných a prírodných vied Prešovskej univerzity. V r. 2004 sa katedra premenovala na katedru geografie a regionálneho rozvoja.

Katedra geografie a regionálneho rozvoja svojimi parametrami predstavuje konsolidované vedecko-výskumné a edukačné pracovisko s vysokou národnou reputáciou

a medzinárodnou akceptáciou. Jej pozíciu na trhu vzdelávania a výskumu posilňuje aj symbióza s ostatnými katedrami fakulty, ktorá je podľa hodnotenia Akademickej rankingovej a ratingovej agentúry z r. 2008 najlepšou fakultou v skupine humanitných fakúlt vysokých škôl v SR. Špecifická pozícia katedry v kontexte ostatných geografických pracovísk spočíva najmä v tom, že sa usiluje o formovanie osobitej geografickej školy založenej na integrovanej podobe geografie. Ide o snahu hľadať premostenie medzi binarizovanou a idiograficko-nomotetickou podobou geografie. Jednou z možností prekonania uvedenej duality môže byť rozvoj regionálnej geografie vychádzajúcej z kontextuálneho holizmu. Geografia je teda chápaná ako integrálna, transdisciplinárna platforma na jednej strane sa usilujúca o explanáciu (vysvetlenie) procesov štrukturujúcich priestor a na druhej strane usilujúca o porozumenie podstaty a identity regionálnych jednotiek rozličných taxonomických úrovní v kontexte každodennej ľudskej skúsenosti.

Translated by Barbora Némethyová

POPULATION DYNAMICS AND POPULATION POTENTIAL IN THE KOŠICE (1999-2005)

***Slavomir BUCHER*[1]**

Abstract: *This paper describes the natural movement and migration movement in the city of Kosice in 1999 and 2005.The natural movement consists of natality and mortality. The migration movement comprises emigration and immigration. The result of migration and natural movement is the total movement of the population. This paper explains the changes in movement of inhabitants in the municipal units in Kosice and interprets growth or decrease of municipal parts of Kosice. We describe usage model of population potential in municipal units of Kosice in 2005.*

Key words: *population potential, natural movement, migration movement, total movement, population density, municipal units, size category of population*

INTRODUCTION

In the past the development of the number of population in Kosice was gradual with the history of the city having been marked by battles and conflicts; therefore Kosice stagnated in several and long periods. The faster growth of the city occurred at the turn of the twentieth century when in 1890 Kosice had 38,817 inhabitants and in 1900 it was already 47,178 inhabitants. Several factors such as disease, poor harvest, starvation and waves of emigration influenced the development of Kosice population. The most important period in the history of the city and its inhabitants was the period following the World War II. The development of the number of population was not gradual (between years 1869 and 2001). We could break it up into two basic phases. Since the population census in 1900 the number of population has increased every 10 years by about ten thousand inhabitants. At this period the number of inhabitants was influenced especially by World War II (from 1939 to 1945).

Second phase is the period from 1950 to 2001, which from the point of view of changes in number of inhabitants in Kosice, played an essential role. This stage was characteristic of steady increase in the number of inhabitants (from 1950 to 2001), whereby significant changes occurred between the years 1961-1980. Rapid increase of number of inhabitants was the consequence of socialist industrialization and localization of a large metallurgical factory – U. S. STEEL facility. Next population increase was incurred by urban development and residential construction followed by migration of population, especially from the rural communities to the city. Due to sufficiency of job opportunities more than 54,000 inhabitants immigrated to the city before 1970's. Total increase during this period

1 **Mgr. Slavomir Bucher,**
Department of Geography and Regional Development, Faculty of Humanities and Natural Sciences, University of Prešov, ul. 17. novembra 1, 081 16 Prešov, e-mail: slavobucher@yahoo.com

was approximately five thousand inhabitants per year. Absolute increase between the years 1980-1991 presented 32,792 people. Total increase of the population compared to previous ten years reduced by over 19.1 %. At this time the number of inhabitants immigrating to Kosice was lower by 19,000 people when compared to 1970's. Natural increase had 60.2 % and migration increase 39.8 % share in total increase of population and in total increase of population in Kosice.

First half of 1990's were characteristic of termination of construction building, which influenced the natural as well as migration movement of the population in Kosice.

Migration decrease in Kosice was recorded from 2001 to present in 2007 (ŠÚ, 2007). Shortage of labour opportunities and high prices of real estate – all this incurred movement of population of Kosice to suburban zones close to the city.

SOURCE AND METHODOLOGHY

The purpose of the paper is to refer to nature and migration movement of population and its effect on individual municipal parts in Kosice (in years 1999 and 2005). The paper describes relationship between migration and natural movement as fundamental indicators of growth of municipal units in space and time. Good options for typology of regional units according to movement of the population presented by method used in England. This method was first employed by Webb and was used to evaluate the municipal parts. We used arithmetic mean within years 2004 and 2005 and applied model of population potential towards identification of individual elements of population. Movement of population was of interest of several geographers, for example Svecova (1998, 2001a, 2001b) orientated towards changes of migration movements of inhabitants and their flows in Slovak cities. Paulen (2001) reviewed migration movement of inhabitants in the cities of Nitra region. Dynamics of population was dealt with in articles of Kandracova (1993, 1995), Batorova (1999), Pavlikova (2000), Dubcova, Kramarekova (1999) and Olas (2000) as well. The issue of natural movement was the object of interest in articles by Podolak (1995) and Mladek (2001).

MOVEMENT OF POPULATION IN MUNICIPAL PARTS OF KOSICE IN THE YEARS 1999 AND 2005

The transformation process brought about profound changes in the political, economical and social sphere to which inhabitants reacted through alteration of their demographical behaviour. The aim of the paper is to point out changes in population dynamics of municipal parts of Kosice according to the size categories in years 1999 and 2005. At this stage the town was divided into twenty-two municipal parts. We have examined the following demographic characteristics: natural, migration and total increase – decrease of population in 1999 and 2005.

The external characteristic of population reproduction is the natural increase or decrease of population. The municipal parts of Kosice may be categorized into parts with natural increase or decrease of the population. Natural increase of the municipal parts decreased in the monitored period from 2.35 ‰ to 1.83 ‰. In 1999 natural increase was observed in up to fifteen municipal parts. Natural increase in 1999 was recorded in five municipal parts; seven municipal parts had natural increase from 5.0 ‰ to 10.0 ‰ and three parts

above 10.0 ‰. Natural decrease was observed in seven municipal parts, out of which three were in size category of over 20,000 inhabitants. Overall, four municipal parts had natural decrease from -5.0 ‰ to 0.0 ‰ and three had decline of more than -5.0 ‰.

The number of municipal parts with natural increase declined from fifteen in 1999 to fourteen in 2005. While in 1999 there were three municipal parts with natural increase over 10.0 ‰, on the other hand in 2005 only 2 remained. In all size categories the number of municipal parts with natural increase of less than 5.0 ‰ slightly increased, on the contrary the number of municipal parts with natural increase from 5.0 ‰ to 10.0 ‰ declined. The number of municipal parts with natural decrease of population increased from seven to eight.

While in 1999 the highest rate of natural increase was observed in the following size categories of municipal parts: 2,000 – 4,999 and 20,000 residents, on the other hand in 2005 the highest rate in size categories of urban parts were as follows: 200 - 499 and 5,000 – 9,999 population. The lowest rates of natural decrease were recorded in the following size categories: 1,000 – 1,999 and 2,000 – 4,999 inhabitants.

The lowest rates of natural decrease (in 2005) were observed in the following municipal parts: Barca (-20.3 ‰), Vysne Opatske (-12.1‰), Juh (-3.6 ‰), Kosicka Nova Ves (-3.3 ‰). The highest rates of natural increase (in 2005) were recorded in the following municipal parts: Lorincik (39.5 ‰), Lunik IX (28.3 ‰), Saca (9.7 ‰), Sidlisko Tahanovce (6.7 ‰).

Development of migration movement in Slovak Republic is connected with the developmental tendencies of the whole residential system in Slovakia as well as with structural-production trends in localization of production and non-production activities. Migration of population in the whole course of post-war period in territorial characteristics was characteristic of one-way orientation from urban to rural areas with the cities presenting significant migration centers due to the wide range of job opportunities and extensive construction building. After 1989 the extent and orientation of migration changed. There is a change of quantitative stagnation in the development of cities, which results in reduced intensity of migration movement of inhabitants. Modification of economic conditions led to reduction of construction building as well as slow development of real estate market.

In 1999 the rate of migration above 20.0 ‰ was recorded in six municipal parts with less than 4,999 inhabitants. In five municipal parts migration increase ranged from 0.0 ‰ to 10.0 ‰ and in two municipal parts from 10.0 ‰ to 20.0 ‰. Migration decrease in 1999 was present in 41.0 % of urban parts (9 municipal parts). Nearly 78.0 % share of municipal parts (7 MPs) with migration decrease of inhabitants was in the size category of up to 20,000 inhabitants. In 2005 the migration increase over 20 ‰ was recorded in just four municipal parts (in 1999 it was six municipal parts). The number of municipal parts with migration increase up to 10 ‰ increased from five to seven (in 2005). The number of municipal parts with migration growth from 10 ‰ to 20 ‰ did not alter during the monitored period. Migration decrease was observed in nine municipal parts just as in 1999. The most significant population decrease was observed during the whole period in the size category above 20,000 people. In Kosice this category includes housing estate complexes built from 1960's to 1980's. Inhabitants (especially the more solvent ones) left these residential areas and found new housing in the suburban zones of the city resulting in deconcentration into municipal parts of rural character, which were located

in the peripheral parts of the city (with rural pattern of the building-up and environment). Migration decrease in municipal parts during the monitored period declined from -2.63 ‰ (1999) to -2.40 ‰ (2005). The highest rate of migration increase (20.5 ‰) in 2005 was recorded in municipal parts of the following size category: 2,000 – 4,999 residents and the lowest rate (1.2 ‰) in municipal parts of the size category of 1,000 – 1,999 inhabitants. The lowest rate of migration decrease (-9.8 ‰) in 2005 was observed in municipal part of size category of 500 - 999 inhabitants. The lowest rate of migration decrease (2005) was recorded in the following municipal parts: Tahanovce (-59.2 ‰), Lorincik (-31.6 ‰), Sebastovce (-9.8 ‰), Dargovskych hrdinov (-9.0 ‰). The highest rate of migration increase (2005) was observed in the following municipal parts: Barca (38.4 ‰), Dzungla (28.5 ‰), Peres (27.6 ‰), Myslava (23.7 ‰).

The outcome of the present activity of natural and migration movement is the total increase or decrease of the population. We may state that in 1999 the majority of the municipal parts maintained the total increase of the population. Total decrease was evident in seven municipal parts, which belonged to size category above 20,000 inhabitants. Total increase over 10.0 ‰ (2005) was observed in eight municipal parts compared to ten municipal parts in 1999. Total growth in the monitored period decreased from -0.28 ‰ in 1999 to -0.57 ‰ in 2005 in the city. The most marked decline was recorded in municipal parts of the size category 500 - 999 inhabitants, from 27.8 ‰ in 1999 to -9.8 ‰ in 2005.

Tab. 1: *Movement of population in 1999 and 2005 in Kosice*

Size category municipal parts by number of inhabitants	Number of municipal parts		1999			2005		
			Nature movement	Migration movement	Total movement	Nature movement	Migration movement	Total movement
	1999	2005	in (‰), medial values of size category MP			in (‰), medial values of size category MP		
200 – 499	2	2	7,4	13,7	21,1	19,8	-1,6	18,2
500 – 999	3	1	3,1	24,7	27,8	0	-9,8	-9,8
1 000 – 1 999	4	6	-1,7	10,7	9	1	1,2	2,2
2 000 – 4 999	5	3	5,9	35,6	41,5	-7,7	20,5	12,8
5 000 – 9 999	0	2	--	--	--	19	10,2	29,2
10 000 – 19 999	0	1	--	--	--	-0,6	-3,5	-4,1
20 000 –	8	7	2,2	-5,7	-3,5	1,6	-4,6	-3
TOTAL	22	22	2,35	-2,63	-0,28	1,83	-2,40	-0,57

Source: Štatistickú úrad SR, 2006, 2000

Tab. 2: *Nature movement inhabitants of the municipal parts of Kosice in 1999 and 2005*

Size category municipal parts by number of inhabitants	Number of the municipal parts of Kosice in 1999 I. and 2005 II. with nature movement of the inhabitants									
	below - 5 ‰		from -5 to 0 ‰		from 0 to 5 ‰		from 5 to 10 ‰		above 10 ‰	
	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.
200 – 499						1	2			1
500 – 999			1			1	2			
1 000 – 1 999	2	1		1	1	2	1	2		
2 000 – 4 999	1	1		1	1	1	1		2	
5 000 – 9 999								1		1
10 000 – 19 999				1						
20 000 --			3	3	3	2	1	2	1	
TOTAL	**3**	**2**	**4**	**6**	**5**	**7**	**7**	**5**	**3**	**2**

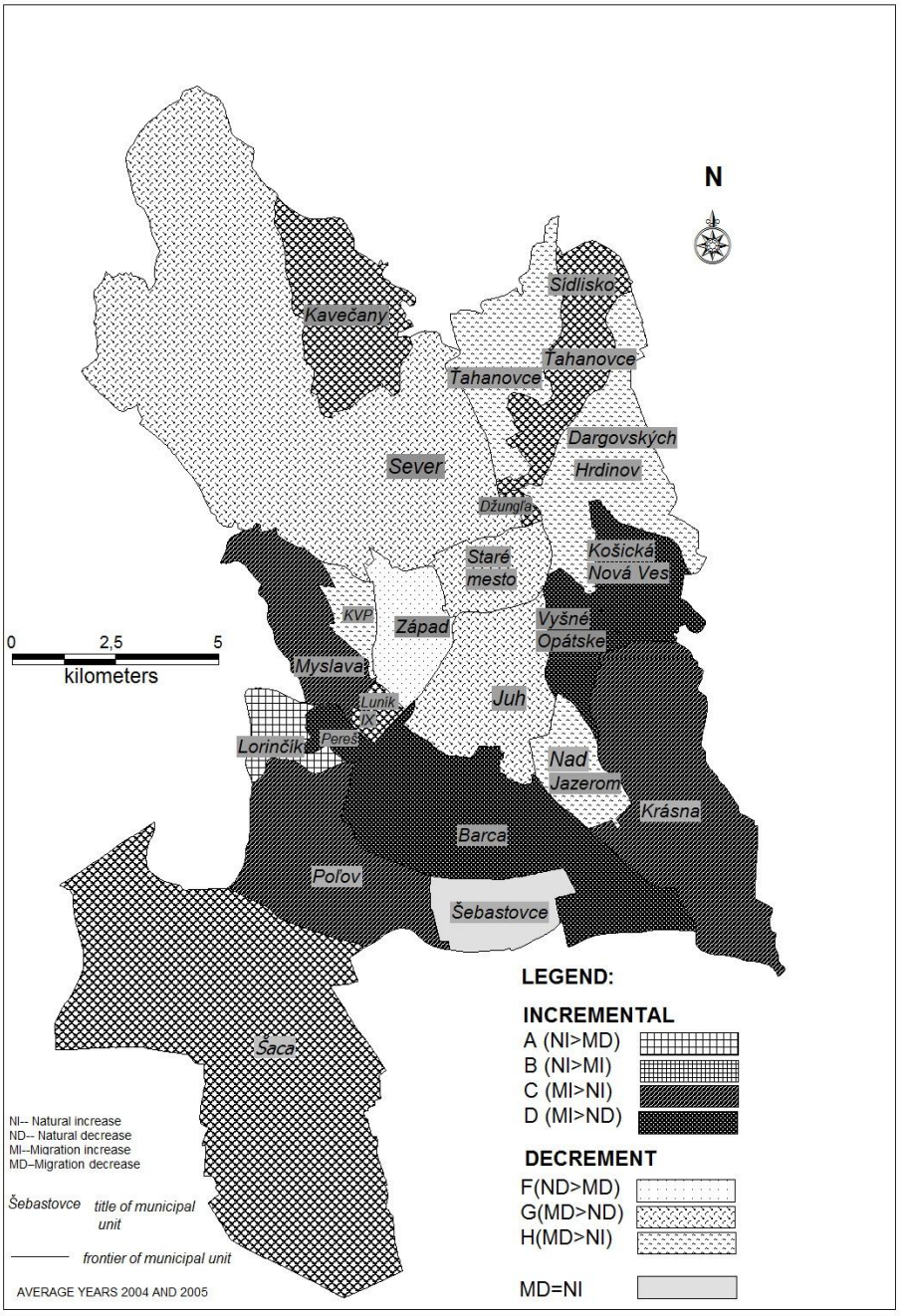
Source: Štatistický úrad SR, 2006, 2000

Tab. 3: *Total movement inhabitants of the municipal parts of Kosice in 1999 and 2005*

Size category municipal parts by number of inhabitants	Number of the municipal parts of Kosice in 1999 I. and 2005 II. with total movement of the inhabitants									
	below - 10 ‰		from -10 to 0 ‰		from 0 to 10 ‰		from 10 to 20 ‰		above 20 ‰	
	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.
200 – 499					1	1			1	1
500 – 999				1	1				2	
1 000 – 1 999		1		1	3	1	1			3
2 000 – 4 999						1	4	2	1	
5 000 – 9 999								1		1
10 000 – 19 999				1						
20 000 --	2	1	5	4		2			1	
TOTAL	**2**	**2**	**5**	**7**	**5**	**5**	**5**	**3**	**5**	**5**

Source: Štatistický úrad SR, 2006, 2000

Map 1: *Types of municipal units by total population change (average years 2004 and 2005)*



Source: Štatistický úrad SR, 2006, 2005

Tab. 4: *Migration movement inhabitants of the municipal parts of Kosice in 1999 and 2005*

Size category municipal parts by number of inhabitants	Number of the municipal parts of Kosice in 1999 I. and 2005 II. with migration movement of the inhabitants									
	below - 10 ‰		from -10 to 0 ‰		from 0 to 10 ‰		from 10 to 20 ‰		above 20 ‰	
	I.	II.	I.	II.	I.	II.	I.	II.	I.	II.
200 – 499		1	1						1	1
500 – 999				1	1				2	
1 000 – 1 999		1			2	3	1		1	2
2 000 – 4 999			1		2	1		1	2	1
5 000 – 9 999						1		1		
10 000 – 19 999				1						
20 000 –	3		4	5		2	1			
TOTAL	**3**	**2**	**6**	**7**	**5**	**7**	**2**	**2**	**6**	**4**

Source: Štatistický úrad SR, 2006, 2000

Tab. 5: *Types of the municipal parts in Kosice according to nature and migration movement of the inhabitants (share within a years 2004 and 2005)*

Types of municipal parts	Municipal parts of Kosice	
	Number	Share in %
Incremental		
A (NI>MD)	1	4,5
B (NI>MI)	5	22,8
C (MI>NI)	3	13,6
D (MI>ND)	4	18,2
TOTAL	**13**	**59,1**
Decrement		
E (ND>MI)	0	0
F(ND>MD)	1	4,5
G(MD>ND)	3	13,7
H(MD>NI)	4	18,2
TOTAL	**8**	**36,4**
MD=NI	1	4,5
TOTAL	**22**	**100**

Note: NI – nature increase, ND – nature decrease, MI – migration increase, MD – migration decrease

Source: author

The lowest decline of the total increase was in category of 200 - 499 inhabitants, from 21.1 ‰ in 1999 to 18.2 ‰ in 2005. Whereas in 1999 all size categories except category with up to 20,000 inhabitants were characteristic of total population increase, in 2005 the total decrease in municipal parts was documented in the following size categories: 500 - 999, 10,000 – 19,999 and the category with over 20,000 inhabitants. The lowest rate of total decrease (2005) was recorded in the following municipal parts: Tahanovce (-53.29 ‰), Stare mesto (-10.17 ‰), Sebastovce (-9.76 ‰), Juh (-8.11 ‰). The lowest rate of total increase (2005) of the population was in these municipal parts: Lunik IX (41.45 ‰), Dzungla (28.51 ‰), Myslava (26.49 ‰), Peres (25.86 ‰).

Population development of municipal parts in Kosice has recently decelerated and we may observe stagnation of population in majority of municipal parts similar to the city of Kosice. The smallest decline of the population dynamics was documented in parts with up to 499 inhabitants. These parts had the highest population increase during the monitored period (from 7.4 ‰ in 1999 to 19.8 ‰ in 2005). Despite this, we observed migration decrease at the end of the period monitored (from 13.7 ‰ in 1999 to -1.6 ‰ in 2005). While till 1989 the direction of migration was aimed at the largest municipal parts of Kosice (housing estate complexes), at present the inhabitants have concentrated to the size categories of municipal parts with lower number of population, which offer them ecologically superior, safe and cheaper living.

Reasonable options for typology of regional units according to movement of the population are presented by method used in England. This method was first derived and used by Webb in order to analyze the population of England and Wales. The method was used to assess the area units. We used arithmetic mean for years 2004 and 2005.

The proportion of municipal parts with total increase of the population was 59.1 %. Total decrease of the population was recorded in 36.4 % of municipal parts. Special category is represented by the municipal part – Sebastovce, where identical natural and migration balance was documented. The largest number of incremental villages is of type B and D (nine parts altogether). For type B (five urban parts) have determining effect on the dynamics of population – migration increase. The third most numerous incremental type of municipal parts is type C (three parts), where migration increase of the population plays an important role being complemented with lower population increase. Out of the sample of villages characteristic of total decrease of population are the H and G groups the most numerous ones (seven units) with migration decrease of population playing an important role. Type G (three parts) combined with natural decrease and type H (four units) combined with natural increase. We were able to identify 13 incremental and 8 decrement municipal parts. Incremental parts were equally located. In the group of municipal parts with total population increase, the municipal parts are equally located (natural increase – 6 municipal parts; migration increase – 7 municipal parts). The findings indicate that in the largest number of municipal parts (7 MS), the migration decrease represents the decisive factor. Natural decrease is relevant in case of municipal part 1 only. If we regard the positive balance of both processes as the evaluation criteria, subsequently only 8 municipal parts meet the following criteria. We may consequently state that only four parts represent combination of natural and migration decrease.

DISTRIBUTION AND DENSITY OF POPULATION

One of the indicators of distribution of inhabitants in space is population density, which is considerably different in the area of the city. The territory of the city of Kosice obtained urban circuits with low population density. Average population density in the city is 968 inhabitants per square km and average population density in Slovakia is 110 inhabitants per square km (in 2005). The largest municipal part is Sever (54,665 square km), which has 364 inhabitants per square km. The most densely populated part is represented by municipal units KVP (12,737 inhabitants per square km) with 25,431 inhabitants. In terms of its area and number of urban circuits is the municipal unit Zapad densely populated as well. Urban parts with high population density are the following: Nad Jazerom (6,118 inhabitants per square km), Lunik IX (5,561 inhabitants per square km), Stare Mesto (4,727 inhabitants per square km). Considering its area and number of population the following municipal parts have low population density: Polov (86 inhabitants per square km), Saca (108 inhabitants per square km), Kavecany (111 inhabitants per square km), Sebastovce (121 inhabitants per square km).

We divided all urban circuits (in 2001) to the following size groups:

The size category of 1 to 100 inhabitants per square km includes overall 12.7 % urban circuits. Majority of urban circuits located in municipal parts: Polov (100 % from urban circuits), Krasna (60 % from UC), Sidlisko Tahanovce (33.2 % from UC) have no more than 100 inhabitants per square km.

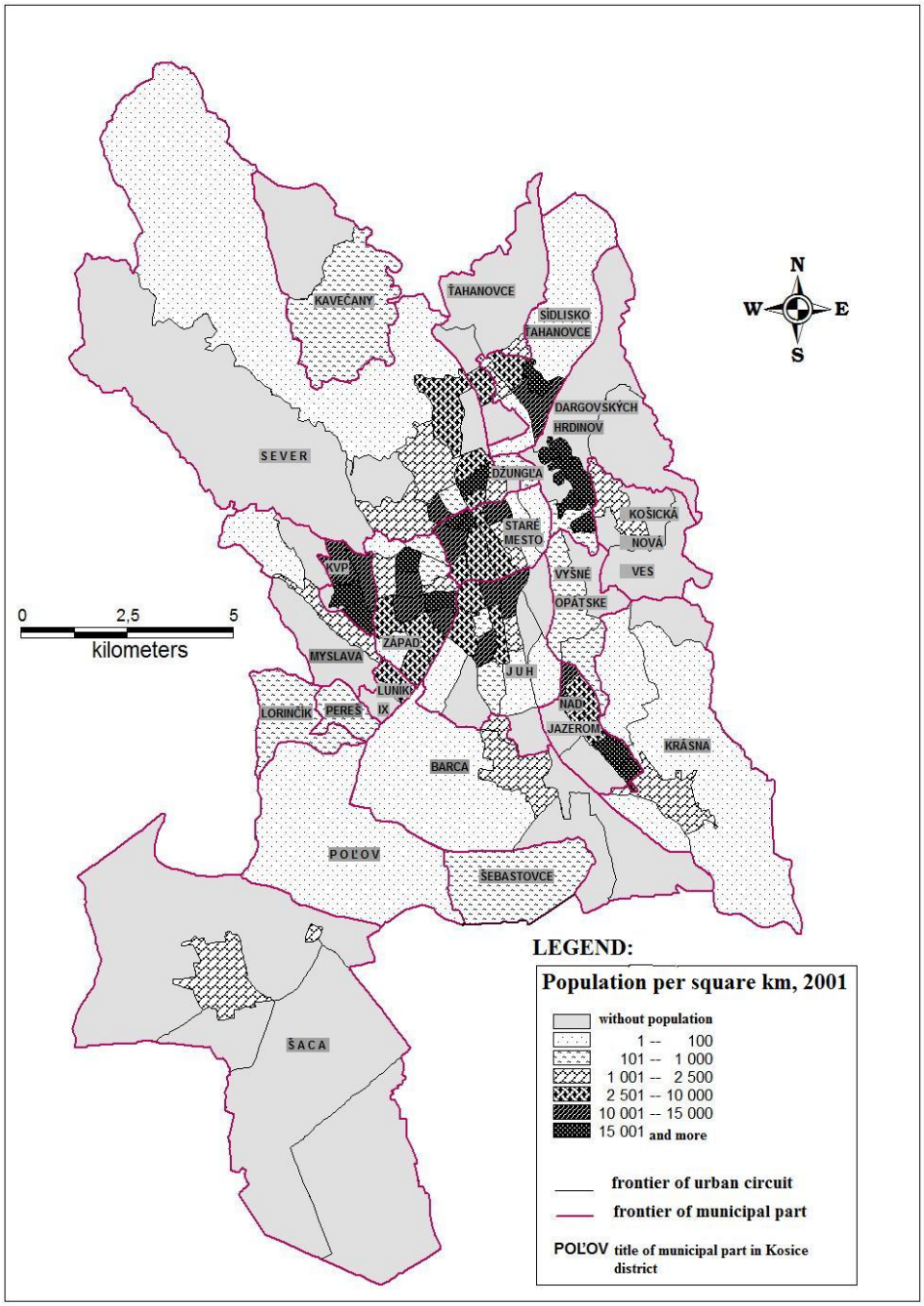
The size category of 101 to 1,000 inhabitants per square km includes overall 9.5 % urban circuits. The following urban circuits located in municipal parts have no more than 1000 inhabitants pre square km: Dzungla (100 % from urban circuits), Lorincik (100 % from UC), Peres (100 % from UC), Sebastovce (100 % from UC). Municipal parts of the first and second size group are represented by municipal parts located on the outskirts of the city and which at present are characteristic of deconcentration processes within the city of Kosice. These municipal parts became part of the city in the second half of the 20th century. Overall 12.7 % urban circuits belong to the size category with 1,001 to 2,500 inhabitants per square km**.** This size category has the highest representation of urban circuits in the following municipal parts: Barca (40 % from urban circuits), Saca (33.3 % from UC), Myslava (25 % from UC).

The size category with 2,501 to 10,000 inhabitants per square km includes 14.3 % urban circuits overall. This size category has the highest representation of urban circuits in the following municipal parts: Lunik IX (50 % from UC), Stare Mesto (36.3 % from UC), Nad Jazerom (25 % from UC). Within this size category, the urban circuits are located in downtown with housing estate character of construction building typical of the second half of the 20th century.

The size category with 10,001 to 15,000 inhabitants per square km includes 14.3 % urban circuits overall. This size category has the highest representation of urban circuits in the following municipal parts: Dargovskych Hrdinov (63.6 % from UC), KVP (40 % from UC), Nad Jazerom (38 % from UC).

An independent group is represented by municipal units without population, where logically the density of population is zero. They had 25.4 % share from total numbers of the urban circuits. This size category has the highest representation of urban circuits in municipal sections: Kosicka Nova Ves (75 from UC), Saca (66.7 % from UC), Tahanovce

Map 2: *Population density of Kosice by urban circuits*



Source: Statistický úrad SR, 2003

(60 % from UC). Majority of these urban circuits has industrial, storage or agricultural exploitation.

POPULATION POTENTIAL OF MUNICIPAL PARTS IN THE DISTRICT OF KOŠICE

As of 12/31/2005 the sum of all potentials (non-induced population potential) in municipal parts of Kosice was 1,243,391 (in 2005) inhabitants per kilometre (100 %). The share of individual municipal parts ranged from 1.988 % (UP Saca) to 7.943 (UP Zapad). High rate of population potential was documented in the following municipal parts: Sidlisko KVP (7.024 %), Juh (6.395 %). Stare Mesto (6.193 %), Lunik IX (5.390 %), Myslava (5.232 %). Large number of population was recorded in the following municipal parts: Sidlisko KVP, Juh, Stare Mesto, which are located in the centre of the city. From the practical aspect, it means that the municipal parts display low distance total from all others points of surveyed territory. Spatial parts like Lunik IX, Myslava have high population potential, which is related to other municipal parts in Kosice by its proximity. We may point out that in models of population potentials applied to the area of Kosice combination of factors is of high value: population and distance.

The distance markedly influences population potential in the following municipal parts: Lunik IX, Myslava and municipal parts with the lowest rate of population potential. The category of districts with the lowest rate of population potential (from 1.988 % to 2.973 %) includes municipal parts, which within the framework of the surveyed area have peripheral location and low number of population (Saca, Polov, Sebastovce, Kavecany, Krasna). Sums of values of the population potentials at age categories 0 - 14 years (15.723 %) and at age category of men 60+, women 55+ (19.085 %) presented approximately one third of the overall sum of population potential in the city (34.808 %). Higher population potential was observed in the following age categories: men 60+ and women 55+. Share of the population potential at age category 0 - 14 years in municipal parts ranged from 0.344 % (Saca) to 1.178 % (Zapad). Spatial parts with the higher rate of population potential at age category 0 - 14 years include the following municipal parts: Zapad (1.178 %), Sidlisko KVP (1.046 %), Juh (0.947 %) and Stare Mesto (0.915 %). The lowest rates were found in municipal sections Saca (0.344 %), Polov (0.431 %), Sebastovce (0.438 %) and Kavecany (0.468 %).

Shares of the population potential at age category: men 60+, women 55+ in urban parts ranged from 0.372 % (Saca) to 1.666 % (Zapad). From the spatial point of view, we obtain similar findings when compared to the population potential at the 0 – 14 years age category. Total sum of the population potential at age category of men 15 – 59 and women 15 – 54 presents a share of 65.19 % from total sum of population potential in the city. Shares of the population potential for the aforementioned age categories range from (1.272 %) in Saca to (5.105 %) in Zapad, whereas the highest rates were observed in municipal parts Zapad (5.105 %), Sidlisko KVP (4.687 %), Juh (4.021 %) and Stare Mesto (3.935 %). The lowest rates were found in Saca, Polov, Sebastovce, Kavecany (from 1.272 % to 1.896 %).

We may conclude that the rates of the population potential obtained by using the model to space of Kosice are affected by distance rather than the size of population with municipal parts Lunik IX (5,368 inhabitants) and Saca (5,096 inhabitants) representing

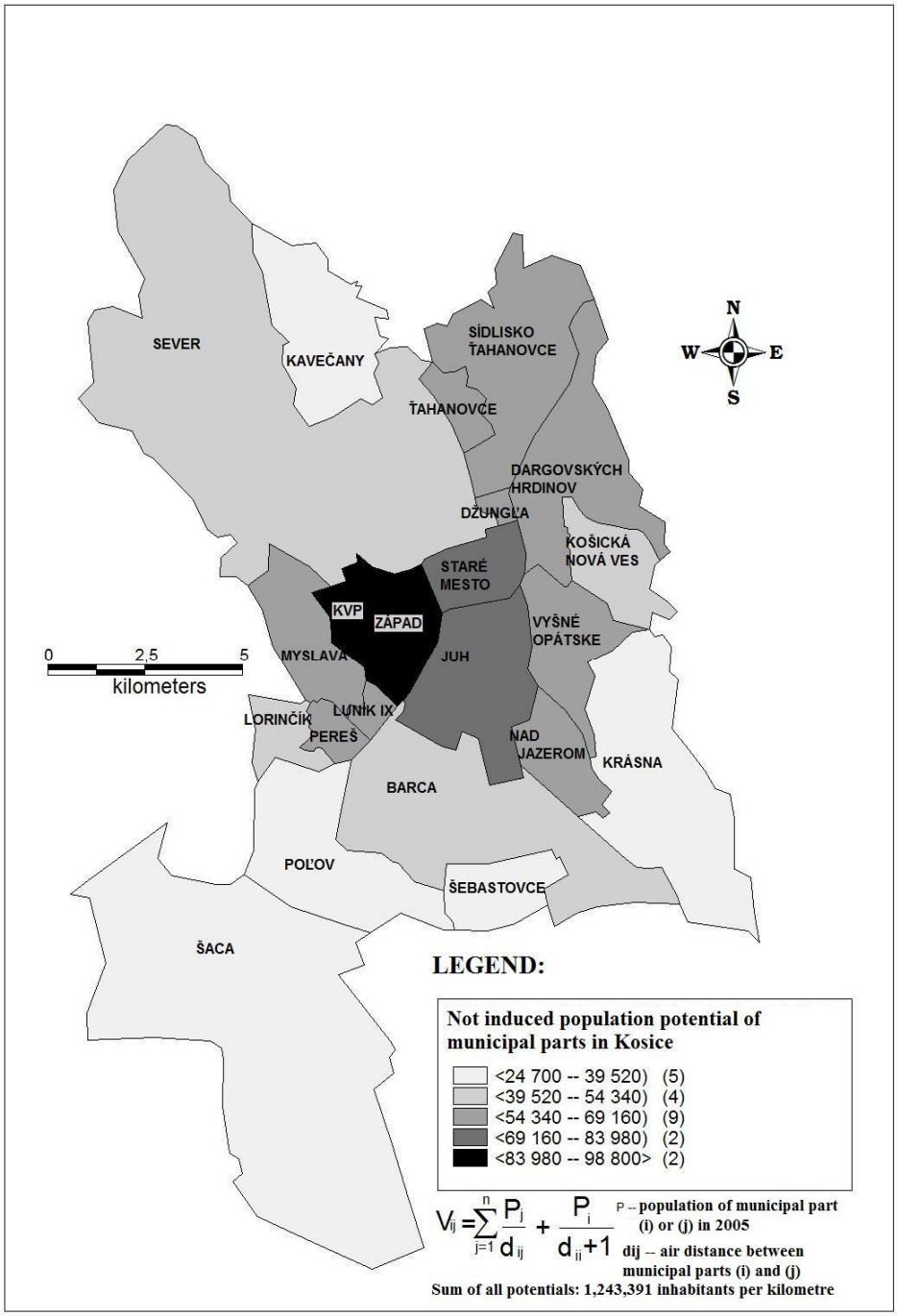
exemplary models. Both spatial units have approximately the same number of population, but impact of the distance results in different total population potential. In case of Lunik IX the total population potential is 67,004 inhabitants per kilometre and urban unit Saca has the population potential of 24,726 inhabitants per kilometre.

Change of rates of non-induced population potential in municipal parts within years 2005 and 1991 ranged from -4,568 to 8,265 inhabitants per kilometre. The highest decrease of rate of non-induced population potential (difference between 2005 and 1991) was documented in the following municipal parts: Zapad (-4,568 inhabitants per kilometre), Juh (-4,330 inhabitants per kilometre), Stare Mesto (-3,708 inhabitants per kilometre), Nad Jazerom (-3,154 inhabitants per kilometres). All aforementioned spatial units of Kosice are located in the centre of the city and all of them were characteristic of total decrease of inhabitants between years 2005 and 1991. These municipal parts have the highest number of permanent residents in the city.

The highest increase rate of non-induced population potential (difference 2005 and 1991) was observed in the following municipal parts: Sidlisko Tahanovce (8,265 inhabitants per km), Tahanovce (7,882 inhabitants per km), Kavecany (1,346 inhabitants per km), Peres (118 inhabitants per km). Besides Sidlisko Tahanovce all municipal parts are of rural character. Between years 2005 and 1991 total decrease of population was observed in all these parts. The highest rate of total increase of population was found in Sidlisko Tahanovce (10,315 inhabitants between 2005 – 1991), which was the consequence of the termination of buildings construction in the first half of 1990's. Tahanovce and Kavecany have high increase of non-induced population potential resulting from the close distance from the municipal part Sidlisko Tahanovce. This urban part affects by her "weight" (number of population) also others spatial units located in its neighbourhood. The second locality with significantly lower increase in non-induced population potential is located in the South-western part of the city and is characteristic of the following spatial units – Peres (1,118 inhabitants per km), Saca (848 inhabitants per kilometre), Lunik IX (inhabitants per kilometre), Lorincik (inhabitants per kilometre), Polov (inhabitants per kilometre). This population potential increase is associated with concentration of inhabitants within the city of Kosice. Non-payers and people of low socio-economic status were relocated from other municipal parts of the city to Lunik IX and Saca. Others municipal parts are of rural nature and with inhabitants from downtown migrating there the economic status improves.

Change of rates of induced population potential during the years 2005 and 1991 ranged in municipal parts from -2,747 to 7.869 inhabitants per kilometre. The highest decline of rates of the induced population potential (difference between 2005 and 1991) was documented in the following municipal parts: Lunik IX (-2,747 inhabitants per kilometre), Vysne Opatske (-2,440 inhabitants per kilometre), Sidlisko Tahanovce (-2,050 inhabitants per kilometre), Myslava (-1,668 inhabitants per kilometre). Therefore, through the changes in the rate of induced population potential the municipal parts, which are influenced by surrounding spatial units, emerge. The highest increase of rates of induced population potential (difference between 2005 and 1991) was found in the following municipal parts: Tahanovce (7,869 inhabitants per kilometre), Dargovskych hrdinov (1,245 inhabitants per kilometre), Kavecany (1,160 inhabitants per kilometre), Sever (579 inhabitants per kilometre). Region with positive rates of induced population potential is located in the

Map 3: *Not induced population potential in municipal units (31.12.2005*)



Source: Author

northern part of the city and is represented by municipal parts bordering with Sidlisko Tahanovce. Therefore, we may state that this spatial unit by its "weight" (number of population) influenced other urban parts directing them towards positive rates of induced population potential.

Acknowledgement: This paper we prepared with the contribution of the grants: VEGA č. 1/0611/09 ,,Koncept miesta v regionálnogeografickej analýze a syntéze a teritoriálnom marketingu: teoreticko-metodologický rámec a aplikácia na vybrané modelové územia". na Katedre geografie a regionálneho rozvoja Fakulty humanitných a prírodných vied Prešovskej univerzity

CONCLUSION

The transformation process brought shining changing in the political, economical and social sphere thereupon inhabitants reacted amendment its demographical behavior. The aim on this topic is point out onto changes in movement population of the urban parts of the Kosice according to the size categories in years 1999 and 2005. At this stage itself town divided into twenty-two municipal sections. We have followed demographic characteristics: natural, migration and total increase – decrease residents in the year 1999 and 2005.

Values of all potentials (not induced population potential) in urban parts of the Kosice achieved 1 243 391 (in 2005) population per kilometre (100 %). Shares of the individuals urban parts itself were at intervals from 1.988 % (UP Saca) to 7.943 (UP Zapad). The highest values of population potential had following urban parts: Sidlisko KVP (7.024 %), Juh (6.395 %). Stare Mesto (6.193 %), Lunik IX (5.390 %), Myslava (5.232 %). Large number of population recorded urban parts like Sidlisko KVP, Juh, Stare Mesto that are located in the centre of town. Practically it means that have low value of distance from all others points of surveyed territory. Spatial units like Lunik IX, Myslava have high population potential, which is fixed nearness others urban parts. Perhaps we point out, that in models of population potentials applied in the area of Kosice has critical assignment combination factors: population and distance.

Population of the city according to urban circuits is located according to the western part of the town – primarily to urban parts: Zapad, KVP, Juh, Stare Mesto alongside the river Hornad especially in urban part Tahanovce and southern part, where river Hornad flows through the municipal part Nad Jazerom. The lowest density of population is in the northwestern part of Kosice, where the foothills (Volovske hills and Cierna Hora hills) are located. Accordingly, the lowest density of population is in the southern part of the city, which is situated in the fertile hollow basin (Kosicka kotlina). The area is ample in traffic and industrial areas (like U.S. Steel Kosice), which are combined with agricultural land.

References

BÁTOROVÁ, S. (1999): Regionálna diferencovanost dynamiky obyvatelstva Nitrianskeho kraja. In: Folia geografika 3. Prešov: PU, 1999. str. 5-12. ISBN 80-88722-64-0.

BEZÁK, A. (1998): Dynamika rastu mestského a vidieckeho obyvateľstva na Slovensku v období 1970-1995. Geografické informácie 5, Univerzita Konštantína Filozofa. Fakulta prírodných vied, Katedra geografie, Nitra, str. 8-17.

BUCHER, S. (2008): Regionálno-geografická analýza mesta Košice. /Diplomová práca/. Prírodovedecká fakulta UK, Bratislava. str. 115.

DICKÁ, J. (2006): Vývoj rozmiestnenia obyvateľov mesta Košice v rokoch 1991 a 2001 z pohľadu priestorovej redistribúcie podľa Clarkovho modelu). Slovenská štatistika a demografia, ročník 16, číslo 1, 66-80 s.

DICKÁ, J. (2007): Vybrané transformačné procesy sociálno-demorafickej intraurbánnejštruktúry mesta Košice. Česká geografie v Evropském prostoru, XXI. sjezd České geografické společnosti, České Budějovice, 548-554s. (CD ROOM ISBN 978-80-7040-986-2)

DICKÁ, J. (2007): Sociálno-demografická intraurbánna štruktúra mesta Košice v roku 2001. Zborník príspevkov zo IV. medzinárodného geografického kolokvia. Danišovce 7. – 9. 11. 2007.

DUBCOVÁ, A., KRAMÁREKOVÁ, H.(1999): Nitriansky kraj. In: Geografia, roč. 7, 1999, č. 3, str. 92-107.

GREGOROVÁ, G. (2001): Model populačného potenciálu a jeho aplikácia na okres Topoľčany. In: Zborník príspevkov SŠDS Súčasný populačný vývoj na Slovensku v európskom kontexte, str. 25-30.

GREGOROVÁ, G., KUSENDOVÁ, D. (2005): Populačný potenciál Slovenska v roku 2001. In: Zborník príspevkov SŠDS Naša demografia – súčasnosť a perspektívny, str. 48-53.

KANDRÁČOVÁ, V. (1993): Príspevok k poznaniu migračnej dynamiky obyvateľstv mezoregiónu. In: Geografia – aktivity človeka v krajine, 1993. str. 129-141. ISBN 80-88697-07-7.

KANDRÁČOVÁ, V. (1995): Príspevok k analýze prirodzeného populačného vývoja mezoregiónu – okresu Prešov. In: Acta Facultatic paedagogicae Universitas Šafarikanae, 1995. str. 168-196. ISBN 80-88697-19-0.

KUSENDOVÁ, D. (1993): Populačný potenciál Slovenska. AFRNUC, Geographica Nr. 32, str. 103-124.

KUSENDOVÁ, D. (1996): Kartografické modelovanie v prostredí geoinformačnýchsystémov: Teoretická báza a geografické aplikácie. Kandidátska dizertačná práca. PRIF UK. Bratislava.

MATLOVIČ, R., (1998): Geografia priestorovej štruktúry mesta Prešov. GEOGRAFICKÉ PRÁCE, roč. VIII, číslo 1. Fakulta humanitných a prírodných vied PU, Grafotlač Prešov. str. 260. ISBN 80-88885-33-7.

MATLOVIČ, R., MATLOVIČOVÁ, K. (2005): Vývoj regionálnych disparít na Slovensku a problem regionálneho rozvoja Prešovského kraja. Folia geographica 8, Prešov, 66-88, ISSN 1336-6157 Ministerstvo výstavby a regionálneho rozvoja SR (2006): Národný strategický referenčný rámec, 2007-2013 (3 verzia). Bratislava.

MATLOVIČ, R. (2006): Geografia – hľadanie tmelu (k otázke autonómie a jednotygeografie, jej externej pozície a inštitucionálneho začlenenia so špecifickým zreteľom na slovenskú situáciu). Acta Facultatis Studiorum Humanitatis et Naturae Universitatis Prešoviensis, Folia Geographica, 9, 6-43.

MLÁDEK, J. 2001. Priestorová diferencovanosť populačného vývoja Slovenska. In: Geografické štúdie Nr. 8. Banská Bystrica: FPV UMB, 2001, str. 41 – 66. ISBN 80-8055-583-4.

OLAS, G. (2000): Niekoľko poznámok k dynamike obyvatelstva Nitrianskeho kraja. In: Geografické štúdie 9, 2000. str. 223-227. ISBN 80-8050-349-4.
PAULEN, J. (2001): Pohyb obyvateľstva v Nitrianskom kraji. In: Súčasné problémy rozvoja vidieckeho priestoru. Nitra: SPU, 2001, str. 125-128. ISBN 80-8069-017-0.
PAVLÍKOVÁ, S. (2000): Štruktúra a pohyb obyvateľstva Košického a Prešovského kraja vzhľadom na ich administratívne členenie. In: Geografické štúdie Nr. 7. Banská Bystrica: FPV , 2000. str. 152-160. ISBN 80-8055-443-9.
PODOLÁK, P. (1995): Prirodzený pohyb obyvateľstva na Slovensku. In: Geographia Slovaca. 1995. str. 35 – 46.
ŠTATISTICKÝ ÚRAD SR, 2000, Krajské mesto Košice 1999. Štatistický úrad Slovenskej republiky pracovisko ŠÚ SR v Košiciach. Košice.
ŠTATISTICKÝ ÚRAD SR, 2003, Štatistický lexikón obcí Slovenskej republiky 2002. Štatistický úrad Slovenskej republiky. Bratislava.
ŠTATISTICKÝ ÚRAD SR, 2005, Krajské mesto Košice 2004. Štatistický úrad Slovenskej republiky pracovisko ŠÚ SR v Košiciach. Košice.
ŠTATISTICKÝ ÚRAD SR, 2006, Krajské mesto Košice 2005. Štatistický úrad Slovenskej republiky pracovisko ŠÚ SR v Košiciach. Košice.
ŠTATISTICKÝ ÚRAD SR, 2007, Vývoj obyvateľstva Košického kraja podľa obcí od roku 1996. Štatistický úrad Slovenskej republiky pracovisko ŠÚ SR v Košiciach. Košice
ŠVECOVÁ, A. (1998): Zmeny vo vývoji prirodzeného pohybu mestského a vidieckeho obyvateľstva v okresoch Slovenska v rokoch 1985 – 1995. In: Geographica Nr. 4. Bratislava: UK, 1998. str. 209-224. ISBN 80-223-1372-6.
ŠVECOVÁ, A. (2001): Hodnotenie miest Slovenska z hľadiska vybraných demografických zmien v rokoch 1980 – 2000. In: Geografické aspekty stredoevropského prostoru. Brno: Masarykova univerzita, 2001. str. 190-195. ISBN 80-210-2664-2.
TOMÁŠIKOVÁ, V. (2007): Zmeny demografického správania mladej generácie v regióne Košíc. Zborník príspevkov zo IV. medzinárodného geografického kolokvia. Danišovce 7. – 9. 11. 2007.

POPULAČNÁ DYNAMIKA A POPULAČNÝ POTENCIÁL KOŠÍC V ROKOCH 1999-2005

Zhrnutie

Populačný potenciál miest SR sa značne spomalil a vo väčšine miest dochádza k celkovému úbytku ich obyvateľstva vo všetkých veľkostných kategóriách. Podobne je tomu tak aj pri mestských častiach Košíc. Transformačný proces priniesol výrazné zmeny v politickej, hospodárskej a sociálnej sfére na čo obyvateľstvo reagovalo zmenou demografického správania sa. Cieľom tohto príspevku bolo poukázať na zmeny v dynamike obyvateľstva mestských častí Košíc podľa veľkostných kategórii v rokoch 1999 a 2005 ako aj ich populačný potenciál podľa jednotlivých vekových kategórií. Významné zmeny nastali v migračnom pohybe, čo sa prejavilo migračným úbytkom obyvateľov v mestských častiach, v ktorých sú lokalizované prevažne sídliskové monofunkčné areály. Naopak

vysoký migračný prírastok zaznamenávajú areály na okraji mesta, kde v súčasnej dobe prevažuje výstavba rodinných domov. Medzi týmito dvomi spomenutými regiónmi mesta dochádza v súčasnom období k dekoncentrácii obyvateľstva. Výsledkom prirodzeného a migračného pohybu je celkový pohyb obyvateľstva. Mestské časti Košíc môžeme rozdeliť na prírastkové (kde prevažuje migračný resp. prirodzený prírastok) a úbytkové (s prevahou migračného resp. prirodzeného úbytku). V Košiciach sme identifikovali 13 prírastkových, 8 úbytkových a 1 mestskú časť, v ktorej je vyrovnaná bilancia migračného úbytku a prirodzeného prírastku obyvateľov. Na základe rozmiestnenia mestských častí podľa celkového pohybu môžeme vyčleniť 2 základné oblasti:

1. Populačne depresná oblasť, pre ktorú je typický celkový úbytok obyvateľov (zaraďujeme tu mestské časti lokalizované prevažne v centrálnej časti mesta – Staré Mesto, Západ, KVP, Juh, Sever, Nad Jazerom, Ťahanovce, Dargovských Hrdinov).

2. Populačne rastová oblasť so zastúpením mestských častí s celkovým prírastkom obyvateľov (južný okrajový pás mesta s mestskými časťami – Myslava, Pereš, Luník IX, Lorinčík, Barca, Poľov, Šaca, Krásna, Vyšné Opátske, Košická Nová Ves. Na severe sú to mestské časti Kavečany, Džungľa a Sídlisko Ťahanovce.

Model populačného potenciálu, ktorý sme aplikovali na jednotlivé mestské časti Košíc môžeme vnímať ako ukazovateľ priestorového rozmiestnenia obyvateľstva, resp. skupín obyvateľstva, alebo ako prostriedok vhodný na posúdenie veľkosti interakcie medzi územnými jednotkami v sledovanom území, prípadne môžeme jeho hodnoty použiť ako vstupné dáta pre výpočet iných ukazovateľov, v ktorých sa populačný potenciál môže použiť ako „váha". Pre Košice sme skúmali populačný potenciál pre jednotlivé vekové kategórie, predproduktívnu, produktívnu a poproduktívnu ako aj zmeny hodnôt neindukovaného populačného potenciálu za roky 2005 a 1991. Na základe empirický výsledkov môžeme konštatovať, že najvyššie úbytky neindukovaného populačného potenciálu v sledovanom období vykazujú mestské časti, ktoré majú:

- centrálnu polohu v rámci mesta
- najvyšší počet trvalo bývajúceho obyvateľstva
- obyvateľstvo týchto mestských častí býva v rozsiahlych sídliskových komplexoch

Najvyššie prírastky v sledovanom období 1991 – 2005 neindukovaného populačného potenciálu majú mestské časti Sídlisko Ťahanovce, Pereš, Šaca, Luník IX.

- vysoké hodnoty neindukované populačného potenciálu v prípade Sídliska Ťahanovce sú ovplyvnené rozsiahlou výstavbou panelových bytov na konci 80. a začiatkom 90. rokov. Vplyv imigrácie mladých rodín a následné kladné hodnoty prirodzeného prírastku ovplyvnili pozitívne aj vývoj populačného potenciálu

- vysoké hodnoty neindukovaného populačného potenciálu v prípade Šace, Luníka IX a Pereša ovplyvnila predovšetkým dekoncentrácia obyvateľov z ostatných mestských častí Košíc do spomínaných častí -- Šace, Luníka IX a Pereša. Do mestskej časti Luník IX a Šaca bolo premiestnené obyvateľstvo z ostatných mestských častí Košíc, ktoré si neplnilo nájomné zmluvy voči mestu „tzv. neplatiči". Ostatné mestské časti sú vidieckeho charakteru a sťahuje sa do nich obyvateľstvo z „centra" mesta, ktoré sa vyznačuje vyšším ekonomickým statusom.

Populácia Košíc podľa urbanistických obvodov je lokalizovaná do západnej časti mesta – najmä do mestských častí Západ, KVP, Juh, Staré Mesto, pozdĺž toku Hornádu najmä v mestskej časti Ťahanovce a v južnej časti, kde Hornád preteká mestskou časťou Nad

Jazerom. Najmenšia koncentrácie populácie je v severozápadnej časti Košíc, kde zasahujú výbežky Volovských vrchov a Čiernej Hory. Taktiež je nízka koncentrácia obyvateľstva v južnej časti mesta, ktorá síce leží v úrodnej Košickej kotline, ale dominujú tu prevažne dopravné (areál letiska) a priemyselné plochy (U. S. STEEL Košice), ktoré sú kombinované s poľnohospodárskym využitím územia.

Recenzovali: Prof. RNDr. René Matlovič, PhD.
RNDr. Stela Lovacká, PhD.

IMPORTANCE AND VALUE OF SOIL ENVIRONMENTAL FUNCTIONS

Radoslav BUJNOVSKÝ[1], Martin VILČEK[2]

Abstract: *Similarly as ecosystem soil provides many services and goods that in soil science are named as soil functions. Besides biomass production, that is possible economically evaluate, the soil provides other ecological functions that are priceless for the society. Sustainability of societal development requires maintenance of soil quality and soil functions - especially the ecological ones. Principles and results of economic valuation of selected soil ecological functions are presented. Average values of selected ecological functions of agricultural soils in Slovakia are based on previous index evaluation of these functions and defined assumptions and represent 4943 € per hectare for water retention, 4720 € per hectare for filtration of organic and inorganic pollutants and 4336 € per hectare for transformation of organic pollutants, respectively. Valuation of soil and its ecological functions seems as possible way for improvement of soil protection especially in modification of soil price at its permanent sealing but financial values should not to be used as a ground for forming ethical values, which are imminently connected with human approach towards soil and its degradation, and which are essentially needed by global society.*
Key words: *soil, soil functions, economic valuation*

INTRODUCTION

Soil as environmental component plays important role as at biomass production and functioning of ecosystems as well as human life quality and thus primarily influences the development of society. This fact can is mentioned in papers and documents since last decade of previous century (e.g. Blum, 1990; Council of Europe, 1992; European Commission, 2006).

Similarly as ecosystem soil provides many services and goods (de Groot et al., 2002) that in soil science are named as soil functions. Besides biomass production, that is possible economically evaluate, the soil provides other ecological functions that are priceless for the society. Recently elaborated proposal of EU Frame Directive on soil protection (European Commission, 2006) considers the following ecological, socio-economic and cultural soil functions:

- biomass production, including in agriculture and forestry
- storing, filtering and transforming nutrients, substances and water
- biodiversity pool, such as habitats, species and genes
- physical and cultural environment for humans and human activities
- source of raw materials

1 **Ing. Radoslav Bujnovský, CSc.,**
Soil Science and Conservation Research Institute, Gagarinova 10, 827 13 Bratislava, e-mail: r.bujnovsky@vupop.sk
2 **Prof. Ing. Jozef Vilček, PhD.,**
Soil Science and Conservation Research Institute, Raymanova 1, 080 01 Prešov, Slovak Republic, e-mail: vilcek@vupop.sk

- acting as carbon pool
- archive of geological and archeological heritage.

Sustainability of societal development requires maintenance of soil quality and soil functions - especially the ecological ones. Besides definition of basic principles for evaluation of selected soil functions it is necessary to search also ways for economic valuation (pricing) that can be considered with regard to modification of agricultural soil taxation.

MATERIALS AND METHODS

The paper is oriented on evaluation the importance of soil functions for the society and benefits from selected environmental functions of agricultural soils. The economic valuation is based on general evaluation of soil functions through accessible or basic set of indicators often called "minimum data set" of indicators (e.g. Doran, Parkin, 1994; Larson, Pierce, 1994) that can embrace as soil as well as site parameters. Individual ecological soil functions are placed into hierarchical system of soil function values. Subsequently suitable frame method of economic valuation is chosen. Economic valuation of selected environmental soil functions is based on previous index evaluation of agricultural soils (Bujnovský et al., 2008), ranked into 5 classes, where existing or derived data on soil parameters that are accessible from databases of Soil information system of Soil Science and Conservation Research Institute Bratislava. The assumptions used as start-point for economic valuation are introduced in Table 2 in next part of paper.

RESULTS AND DISCUSSION

Soil use in relation to development of human society and soil functions in simplified form illustrates Tab. 1.

Tab.1: *Societal interests linked with soil use and societal values as starting point for sustainable societal development*

Societal values relevant to soil	**Societal interests relevant to soil use**
Ecological values corresponding with water retention, substances filtration and transformation, buffering soil changes (pH), biodiversity pool	Maintenance of soil quality and other affected environmental constituents
Social values corresponding with biomass production and partly with other ecological functions	Provision sufficient amount of safe food as contribution to the creation of good health state of population Maintenance of potential possibility for alternative soil and landscape use
Socio-economic values corresponding with soil function as space for economic activities of human (source of raw materials, space for infrastructure and residential development) and partly with biomass production	Development of economically oriented activities with aim to promote regional development, development of employment, living and economical standard of people

Source: authors

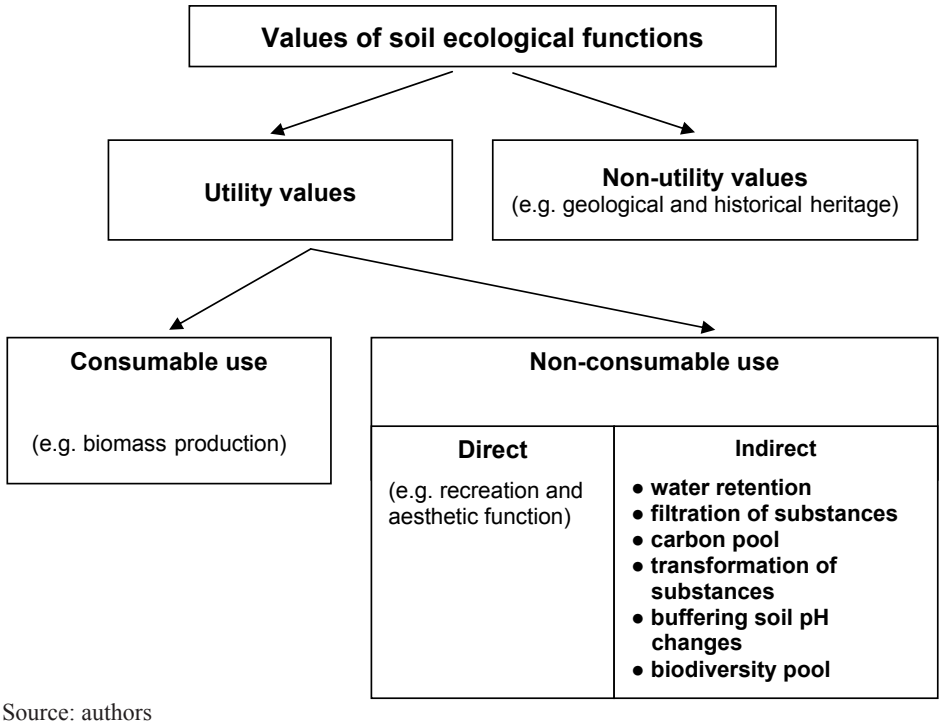
It is necessary to mention that in given system usually dominate economically oriented societal interests despite of fact that society claim for many ecological and social values of soil and landscape. Preference to economic interests together with reluctance to search compromise solutions is often manifesting in soil degradation.

Living conditions and subsequently quality of human life directly or indirectly depends on the accessibility environmental goods and services that usually have non-monetary value (de Groot et al., 2002). As introduce Scott et al. (1998), services represent properties of ecological, soil functions from that human derives the benefits. While production function (biomass production) brings utility values, many soil ecological functions can be ranked into regulation functions of environment (e.g.. Daily, 1997; de Groot et al., 2002; Hawkins, 2003) - see Fig. 1.

Economic valuation of selected soil functions - in analogy to ecosystem services (e.g. deGroot et al., 2002; Faber et al., 2002; Daily, 1997; Hawkins, 2003; Hackett, 2006) – represents indirect market economic valuation of selected regulation soil services (expressed by ecological functions) can be based on estimation of *i)* saved or avoided costs due to provision of given soil function or *ii)* replacement costs relating with returning of damaged soil into original state or quality. So the values of most soil ecological functions are classified as use values of indirect non-consumptive use.

Economic valuation of selected soil functions is based on assumptions introduced in Tab. 2.

Fig. 1: *Ranking of services resulting from soil ecological functions into value categories*



Source: authors

Preliminary average value of selected ecological functions of agricultural soils in Slovakia represents 4943 € per hectare for water retention, 4720 € per hectare for filtration of organic pollutants (including practically inorganic pollutants) and 4336 € per hectare for transformation of organic pollutants, respectively. Buday et al. (2006) estimated the replacement costs resulting from positive externality of agricultural landscape (protection against floods, prevention against water erosion, absorption of SO_2 and NO_2 and disarming of organic wastes) at 465 to 597 € per hectare. Linkeš et al. (1996) introduce the non-production soil functions of Slovakia at 830 € per hectare. Presented estimation of values of ecological soil functions significantly exceeds existing estimations.

Tab. 2: *Frame for economic valuation of selected soil ecological functions*

Soil function	**Benefit or remediation saved costs**
Water accumulation retention water capacity in soil (up to 1 m)	Soil is regarded as reservoir Average costs of artificial basin are considered to be 2 € per 1 m^3.
Filtration and immobilisation **of inorganic pollutants** sorption of organic pollutants on SOM and clay expressed through evaluation of significant soil parameters (Cox, SOM quality Q4/6, topsoil depth) with regard to average sum of rainfall **Filtration and immobilisation** **of organic pollutants** sorption of organic pollutants on SOM and clay expressed through evaluation of significant soil parameters (Cox, SOM quality Q4/6, topsoil depth) with regard to average sum of rainfall	Soil is regarded as water treatment plan and price of waste water collection approximately 0.75 € per 1 m^3 is taken as price for the soils category with very high capacity for substances filtration. Of course this economic valuation embraces filtration inorganic and organic pollutants. So the above introduced price is divides by half for each category of pollutants but spatial distribution of soil capacity to provide filtration remains spatially different – according to original separate index evaluation of soil capacity to filtrate inorganic and organic pollutants
Transformation of organic pollutants biotic and abiotic transformation of organic pollutants expressed through evaluation of selected parameters (SOM quality – Q4/6, Cox, clay content, pH) with regard to average annual air temperature	It is assumed that very high ability of soil to transform the organic pollutants can be identical to costs for soil decontamination (over 1000 $\mu g.kg^{-1}$ PAU). Average PAU content in Soils of Slovakia is around 200 $\mu g.kg^{-1}$ PAU. The assumed costs for decontamination are 30 USD per tonne and 0.1 m soil layer is assumed.

Source: authors

Valuation of soil and its ecological functions seems as possible way for improvement of soil protection especially in modification of soil price at its permanent sealing. In spite of that, in harmony with Sciama (2007) financial values should not to be used as a ground for forming ethical values, which are imminently connected with human approach towards soil and its degradation, and which are essentially needed by global society.

CONCLUSIONS

Economic valuation of soil ecological functions offers the broader view on real importance and subsequently the value of the soil for the society. Estimated economic value of selected soil ecological functions is considered as contribution to the improvement of soil protection especially in modification of soil price at its permanent sealing.

This work was supported by the Slovak Research and Development Agency under the contract No. APVV-0124-06 and RTD project „Multifunctional soil use" supported by Ministry of Agriculture No. 2006 UO 27/090 03 03/090 03 19 as well as APVV projects No. 27-036602.

References

BLUM, W.E.H. (1990): The challenge of soil protection in Europe. Environ. Conserv. 17, 72-74.

BUDAY, Š., CHRASTINOVÁ, Z., GUBOVÁ, M., FÁZIKOVÁ, M., KUSÁ, Z., PETRÁŠOVÁ, V. ET AL. (2006): Rural development and changes of food verticals in the context of Slovakia integration into EU. VÚEPP, Bratislava, 231 pp. (in Slovak)

BUJNOVSKÝ, R. ET AL. (2008): Evaluation and pricing of soil and its functions. (manuscript) - in Slovak.

COUNCIL OF EUROPE (1992): Recommendation No. R (92) 8 of the Committee of ministers to member states on soil protection. Council of Europe, Brussels, 4 pp.

DAILY, G.C. (ED.) (1997): Nature's services: Societal dependence on natural ecosystems. Island Press, Washington, D.C., 394 pp., ISBN 1-55963-475-8.

DE GROOT, R.S., WILSON, M.A., BOUMANS, R.M.J. (2002): A typology for the classification, description and valuation of ecosystem functions, goods and services. Ecological Economics 41, 393-408.

DORAN, J.W., PARKIN, T.B. (1994): Defining and assessing soil qiality. In: Doran, J.W., Coleman, D.C., Bezdicek, D.F., Stewart, B.A. (eds.), Defining soil quality for a sustainable environment. SSSA Spec. Pub. No. 35, 1994, 3-21, ISBN 0-89118-807-X.

EUROPEAN COMMISSION (2006): Proposal for a directive of the European Parliament and of the Council establishing a framework for the protection of soil and amending Directive 2004/35/EC. COM(2006) 232 final. European Commission, Brussels, 30 pp.

FABER, S.C., CONSTANZA, R., WILSON, M.A. (2002): Economic and ecological concepts for valuing ecosystem services. Ecological Economics 41, 375-392.

HACKETT, S.C. (2006): Environmental and natural resources economics. Theory, policy, and the sustainable society. M.E. Sharpe, Inc., London, 524 pp. ISBN: 0-7656-1472-3.

HAWKINS, K. (2003): Economic valuation of ecosystem services. University of Minnesota, 42 pp.

LARSON, W.E., PIERCE,F.J. (1994): The dynamics of soil quality as a measure of sustainable management. In: Doran,J.W., Coleman,D.C., Bezdicek,D.F., Stewart,B.A. (eds.), Defining Soil Quality for a Sustainable Environment. SSSA Spec. Publ. No. 35, 37-51, ISBN 0-89118-807-X.

LINKEŠ, V., BIELEK, P., JURÁNI, B., BUJNOVSKÝ, R. (1996): Benefits from non-production functions of the soil and its agricultural use. (Study report) VÚPÚ, Bratislava, 1996, 16 s. (in Slovak)

SCIAMA, Y. (2007): Towards a planet-wide ethic. A talk with Dominique Bourg. Research EU No. 52, 16-17.

SCOTT, M.J., BILYARD, G.R., LINK, S.O., ULIBARRI, C.A., WESTERDAHL, H.E. (1998): Valuation of ecological resources and functions. Environmental Management 22, 49-68.

VÝZNAM A HODNOTA EKOLOGICKÝCH FUNKCIÍ PÔDY

Zhrnutie

Pôda obdobne ako ekosystém zabezpečuje viacero služieb a poskytuje statky ktoré sa v pôdoznaleckej terminológii nazývajú funkcie pôdy. Okrem produkcie biomasy rastlín, ktorú je možno ekonomicky hodnotiť, pôda zabezpečuje ekologické funkcie ktoré sú pre spoločnosť k nezaplateniu. Udržateľný rozvoj spoločnosti predpokladá udržiavanie kvality pôdy a jej funkcií – predovšetkým ekologických. Príspevok prezentuje ekonomické hodnotenie prínosov vybraných ekologických funkcií poľnohospodárskej pôdy pre spoločnosť. Priemerná ekonomická hodnota vybraných ekologických funkcií v rámci poľnohospodárskych pôd je nasledovná: schopnosti pôdy akumulovať vodu 4943 €.ha^{-1}, filtrácia organických a anorganických polutantov 4720 €.ha^{-1} a 4336 €.ha^{-1} transformácia organických polutantov. Hodnotenie pôdy a jej ekologických funkcií sa ukazuje ako možná cesta pre zlepšenie ochrany pôdy predovšetkým pri modifikácii ceny pôdy pri jej trvalých záberoch. Napriek tomu, oceňovanie nemôže byť použité ako základ pre formovanie etických hodnôt bezprostredne spojených s postojom človeka k pôde a jej degradácii, ktoré globálna spoločnosť tak naliehavo potrebuje.

Recenzovali: Prof. RNDr. Eva Michaeli, PhD.
Dr. h. c. prof. RNDr. Florin Žigrai, DrSc.

LANDSCAPE RESEARCH IN TOPIC AND CHORIC DIMENSION FROM THE GEOGRAPHICAL POINT OF VIEW

***Vladimír ČECH*[1]**

Abstract: *The article deals with the theory of landscape research in topic and choric dimension. The introduction deals with different ways of understanding of the essential object of the landscape research in four "centers" of its survey: German, Russian, Anglo-American, and Slovak. The following part is about the topic and choric dimensions as about the essential size categories, which contain units used for the landscape research. Both, the characteristics of the partial units of the topic dimension, and different understanding of a geotope as an essential complex unit of a geoecological landscape research, are followed by information about the units of the choric dimension.*
Key words: *topic and choric dimension, geotop, landscape, landscape research*

INTRODUCTION

Geoecology is currently focusing on the study of **landscape**. However, the term landscape is not understood by everybody in the same way. This is caused by the complicated geography development, infiltration of influences from other sciences which cooperate in landscape research and differentiated approaches of geographers. New knowledge comes with the dynamic development of this topic and the research methods improve constantly.

German geography schools (landscape-ecology communities) see the landscape as a **total geographical complex** with the emphasis on the ecological approach. The complex site analysis is the typical method used by these schools. The research in the topic dimension (on tessera) is the base for the choric synthesis and the landscape application assessment. This research includes terrain observations, landscape elements quantitative measurement (half-stationary research) and laboratory testing. It provides the researcher with general information for further research – choric structures analysis, landscape potential assessment, conflicts in landscape use, etc. Bastian – Schreiber (1994) give an example: 'landscape is the part of the Earth's surface, geosphere, which, depending on its shape, outer look, process and functional mutual correlation of its phenomena, on a concrete part of the surface, creates spatial uniformity of a certain character (total character - A. von Humboldt), '.

In Russian geographers' perception, landscape is a physical-geographical complex in a concrete as well as a general meaning (as a type). The landscape study is based on the component analysis of the mutual relations. The most often method used in this school is the deductive physical-geographical regionalization. Beručašvili - Žučková (1997): 'landscape is a genetic homogenous natural territorial complex with equal geological

1 **RNDr. Vladimír Čech, PhD.,**
Department of Geography and Regional Development, Faculty of Humanities and Natural Sciences, University of Prešov, ul. 17. novembra 1, 081 16 Prešov, e-mail: cech@unipo.sk

fundament, type of georelief and climate. It consists of the microchoras, dynamically connected and repeated on a principle, which are typical only for the given landscape'.

American authors Turner-Gardner-O'Neill (2001) present a universal definition of landscape: 'an area spatially heterogeneous at least in one studied factor'. Their approach is similar to the British one where landscape is a spatial portfolio of georelief forms.

For the **Slovak** geographers, the landscape represents a material entity, i.e. real landscape consisting of abiotical, biotical and anthropogenic components with human activity (society) as an important factor. The landscape has an aesthetic, as well as an emotional aspect (the landscape image and the landscape as an identity). It is the material, spatial and dynamic part of the Earth's surface (Earth's landscape zone) with the visual demonstration. It consists of mutually influencing natural and anthropogenic complexes of different taxonomic levels with numerous bonds and relations.

According to Drdoš (2004), the landscape can be divided into these types:

- Real landscape can be as: 1. Physical-geographical entity: physical-geographical (natural content of the real landscape) or natural landscape 2. Cultural-geographical entity: cultural landscape (anthropogenic content of the landscape) 3. Geographical, total entity: geographical landscape. The landscape as a geographical, total reality (connection between nature – technology – society), which is a subject of an interdisciplinary research. 4. Environmental entity: landscape as a human environment (life environment).
- Landscape as a perception (perceived landscape, landscape view)
- Landscape as an emotional experience (landscape identity)
- The landscape system: 1. landscape ecosystem (functional term, geographical landscape in spatial expression) 2. geosystem (geographical, physical-geographical and abiotical system) or geoecosystem (and geobiosystem)
- Landscape as a research conception 1. Geographical conception (landscape as a material entity) 2. Ecological conception (landscape as an ecosystem or a group of ecosystems) 3. Environmental conception (landscape as a home or a human environment) 4. Aesthetic conception (landscape as a perception, view and/or identity)

GEOGRAPHICAL DIMENSIONS

There are area units (complexes) of different size studied in landscape research, their size ranging from several square meters to the whole physical-geographical zone. This creates the base for the division of the physical-geographical complexes into categories according to the **geographical dimensions**. According to Bastian-Schreiber (1994), dimensions are a geographical issue. Different cartographic scales provide us with various information, map content and often miscellaneous methods are used. Usually, there are 4 dimensions: 1. **topic**, 2. **choric**, 3. **regional**, and 4. **planet** (global). This part deals with the first two, which are generally studied in the complex physical-geographical research.

In Mičian's opinion (1990), **topic** dimension contains the smallest physical-geographical complexes. These complexes carry equal dynamics and are relatively homogenous in the geoecological perspective. The physical-geographical complexes of this dimension represent the basic structural cells for the nature environment. Here we study vertical relations and bonds between the components and elements on the great scale maps (1: 5 000, 1: 10 000, 1: 25 000). Map area depends on the physical-geographical structure of the Earth's surface and can range from 1 to several ars.

THE SMALLEST TOPIC AND CHORIC UNITS

The research (geotopological stationary and half-stationary research) is carried out on representative spots – tesseras, spread on the characteristic lines determined by typical physical-geographical structures. The outcome, a catalogue of individuals, is put into the vertical types called geoforms. The areas of several equal geomers, areas of geoforms, make a complex physical-geographical unit of topic dimension – **geotop** (ecotop). When the divergence reaches 15 %, we talk about polymorph geotop or ecotop; under 15 % it is a half polymorph geo- or ecotop. Haase et al. (1991) distinguish: 1. monomorph geotops with only one elementary geomer (monomorph geotop = elementary geomer), 2. polymorph geotops containing up to 15 % foreign geomers. A geotop is in Russian literature called a **facia**, an **ecotop** in older German works. A geotop is the smallest complex, physical-geographical, relatively homogenous, spatial unit with parallel processes. This unit contains the same rock type, georelief, soil, climate, water and one biocoenose. It is also the smallest unit that can be mapped; therefore, a geotop is a complex topic unit. The partial topic units are also used in the research; they are described by Drdoš (1999): **1. A morphotop** is a homogenous geomorphologic spatial unit defined by the unified morph system processes and the geomorphographic attributes. These attributes underlie the unified form of a morph top. **2. A pedotop** is the smallest spatial soil unit defined by the unified pedogenetic and ecological processes in the soil system. The unified soil form is the main criterion for the homogeneity of a pedotop. **3. A climatetop** is the smallest spatial climate unit defined by the unified climate processes in the topic climate system. These processes underlie the unified form of a climate top. **4. A hydrotop** is the smallest spatial hydro unit defined by the unified and directed hydro processes in the hydro system. These processes underlie the unified hydro mode. **5. A phytotop** is a small spatial unit containing homogenous vegetation, i.e. one phytocoenosis. **6. A zootope** is a small spatial unit with homogenous zoocoenosis adapted to a phyto top. It can be modeled as a **biotop.** The biotop is a three dimensional site of vegetal and animal organisms or their communities. The biotic and abiotic content of this site creates such living conditions which define the functions of its biosystem. Drdoš (2004) suggests a more exact term biocoenotope considering the biotop as a complex including partial tops. Some authors include among partial tops a **lithotop** – an area with unified rock attributes.

Mičian (2000) presents three views on geotops:

- The traditional, or static point of view describes the area delimitation of a geotop. It also informs if the geotop is **monomorph** or **polymorph,** depending on the number of tiny 'heterogeneous' areas called topvariants or geomers. The processes in the geotop are not important.
- The newer **dynamic** viewpoint focuses on **processes** and is represented by a multilevel classification. The lowest hierarchical level, **the main geotop groups**, can be divided as following:

Percotops. Main features: the infiltration is not decelerated; the maximum short period of increased infiltration is in winter or after extra precipitation. There are no other signs (or slight ones up to the depth of 1 m) of extra soil moisture. There cannot be any impermeable layer. Steady average annual precipitation does not result in flowing on the surface (to form relief). All soil moisture (leftover from evaporation) is transported from the soil to the die through the year round.

Conpercotops. These tops have the same features as percotops; however, they receive more water solution from the neighboring slopes. The groundwater flows within the conpercotop.

Efluitops are mostly located in the top and middle part of a slope; therefore, water solutions flow on the surface throughout the year in a periodic and episodic way.

Afluitops are situated at the bottom part of a slope, in the slope depressions (e.g. dell). Also the water supply and the dissolved substances provide us with the dominant material mechanically. (The soil contains more nutriments and moisture than in efluitops.)

Stagnotops. The infiltration is decelerated without any side movement of the water solution (higher than 2 m). An obstruction for the infiltration could be an impermeable die or a soil horizon, slowing down the process. Typical soils are **planosols**, other types can occur as well.

Umitopes are the geotops influenced by the underground water which level oscillates from 2 m to 80 cm during the year. Fluvisols are the typical soil type of this geotop.

Umenotops' underground water fluctuates between 80 and 40 cm with prevailing glevic fluvisols and fluvi-glevic phaeozem.

Perumentops lack oxygen due to the annual underground water level higher than 40 cm. On eutric gleysols grow various layers of peat. These are the die for eutric histosols (dystric histosols). E.g. wetlands belong to perumenotops.

Irigotops are periodically or episodically flooded, also during the vegetation period, with the flood plain mode.

Technotops – artificially created tops almost completely impermeable.

Water ecosystems of dead waters are developed in deeper water reservoirs – lakes and dams.

- Minár (1998) presents the third view, **quantitative**, and recommends to distinguish (in any scale) **primary** and **secondary (gradient) homogenous units. Primary homogenous units** are defined as areas where the differentiation of observed attitudes is under the differentiation level. This estimate is based on the possibilities, research targets, time and spatial range and the individual character of the studied region. **Secondary – gradient homogenous units** change the homogeneity – gradient of the observed parameters in a certain direction (as a result of changing a soil type into another, underground level decrease, etc.).

The term **physiotop,** originating in German geography, is often referred to as an abiotop. According to Neef (1967), it can be defined as a topic unit containing mutually interactive abiotic factors, which are relatively stabile and variable (the physiotop is abstracted from a biota). When researching and mapping the landscape, the physiotop's advantages, compared to a geotop, dwell in relatively stabile signs. These are easier to formulate and quantify since the vegetation has already been changed. English literature refers to the physiotop as a **site** and the biota as a **cover.** A geotop contains both site and cover. Drdoš (1999) puts forward the importance of defining the physiotop because of its relative stability. It carries the qualities important for the ecological stability, landscape potential and other landscape use. Its area is usually a part of the ecotop's area. Some authors consider the terms geotop and ecotop as synonyms; others as an abiotic-biotic unit. Occasionaly, the geotop is considered to be an abiotic unit, which puts the geotop on the same level as the physiotop.

The horizontal relations between the topic complexes and their groups are the subject of the research in the **choric** dimension. The smallest unit of this dimension is a nanochora. It is created by the physical-geographical connection of at least two geotops with the same mutual sign. Some authors do not accept the nanochora; as the smallest unit they consider a microchora. If we acknowledge the existence of the nanochora, then the microchora consists of two nanochoras, which are connected by the activity of the physical-geographical factors. A mezochora is a higher level unit consisting of mutually connected microchoras. A macrochora is created by joining some mezochoras together. Several authors include the macrochora into the **regional dimension.**

CONCLUSION

The problem of the landscape exploration lies in the complicacy of the structures and relations among its structural parts and in the wide range of problems, which this subject of the study offers to the experts. The landscape research is mostly realized in the topic and choric dimensions. The topic dimension contains the research of the vertical relations of the physic-geographical elements and their units. The result is the assignment of the smallest quasi-homogeneous physiographical units. There are distinguished the partial topes and the complex topical units – geotopes. The subjects of the study of the choric dimension are the horizontal relations among the choric complexes and their groups. The smallest unit of the choric dimension is a nanochore, which arises from the connection of at least two geotopes on the base of a particular common feature.

Acknowledgement: This paper we prepared with the contribution of the grants: VEGA 1/4028/07 „Skúmanie a geoekologické hodnotenie zmien využívania kultúrnej krajiny vybraných podhorských regiónov Slovenskej republiky“ a VEGA 1/4366/07 „Pedogeografické aspekty multifunkčního využívania poľnohospodárskej krajiny“ na Katedre geografie a regionálneho rozvoja Fakulty humanitných a prírodných vied Prešovskej univerzity.

References

BASTIAN, O., SCHREIBER, K. F. (1994): Analyse und ökologische Bewertung der Landschaft. Gustav Fischer Verlag, Jena, Stuttgart, 491 pp. ISBN 3-334-60534-5.

BERUČAŠVILI, N.L., ŽUČKOVA, V.K. (1997): Metody kompleksnych fiziko-geografičeskich issledovanij. Izdavateľstvo Moskovskogo Universiteta, Moskva, 319 pp. ISBN 5-211-03502-X.

DRDOŠ, J. (1999): Geoekológia a environmentalistika - I. časť. Krajinná ekológia - geoekológia, krajina, životné prostredie. 1. vyd. FHPV PU, Prešov, 153 pp. ISBN 80-88722-69-1.

DRDOŠ, J. (2004): Geoekológia a environmentalistika - I. časť. Krajinná ekológia, jej environmentálne poslanie a úlohy. 2.vyd. FHPV PU, Prešov, 202 pp. ISBN 80-8068-312-3

HAASE, G., et al. (1991): Naturraumerkundung und Landnutzung. Beiträge zur Geographie, 34/1, Akademie Verlag, Berlin, 373 pp. ISBN 3-05-500396-9.

MIČIAN, Ľ. (1990): Základy náuky o fyzickogeografickej krajine. In: Mičian, Ľ. - Zatkalík, F. Náuka o krajine a starostlivosť o životné prostredie. 2. vyd. PriF UK, Bratislava, p. 17-68. ISBN 80-223-0268-6.

MIČIAN, Ľ. (2000): Three views on geotopes and methods of their mapping. Ekológia (Bratislava), 19, 2, p. 41-45.
MINÁR, J. (1998): Georeliéf a geoekologické mapovanie vo veľkých mierkach. Habilitačná práca. PriF UK, Bratislava, 165 pp.
NEEF, E. (1967): Die theoretischen Grundlagen der Landschaftslehre. Hermann Haack, Gotha/Leipzig, 152 pp.
TURNER, M.G., GARDNER, R.H., O´NEILL, R.V. (2001): Landscape Ecology in Theory and Practice. Springer, New York

VÝSKUM KRAJINY V TOPICKEJ A CHORICKEJ DIMENZII Z GEOGRAFICKÉHO UHLA POHĽADU

Zhrnutie

Problém skúmania krajiny spočíva v komplikovanosti väzieb a vzťahov medzi jej štruktúrnymi časťami i v šírke problémov, ktoré tento predmet štúdia ponúka pre odborníkov. V nemeckej škole sa presadzuje ponímanie krajiny ako totálneho geografického komplexu. Do popredia výrazne vystupuje ekologický prístup v chápaní krajiny. Charakteristické je dôsledné používanie metódy komplexnej stanovištnej analýzy. Výskum v topickej dimenzii (na tessere) je bázou pre chorické syntézy i pre aplikačné hodnotenia krajiny. Tento výskum, zahrňujúci terénne observácie, kvantitatívne merania krajinných prvkov (polostacionárny výskum) i laboratórne práce poskytuje všeobecnú informačnú bázu pre ďalšie výskumy - analýzy chorických štruktúr, hodnotenia potenciálu krajiny, konfliktových situácií vo využívaní zeme a pod. Pojmu krajina v ruskej (sovietskej) geografickej škole je najčastejšie prisudzovaný fyzickogeografický rozmer, resp. krajina je chápaná ako konkrétny fyzickogeografický komplex v konkrétnom zmysle, vo všeobecnom zmysle i ako typ. Štúdium krajiny je založené na analýze vzájomných vzťahov jej zložiek. Charakteristické pre túto školu je používanie metódy fyzickogeografickej regionalizácie, a to najčastejšie deduktívnej. Na rozdiel od nemeckej školy sa základný krajinný výskum nerobí na tessere, ale v krajine.

Výskum krajiny sa najčastejšie realizuje v topickej a chorickej dimenzii. Topická dimenzia zahrňuje výskum vzájomných (vertikálnych) vzťahov fyzickogeografických zložiek a ich prvkov, výsledkom ktorého je stanovenie najmenších kvázi homogénnych fyzickogeografických jednotiek. Rozlišujeme čiastkové - topy a komplexné topické jednotky - geotopy. Čiastkové topické jednotky sú: litotop, morfotop, klimatop, hydrotop, pedotop, biotop (Drdoš, 2004 navrhuje spresnený pojem biocenotop, lebo pojem biotop v ekológii je komplexný a zahrňuje čiastkové topy).

Komplexnou jednotkou topickej dimenzie je geotop (v literatúre sa často označuje ako ekotop). Chápeme ho ako najmenšiu komplexnú fyzickogeografickú, relatívne homogénnu priestorovú jednotku, s jednotne prebiehajúcimi procesmi. V jej rámci sa vyskytuje rovnaký typ horniny, georeliéfu, pôdy, klímy, vody a jednej biocenózy. Súčasne je to aj najmenšia mapovateľná jednotka.

Ak abstrahujeme od biocenózy, získame fyziotop (resp. abiotop), ktorý je daný abiotickým komplexom. Priestorom biocenózy je biotop (resp. stanovište biocenózy). V praxi

však patria biotické zložky geotopu k najviac antropogenizovaným častiam. Preto sa vo výskume od bioty často abstrahuje a operuje sa potenciálnou prirodzenou vegetáciou.

Predmetom výskumu v chorickej dimenzii sú horizontálne vzťahy medzi topickými komplexami a ich skupinami. Najmenšou jednotkou chorickej dimenzie je nanochora, ktorá vzniká fyzickogeografickým spojením najmenej dvoch geotopov na základe určitého spoločného znaku. Niektorí autori neuznávajú existenciu nanochory a za najmenšiu jednotku chorickej dimenzie pokladajú mikrochoru. Ak uznávame existenciu nanochor, potom mikrochora sa skladá najmenej z dvoch nanochor, spojených pôsobením fyzickogeografických faktorov. Vyšší stupeň predstavuje mezochora, ktorá je tvorená súborom fyzickogeograficky vzájomne spätých mikrochor. Spojením viacerých mezochor získame makrochoru, ktorú niektorí autori zaraďujú do ďalšej - regionickej dimenzie.

Recenzovali: Prof. RNDr. Ján Drdoš, DrSc.
Prof. RNDr. Eva Michaeli, PhD.

COMPLEX SITE ANALYSIS AND SYNTHESIS ON A GEOGRAPHICAL SITE AS A METHOD IN THE GEOECOLOGICAL RESEARCH

Vladimír ČECH[1]

Abstract: *The article deals with a complex site analysis and synthesis on a survey (geographical) site as an essential exact method of the geoecological landscape research. The research is realised on the representative points-tesseras, which should have been spread on charakteristic lines. The research gives a catalogue of individuals. On the basis of their common signs, they are put into the types. These research points must be choosen, so that they could be enough representative; they should include different forms of georelief, soil subtypes etc. On this survey (geographical) site, physicogeographical differential and complex analysis is realised and then synthesis. This method is very laborious, demanding on time on material and financial costs, but brings objective results.*

Key words: *geoecological research, complex site analysis, complex site synthesis, tessera*

INTRODUCTION

Currently in topic and choric dimension, one of the most often used methods in the geoecological research is **a complex site analysis** on a survey (geographical) site with a **synthesis** as a follow-up. In the topic dimension, Barch et al. (1988) suggest to use such complex site analysis which divides the landscape on the vertical profile into 'all possible elements'. The emphasis is put on the elements with the most information about the complex. They especially include the highly integrating partial complexes (soil form, soil moisture mode) with the georelief as a guiding factor for many processes. The climate and the geological composition are highly integrating processes, too. These surveys are realized on representative sites – tesseras located on typical lines. The survey provides us with a catalogue of individuals, which are categorized into so called vertical types – geoforms. The area of a geoform is a geomer. Several equal geomers create a geotop (ecotop). The tessera is the base for various analyses, syntheses, tessera typification, and extrapolation from a tessera to an area.

EXAMPLE OF THE METHOD

Scholz et al. (1979) paper shows an example of the complex site analysis and synthesis usage in the topic dimension. The methodology consists of the following stages:

- **Geotopological differential analysis** – at this stage, the available material about the landscape components is assessed (geological, geomorphological, pedological, hydrological, climatic and botanic) and complemented by the field survey. As a result, we gain the characteristic attributes of the landscape components (e.g. geo-

1 **RNDr. Vladimír Čech, PhD.,**
Department of Geography and Regional Development, Faculty of Humanities and Natural Sciences, University of Prešov, ul. 17. novembra 1, 081 16 Prešov, e-mail: cech@unipo.sk

relief elements and forms, substrate character), series of attribute thematic maps and charts (results of the measurement).

- **Geotopological complex analysis** – firstly, by the field observation we determine the mosaic of the sites (with the help of the geotopological differential analysis results). The representative sites supply us with the attribute combinations of the landscape components. This allows us to comprehend components' mutual relations and their activities. The lined-up sites have to intersect the typical sites in order to set the geocomplexes bounds exactly.
- **Geotopological synthesis** – the complex geotopological analysis helps organizing the attribute combinations of geocomplexes. Based on this, it is possible to define their homogeneous areas – geotops (ecotops).

MODIFICATION OF THE METHOD

Čech (2003) slightly modifies this method by not using the special terminology – from the geotop through the nanochora, microchora, etc. However, on each taxonomic level, he marks the defined units as physical–geographical complexes (of the corresponding level). He distinguishes three basic stages:

Lead-in stage:

Obtaining, studying, extraction and processing the maps and other basic documents (published and non-published) which deal with the studied area. It is important to have already mastered the theoretical and methodological knowledge about the studied area.

Consulting with various specialists, visiting science and other institutions. Information provided from the literature in the public libraries might be insufficient, it is necessary to fill up on it from archives and libraries at relevant science institutions, state and private organizations or private persons.

This stage also includes making first maps and drafts from existing maps as an important tool for the field research. The typical maps at this stage are a geological map, a geomorphological map with basic forms (valleys, saddles, etc.), a hypsometric map, a map of relative altitudes, a map of real slope inclination, a hydro-geological map, a map of surface water and springs, a map of soil types, a map of potential vegetation, etc. We can also draw a map of spatial structure of physical-geographical complexes by layering the analytical maps (geological, geomorphological, soil, potential natural vegetation).This draft map contains many problematic areas whose joining to a complex or separation to an individual complex depends on the field survey. A suitable way of completing the information about each area is the chart form. The draft maps are the base for the field survey when they are completed, refined and corrected. A preliminary physical–geographical typification can be carried out at this stage; however, the final cartographical outcome is done at the last final stage.

Preparing the material and tools (e.g. a spade, a pedological drill, a compass, a hypsometer, GPS, a notebook, a laser telemeter, a camera, HCl solution, etc.) for the field survey. The field mapping is often done in these map scales: 1:5000, 1:10 000, 1:25 000.

The field research. The georelief is one of the most significant factors influencing the spatial structures of physical–geographical units. Therefore, it is likely that the geomorphological survey is carried out at first. The attention should be focused on

mapping the basic mezzo and micro georelief forms. The draft maps are completed and corrected (e.g. springs locations, real vegetation, anthropological objects, rock components in quarries).

THE STAGE OF THE GEOECOLOGICAL FIELD SURVEY

The methodology of the geoecological field survey. The main method is the complex site analysis on a research site (geographical site, tessera). To make these sites as representative as possible, we use the information from the draft maps of physical – geographical complexes, typification, the georelief map and other basic documents. If there are any problematic areas, the sites are densified in order to get the highest possible homogeneity. The georelief forms are often an important factor for placing the sites. There are usually more sites on one form of georelief. To analyze the components on a site we should create a form of inventory reports of the sites (chart 1). For each physical–geographical component there exist some questions to which answers offer real characteristics. The content of the inventory reports is determined by the assumed content of the physical–geographical map, tools, the length of the research, etc. Some characteristics are possible to be completed before the field survey starts, e.g. a general categorization of the studied area into regions (e.g. reference to a hydrogeological structure or a type of potential vegetation). The main issue is the choice of those representative characteristics which are possible to be followed on every site in the whole area.

An inventory report of a representative site	
The number of a representative site:	Date: Time: Author:
Location: Cadastre:	Particular location:
Geomorphologic classification:	Unit: .
(Mazúr-Lukniš 1986)	Subunit:
	Part
Lithosphere	
Geological classification:	
Rock type :	Rock subtype:
Rock color:	Rock age:
Georelief	
Altitude: Inclination:	Exposition:
Genetic form:	
Geometric form:	
Mantle rock type:	
Geomorphologic processes:	
Atmosphere	
Climatic area (Atlas krajiny 2002):	
Climatic district (Atlas krajiny 2002):	
Climatic-geographic classification (Atlas SSR 1980):	
Annual precipitation: January temperature: July temperature:	
Unfavorable climatic influences on the site:	
Position of the area to the unfavorable influences:	
Micro- and topic climate: .	

Hydrosphere
Drainage:
Hydro geologic unit:
Hydro geologic structure:
Permeability type:
Momentary depth of the underground water level:
Momentary depth of the surface water level:
Natural surface drainage: .
Natural underground drainage:
Floods: Flow/strength:
Pedosphere
Soil surface covered:
Soil group:
Soil type: Soil subtype:
Soil variety:
Physiological depth of soil:
Depth of A horizon:
Horizon identification:
Characteristics according to the horizons (color, structure, moisture, consistence, soil skeleton, granularity, root system density, reaction to 10% HCL solution, etc.):
Biological activity:
Phytosphere
Phyto geografic zone (Atlas SSR 1980):
Phyto geografic sub zone (Atlas SSR 1980):
Potential natural vegetation:
Real vegetation:
Physiognomic form: .
Ecological form:
Dominant type: Vitality of the dominant type:
Stage identification:
Canopy thickness (stage E3):
Thickness (stage E2, E1):
Health condition (all stages):
Age of the wood species (stage E3, or E2):
Variety of sorts (all stages):
Anthropogenic change of vegetation:
Physiognomic -variety structure of the forest crop:
Exploitation of the forest crop:
Renewal of the forest crop:
Wood species damage (agent and volume of the damage):
Zoosphere
Biotop:
Type of found animal:
Locating the animal:
Site of the animal:
Stadium of animal's evolution:
Group:

Anthrop sphere
Found anthropologic object:
Location of the nearest anthropologic object:
Found anthropologic influence/intensity of the influence:
Area protection level:
Category and name of the protected area: .

Chart 1 An inventory report of a representative site form (Čech, 2003)

FINAL STAGE:

The synthesis of the obtained information at the research sites and processing of the text and the map part. The inventory report of the research sites provides us with the valuable information on the landscape zone components. The final stage adds the missing spatial dimension and we create the individual homogenous spatial physical–geographical complexes of the geotop (ecotop) character (IHSPGC). The areas of these complexes are defined on the basis of data analysis obtained by the field survey on the sites and from other documents. The borders are determined according to the significant changes in the main differentiation actor – mostly georelief, soil types or their combination. In many cases, the neighboring representative sites have the same characteristics (e.g. when located on the different parts of the same slope). This means that they belong to the area of one IHSPGC, or by generalization, they have become a part of one IHSPGC. Therefore, one representative site need not be one IHSPGC. For a better overview, it is possible to create the inventory reports with combined and unified data from each representative site. We group the physical–geographical complexes on the basis on their mutual signs into the types of the homogenous spatial physical-geographical complexes (THSPGC). These types can be put into several taxonomic levels. The last section is the composition of the text and the map part (Programs CorelDraw, ArcView, etc.).

CONCLUSION

The complex physical-geographical landscape survey in topic dimension, together with the complex site analysis and synthesis on a geographical site, is a financially and physically demanding, time-consuming process; nevertheless, it guarantees obtaining relevant and objective information about physical-geographical landscape as a whole and its spatial differentiation.

Acknowledgement: This paper we prepared with the contribution of the grants: VEGA 1/4028/07 „Skúmanie a geoekologické hodnotenie zmien využívania kultúrnej krajiny vybraných podhorských regiónov Slovenskej republiky“ a VEGA 1/4366/07 „Pedogeografické aspekty multifunkčního využívania poľnohospodárskej krajiny“ na Katedre geografie a regionálneho rozvoja Fakulty humanitných a prírodných vied Prešovskej univerzity.

References

BARSCH, H., BILLWITZ, K., REUTER, B. (1988): Einführung in die Landschaftsökologie. Potsdam (PH).

ČECH, V. (2003): Fyzickogeografická analýza a regionalizácia krajiny centrálnej časti pohoria Galmus a priľahlej časti Hornádskej kotliny. Dizertačná práca: KgaG FHPV PU Prešov, 350 p.

SCHOLZ, D., SCHOLZ, E., KIND, C., BARSCH, H. (1979): Geographische Aarbeitsmethoden. Gotha (Hermann Haack).

KOMPLEXNÁ STANOVIŠTNÁ ANALÝZA A SYNTÉZA NA GEOGRAFICKOM BODE AKO METÓDA GEOEKOLOGICKéHO VÝSKUMU

Zhrnutie

V súčasnosti jedna z najpoužívanejších metód geoekologického výskumu v topickej a chorickej dimenzii je tzv. komplexná stanovištná analýza na výskumnom (geografickom) bode a následná syntéza. Barch et al. (1988) v rámci topickej dimenzie navrhuje použitie komplexnej stanovištnej analýzy, ktorá si vyžaduje krajinu na vertikálnom profile rozložiť do „všetkých možných prvkov“, pričom je potrebné položiť dôraz na tie prvky, ktoré majú o celkovom komplexe najväčšiu výpoveď. Sú to najmä vysoko integračné čiastkové komplexy (pôdna forma, vlhkostný režim pôdy), ku ktorým pristupuje georeliéf ako riadiaci faktor pre mnohé procesy. Doplňujúce, hoci vysoko integračné sú aj klíma a geologická stavba. Tieto výskumy sa vykonávajú na reprezentačných bodoch - tesserách, ktoré majú byť rozložené na charakteristických líniách. Výskumom sa získa katalóg indivíduí, ktoré sa podľa rovnakých znakov zaraďujú do typov, nazývaných aj vertikálnymi typmi a označujú sa ako geoformy. Areál geoformy je geomer. Areály viacerých rovnakých geomerov tvoria geotop (ekotop). Tessera (výskumný bod) je základom pre rôzne analýzy, komplexné analýzy, syntézy, typizáciu tessier, extrapoláciu z tessery do priestoru, atď.

Príkladom použitia postupu komplexnej stanovištnej analýzy a syntézy v topickej dimenzii je práca Scholza et al. (1979). Metodika spočíva v týchto troch krokoch:

- Geotopologická diferenciálna analýza - v tomto kroku sa vyhodnotia dostupné materiály o krajinných zložkách územia (geologické, geomorfologické, pedologické, hydrologické, klimatické, botanické, resp. lesnícke) a doplnia terénnym výskumom. Výsledkom sú charakteristiky znakov jednotlivých krajinných zložiek (napr. prvky a formy georeliéfu, charakter substrátu, atď.), série tématických máp znakov a tabuľky (výsledky meraní).
- Geotopologická komplexná analýza - v prvom kroku sa observačným spôsobom stanovuje mozaika stanovíšť v skúmanom území (na základe výsledkov geotopologickej diferenciálnej analýzy). Cieľom je na reprezentačných bodoch stanovišťa zistiť kombinácie znakov krajinných zložiek, čo dovolí pochopiť systém ich vzájomných vzťahov a ich spoločné pôsobenie. Body musia byť zoradené na líniách, ktoré pretínajú typické miesta stanovišťa, aby bolo možné presne vyhraničiť geokomplexy.

- Geotopologická syntéza - komplexná geotopologická analýza dovoľuje usporiadať znakové kombinácie geokomplexov, na základe ktorého sa môžu stanoviť ich homogénne areály - geotopy (ekotopy).

Príkladom použitia tejto metódy s určitou modifikáciou je práca Čecha (2003). Autor nepoužíva špeciálne názvoslovie - od geotopu cez nanochory, mikrochory a pod., ale na každom taxonomickom stupni vyčlenené jednotky označuje ako fyzickogeografické komplexy (príslušného rádu).

Recenzovali: Prof. RNDr. Ján Drdoš, DrSc.
Prof. RNDr. Eva Michaeli, PhD.

THE INTRODUCTION TO THE ISSUE OF THE SPECIALISED HIKING TRACES AT THE BACKGROUND OF THE MOUNTAIN BIKING PROGRESS IN THE WORLD AND IN SLOVAKIA

Peter ČUKA[1]

Abstract: *The mountain-biking was established in Slovakia in the last decade of the 20th century. Author participated at the very first researches of MTB since the 1996. The first part of the work includes the history of MTB in the world and its reflection in Slovakia. Then it specifies the regions of MTB activities in the world and in Slovakia. In the article the author introduces the notion of singletrack as a specialized hiking path, he proposes the scheme of singletracks evaluation by valorisation and a typogram with 12 evaluating features. The most important result of the work is the specification of the function of geography of tourism on examination and advertisement of the mountain-biking.*
Key words*: sigletracks, moutainbiking, typology, mountainbiking regions in Slovakia*

INTRODUCTION

The mountain-biking was established in Slovakia in the last decade of the 20th century. It is perceived in terms of etymology either as the sport branch of biking, or as one of the newest and the most dynamically improving forms of the hiking activities. The popularity of the mountain-biking in Slovakia is the result of very attractive nature conditions of Slovak highlands, which cover the major part of the country, i.e. 55,1% of the area, and consistently improving the social-economic conditions of the majority of people (according to older literary sources, e.g. M. Lukniš (1972) says that the mountainous area covers about 59% of the area, according to the flora grades, R. Midiriak (2005) claims, that the mountainous area covers only 13% of the land). However, our experiences and the first research depict that even though there is a huge possibility to get several different techniques of the mountain bikes, only a very small and a specialised group of mountain bikers are interested in biking at the inter-mountain and mountain areas.

The aim of this study is to show on the potential of Slovak highlands for the mountain-biking use, its` historical and geographical coherence of progress, the potential of hiking traces net, and the efficiency and ecological capacity of building the single tracks of the mountain-biking usage.

Not only the huge experience but also the heuristic methods, the methods of historical and geographical research, expertise methods, SWOT analyses and comparable methods are applied in the study.

1 **Doc. PaedDr. Peter Čuka, PhD. m. prof.,**
Department of Geography and Regional Development, Faculty of Humanities and Natural Sciences, University of Prešov, ul. 17. novembra 1, 081 16 Prešov, e-mail: cuka@gmail.com

THE ORIGIN AND DEVELOPMENT OF MOUNTAIN BIKING

The history of origin of the mountain-biking was established in the USA in 1973. Three biking fans, Gary Fisher, Charles Kelly and Joe Breeze moved from a hippies´ group in San Francisco to the mountain-biking in Fairfax rural surroundings. They have begun to enjoy riding on the steep up-hills. Moreover, they have begun to use not only huge made-over bikes on Mount Tamalpais hills, but also they have made them later for the cross riding (Muntág, S. 1993). After joining Tom Richie into the business, there have been established first two companies for production "mountain bikes" – Ritchie and Specialized. Technical requirements of bikes have established the first sub-groups of biking-technique into mountainbike (MTB) and all terrain bike (ATB). These technical sup-groups have gradually extended in a way to be able to provide the appropriate sport-technical equipment for all hiking accessible terrains and its users. As a result, nowadays there is within the group of bikers (tourists and trained bikers), who are focused on the cross country (XC – widely understood mountain terrain), enduro (bikers mainly riding on the short circles with fast rides and overall sprung frames), downhill (mainly focused on downhills), but also the combination of types mentioned above (e.g. fix track with soft terrain involved prefer so-called cross hiking bikers, the ride on made-up built circle so-called BMX, or so-called freestyle riders with acrobatic stunts.

The mountain-biking origin influenced in the world these important factors:

- Fashion movements back to the nature. The „green thought" has become very attractive in the USA especially after the social mare from the Vietnam War and the first wave of the oil crisis.
- Development of new technologies. They have allowed construction fix enough and lightweight bikes, which have been properly made for the ride in terrain. Furthermore, the new technology of sprung bikes and lite hi-tech frames, e.g. carbon ones, has been applied.
- Mass motorization, which originally pushed out the road bikers and mountain bikers from the most frequent and dangerous roads to terrain (by the way there originally belonged also the seller of road bicycles Gary Fisher).
- The business success and management technology, mainly of Japan companies (Shimano), which have engrossed the production of accessories and their sale has globalized.
- Joining of particular networks has become organized. Influential sport-public associations and organizations has been established gradually, which has been focused basically on marking the hiking traces, building and its maintaining (single-...), the organization of events, the popularization of mountain biking etc.

The first organizations, which have focused on the mountain-biking in the world, belong a north-american IMBA (International Mountain Bicykling Associacion) established in 1988. Membership base guarantees the internationality, which is organized in particular divisions in the USA, Canada, abroad, it means that is possible to join in it any other clubs. The main effort belongs to (www.go.imba.com). The main issue, which is rooted in this membership, is: making new specialized traces, its supervising, public relations, organizing and providing the training and camps etc. In addition, many others free public associations and organizations have developed their activity in the USA, which support the progress of mountain-biking. One of them is also MTF - Mountain Trails Foundation

based in 1994, of which the main aim is the building, maintaining and popularization of all the hiking traces and paths for all tourists.

The similar one called ČEMBA organization was established in Czech Republic in 2007, in Slovakia there is SloMBA (Slovak Mountainbiking association) based from 2008, located in Prešov. The historical predecessors of SloMBA were primarily mountain biking clubs. They were established in 1989, when the first mountain bikes were imported to Czechoslovakia. For example, C.B.S. MTB club in Vrútky came into existence in 1992 (Vojtanovská, 1996). After the democracy birth many new biking groups has been established in the first decade of this period, to which belong e.g. BBBikers in Banská Bystrica (www.bbikers.sk). SCK – Slovenský cykloklub has come into existence in 1994 located in west Slovakia, which was focused on mountain-biking activities. One year later the first Dubnický MTB biking tour took place as an official tournament.

SINGLE-TRACKS – SPECIAL HIKING TRACES

Tradition of marked hiking traces in Slovakia dates back to Austria-Hungary period. The first hiking club was established in 1863 in Banská Štiavnica (Slimáková, 1972). There are nowadays about 900 km of marked hiking traces in Slovakia. One quarter of them is used very intensively by mountain bikers.

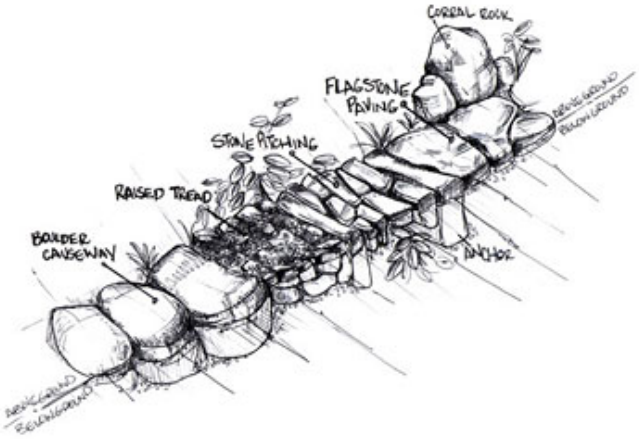
Biking single-tracks have come into existence in the USA with the beginning of mountain bikes. Their methodology takes origin from the manner, of which the walking and horse paths have been made. The hope of success has forced the woodsmen from Scotland and Wales to build the biking traces ten years ago. ČEMBA summarized five most important reasons for building single-tracks into following motto:

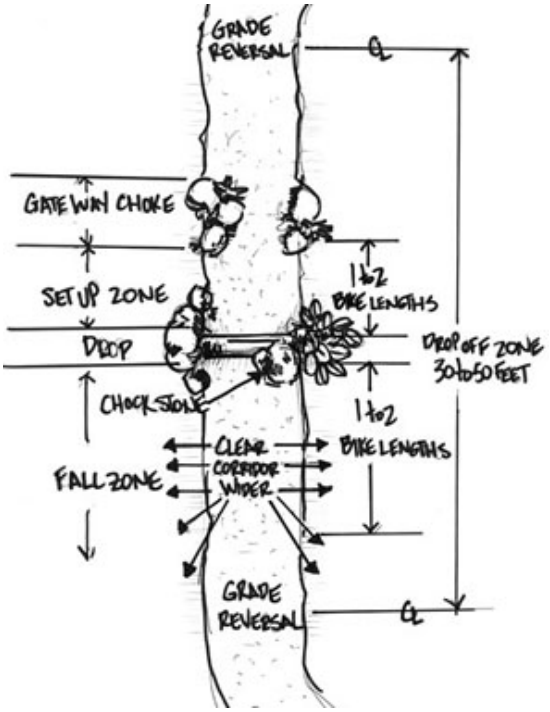
- more nature
- more fun
- more ride
- more opening hours
- more security

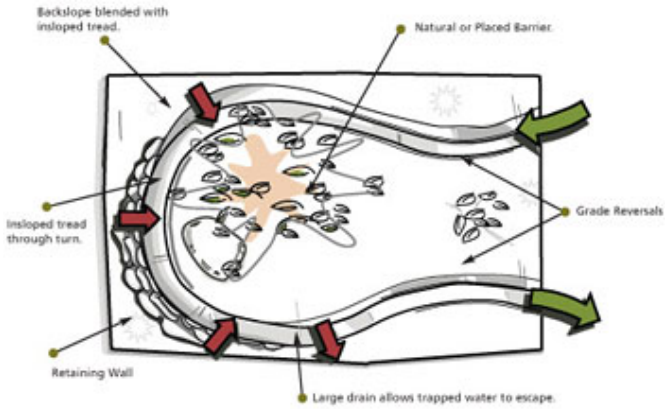
The trace 1,8 m wide has got nature terrain, it cannot never rise more than the half of the propensity of down-line and the sector of the trace would never have the overall propensity more than 15%. The crown of the path is wholly gashed into the hill and it is slightly declined in a vertical way to take away the water. Path changes very often the propensity and direction in a short sector on its way forward. It protects the water flow not to take the speed, which causes the erosion. This type of the trace also controls the speed, in which the bikers can ride on.

Single-track is a cheap one, if it is properly made, it requires minimal maintenance. One kilometer of an asphalt biking trace can cost more than three million Slovak crowns, one kilometer of single-track may cost 100 – 300 thousands up to the type of terrain. Single-track harmonizes different various groups of users, bikers, walkers as well. There are no restrictions and commands needed, bikers can ride only in such a speed, which does not threaten the others. Single-track represents the less impact into the nature processes, it grows with the age and joins it, too. The old hunting traces are the most similar to the single-tracks in Slovak and Czech conditions. These are built in a way not to make the hunter gasped and enable to spot. Therefore, they follow the hills in slight and steady propensities. On the other way, high – tech single-trace is composed in a way to please body and soul of mountain biker. They are more skilfully active and visual.

Methodology of locations, building, maintenance and using of single-tracks highlight IMBA members through national MTB associations and clubs. The pictures taken from the studies of H. Hermanová (2007, 2008 a, 2008 b) and web sites of ČEMBA and SloMBA illustrate the basis of the building and advantages of single-track usage in the mountainous terrain.







Sideslope grade of 25% or less is best.

However, in Slovak conditions it is also very important for the value of an active mountain hiking so that the roads of industrial use provide mild conditions for mountain-biking or walking. Hiking traces, which are used, would have to be managed on the base of nature terrains, which is one of the basic features of single-tracks (Hermová, 2007) (www.slomba.sk).

It may be stated that the word single-track contains:

- specially built hiking mountain-biking trace, which has to protect the natural environment and bikers, too
- methodology of building, maintaining and rules of using the trace

To the first single-tracks in Slovakia belong the sectors of trace on Suchý vrch 738 m.n.m. situated in Kremnické vrchy approximately 3 km north-west from Banská Bystrica.

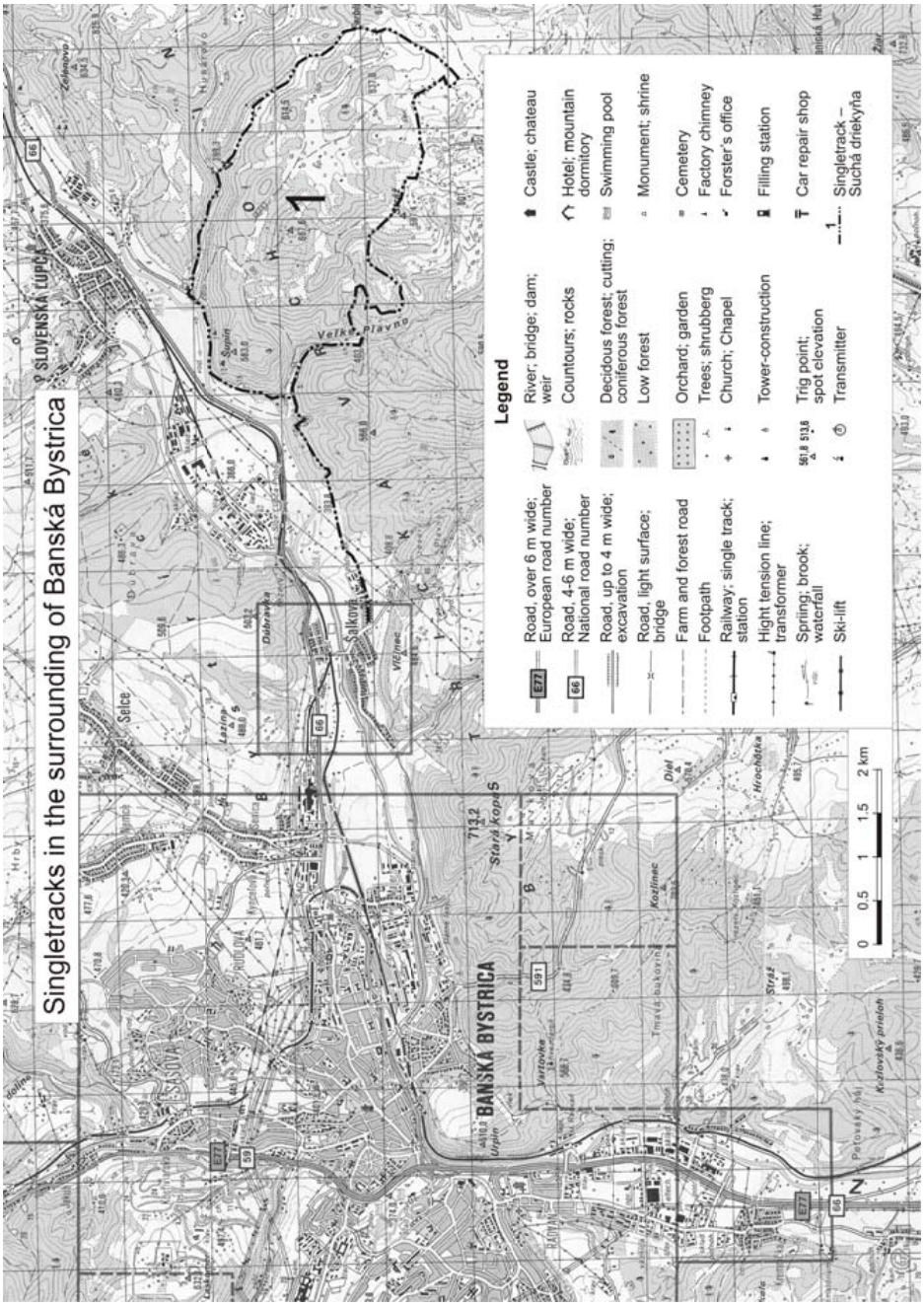
MOUNTAINBIKING REGIONS - INTRODUCTION

As it is seen from historical development of MTB activities, the first regions of hiking bikers have been formed in the USA. Except California, mountain-biking has extended into the huge area that may commonly called as Rocky Mountains (National Park Rocky Mountains, New Mexico, Utah, Colorado Wyoming, Idaho, Montana a Canadian Rockys). Alaska mountain regions belong to the very important parts, too. Moab, Park City Mountain Resort, Boulder, Nederland, Nhort Star at Tahoe, Anchorage, Nome and others represent the most important biking resorts in the USA.

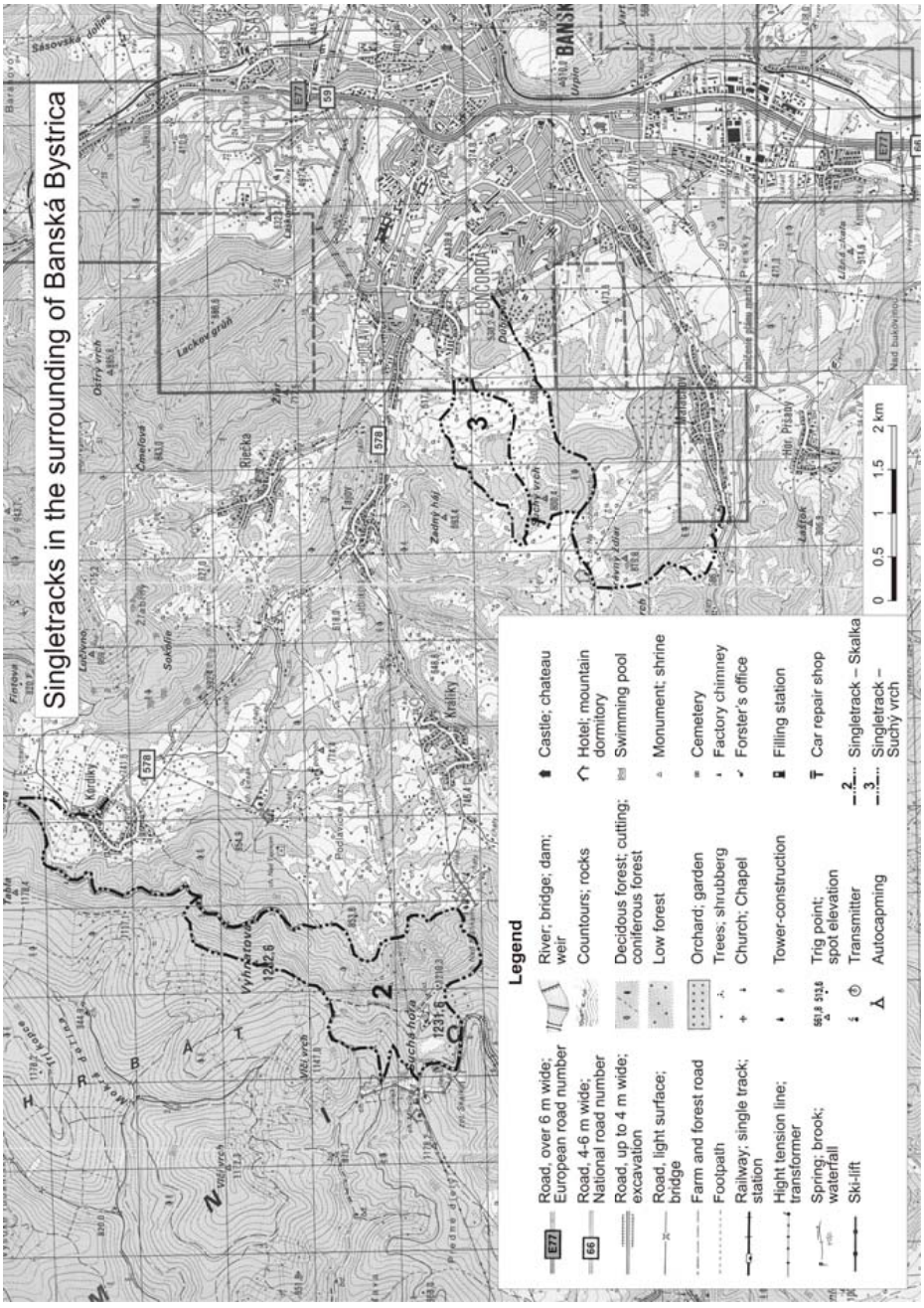
In Europe there prevail the Alp regions. There are very common in Otztal, Stubaier Alp regions, but also in High Taury and Dolomits areas.

Approximately 5 millions visitors travel every year in Lago di Garda regions in Italian Dolomits. 3 millions of them are interested especially in the mountain-biking activities, the rest is focused on windsurfing, hiking, agrotourism and cultural tourism. There are the largest MTB in Europe, as Riva di Garda, Torbole, Malcesine, Nago, Arco, Limone sul Garda and others. The particularity of this region is the fact that the major part of bikers come from Germany – app. 60%.

The Germans as the participants of the foreign tourism have very heterogeneous scale of recreational behaviour. There we have to perceive the German bikers from the point of view of final destination. The outdoor activities, including mountain-biking are performed only by about 11% of Germans.

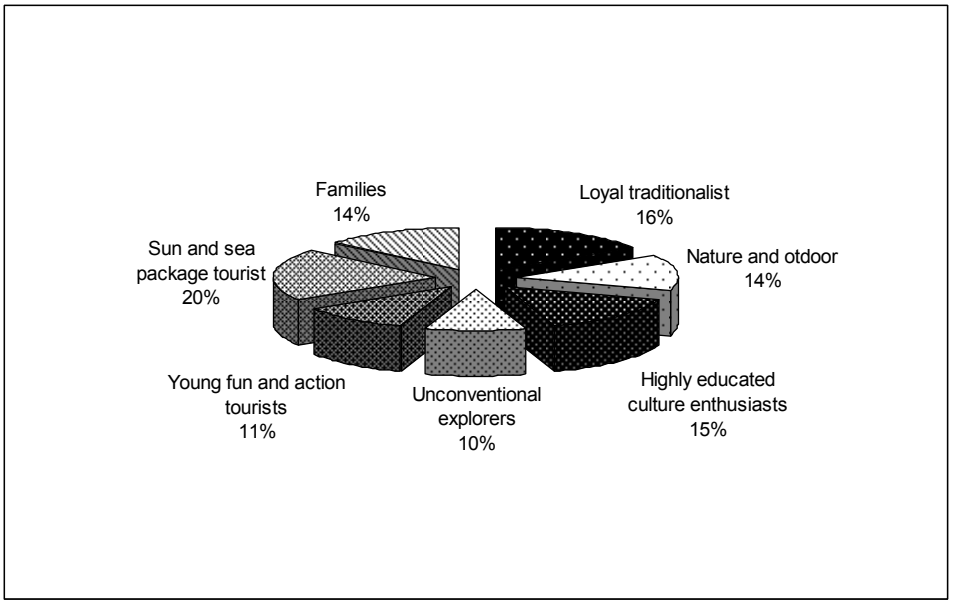


Source: Terrain research



Source: Terrain research

TYPOLOGY OF GERMAN TOURISTS` ACTIVITIES



Source: Environmentally friendly travelling 2006

The most potential regions in Slovakia for MTB progress are the areas of big basin cities with mountainous environment around. There are mainly Banská Bystrica, Žilina, Prešov, Zvolen and Martin.

The typical feature of Slovakia is the fact, that generally the most attractive and the most visited mountain range – The Tatras does not have a potential for the MTB. MTB is completely excluded from the Eastern Tatras, especially from the Belianske Tatras due to the law restrictions of the NAPANT national park. The other areas of the Tatras are from the point of view of relief and conception of hiking traces and traces for MTB practically not available.

The surrounding of Banská Bystrica is very outstanding for the MTB activities. Kremnické mountains, Strarohorské mountains, Veľká Fatra and Poľana are typical for their relief variability and relative heights do 1592 m above the sea level – Ostredok and relative height rise over 1200 m. All the mentioned orographic parts have high density of marked hiking traces and MTB traces. MTB traces are concentrated mainly in Kremnické vrchy at the range line of Vyhnatová 1282 m, Suchá Hora, 1231 m, Zlatá Studňa 1265 m and Velestúr 1254 m above the sea level. In the former mining towns and villages there is a dense net of mining roads with the solid base – for example in the line of Polkanová – Piesky – Panský diel, 1100 m above the sea level. In the valley villages area sucha s Harmanec, Tajov, Králik, Riečky and so on, there is a dense net of asphalt wood path. Some of them propose really outstanding activities: e.g. Moštenica – Kalište, Donovaly – Polianka, or Banská Bystrica – Kordíky. There are about 250 km of marked hiking traces that can be used for the MTB activities in Banská Bystrica surroundings.

SOME PROPOSALS FOR MTB PROGRESS IN SLOVAKIA

The present MTB progress in Slovakia is from the point of view of SWOT analysis influenced by some basic factors.

The advantages are mainly: natural conditions of Slovak highlands, dense net of hiking traces, net of marked hiking tracks, progress of biking traces and single-tracks, organising background MTB and business – service network.

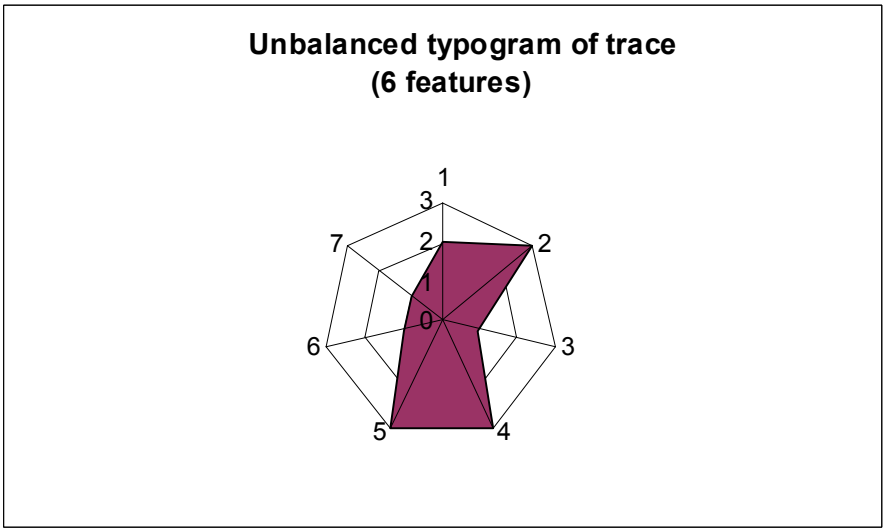
A disadvantage is the weak legislative. The law 61/1977, formed especially with the paragraphs § 52, § 30, § 31 law about the forest from 2008, which are restrictive.

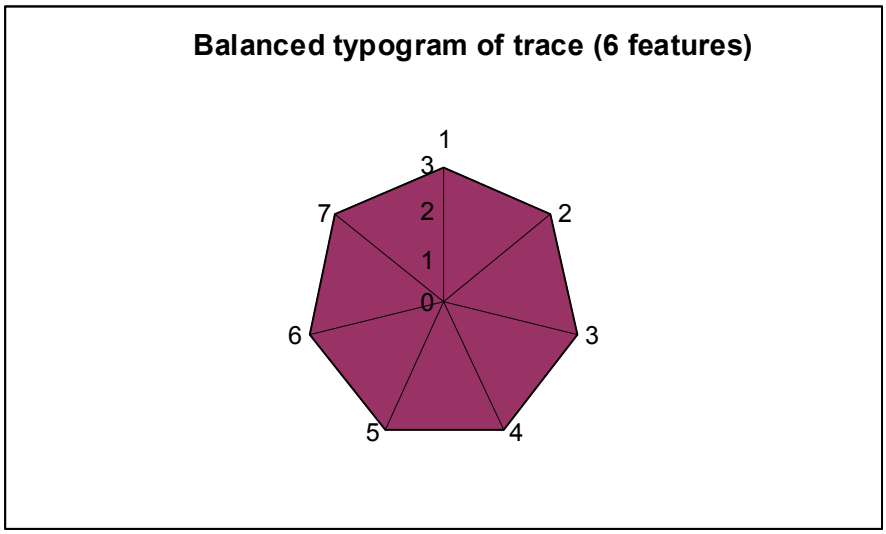
The possibilities, how to develop mountain-biking in Slovakia, are mainly the work of public and of groups of interest, and of the possibilities to gain the financial costs from EU structural funds.

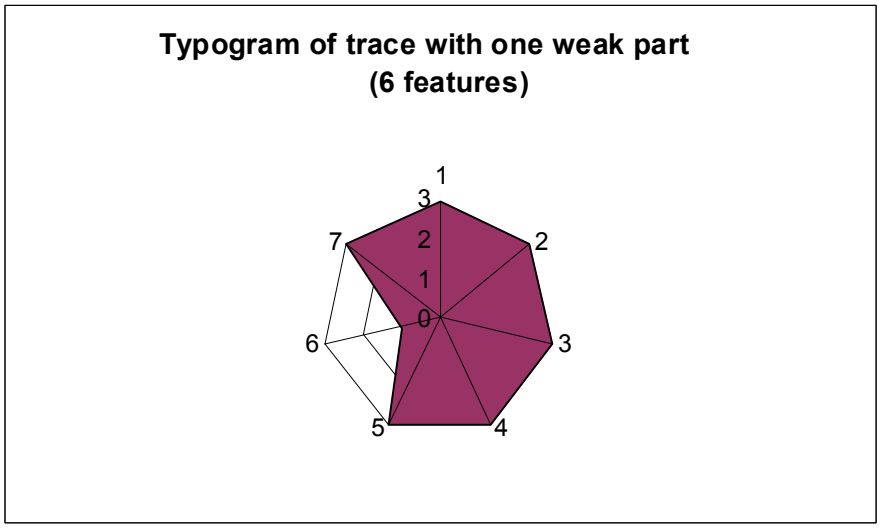
We can see the threads of MTB progress especially in non-adequate public relations. There are some magazines published in Czech Republic, which are related to this issue and made popular mountain-biking and hiking as ecological form of tourism (Velo, Peloton, MTB etc.), on the other hand a positive propaganda is missing in Slovakia.

The popularity of mountain biking has influenced the edition of mountain-biking maps. There are in legend of maps biking traces represented by two features, the total length and rise of the trace.

K. Vojtanovská (1996) approaches to the valorisation with the help of six evaluative features. They are the length, rise, forestness, view attraction, other hiking activities on the trace and frequency of bikers riding on the trace. This more difficult valorisation results into more combinations of the trace typologies, which enable more complex comparison of individual tracks.







We have proposed the complex typology of traces by the empirical experience and study of mostly observing values by bikers themselves. Typology contains twelve evaluative features, organized into two groups.

The complex typology proposal of MTB:

A group of objective valorization of traces, group B – of subjective valorization.

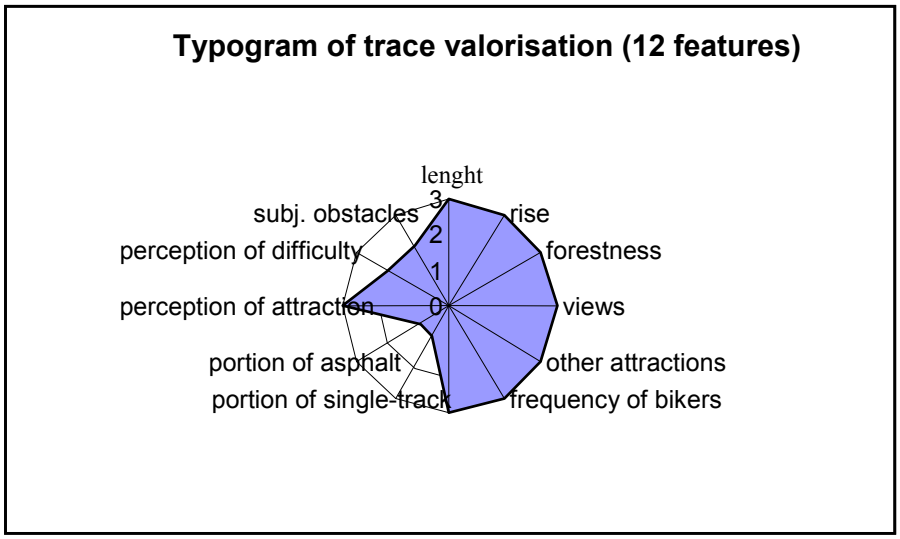
A – trace length

- trace distance from start (length of formations)
- rise length
- trace cover

- amount of views on the trace
- amount of single-tracks on the overall trace length
- amount of asphalt, fixed road/terrain

B – hiking activities on the trace

- perception of the trace attraction
- perception of the trace difficulty
- frequency of bikers´ and tourists´ appearance on the trace
- subjective obstacles on the trace (transmission, conflict with other kinds of tourism, damaged or destroyed terrain etc.).



Tasks of the geography of tourism at theoretical and practical level by studying the mountain-biking:

Geography, mainly geography of tourism, will have to join all the basic stones of its essential scope. The main task is to produce open-space models by the help of holistic approaches, which are mediated and generalized by cartography.

Theoretically, with the research aimed on the MTB issue, we can set these following research tasks of the geography of tourism:

1. To verify the space functions of MTB activities. It means mainly – regional specification of MTB, season of MTB, setting of background of MTB activities (offering and marketing factors), and quantity parameters of MTB activities.
2. The setting of appropriate geographical models of MTB activities.
3. With the most appropriate publication activity to help to raise MTB attraction for sport-hiking public. Geography of tourism has to become the proper supporter of MTB activities and in addition the equal and supplementary partner to all other disciplines, which are studied on that (sports theory, sport psychology, landscape ecology, landscape and trace architecture, economics and management of tourism etc.).

4. Try to generalize in the most possible way the search of mountain-biking forms (cross country, free ride, downhill etc.) and their impacts not only at local ecosystems, but also to identify and eliminate the possible legislative or less formal obstacles of MTB progress. As a result, it is the best to combine basic terrain orders with special methods developed for these purposes (experimental method, methods of social-political lobbying etc.).

Practically, with the research aimed on the MTB issue, we can set these following research tasks of the geography of tourism:

1. To contribute by the terrain measures to ecological knowledge in the level of land-ecological mapping.
2. By the application of human-geographical methods (mainly apprehensive, behaviour, and methodological etc.) to influence on the raising of satisfaction for the users of sport-hiking activities focused on MTB.
3. By the application of human-geographical methods (quantity, intensity measuring of density of marked tracks dedicated to MTB etc.) to contribute to special selection of marked tracks dedicated to MTB.
4. By the cartographic applications and applications of GIS to help with the production of proper biking tracks, software GPS maps, too.

Acknowledgement: This paper we prepared with the contribution of the grants: VEGA 1/0236/08 „Potenciál cestovného ruchustredného Slovenska v geografických modeloch“.

References

ČUKA, P. (2007): Priestorová dynamika infraštruktúry CR v Banskej Bystrici a jej rekreačnom zázemí. Geografické štúdie 14, UMB, Banská Bystrica 100 s.

ČUKA, P. (2008): Shaping of development trends of tourist traffic in Banská Bystrica and its recreational background out of geographic tourist tarfficand movement wiew. IN: ETHNE. MIĘDZYNARODOWE STUDIA SPOŁECZNO-HUMANISTYCZNE 1/2008, Warszawa , s .229-239, ISSN 1898-8431.

ČEMBA (2008): Pět důvodů pro singltrek. In. www.cemba.sk

DAFIDD, D. (2008): Podklady pro stavbu stezky v Jabloneckých Břizkách. In: Mimoprodukční funkce lesa, cyklistika v lesních majetcích. Zborník konference, Jablonec nad Nisou – Mšeno, ČeMBA, Ministerstvo zemědelství,Čsl, 84 s.

Environmentally friendly travelling 2006. EUTAT Wien s 95

MARION, F., WIMPEY, J. (2008): Dopady terénní cyklistiky na životní prostředí: přehled vědeckých výzkumú a postupů údržby. In: Mimoprodukční funkce lesa, cyklistika v lesních majetcích. Zborník konference, Jablonec nad Nisou – Mšeno, ČeMBA, Ministerstvo zemědelství,Čsl, 84 s.

MUNTÁG, S. (1993): Mountain bike. Kúzla a úskalia horskej cyklistiky. Vega, Vrútky 167 s.

EASCOTT, D. (2003): Backcountry biking in the Canadian Rockies. Rocky Mountain Books, Winnipeg, Canada 408 s.

HERMOVÁ, H. (2008): Rekreační cesty pro cyklisty. Východiska, důsledky a řešení. Jablonec nad Nisou, ČeMBA 29 s.

HERMOVÁ, H. (2008): Rekreační lesy pro cyklisty a jejich dopad na krajinu.In: Mimoprodukční funkce lesa, cyklistika v lesních majetcích. Zborník konference, Jablonec nad Nisou – Mšeno, ČeMBA, Ministerstvo zemědelství,Čsl, 84 s.
HERMOVÁ, H. (2007): Cyklostezky pro tatrovky. In: Ekolist 11/07 www.ekolist.cz
SLIMÁKOVÁ, L. (1972): Pobyt v prírode a turistika. PF, Banská Bystrica 205 s.
VOJTANOVSKÁ, K. (1996): Možnosti rozvoja cykloturistiky v priestore NP Malá Fatra. Diplomová práca, vedúci práce, P. Čuka, UMB, FPV, Katedra geografie a KE, Banská Bystrica 72 s.
Novela zákona č.326/2005 Zz. z 21.06.2007 NRSR

Excerpted internet sources
www.lagobiker.it
www.iVelo.cz
www.go.imba.com
www.cemba.cz
www.slomba.sk
www.bikemania.sk
www.bbbikers.sk /autor článku je členom zoskupenia BBBikers/

ÚVOD DO PROBLEMATIKY ŠPECIALIZOVANÝCH TURISTICKÝCH TRÁS NA POZADÍ ROZVOJA HORSKEJ CYKLISTIKY VO SVETE A NA SLOVENSKU

Zhrnutie

Horská cyklistika (mountainbiking - MTB) sa na Slovensku etablovala v poslednom desaťročí 20 – teho storočia. Autor sa podieľal na prvých geografických výskumoch MTB od roku 1996. V prvej časti je zrnutá história MTB vo svete a jej reflexie na Slovensku. Ďalej vymedzuje regióny aktivít MTB vo svete a na Slovensku V štúdii autor vymedzuje pojem singltrek, ako špecializovaný turistický chodník, podáva návrh na hodnotenie singltrekov valorizáciou a typogramom s 12 – timi hodnotiacimi znakmi. Dôležitým výsledkom práce je vytýčenie úlohy geografie cestovného ruchu pri skúmaní a propagácii MTB.

Recenzenti: Prof. RNDr. Eva Michaeli, PhD.
Prof. Ing. Marian Gúčik, PhD.

THE DEMOGRAPHIC SITUATION OF THE ROMA MINORITY IN THE MICRO-REGION "STRÁŽE"

Zuzana DOLNÁ[1]

Abstract: *The paper provides a current view of the demographic situation of the Roma community in the Stráže micro-region. In more detail, it deals with the population numbers of the Roma and their age structure.*
Key words: *Roma, Roma Minority, Stráže Micro-region, Demographic structure,*

INTRODUCTION

The Stráže micro-region is situated to the north-west of Prešov and takes up an area of about 180,65 square kilometers. It consist of 22 villages, including the town of Veľký Šariš. Due to the fact that in the time of our research the micro-region was formed by 18 villages, this article was aimed only on them exclusively. The aim of this paper is the characterization of the demographic structure of the Roma in this area. The demographic analysis provides more current and exact data about the Roma inhabitants in the respective villages of the region. The whole micro-region has got 18 474 inhabitants, of which 1 654 a Roma, which is 8,95%. The Roma inhabit five villages of this region (Kapušany, Malý Slivník, Spišská Poruba, Terňa and Veľký Šariš).

METHODOLOGY AND INPUT DATA

The input data is taken from statistical census yearbooks from the years 1991 and 2001, from information acquired from the Statistical Office, from registry offices and local councils. The main concern was the number of Roma inhabitants in the years 1991, 2001, 2007 and the comparison of this number in the years 1991, 2001. Further on, the research deals with the age and gender structure of the Roma in comparison with the majority inhabitants. The natural migration of the Roma inhabitants has been characterized by means of the Vitality index (Iv) for the period of 1997-2007.

ROMA POPULATION IN THE STRAŽE MICRO-REGION

In the 1991 census, 496 inhabitants claimed Roma nationality, which, with respect to the overall population of 16 378, presented 3%. In 2001 the number rose to 501, i.e. 3% of the overall population. This information is not relevant, as in censuses, the Roma tend to claim Slovak nationality. In 2007, according to the internal data of the local councils, the region inhabited 1 654 Roma. The highest rate of Roma inhabitants in 2007 was in Malý Slivník, where the Roma present 72,8% of the overall population of the village. In the near

1 **Mgr. Zuzana Dolná,**
Department of Geography and Regional Development, Faculty of Humanities and Natural Sciences, University of Prešov, ul. 17. novembra 1, 081 16 Prešov,
e-mail: zuzana.dolna@gmail.com

future, the Roma may become a majority in the village of Šarišská Poruba, with its current 40,0%. The lowest number of Roma inhabitants is in Kapušany (2,7%).

Tab. 1: *The population numbers of the Stráže micro-region in the years 1991, 2001 and 2007*

Micro-region Stráže	1991	2001	2007
Majority population	15882	17018	16820
Roma minority	496	501	1654
together	16378	17519	18474

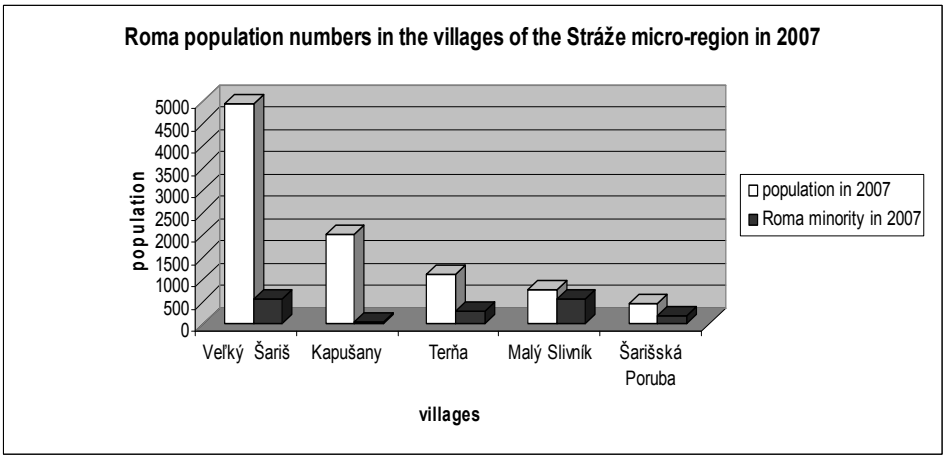
Source: The Statistical Office of the Slovak Republic, original research)

Tab. 2: *Roma population percentage in the respective regions of the Stráže micro-region in the years 1991, 2001 and 2007,*

Village	Population in 1991	Roma minority in 1991		Population in 2001	Roma minority in 2001		Population in 2007	Roma minority in 2007	
		abs.	%		abs.	%		abs.	%
Veľký Šariš	4058	130	3,2	4055	244	6,0	4941	568	11,5
Malý Slivník	481	273	57,0	651	91	14,0	765	557	72,8
Terňa	854	2	0,2	1044	88	8,4	1114	295	26,5
Šariš. Poruba	362	91	25,0	398	31	7,8	451	180	40,0
Kapušany	1859	0	0,0	2068	47	2,3	2010	54	2,7

Source: The Statistical Office of the Slovak Republic, local councils of the respective villages of the region

Graph 1: *Roma population numbers in the villages of the Stráže micro-region in 2007*

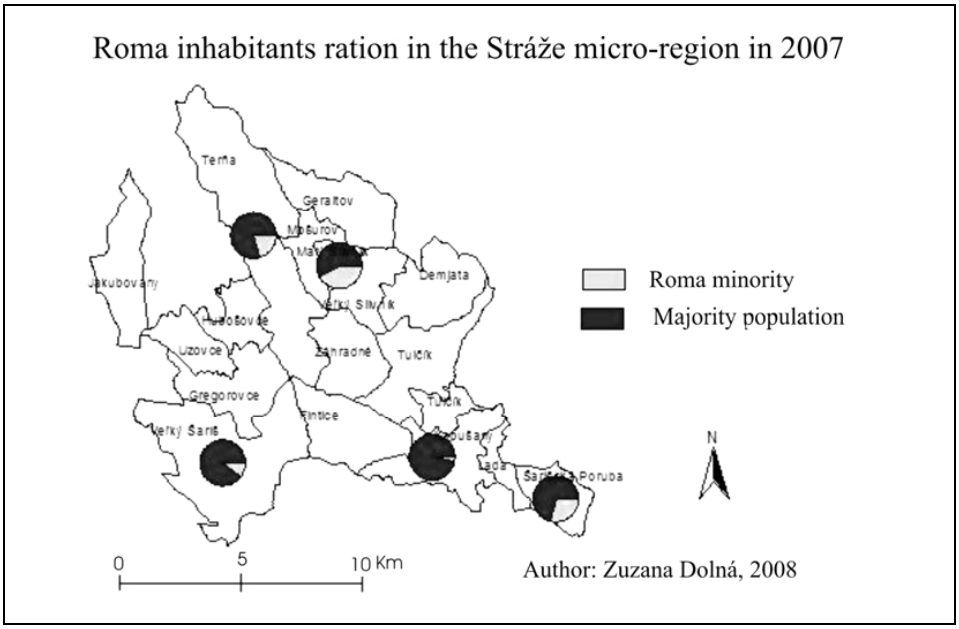


Source: author

An interesting fact to notice is the increase in the number of Roma, meaning an increase in their share in the overall population of the village of Terňa. Whereas in 1991, the share

was just 0,2%, in 2001 it was 8,4%. In 2007 we found out on the basis of the data gained from our own research that the portion of Roma minority was 26,5%. This rapid increase may be attributed to more precise data collected in a field research. The Roma population development of Šarišská Poruba is of a sinusoidal character. Whereas in 1991, it was 25%, in 2001 the number fell to 7,8%.

Map 1: *Roma inhabitants ration in the Stráže micro-region in 2007*



Source: Author

GENDER STRUCTURE

The overall population of the Stráže region in 2007 was 18 474, of which 50,9% was male and 49,5% female. Roma women make up 53,9% and the majority population females 50,6%. The only exception is the village of Šarišská Poruba, where the ration of Roma is 1:2 in favour of females. The most female Roma live in Malý Slivník, the most male Roma in Veľký Šariš. An interesting fact is that in all villages with Roma population, females outnumber males. One exception is the village of Kapušany.

The masculinity index in 2007 reached its peak in Kapušany (1077), its low in Šarišská Poruba (607). The masculinity index for the whole micro-region Roma population in 2007 is 852, whereas the fertility index is 1173. The highest fertility index in 2007 was recorded in Šarišská Poruba (1647).

Tab. 3: *Stráže Micro-region Population in Terms of Gender by Dec. 31. 2007.*

Micro-region Stráže	female	male	together
majority population	8503	8317	16820
Roma minority	893	761	1654
together	9396	9078	18474

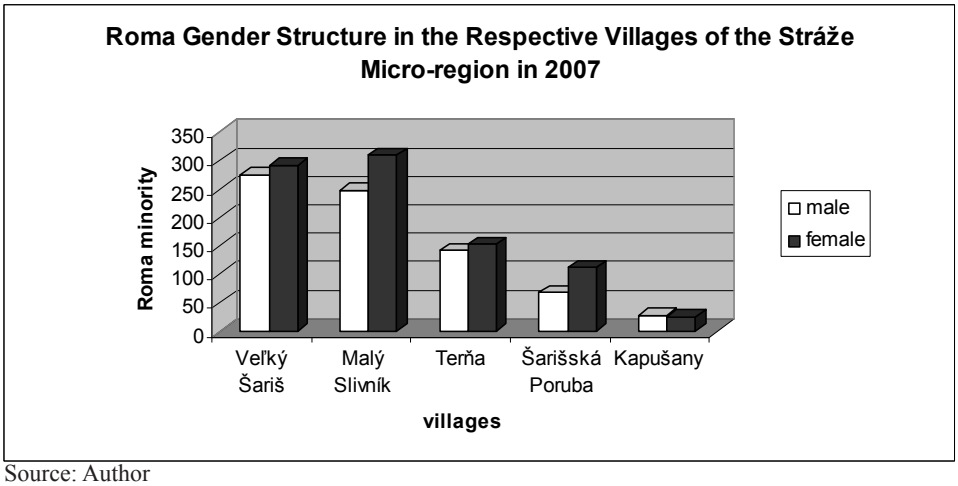
Source: The Statistical Office of the Slovak Republic, original research

Tab. 4: *Roma Gender Structure of the Respective Villages of Stráže Micro-region in 2007.*

Village	male	female	together	I_m	I_f
Kapušany	28	26	54	1077	929
Malý Slivník	247	310	557	797	1255
Šariš. Poruba	68	112	180	607	1647
Terňa	142	153	295	928	1077
Veľký Šariš	276	292	568	945	1058

Source: The Statistical Office of the Slovak Republic, original research
I_f – fertility index, I_m – masculinity index

Graph 2: *Roma Gender Structure in the Respective Villages of the Stráže Micro-region in 2007*



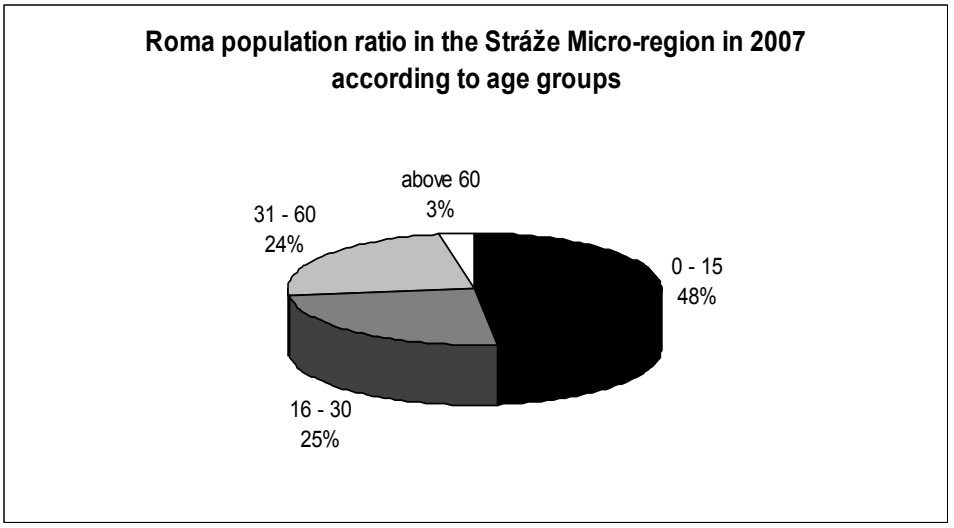
Source: Author

AGE STRUCTURE

In terms of age structure, the main role is played by children and adolescents, especially up to 15 years of age and adults of 21 – 30 years of age, which indicates a predisposition to a similar, if not even higher rise in population numbers of Roma, as in the past years. This hypothesis is also supported by the fact that the Roma population is sexually active very early. The overall Roma population up to the age of 15 is 784, which is 47,4% of the overall Roma population. The highest number of children up to 5 years of age, according to

the data acquired, is in the village of Malý Slivník. The only exception here is the village of Kapušany, which is caused by a low number of Roma living there. Similarly striking is the number of Roma older than 60, which is just 3,2%. The village of Terňa is an exception here, where the different age groups are rather balanced. The Roma population age index in this region in 2007 is 664, which indicates a very progressive type of population, with a predisposition of further growth.

Graph 3: *Roma population ratio in the Stráže Micro-region in 2007 according to age groups*



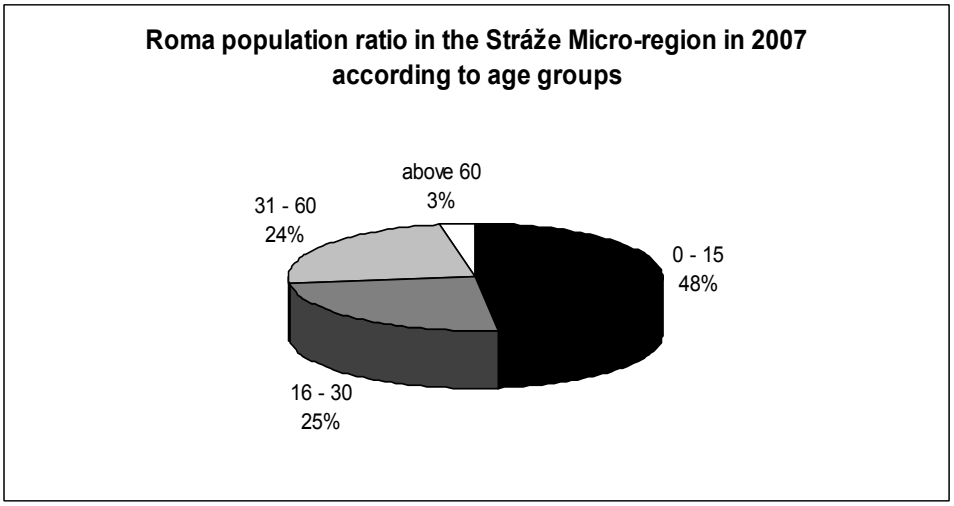
Source: Author

Tab. 5: *Roma population ratio in the Stráže Micro-region in 2007 according to age groups*

Age groups	Roma population						
	Šariš. Poruba	Terňa	Malý Slivník	Kapušany	Veľký Šariš	together	together %
0 - 5	43	48	128	10	101	330	20
6 - 10	42	38	72	8	87	247	15,2
11 - 15	26	28	77	9	67	207	12,5
16 - 20	17	34	64	8	48	171	10
21 - 30	17	45	74	3	110	249	15
31 - 40	16	40	71	10	57	194	11,3
41 - 50	10	36	44	5	59	154	9
51 - 60	9	8	26	0	22	65	4
nad 60	0	26	9	1	17	53	3

Source: The Statistical Office of the Slovak Republic, original research

Graph 4: *Roma population according to age groups in the Stráže Micro-region in 2007*



Source: Author

NATURAL ROMA MINORITY MIGRATION

Comparing the natality and mortality, a clear positive difference between the born and deceased is discernable. The highest difference is in Malý Slivník, resulting from a rather high Roma population and its age structure. A similar trend was recorded in Veľký Šariš. The natural increase in Roma population in the micro-region in the period from 1997 to 2007 was characterized by means of the vitality index (Iv)the value of which is 7,2, indicating an increased procreation of the population.

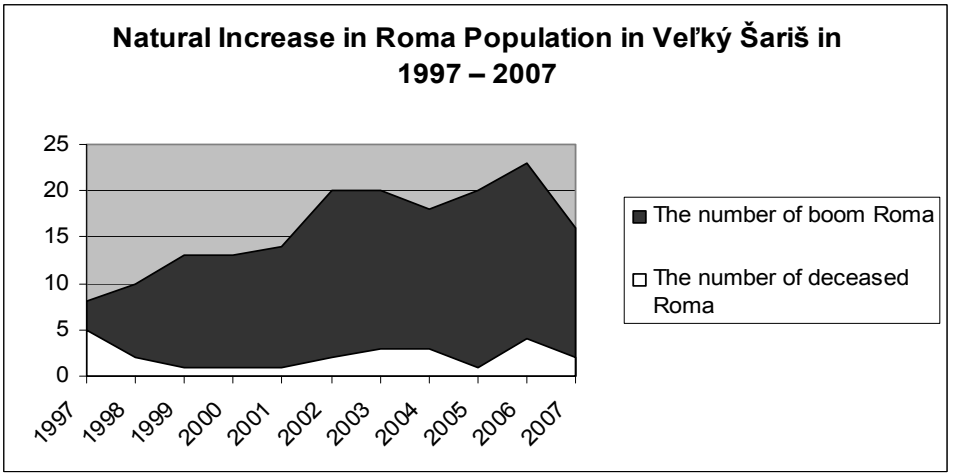
For a graphic presentation of these numbers in 1997 -2007, the Veľký Šariš and Malý Slivník have been chosen, as the highest increase has been recorded here.

Tab. 6: *The numbers of born and deceased Roma in the Stráže Micro-region in 1997-2007*

village	The number of boom Roma in 1997 - 2007	The number of deceased Roma in 1997 - 2007
Šariš. Poruba	68	10
Terňa	89	15
Malý Slivník	226	21
Kapušany	19	2
Veľký Šariš	126	25

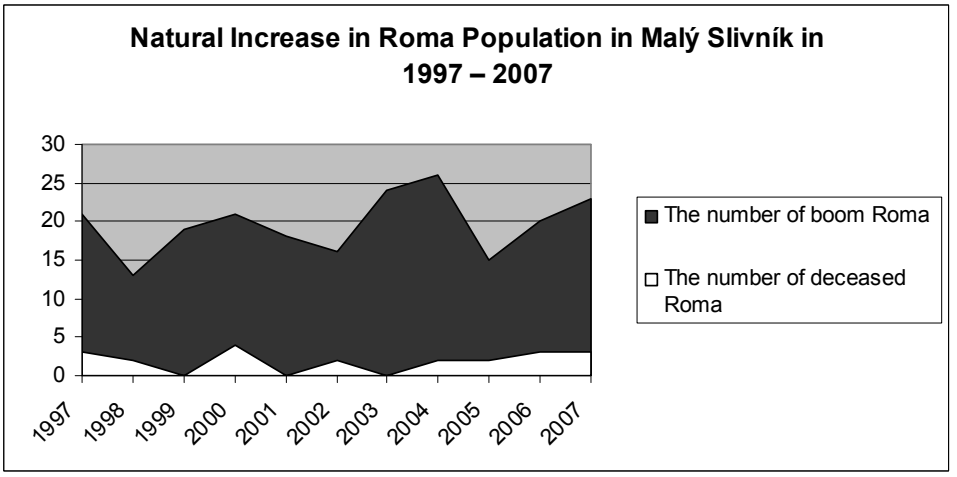
Source: local councils of the respective villages of the region, original research

Graph 5: *Natural Increase in Roma Population in Veľký Šariš in 1997 – 2007*



Source: Author

Graph 6: *Natural Increase in Roma Population in Malý Slivník in 1997 – 2007*



Source: Author

CONCLUSION

In 1991, the Roma population presented a 3,1% share in the overall population and in 2001, the number declines to 2,9%. By our own research and by cooperation with local councils we have found out, that in December 31, 2007 there were 1654 Romas living in the micro-region Stráže representing 8,7% portion of population. As the Roma population up to the age of 15 presents 47,4%, it may be asserted that the Roma population in the region will rise, due to a positive development in social and economical areas and due to a specific sexual life with no increase in education.

The data acquired in 2007 from local councils and field research are regarded as more reliable. It may therefore be stated that the data from 1991 to 2001 does not correctly reflect the real numbers of Roma population, as the data was based on information provided by the Roma community itself.

The acquired data indicate an increase in the area of research. An important point here is that the Roma become aware of their social situation and pay more attention to education, to prevent social exclusion.

References

BAŠOVSKÝ, O., MLÁDEK, J. (2001): Geografia obyvateľstva a sídel, PvF UK, 1989, s. 58-109

DUBAYOVÁ, M. (2001): Rómovia v procesoch kultúrnej zmeny, Filozofická fakulta Prešovskej univerzity, Prešov, 183 s.

FEDIČ, V. (2001): Východoslovenskí rómovia a II. svetová vojna, Redos, Humenné, 2001, s. 65-68

KANDRÁČOVÁ, V. (2002): Priority geografického výskumu „rómskeho problému", Stály rozvoj regiónov, ManaCon, Prešov, s. 112-116

MATLOVIČ, R. (2005): Geografia obyvateľstva Slovenska so zreteľom na rómsku minoritu, FHPV PU, Prešov, s. 231-284

MICHAELI, E., MATLOVIČ, R., DRAVECKÁ, B., HOFIERKA, J., IVANOVÁ, M. (2008): Kvalita života rómskej komunity v meste Levoča, Plzeň, University of West Bohemia, 129-136

MICHAELI, E., MATLOVIČ, R., KLAMÁR, R. (2002): Vybrané regionálnogeografické aspekty rómskeho obyvateľstva v prešovskom kraji, Stály rozvoj regiónov, ManaCon, Prešov, s. 85-95

PEŠÁKOVÁ, J. (2005): Rómska komunita na slovenskom vidieku – jej demografická situácia a aktivity (na príklade obce Malý Slivník), Formovanie európskej občianskej spoločnosti, FFPU, Prešov, s. 278-287

DEMOGRAFICKÁ SITUÁCIA RÓMSKEJ MINORITY V MIKROREGIÓNE STRÁŽE

Zhrnutie

Mikroregión Stráže mal v čase výskumu 18 474 obyvateľov z toho 1 654 Rómov. Rómske obyvateľstvo je zastúpené v piatich obciach mikroregiónu a to: Kapušany, Malý Slivník, Šarišská Poruba, Terňa a v meste Veľký Šariš. Pri sčítaní obyvateľstva v roku 1991 sa k rómskej národnosti prihlásilo celkovo 496 obyvateľov, t.j. 3% z celkového vtedajšieho počtu obyvateľov a v roku 2001 to bolo 501 obyvateľov, čo tvorilo tiež 3% z celkového počtu obyvateľov. V roku 2007 sa tu podľa interných materiálov obecných úradov nachádza 1 654 Rómov. Vo vekovej štruktúre najpočetnejšiu skupinu tvoria deti vo veku do 15 rokov - 47,4%. Ďalšiu skupinu predstavuje obyvateľstvo vo veku 21-30 (15%), na základe čoho predpokladáme rovnaký, ak nie vyšší nárast rómskeho obyvateľstva ako v predchádzajúcich rokoch. Index veku obyvateľstva rómskej minority mikroregiónu

v roku 2007 nadobudol hodnotu 664, z čoho vyplýva, že sa jedná o veľmi progresívny typ populácie. Prirodzený prírastok Rómov za obdobie 1997 – 2007 sme charakterizovali pomocou vitálneho indexu (I_V), ktorého hodnota je 7,2, čo značí rozšírenú reprodukciu obyvateľstva prirodzeným prírastkom.

Recenzovali: Prof. RNDr. Viliam Lauko, CSc.
RNDr. Alena Lukáčová, PhD.

MEASUREMENT OF PLACE MARKETING ORIENTATION

Magdalena FLOREK[1]

Abstract: *Place marketing is seen as one of the approaches to enhance and strengthen the place development and its management. However, separate and single marketing activities do not reflect the full adaptation of marketing concept. It is therefore useful and necessary to define the symptoms of marketing orientation and measurement tools that enable to diagnose the level of its implementation in particular place. It can be done by using a normative approach to evaluate market orientation in organizations proposed by Narver and Slater (1990), based on five components: customer orientation, competing tor orientation, interfunctional coordination, long-term focus and profitability. It is suggested to adapt this approach and adjust for place marketing purposes by defining relevant list of attributes.*
Key words: *place marketing, marketing orientation*

INTRODUCTION

To ensure the welfare of local communities, local governments have to face external and internal competition for investment, tourism, public funds and organising hallmark events among others. To meet the challenges the need for an adequate management method appeared to support places in building and sustaining competitive positions on the regional, national or international stage. In search of theoretical concepts that respond to that need, transfer and adaptation of marketing approach on territorial ground became very common in last decades. Place marketing, and recently more often, place branding, are seen as possible approaches (e.g. Kotler et al., 1993; Matson, 1994, Olins, 2003; Kavaratzis, 2004; Anholt, 2005) but also as a panacea and not quite understood process for attracting desired segments and places' growth (Papadopoulos and Heslop, 2002; Anholt, 2005; Parkerson and Saunders, 2005; Kavaratzis, 2004). Consequently, these concepts are often utilized without holistic approach focusing on single activities. As separated and independent, they cannot be seen as indication of place marketing orientation. Natural need exists therefore to define the symptoms, being reflected in adequate measurements, of place marketing approach. This allows to diagnose the level and pace of adaptation of marketing rules and its tools to particular places.

LOCAL DEVELOPMENT CHALLENGES

The development of territories of different scale, because of its goals set, is an issue of social importance. It could be even assumed, there is a social demand for closer recognition of methods that enable to manage countries, regions, cities, towns and communes effectively. The reasons of distinguishing marketing as an approach to local development

1 **Magdalena Florek, PhD.,**
The Poznan University of Economics, Department of Trade and Marketing, Al. Niepodleglosci 10, 60-967 Poznan, Poland, e-mail: m.florek@ae.poznan.pl

might be seen therefore in pragmatic necessity. In particular, of important meaning were and still are:

- growing competition between places, understood not only as competing of particular companies in different places but as competition between complex territories;
- globalisation process that enables the transfer of capital, people, goods, services or technology. In the same time it requires a counterbalance through activities undertaken at the local level (Hetzel 1997, p. 32). Place marketing utilises this way the diverse potential of its territory to galvanise it into a recognisable and differentiated entity in the market place (Florek, Insch and Gnoth, 2006, p. 277);
- changes in a role and decision range of local governments;
- immediate promotion activities applied by local governments and gradual interest in marketing as a pragmatic way to manage the place;
- the increase of society awareness of belonging to local, regional, national or ethnic communities (Szromnik, 2002);
- growing demand for public support of decision and activities implemented.

The application of marketing concept in management on local levels results also from the fact that each organization, either profit or non profit oriented, has to search for new methods that enable to increase the effectiveness of its operation. The easiest possibility is to reduce the dissonance that exists between expectations and needs of particular community and the way these needs are satisfied through proposed offer (Domański, 1997, p.20).

Therefore, when applying marketing approach to the local or regional economy, an assumption is made that city or region operates similarly to private company. It "produces" goods and services to satisfy needs of consumers located on internal and external markets. It exists in competitive environment striving to attract investors, capital and new outlets for local goods. If we look at the commune, city, region or country as a complex product that consists of a number of material and immaterial products mutually connected, and also as an economic category (a subject of demand and supply) it can be exposed to market game (Berg et al, 1990).

At the same time, political instruments of exercising power (actually keeping the power), techniques of getting votes and orientation on short-term results, are factors that determine the actual, not recommended, ability of territorial authorities to undertake unpopular in the short term decisions (Markowski, 1999). Thus, the strategic decisions are often postponed for short term ones, frequently incoherently with superior goals or not indispensable but bringing visible and immediate effects. In the case of local government, the effects of incorrect orientation are moved away because local community cannot choose new administrative authorities until next election (Domański, 1997) (every four years in Poland for example). Because of the election cycle it is quite common in practice that goals to achieve and strategies to implement are being changed that results in their continuous beginning instead of finalizing. These tendencies obviously caused a big barrier in effective marketing implementation in places.

MARKETING ORIENTATION AND ITS MEASUREMENT IN THE CONTEXT OF PLACES

Marketing concept can be viewed as a set of attributes (principles) of management. Kohli and Jaworski (1990, p.1) use the term 'market orientation' to mean "the implementation of the marketing concept". It is assumed that market orientation is a formula that enables operationalisation of marketing concept and its extensive analysis, also in the context of implementation aspects (Fonfara, 2002). The key problem is the measurement of such understood marketing orientation.

Since marketing has an interdisciplinary character, the final result depends not only on the input of particular disciplines but also on its ability of transformation. Marketing orientation ranks among the phenomena of the highest level of complexity. This is why it cannot be measured directly and its operationalisation is necessary. To achieve this, the main features need to be convert into symptoms that can be the subject of research and can reflect the measure of marketing orientation advancement (Misiąg, 2001).

In the case of places the problem seems to be even more complex. It results mainly from the lack of former interest in evaluation of level of marketing orientation in places and consequently lack of development of relevant methodology (see methodology and surveying device used in Polish towns presented by Szromnik, 2003).

Therefore, in the evaluation of marketing orientation of places, the former achievements within companies area should be analysed and utilized. These, to a large extent base on technical (normative) approach. This approach consists of formulation of technical standards (norms) related to 1) the ways of thinking or subscribed values, 2) the ways of acting within particular attributes of marketing concept and 3) examining the level of their application (Kłeczek, 2003, p.29).

Starting point in defining of explanation variables to examine the market orientation in places can be the classification of variables proposed by Narver and Slater (1990, p. 22). They see market orientation as a one-dimension (because of close relationships between criteria) construct that consists of three behavioral and two decision components: consumer orientation, competitor orientation, interfunctional coordination, a long-term focus, and a profit objective.

Taking into consideration the peculiarity of entities such as territorial units, the above criteria can be developed into following attributes:

- analyzing, defining and understanding of target markets needs and behaviours as well as adjusting the place offer to defined target market(s),
- analyzing and understanding of competitors behavior,
- coordination of all functions (and organizational units) around satisfying diagnosed needs and preferences of target markets,
- profitability control,
- long-term prospect of marketing activities planning.

The five attributes that reflect the foundation of marketing concept should be next developed into relevant variables (see table 1).

Tab. 1: *Attributes and variables of marketing orientation of a place*

Attributes of marketing concept	Variables
1. analyzing, defining and understanding of target markets needs and behaviours and adjusting place offer to defined target market(s)	• ability to define target market(s) • level of knowledge about target market(s) • researching of needs, expectations and preferences of target market(s) as well as trends • relationships between local authorities and inhabitants • analysis of place product using different methods • modification of place product • image measurement and monitoring • place communication activities
2. analyzing and understanding of competitors behavior	• ability to define competitors within target market(s) – direct and indirect • monitoring of competitors' activities
3. coordination of all functions (and organizational units) around satisfying the diagnosed needs and preferences of target markets	• existence of marketing/promotion unit within the place organizational structure and its role • quality of marketing service in this unit • cooperation and coordination between organizations within a place around common marketing goals
4. profitability control	• level and structure of marketing budget • measurement of effectiveness of marketing activities • existence of monitoring system
5. long-term prospect of marketing activities planning	• definition of long-term marketing goals • formulation of marketing plans • coordination of place marketing strategy and goals with place development strategies/plans • formulation of place brand strategy

Source: author

The above attributes and variables should, at next stage, be developed into adequate questions (for example in questionnaire that can served as a research tool) with relevant scales. They can be adopted and adjusted depends on the type and scale of subject (place) being surveyed. The research tool needs to ensure all the postulated attributes are taken into consideration and enable their measurement. The consistent and comparative scale will allow to track the changes in the level of marketing orientation of particular place as well as benchmark pla.

CONCLUSION

Marketing has an interdisciplinary and complex character thus the final result of its application depends not only on single and accidentally activities such as promotion or visual identity, but on the whole set of actions in many areas. It is therefore purposeful to define the symptoms that reflect place marketing orientation and that measurement tool that enable to diagnose the level of this orientation of particular place. Such analysis should be conducted and the orientation should be evaluated foremost to discover weak points and areas to improve.

Because full adaptation of market orientation requires adaptation of the whole range of attributes of marketing concept, the above suggested measurement method enables to identify the level and track the pace of its adoption.

References

ANHOLT, S. (2005): Brand New Justice, Elsevier Butterworth-Heinemann, Oxford, UK.

BERG, L., VAN DER KLAASSEN, L.H., VAN DER MEER, J. (1990): Strategische City – marketing, Scoonhoven: Academic Service.

DOMAŃSKI, T. (1997): Marketing terytorialny - wybrane aspekty praktyczne in Domański, T. (Ed.) Marketing terytorialny - strategiczne wyzwania dla miast i regionów, Uniwersytet Łódzki, Łódź.

FLOREK, M., INSCH, A., GNOTH, J. (2006): City Council websites as a means of place brand identity communication, Place Branding, Vol.2, Issue 4, pp.276-296.

FONFARA, K. (2002): Proces wdrażania koncepcji marketingowej w polskich firmach – wnioski i dylematy in Żabiński, L. and Śliwińska, K. (Eds.) Marketing- koncepcje, badania, zarządzanie, PWE, Warszawa.

HETZEL, P. (1997): Dlaczego marketing terytorialny ma obecnie tak duże znaczenie? in Domanski, T. (Ed.) Marketing terytorialny - strategiczne wyzwania dla miast i regionów, Uniwersytet Łódzki, Łódź.

KAVARATZIS, M. (2004): From city marketing to city branding: Towards a theoretical framework for developing city brands, Place Branding, Vol. 1, Issue 1, pp. 58–73.

KŁECZEK, R. (2003): Orientacja rynkowa w przedsiębiorstwie – podejścia metodologiczne i kierunki rozwoju badań, Akademia Ekonomiczna, Wrocław.

KOHLI, A.K., JAWORSKI, B.J. (1990): Market orientation. The Construct, Research Propositions and Managerial Implications, Journal of Marketing, Vol. 54, No. 2, pp. 1-18.

KOTLER, P., HAIDER, D., REIN, I. (1993): Marketing Places Attracting Investment, Industry, and Tourism to Cities, States and Nations, The Free Press/Macmillan, New York, NY.

MARKOWSKI, T. (1999): Zarządzanie rozwojem miast, PWN, Warszawa.

MATSON, E. W. (1994): Can cities market themselves like Coke and Pepsi do?, International Journal of Public Sector Management, Vol. 7, No. 2, pp. 35–41.

MISIĄG, F. (2001): Orientacja marketingowa jako przedmiot badań' in Marketing u progu XXI wieku, Akademia Ekonomiczna, Kraków.

NARVER, J.C. AND SLATER, S.F. (1990): The Effect of Market Orientation on Business Profitability, Journal of Marketing, Vol. 54, No. 4, pp.20-31.

OLINS, W. (2003): On Brand, Thames & Hudson, London, UK.
PAPADOPOULOS, N., HESLOP, L. (2002): Country equity and country branding: Problems and prospects, Journal of Brand Management, Vol. 9, No. 4/5, pp. 294 – 314.
PARKERSON, B., SAUNDERS, J. (2005): City branding: Can goods and services branding models be used to brand cities?, Place Branding, Vol. 1, No. 3, pp. 242–264.
SCHMIDT, K. (1995): The Quest for Identity, Cassell, London.
SZROMNIK, A. (1997): Marketing terytorialny - geneza, rynki docelowe i pomioty oddziaływania', In Domanski, T. (Ed.) Marketing terytorialny - strategiczne wyzwania dla miast i regionów', Uniwersytet Łódzki, Łódź.
SZROMNIK, A. (2002): Marketing terytorialny – koncepcja ogólna i doświadczenia praktyczne', In Markowski, T. (Ed.) 'Marketing terytorialny', PAN, Warszawa 2002
SZROMNIK, A. (2003): Wykorzystanie analizy czynnikowej w badaniach marketingowej orientacji miast', in: Mazurek-Łopacińska. K. (Ed.), Badania marketingowe – metody, tendencje, zastosowania', Akademia Ekonomiczna, Wrocław.

POMIAR ORIENTACJI MARKETINGOWEJ JEDNOSTEK TERYTORIALNYCH

Streszczenie

Jedną z determinant skuteczności marketingu w zarządzaniu jednostkami terytorialnymi jest konieczność zaakceptowania i wdrożenia pełnej orientacji marketingowej przez samorządy terytorialne. Zastosowanie pojedynczych działań czy instrumentów marketingowych nie odzwierciedla bowiem przyjęcia koncepcji marketingowej w terytoriach.

W związku z tym konieczne jest zdefniowanie symptomów orientacji marketingowej i metod pomiaru, które umożliwią diagnozę poziomu implementacji marketingu w konkretnej jednostce terytorialnej. Można tego dokonać w oparciu o podejście techniczne (normatywne), stososowane to oceny orientacji marketingowej przedsiębiorstw zaproponowane przez Narvera i Slatera (1990). Obejmuje ono pięć komponentów: zorientowanie na nabywcę, zorientowanie na konkurentów, koordynację funkcji przedsiębiorstwa, długoterminowy horyzont oraz rentowność. W artykule zapropowano adaptację podejścia normatywnego dla potrzeb marketingu terytorialnego modyfikujac i definiując odpowiedni zestaw atrybutów, za pomocą którego możliwa jest ocena stopnia aplikacji koncepcji marketingu w jednostkach terytorialnych i śledzenie zmian w tym zakresie.

Recenzovali: Prof. RNDr. René Matlovič, PhD.
RNDr. Kvetoslava Matlovičová, PhD.

MIĘDZYMORZE AS A POLISH GEOPOLITICAL CONCEPT

Robert IŠTOK[1], Tomáš KOZIAK[2]

Abstract: *At the end of the 30's, when Polish statehood was endangered, its geopolitical thinking was dominated by the concept of Międzymorze. The concept followed the project, advocated by J. Piłsudski during the time of formation of independent Poland. Polish foreign minister J. Beck attempted to implement the renewed project but he did not succeed. Similar projects proposed by Polish politicians during the World War II and after 1990 failed too. The study deals with geopolitical aspects of the Międzymorze concept and it is a research introduction to this topic.*
Key words: *geopolitics, Central Europa, Poland, Miedzymorze*

INTRODUCTION

The geopolitical concept of *Międzymorze* (in Latin Intermarium), called also the "Third Europe" is less known, but the very interesting project, which emerged at the Polish foreign policy during the 30's of the last century. The roots of the concept are during the era of formation of the Polish state after the World War I. Its implementation has not been successful and therefore it was discussed within the Polish historical research as the part of the Polish diplomatic history as well as the part of the Polish political thinking. However, the concept is also an integral part of the Polish geopolitical tradition. Similar ideas emerged also within the intellectual environment outside the Central Europe, e.g. in the French project of A. Tardieu (1932), in the Eastern Pact (1934-1935), or in variants of the Danubian Pact (1932-1936).

Interwar Poland was the largest country in the Central-East Europe and therefore Polish politicians considered it as a natural leader in the region. For that reason, it would take initiative for the organization of this geopolitical region. One of such models represented the creation of "wall" between Germany and Russia (the Soviet Union), called by its location *Międzymorze* (region bounded by the Baltic, Black and the Adriatic Sea). Geopolitical concept of *Międzymorze*, developed in the late 30's linked to ideas that were developed in the Polish political thinking not only after 1919 when Poland gained its independence but also prior to that date.

Polish geopolitical projects in the context of *Międzymorze*

Polish authors found the roots of the *Międzymorze* concept as early as in the policy of Polish monarchs and statesmen during the Middle Ages. As the greatest success in

1 **Prof. RNDr. Robert Ištok, PhD.,**
Department of Geography and Regional Development, Faculty of Humanities and Natural Sciences, Prešov University, 17. novembra 1, 080 01 Prešov, e-mail: istok@unipo.sk
2 **PhDr. Tomáš Koziak, M.A., PhD.,**
Political Sciences Institute, Faculty of Arts, Prešov University, 17. novembra 1, 080 01 Prešov, e-mail: tomasko@unipo.sk

promoting the integration of this area is considered the implementation of the so-called Jagiellonian concept, which has resulted to the connection of four countries: Poland, Hungary, Bohemia and Lithuania under the rule of one dynasty in the 15th century. Thus, the case of *Międzymorze* is a long-lasting idea, which was based on geopolitical factors affecting that area.

In the middle of the 19th century Polish Count Czartorysky presented the plan for the federal union of the Central European nations, reaching to the Caucasus aimed against Russia. Implementation of this plan would, in his opinion, help the emergence of the Polish state in the form of the regional power (Hacker, 1996).

The roots of modern *Międzymorze* concept can be found just after the World War I. Polish general and politician J. Piłsudski (1867-1935) tried to find possibilities to strengthen independence of the newly created Polish state. The geopolitical situation as well as the very existence of a young country was threatened by its close and strong neighbours – the Soviet Russia and Germany.

Piłsudski considered its eastern neighbour more dangerous and therefore he saw the prospect of Polish independence in the way of weakening Russia by secession of Lithuania, Belarus and Ukraine and their merging with Poland in the form of federation or any other kind of union. Provisional emergence of independent Ukraine (1918-1922) did not foster that project because its policy was not aimed at cooperation in Poland. Tense Polish-Lithuanian relations did not permit the establishment of the union so, particularly when Piłsudski talked about the incorporation of Lithuania into the Polish state (Nowak, 2008). Thus, this attempt to revise geopolitical arrangements of the Eastern Europe was not successful and Piłsudski's intention to restore Poland in the form of great power, equivalent to Russia, failed too.

Although the new State has successfully maintained its independence, the target geopolitical concept, formulated by his birth, were not fulfilled. Piłsudski's motto "Poland will be a great or nothing" reflected the interwar Polish foreign policy in search of Polish "size" in unfavorable geopolitical conditions. Nevertheless, during the interwar period Poland tried to present itself as a great power in the area of Central and Eastern Europe and tried to carry out an independent foreign policy.

GEOPOLITICAL CONDITIONS FOR THE ORIGIN OF THE CONCEPT OF *MIĘDZYMORZE*

The revival of Piłsudski's concept came with changes in geopolitical conditions during the 30's. The foreshadow of its resumption was the book by S. Gużkowski "Imperium Jagellonicum" in 1931, in which the author proposes to create a confederation of states from Finland to Greece and even with Turkey (Marczak, 2005).

Polish politicians became increasingly aware of the increasing danger because of the place of their country between two powers. German military capability has grown according to its power ambitions and traditionally had the eastern direction. The Soviet Union could not be regarded as a reliable neighbor so, especially because of its revanchistic plans.

Thus, for Poland it was necessary to assess the geopolitical layout of the Central Europe and to seek a way out of this situation by promoting the implementation of „policy balance" (P. Lossowski, cit. Kornat, 2008). As a consequence various geopolitical scenarios resulted:

- to search for an understanding with one of the neighboring powers,
- an agreement with two neighboring powers,
- to set up a defensive block of small states in the region under the leadership of Poland, aimed against threats of Germany and the Soviet Union.

Polish diplomacy of the 30's followed the second and the third scenario. On July the 25th, 1932 Poland concluded the nonaggression pact with the Soviet Union and on January the 26th, 1934 with Germany (but without guarantees of the common border). However, it was obviously only a short-term solution for the unfavorable geopolitical situation of the Polish state and therefore it was necessary to strive for the realization of the third scenario.

The initiator of the revival of the *Międzymorze* geopolitical concept was the Polish foreign minister J. Beck (1894-1944). In his opinion, the best way how could Poland face these threats is to balance between two neighboring powers, to bring Poland closer to the United Kingdom instead to France, to cooperate with Turkey and Japan and especially to develop a firm collaboration with smaller countries of Central Europe. The concept was promoted in Polish foreign policy especially during the tensed years of 1937-1939. As M. Kornat (2008) observed, the principle of that politics is very difficult to reconstruct, since it has not been implemented and J. Beck has never explained its principles. Similarly, his opinion about the territorial scope of *Międzymorze* has not been fully clarified.

Beck based his policy on a pragmatic calculation of geopolitical changes in Europe during the 30's when two power blocks started to form: the fascist block led by Germany and the bloc of Western powers, led by Great Britain and France. Therefore, according to him, it was necessary to create the third group of Central European States, which could become „the third Europe". (He did not consider the Soviet Union - Russia as a European power.)

THE NATURE OF THE *MIĘDZYMORZE* CONCEPT AND THE ATTEMPTS OF ITS REALIZATION

The creating of *Międzymorze* should elevate Poland to the level of a regional power able to influence the situation in the Central East Europe. The concept should, at the same time, respond to the question about ensuring Polish security, sovereignty and its national interests. M. Kornat (2008) argues, that J. Piłsudski and J. Beck were convicted that the Central East Europe is Balkanized because of a number of small countries, which are only a subjects of an external powers. Therefore it is necessary to pool their potential under the natural leadership of Poland.

Beck saw the solution is grouping of states between the Baltic, Black and the Adriatic seas. These states were, as well as Poland, also threatened by the two dominant powers - Germany and the Soviet Union. Poland should stand at the forefront of the group, which would hamper the imperial ambitions of powerful neighbors.

The pragmatism of Beck's political thoughts is reflected also in his deideologizated approach to security issues, based on geopolitical determinants, which are, according to him, set regardless the political orientation of the ruling governments. Therefore he assumed the pragmatic understanding between the mentioned states, which will accentuate the preservation of their independence. Such a premise was, according to him, sufficient for their interest for the mutual cooperation.

According to M. K. Kaminski and M. Zacharias (1993), Poland calculated for the implementation of the *Międzymorze* project with the support of the third power – Italy, which would result to the creation of an axis Warsaw - Budapest - Bucharest - Belgrade - Rome. The backbone of this alliance should be the cooperation between Poland, Hungary and Romania, with support of Yugoslavia and Italy. As Beck assumed, Italy is solidary with Germany only in relation to the Western powers, while in the eastern direction it is its rival. This assumption, however, proved to be wrong.

The *Międzymorze* concept did not count with the inclusion of Austria and Czechoslovakia. One of the reasons for that was an assumption that these countries will be objects of the German expansion soon and therefore they can not be considered as permanent geopolitical entities in the Central Europe. In case of Czechoslovakia, there were also other reasons stemming from its geopolitical position and its problematic relation with Poland.

However, the area between the Danube and the Balkans was geographically remote from the Polish policy, because its political thinking was traditionally dominated by the main European geopolitical axis, which ran horizontally on the east – west line. Polish interests were, in such a context, directed especially to the Baltic States. *Międzymorze* was, with its vertical geopolitical direction which has been out of the traditional Polish ambitions, essentially a new concept. This was also reflected in the intensity and the quality of relations with most countries lying in the area south of the Polish border. However, it should be noted that these relations (with the exception of Czechoslovakia) were essentially good and developed also on the basis of Slavic solidarity, while Poland strived to present itself as the most reliable defender of the Slavic patriotism.

The activity of the Polish diplomacy was focused especially on the creation of the basis for *Międzymorze* project, which has been seen in the close cooperation between Poland, Hungary and Romania. This effort, however, was not successful. Polish-Hungarian relations have been positively affected especially by their common hostility to Czechoslovakia. Creating a common Polish-Hungarian border after the break up of Czechoslovakia had not any significant effect on the geopolitical preconditions for implementation of the *Międzymorze* concept. Relations with Romania have been affected by its different interests and its membership in the Little Entente. After its breakup, Romania was focused on the cooperation with Germany. The failure of the Polish rapprochement with Hungary and Romania reduced the importance of the Balkan States for building the compact partnership of the *Międzymorze* concept. The improving contacts with Latvia and Estonia did not bring the desired effect. Other Scandinavian countries have been reluctant to engage themselves in the complicated Central European issues.

Thus, the feverish Polish efforts to gain allies during the period of escalation of the external pressure were not successful and Poland had to face the German aggression alone. From the geopolitical point of view it was considered a barrier to German expansion to the east and as such was condemned to doom. It seems that the Polish diplomacy nor its political thinking were not able to build and implement a real geopolitical concept, which would lead the Polish state to survive.

THE EVALUATION OF THE *MIĘDZYMORZE* CONCEPT AND THE REASONS FOR THE FAILURE OF ITS IMPLEMENTATION

The *Międzymorze* project can be viewed as an ambitious and courageous. However, we must point out its unreality, which is sometimes regarded also as a political mistake (H. Roos, cit. Kornat, 2008). Moreover, it is questionable whether the creation of such a bloc would have a sufficient power potential, able to face Germany, or the Soviet Union (Russia), not to mention the option of their common pressure. The *Międzymorze* project was significantly weaken by ignoring Czechoslovakia with its industrial and military potential.

Factors not favorable for realization of this geopolitical idea can be summarized as follows:

1. Some authors stress the fact that Poland was not able to influence the smaller countries around, because of its limited power potential in terms of carrying out this objective. Polish politicians obviously overestimated the material power and the potency of their country, which also resulted to the failure of the *Międzymorze* project. Another reason to distrust the Polish initiative was the attitude of neighboring countries, which perceived Poland to be an expansionary state. It was associated especially with its annexation of Vilnius (Vilnjus) in 1922 from Lithuania and Zaolzie and with events concerning Czechoslovakia in 1938. Even a famous expert H. Seton-Watson described the *Międzymorze* project as the expression of "Polish imperialism" (cit. Kornat, 2008). In addition to that, Central European politicians considered refusal of the close relations with Poland as the way how to avoid conflict with Germany or/and the Soviet Union, respectively.

2. In the area of Southeast Europe and the Balkans the *Międzymorze* project clashed with the geopolitical objectives of the Little Entente and Italy. However, the efforts to create a grouping of states in the area of Central Europe led by Poland, collided especially with the interests of Germany, which were presented under the long-term geopolitical code of Mitteleuropa. As it was pointed out by a Polish journalist W. Spring (1867-1953), who was a supporter of the discussed project, its creation without backing of Germany could not serve as a barrier against a potential aggression from Russia (Eberhardt, 2006). He promoted an establishment of the Central European bloc, where Poland meets Germany in the partner's role within the concept of Mitteleuropa. Such an idea was supported also by A. Bocheński (1909-1944). According to him, the deepening of the Polish-German cooperation would give Poland a significant position within the project of Mitteleuropa.

3. Another complications for Polish diplomacy in terms of an implementation of the *Międzymorze* project came from mutual relations of states to be part of it. The course of history, especially after the World War I., created many animosities among them, which were difficult to overcome. These were reflected especially in a border disputes and in a various inter-ethnic tensions. In addition to that, the *Międzymorze* countries were too heterogeneous in terms of levels of their political and economic development.

4. Therefore, each state primarily reflected its own situation and tried to solve the problems by itself. One of the solutions was the rapprochement with Germany and the fascisation as was the case of Hungary and Romania – countries that were intended to be a backbone of the *Międzymorze* project. Thus, Piłsudski's pragmatic and deideologized approach was not successful.

5. Geopolitical conditions for the creation of the *Międzymorze* project were unfavourable also because of Poland's tensed relations with Czechoslovakia, whose territory limited the Polish contact to the south. According to H. Roos (cit. Kornat, 2008) the Polish refusal to cooperate with that neighbor was one of the major causes of the failure of the discussed concept. The effort to destroy Czechoslovakia was in fact a short-sighted, because it only confirmed the German hegemony in the Central Europe. Although the breakup of Czechoslovakia created the common Polish-Hungarian border which was the help for realization of the *Międzymorze* project, the subsequent course of events deprived Poland of any chance to push for its own geopolitical concepts.

THE POLISH CONCEPTS FOR THE CENTRAL EUROPEAN INTEGRATION SINCE THE BEGINNING OF THE WORLD WAR II

The *Międzymorze* concept remained a part of the Polish political thought during the World War II and between the years 1939-1942 became one of the most discussed projects of the postwar geopolitical arrangement for Europe. The reason for that was especially in the reflections of the exiled political elites from Central and Eastern European countries, to the existing situation. Politicians came to the conclusion about the necessity to create a grouping of states in the area between the Baltic, Black and the Adriatic seas.

The idea of creating a Federation of Central and Eastern European states was discussed in the New Europe magazine by Polish diplomat A. Mühlstein and by the U.S. military experts. They were supported by P. H. Cross, who was an advisor to President F. D. Roosevelt (Sadowsky, 2005). Ideas about its definition were different, but the presence of Poland, however, was considered necessary. According to P. Eberhradt (2006), the concept of a union between the Carpathians and the Baltic Sea was supported also by journalist I. Matuszewski (1891-1946), the author of „O co walczymi" (transl. „What we are fighting for"), published in 1942.

The 10th session of the Polish Government on October, 10 1939 called for the creation of the Central European power center led by Poland, which would counterweight Germany and the Soviet Union. In November 1939, the Polish government in exile expressed its interest for the wider cooperation of the Central and Eastern European countries. The statement was supported also by President W. Sikorski in his letter to homeland (Sadowsky, 2005). The emphasis was placed on military and political cooperation with Czechoslovakia.

On November, 11 1940 the Polish and the Czechoslovak governments-in-exile signed a join declaration affirming their intention to deepen their postwar co-operation and to form a confederation. They also expressed the hope that this collaboration would attract other Central and Eastern European countries to join in. The planned confederation included also the Baltic States, Hungary, Austria, Romania, Yugoslavia, Bulgaria, Albania and Greece (Kobeszko, 2005). The intention of the establishment of the Confederation was confirmed by the common Polish-Czechoslovak declaration, signed on January, 19 1942.

According to the Polish Prime Minister in exile W. Sikorski the realization of the *Międzymorze* project in form of confederation between the Central and Eastern European states would help to consolidate the European postwar situation with defeated Germany and strengthened Soviet Union. Polish politicians in exile introduced the concept also to the Allies. However, the opinion divergences between Poland and Czechoslovakia halted

the project soon. While the Polish party pressed for creation of a close union (federation), Czechoslovak politicians spoke about loose confederation. In addition to that, the Czechoslovak government-in-exile headed by President E. Beneš pursued the cooperation with the Soviet Union, which does not support this concept.

An effort to implement the *Międzymorze* concept remained part of the Polish political thinking until the end of World War II. The Polish Council of National Unity, declared in July 1945 that the Polish nation is attached to a large family of the Central European nations by its geopolitical location and the common history and thus it is eager to create the closest political, economic and cultural unity with them. (cit. Kobeszko, 2005). These words, however, became for a long time a symbol of unrealized Polish initiative to create a union of the Central and Eastern European states.

After 1945, the realization of the concept became impossible because of the bipolar world and the Soviet control of the *Międzymorze* area. The idea of this concept was maintained only within the Polish emigrant circles in Paris, where „The Convention of the *Międzymorze* countries" was adopted in 1948 (Konarski, 2005). It presented a union of sixteen Central and Eastern European states.

The revival of the *Międzymorze* concept during the 90's is associated with activities of L. Moczulski and his party Konfederacja Polski Niepodległej (transl. Confederation of Independent Poland). The concept they are trying to pursue is based on geopolitical assumption that close cooperation of the Central and Eastern European countries could give them multilateral benefits, including their better recognition within the wider European policy. Sovereignty of the individual states, however, would be untouched. According to Moczulski the „new" *Międzymorze* project would include eighteen Central and Eastern European countries, with area of more than 2,2 million km^2 and with nearly 200 millions inhabitants (Moczulski, 1999). As he expected, *Międzymorze* could act also as a some kind of interstage prior to accession these states into the European Union.

Another assumption was based on the idea that Poland as the largest body of such union would serve as a representative of the countries negotiating their accession to the European Union. In addition to that, the new *Międzymorze* with its strong human and economic potential would gain a significant position within the European as well as world politics (Kobezko, 2005). During the accession process into the European Union, however, the concept stayed out of any serious interest.

Thus, the idea of regional cooperation under the leadership of Poland was not implemented in that period. One of the main reasons for that lies in the fact that Poland does not have sufficient potential to be accepted by these countries as a regional power (Konarski, 2005). Such a prospect is above all coming from its cooperation with France and Germany (within the Weimar Triangle); however, it is a copy of „horizontal" direction of the Polish geopolitical interests.

CONCLUSION

Considering the geopolitical situation during interwar era Beck's *Międzymorze* was not a realistic concept. The reasons were already mentioned factors, as well as lack of time for its implementation. Perhaps it could be viewed as an idea for a future. But the course of events after the World War II did not create favorable conditions for this form of cooperation in the Central East Europe.

By laps of time, it could be easy to evaluate the project as an unrealistic or even a naive. But, as M. Kornat (2008) wrote, what seems to be naive or anachronistic now might be logical and natural within the historical and geopolitical categories of that time.

The *Międzymorze* project was certainly one of the most original geopolitical concepts created within the Polish foreign policy ever. Its implementation was designed to address the problem of adverse geopolitical position of Poland during the interwar period and after the World War II. Although the present state of the European integration process made it outdated, its research certainly contributes to the mapping of geopolitical aspects of the history of the Central and Eastern Europe.

Acknowledgement: The paper is part of grant project VEGA No.1/0045/09 Slovakia and Poland – geopolitics, political and human-geographical relations. Head of project: Prof. RNDr. Robert Ištok, PhD.

References

BOCHEŃSKI, A. (2005): *Trudności polityczne Federacji Środkowo-Europejskiej*. Online: http://www.omp.org.pl/index.php?module=subjects&func=viewpage&pageid=30 [7.11.2005].

EBERHARDT, P. (2006): Twórcy polskiej geopolityki. Kraków.

HACKER, H. (1996): Středoevropské plány jako pokusy o evropské mírové uspořádání. Střední Evropa, 1996/56, p. 11-33.

KAMIŃSKI, M. K., ZACHRIAS, M. (1993): W cieniu zagrozenia. Polityka zagraniczna RP 1918-1939. Warszawa.

KONARSKI, M. (2005): Czy warto wracać do "międzymorza". Online: *www.psz.pl/index2.php?option=com_content&do_pdf=1&id=1291* [8.7.2008].

KORNAT, M. (2008): Realna koncepcja czy wizja ex post? Polska idea „Trzeciej Europy" (1937–1938). Online: http://politologia.wsb-nlu.edu.pl [28.11.2008].

KREDÁTUS, J. (2004): Poľské ambície a pád. Zahraničná politika Poľska v prvej polovici 30-tych rokov 20. storočia. In: Historická revue. 15, 2004/12, p. 30-32.

KOBESZKO, Ł. (2005): Zapomniane międzymorze. Online: ww.patriota.pl/?dzial=publicystyka&nr=15 [7.11.2005].

LUKÁČ, P. (1998): Poľsko a Slovensko (susedia obrátení k sebe chrbtom?). In: OS. 1998/2, p. 21-24.

MARCZAK, T. (2005): *Międzymorze wczoraj i dziś*. Online: http.//www.ism.uni.wnc.pl/publikacje/polonia/marczak_miedzymorze_wczoraj_i_dzis.pdf [8.12.2005].

MOCZULSKI, L. (1999): Geopolityka. Potega w czasie i przestrzeni. Warszawa.

NOWAK, A. (2008): Geopolityczne koncepcje Józefa Piłsudskiego. Online: http://www.omp.org.pl/index.php?module=subjects&func=viewpage&pageid=726 [28.11.2008].

PRZESMYCKA, K. (2005): Miedzymorze… dzisiaj? Geopolitika Europy Srodkowo Wschodniej. Online: http://205.209.165.30/~koliber/konsensus/index.php [8.12.2005].

SADOWSKI, J. (2005): Polscy federalisci i konfederalisci w czasie II. wojny swiatowej (czesc 1). Studia Europejskie. 2005/3, p. 9-31.

MEDZIMORIE AKO POĽSKÁ GEOPOLITICKÁ KONCEPCIA

Zhrnutie

Geopolitická koncepcia Medzimoria (po poľsky *Miedzymorze*, po latinsky *Intermarium*), nazývaná aj „Tretia Európa“, je menej známym, ale o to zaujímavejším projektom, ktorý vznikol na pôde poľskej zahraničnej politiky v 30. rokoch minulého storočia. Medzivojnové Poľsko bolo najväčšou krajinou stredovýchodnej Európy a poľskí politici považovali svoj štát za prirodzeného hegemóna tohto regiónu. Preto by to malo byť práve Poľsko, ktoré by malo vyvíjať iniciatívu na geopolitické usporiadanie tohto priestoru. Korene modernej poľskej koncepcie Medzimoria možno hľadať tesne po skončení prvej svetovej vojny. J. Pilsudski (1867 – 1935), poľský generál a politik, intenzívne hľadal možnosti upevnenia samostatnosti novovzniknutého poľského štátu. Pilsudski považoval za nebezpečnejšieho východného suseda a preto videl perspektívu poľskej nezávislosti v oslabení Ruska cestou odtrhnutia Litvy, Bieloruska a Ukrajiny, ktoré sa mali spojiť s Poľskom vo forme federácie alebo iného zväzku. Renesancia konceptu J. Pilsudského prebehla v 30. rokoch minulého storočia. Poľskí politici si čoraz viac uvedomovali rastúce nebezpečenstvo, vyplývajúce z polohy poľského štátu medzi dvoma mocnosťami. Iniciátorom renesancie tejto geopolitickej koncepcie bol minister zahraničných vecí Poľska v rokoch 1932 až 1939 J. Beck (1894 – 1944). Tento politik videl riešenie ohrozenia Poľska v udržaní rovnováhy medzi oboma susednými mocnosťami, v zblížení s Veľkou Britániou, ktoré bude nadradené spojenectvu s Francúzskom, v spolupráci s Tureckom a Japonskom a najmä v aktívnej politickej činnosti v zmysle priblíženia sa k menším štátom v stredovýchodnej Európe. Poľsko sa vytvorením Medzimoria malo dostať na úroveň mocnosti, ktorá bude schopná ovplyvňovať vývoj v stredovýchodnej Európe. Projekt Medzimoria možno hodnotiť ako ambiciózny a odvážny. Zároveň sa však poukazuje na jeho nereálnosť, dokonca je niektorými autormi považovaná za politický omyl. Možno konštatovať, že geopolitický projekt Medzimoria je jedným z najoriginálnejších koncepcií, ktorá sa vytvorila počas vývoja poľskej zahraničnej politiky. Jeho realizácia mala slúžiť na riešenie problému nepriaznivej geopolitickej polohy Poľska v medzivojnovom období, resp. aj po druhej svetovej vojne. Aj keď je v súčasných podmienkach európskych integračných procesov Európy je už neaktuálny, jeho výskum však určite prispieva k mapovaniu geopolitických aspektov histórie stredovýchodnej Európy.

Recenzovali: Prof. RNDr. René Matlovič, PhD.
Doc. PhDr. Peter Terem, PhD.

LANDSCAPE STRUCTURE CHANGES IN MODEL VILLAGE OF HLINNÉ, VYŠNÝ ŽIPOV AND ZLATNÍK

Eva MICHAELI, Monika IVANOVÁ, Jana JUHAŠČIKOVÁ[1]

Abstract: *An important attribute of landscape as geosystem is its structure, inner construction which is presented by unity of mutual bonds among its elements and components as well (Chorley, Kennedy 1971 in Oťaheľ, et. al. 2004). Landscape structure interacts and reflects important countryside characteristics, which importance is evident, from the long term point of view, in their self-regulated abilities. Comparing recent landscape structure represented by land cover layers from quite close time periods, relatively short time changes could be analyzed, which enable to consider the landscape dynamism in context of socioeconomic and political stimuli (Oťaheľ, et. al. 2004).*
The aim of this contribution was to evaluate changes in the landscape structure on the basis of land cover changes evaluation during three time horizonts: 1826, 1956 a 1991. Methodical approach was derived from adapted databasis of Corine Land Cover, which was adapted according to the results of field research and the area of investigated region. The process of identification and following statistically-spatial analysis of land cover layers in particular time periods was realized by GIS softver Arc View 3.2 and softver Microsoft Office Professional - Excel 2000.
Key word: *landscape structure, landscape cover, landscape development, GIS*

INTRODUCTION

Recent landscape is a result of stage process during which existing natural conditions were utilizated by human society to fulfil its needs. Its structure interacts and reflects important information on landscape components, factors, processes and many other phenomena which are not of material character as well (Dobrovodská, 2000). In this context the evaluation of the landscape structural changes could be considered as one of the key tool for planning and designing activities in the country as well as the prediction of its future development resulting from the knowledge of landscape development in particular time horizonts.

Changes in structure of landscape utilization are caused by social oscillation or by limits of natural surrounding. (Olah 2003, Petrovič 2005). Aspects in question activate space-time changes in landscape utilization. This implies that recent forms of landscape utilization, occurence and preserving historic landscape structures in given region is the result of long-term development. (Boltižiar, Chrastina 2006).

1 **Prof. RNDr. Eva Michaeli, PhD., RNDr. Monika Ivanová, PhD., Bc. Jana Juhaščiková,** *Department of Geography and Regional Development, Faculty of Humanities and Natural Sciences, Prešov University, 17. novembra 1, 080 01 Prešov,*
e-mail: michaeli@unipo.sk, v8skrabu@unipo.sk, lipjanka@gmail.com

Observing the land cover in particular time horizonts enables to understand better its dynamism and development, intensity of the landscape utilization by a man. The following pieces of work indicate the topicality of the given subject matter: Falťan 2000, Cebecauerová, Cebecauer 2004, Oťaheľ, et. al. 2004, Boltižiar 2007, Cebecauerová 2007, Hofierka 2008, Michaeli, Hofierka, Ivanová 2008a,b)

METHODOLOGY

Human influence on the environment in the researched region cannot be understood as one-shot and short-time matter. Landscape was developed under the influence of more important factors which are reflected in the land use. The contribution concentrates on the evaluation of short-time and middle-time changes, which show the dynamism of the landscape development. These changes were evaluated by comparison of physical states of the landscape structure represented by land cover classes in years 1826, 1956 a 1991. The land cover layers creation and their statistic analysis were analyzed by using ArcView GIS 3.2 software. Military topographic maps from given period were used as an underlayer. After standardizing of topographic maps, identification and digitalization of land cover classes followed, using „on screen" method. A flexible databasis system, which enabled statistically-spatial analysis of the landscape structure was the result. One of the outputs was also cartographic display of the individual land cover layers, which were verificated by the field research. After overlaying them, the contingent tables presenting areal changes in land cover during 1826-1956, 1956-1991 and 1826 – 1991 were created through the script (http://www.geomodel.sk/sk/download/downloadav.htm#make_vector_grid).

STUDY AREA

The area of interest spreads in the Topľa river basin, in the area of the Carpathian subsystem, to be more accurate, at the place of meeting the Inner West Carpathian Mountains and the Outer East Carpathian Mountains. The northern part of the investigated area belongs to the subregion of the Beskydy foothill of the Low Beskydy region subprovince the Outer East Carpathian Mountains, the southwest part belongs to the subregion of the Slánske mountains Matransko – slanská region subprovince the Inner West Carpathian Mountains and the south part belongs to the subregion of the Východoslovenská uplands region, the Východoslovenská lowlands subprovince Big Danube Basin (Mazúr, et. al. 1986).

The west and the east part of the area of interest can be identified with the west and the east borders of the cadastral territories of villages Hlinné, Vyšný Žipov and Zlatník, the northern border is the same as the cadastral border of village Vyšný Žipov, the southern is the same as the cadastral border of village Hlinné. Regarding the cadastral area (632 hectares) the village Zlatník belongs to smaller villages. It is situated at the junction of the Podslanská uplands of the Východoslovenská uplands and Šimonka massive in the Slanské mountains in the valley of the stream Zlatníčok. This one is a right side tributary of the Topľa with its lenght about 4 kilometres. The middle part of the village lies in the altitude 270 metres above sea level, whilst the sea level of all cadastral region of the village is in the range from 210 to 813 metres above sea level.

The village Vyšný Žipov (1139 hectares) spreads in the Beskydy foothill at the border of the Hanušovce and the Mernícka uplands. The village lies in the altitude from 140

to 297 metres above sea level. The altitude 155 metres above sea level was measured in the middle of the village. The vicinity of the village is mostly deforested, there is a forested area only in its eastern part. The village Hlinné is situated in the Topľa floot plain of the Východoslovenská uplands between the villages Zlatník and Soľ. Its area is 1 255 hectares. The highest point of the cadastral territory is Ivanov vrch (813 metres above sea level). The altitude 152 metres above sea level was measured in the middle of the village. In percentage calculation 41,5 % of the whole area belongs to the village Hlinné, 37,6 % to Vyšný Žipov and 20,9 % to Zlatník.

On the basis of the territorial-administrative structure investigated villages belong to Prešov Region, the District Vranov nad Topľou. Regarding the District town, their location is eccentric. The closest is Hlinné village, which air line distance is 10 km.

LANDSCAPE STRUCTURE IN THE YEAR 1826

Regarding the utilization aspect, investigated area represented well balanced country with 49.2% share of agricultural areas and 48.6% share of forests, seminatural areas and waters in 1826 (fig. 1).

From the point of view of the area, the largest village was Hlinné (1255 hectares). Besides urban and agricultural function it fulfilled also spa-recreation function as there are sulphurous springs in locality of Slatinka (the southern part of the cadastral territory of the village), which conditioned the foundation of a small spa. Rheumatic diosorders were cured there. After formation of ČSR the spa cased to exist. Vyšný Žipov and Zlatník had only urban and agricultural function in given period.

Road network was not developed in the period of Austria-Hungarian monarchy (13,4 hectares). It connected the investigated villages with Vranov nad Toľpou and Prešov.

The agricultural land was represented by meadows (279.6 hectares) and arable land (1 208.5 hectares, table 1, fig. 1). Arable land occured in flat and upland parts of the landscape. The largest areas were situated in the vicinity locality of Panská tabuľa in the cadastral territory of the village Zlatník (to the north from the Zlatníčok stream). Permanent grasslands spread in the area of 279.6 hectares. It was represented by meadows only. They occured mostly in the floot plains and in the places, where forest land and arable land met.

The broad-leaved forests occupied almost 47% of all investigated area in 1826. Their biggest occurence was in the north and west part of the cadastral territory of the village Zlatník and in the vicinity of an area Ivanov vrch (813 metres above sea level) in the cadastral territory of the village Hlinné. Concerning the species representation, the most dominant were beech-oak and oak-maple forests.

Water flows occupied the area of 58.9 hectares (table 1). The most important stream of the region was (and still is) the Topľa river. Only a short segment 5.75 km, of its total length 129.8 km, flows through the investigated area. Its numerous meanders had influenced the origination of the dead stream branches in later period.

LANDSCAPE STRUCTURE IN THE YEAR 1956

Urban and technical country (fig. 2) was represented by continual build up area with family houses and gardens (81.7 hectares) and road network (22.7 hectares) in 1956. These were the types of land cover with the highest concentration of human activity. One

of the most important factors was the settlements functional point of view concerning living, work and satisfying all the needs related to life and traffic.

In the effort to ensure employment for the local people and to continue the tradition of the thread craft, the village Hlinné built a flax mill in the period 1950 - 1952 – for a rough process of flax and hemp as a subsidiary of Tatraľan Kežmarok. In 1956 this industrial park took a territory of 25.9 hectares. From the functional aspect the village can be evaluated as a village with developed industrial function and service-housing functions as well. The other two villages of the investigative area fulfilled only housing function.

The main function of the road network (22.7 hectares, table 1) was to interface the villages of the investigated region with the main road line connecting towns Vranov nad Topľou and Prešov. The best road accessibility from the investigated villages had (and still has at present) village Hlinné. The main road and the railway number 193 and 194 in direction Vranov nad Topľou – Prešov goes through this village. There is no railway in the villages Zlatník and Vyšný Žipov, but they are connected to the main road with the access road.

The agricultural land (fig. 2) of the investigated area was represented by the types of meadows (119.4 hectares), pastures (194.3 hectares) and arable land (1 221.7 hectares, table 1). The arable land occured in plain and upland parts of investigated area. Permanent grasslands overgrowth took the area of 313.7 hectares. It was presented by the types of meadows without trees and shrubs (37,4 hectares),meadows with trees and shrubs, pastures with trees and shrubs (82.0 hectares), pastures without trees and shrubs (26,1 hectares) and pastures with trees and shrubs (168.2 hectares).

Forest country (fig. 2) was represented by the types of coniferous (56.9 hectares), broad-leaved forests (1 129.2 hectares) and underwood (123.6 hectares, table 1), which occured as a coherent tree cover with forest industry function. Coniferous forests formed a smaller parts in the northern area of the cadastral territory of the village Zlatník. These were mostly the pine trees. Spruce forests occured only in the saddleback in the north direction from the vicinity area the Spálená hora (550 metres above sea level) in the cadastral territory of the village Hlinné. The other type of the land cover are broad-leaved forests (1 129.2 hectares). The largest area was situated in the west part of the investigated region. Regarding the types, there were beech-oak, beech and beech-maple forests. There were open woodlands in the higher floot plain besides submersible regions. The underwood (123.6 hectares) was planted in the areas of the former timber harvesting. The largest area was taken near the stream Zlatníčok.

Water flows and water surfaces took 39.2 hectares (table 1, fig. 2). There is a certain change in the river network at the present time in comparison to the river network in 1826, especially in the shape of river-bed Topľa and its tributaries (the Zlatníčok, the Slaný potok, the Hrabovec, the Uhliskový, the Hlinský potok and the Petkovský jarok).

The relict of the original river Topľa basin - the dead stream branch, which was announced as a protected natural object with original bank vegetation and water flora was found (and still exists there) near the residential part of the village Vyšný Žipov .

The specific feature is the occurence of the swamp (2.3 hectares, table 1) with herbal vegetation preferring humidity. It is localized near the river Topľa at the border of the cadastral territories of villages Hlinné and Vyšný Žipov.

LANDSCAPE STRUCTURE IN THE YEAR 1991

The influence of the human activity can be seen in its most intensive form in this phase of the landscape development. The area construction with residential houses and gardens covered 146.924 hectares in 1991. The main function for individual villages is the housing function but also another functions can be seen, which are typical for the inner organization of each village.

Regarding the cadastral territory, the largest village in the investigated region was Hlinné. This village did not fulfil only housing function in the research period, but also industrial function. The industrial park takes 19.7 hectares (table 1) and concentrates on linen thread and flax hards production. The terminal figure in its development was year 1984, when the line for processing secondary textile materials with capacity 350 tons and production of unvowen fabrics was launched. The processing capacity was increased to 1 400 tons in year 1990. Gradually the processing of flax stems was finished (company LYKOTEX Slovakia s.r.o.).

The road network was gradually developed as well. The main function of it was to connect towns of the research area with the main road (Vranov nad Topľou and Prešov). The best developed road network was in the village Hlinné with the direct access to the main road line I/18. The bridge over the Topľa was built in the village Vyšný Žipov in 1965 and the access road to the village was improved as well as the road surface and the side roads in the cadastral area (the build up areas extending). The railway in the Hlinne village was very important especially for LYKOTEX Slovakia s.r.o. industrial company. Agricultural cooperatives were buil up in this period, in the village Hlinné (11.3 hectares) and in the village Vyšný Žipov (5.9 hectares).

Agricultural landscape (fig. 3) was characterized by types of meadows (234.4 hectares) and arable land (1 216.8 hectares, table 1) in this period.

Forest and seminatural landscape (fig. 3) was presented by coniferous (32.0 hectares), mixed (61.3 hectares), broad-leaved forests (1 207.4 hectares) and underwood (11.0 hectares, table 1), which surrounded forest areas. Coniferous forests took only smaller areas in the north and the west of the cadastral territory of Zlatník village. In the west part of the cadastral territory of Hlinné village, there was a low moor phytocoenose which was announced by the Ministry of culture of the Slovak Republic as a state natural preserve in 1981 - the Hlinská jelšina – in area 46.15 hectares. It has still been a protected region. It is a foothill depression supplied with water from more springs.

River network did not change significantly in this period. Water flows and water surfaces took an area of 39.5 hectares. There was a new region determined at the Topľa – Alluvial deposits of the Topľa river. A mineral spring, rich in chlorine, calcium and magnesium, occured in the valley of the Hrabovec stream, which runs across the southern part of the cadastral territory of the village. At its basis a protected region – Hlinská jelšina was established. Since 1981 the Landscape area of the Slaný stream in the upper course of above mentioned stream has belonged among the protected regions. Besides dead stream branch of the river Topľa (1956), which has been already mentioned, there was another dead stream branch found at the analysis of the land cover in 1991. It occurs at the border of the cadastral territory of the villages Hlinné and Vyšný Žipov. Humid areas were represented by a swamp in area of 1.139 hectares.

CHANGES IN THE LANDSCAPE STRUCTURE

Landscape structure of the investigated area has sinificantly changed since 1826. The researched area represented well balanced landscape with 49.2 % share of agricultural areas and 48.6 % share of forest, seminatural areas and water from its utilization point of view in 1826. Although the region received its agricultural character during Ausria-Hungarian monarchy, its importance was strenghtened after socialism formation. The second half of the 19th century was marked by huge land disintegration, which could not bring enough food for its users. Agricultural land was transformed during the observed period 1826 – 1991. These changes were influenced by the collectivization. The area of agricultural land increased only in o 1.5 % (table 1) during the period 1826-1956. Gradual intensification of agricultural activities, using of artificial fertilizers and mechanisms in production reflected in yields increase in later period. It is possible to conclude, on the basis of historical notes analysis, detailed statistically-spatial analysis of topographic maps and as well as on the results of the field research, that the landscape kept this character approximately to the end of eighties of the 20th century. The increase of agricultural activities till 1956 was slow. There was no significant change in the land cover, where arable land transformation without scattered line and spot vegetation into arable land with scattered line and spot vegetation (graph 1) dominated. Arable land share increased only in 13.2 hectares (table 1) during this period. More significant increase was observed in type of permanent grasslands overgrowth (in 34.1 hectares). There was a transformation of broad-leaved forests into arable land (in case 134.3 hectares) during the period 1826-1956, but significant increase was eliminated by opposite tendency (graph 1).Regarding the inner political situation in former Czechoslovakia, the greatest increase of agricultural activities could be dated from 60ties to 80ties of the 20th century. It can be seen in 93.83% increase of arable land without scattered line and spot vegetation (observed period 1956-1991). The results of land cover layers analysis from the period 1956 -1991, according to which 74.7 hectares of broad-leaved forests and 435.3 hectares of arable land with scattered line and spot vegetation transformed into arable land without scattered line and spot vegetation (graph 2), are another proofs.

However, the whole share of agricultural land utilization decreased during observed period 1956-1991. The turning point was the year 1989, when the agricultural production transformed as the result of shift toward the market economy system. Disintegration of cooperatives meant attenuation of agricultural activity resulting in the decrease of agricultural land utilization. Although its area was relatively high in 1991 (47.9%), in comparison to 1956, its share decrease in 2.8%, which did not reach the level of 1826 (table 1).

Landscape structure is specified by relevant functions as well, which significantly determine the way of social landscape utilization. Villages fulfilled mostly housing and agricultural functions during all the investigated period. The only exception was the village Hlinné. During Austria-Hungarian period the village Hlinné fulfilled also spa-recreation function, that ceased to exist in later time. From the aforesaid we can conclude that the village started to fulfil its industrial function since 1956 and its natural-protection function since 1981.

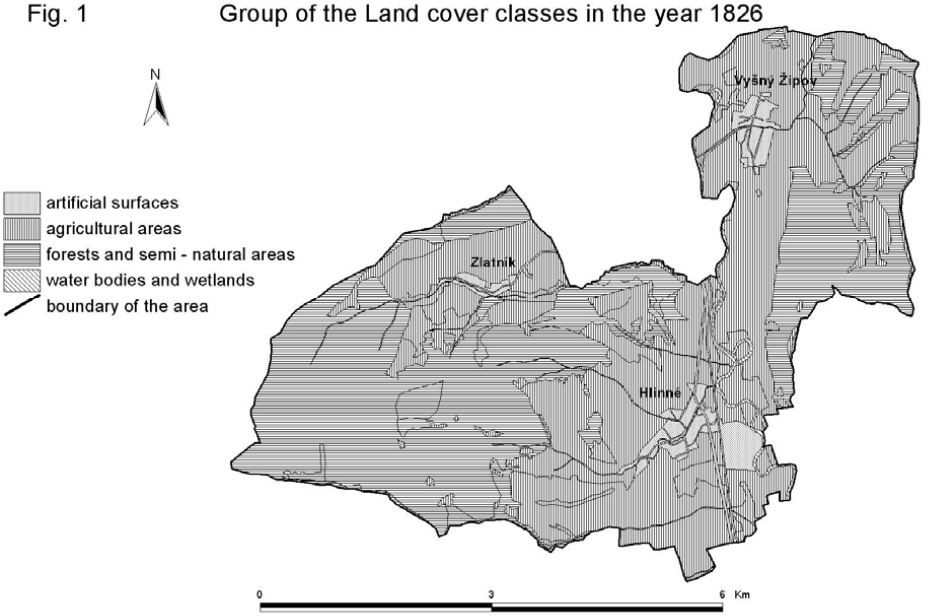
Comparing the maps of secondary military mapping and military topographic maps from 1956 and 1991, the river network changes are observed. Many water intakes of

present existing rivers disappeared, resulting in decrease of water acreage from 58.850 hectares to 39.765 hectares (investigated period 1826-1991, table 1). As a result of the regulation of the river Topľa and its tributaries, the artificial river basins were formed e.g. in Vyšný Žipov and Hlinné. Another change is the formation of a swamp in area of 1.1 hectares (table 1), which was formed by transformation of arable land and water flows in terrain upland depression.

Human intervention into land cover was manifested also in typological forest composition. Whilst in 1826 there were exclusively broad-leaved forests, in 1956 the areas of coniferous forests appeared and in 1991 mixed forests were present in the investigated area as well. The biggest forest overgrowth was seen in 1826, when it covered almost 47 % of investigated area. During period 1826-1991 there was a decrease of braod-leaved forests in 14.5% (table 1) observed. Most of them were transformed into arable land (270.3 hectares) and meadows (101.6 hectares, graph 3).

Significant changes were occured in the residential areas. They reached an increase in 51.4 % in the first investigating period during 1826 – 1956, during the second period in 1956 – 1991 it was even in 80.1 %. The increase was mainly caused by transformation of road network and adjacent areas. Arable land without scattered line and spot vegetation participated significantly in its increase till 1956.

Fig. 1 Group of the Land cover classes in the year 1826



Tab. 1: *Areal acreage of land cover classes in 1826, 1956 a 1991*

Classes of land cover		Area (in ha) in 1826	Area (in ha) 1956	Area (in ha) 1991
1	continual build up area with residential houses and gardens	54.0	81.7	14.2
2	road network and ajacent areas	13.4	22.7	27.8
3	railway network	-	6.7	5.9
4	cemeteries	-	2.2	2.1
5	areas of sports and laisure facilities	-	0.9	3.7
6	industrial areas	-	25.9	19.7
7	areas of agricultural cooperatives	-	-	17.2
8	arable land without scattered (line and spot) vegetation	1208,5	595.3	1153.8
9	arable land with scattered (line and spot) vegetation	-	626.5	63.0
10	meadows without trees and shrubs	279,6	37.4	234.4
11	meadows with trees and shrubs	-	82.0	-
12	pastures without trees and shrubs	-	26.1	-
13	pastures with trees and shrubs	-	168.2	-
14	coniferuos forests	-	56.9	32.0
15	mixed forests	-	-	61.3
16	broad-leaved forests	1412,4	1129.2	1207.8
17	underwood	-	123.6	11.0
18	water flows and regulated water flows	58,9	39.2	39.8
19	swamps	-	2.3	1.1

Fig. 2 Group of the Land cover classes in the year 1956

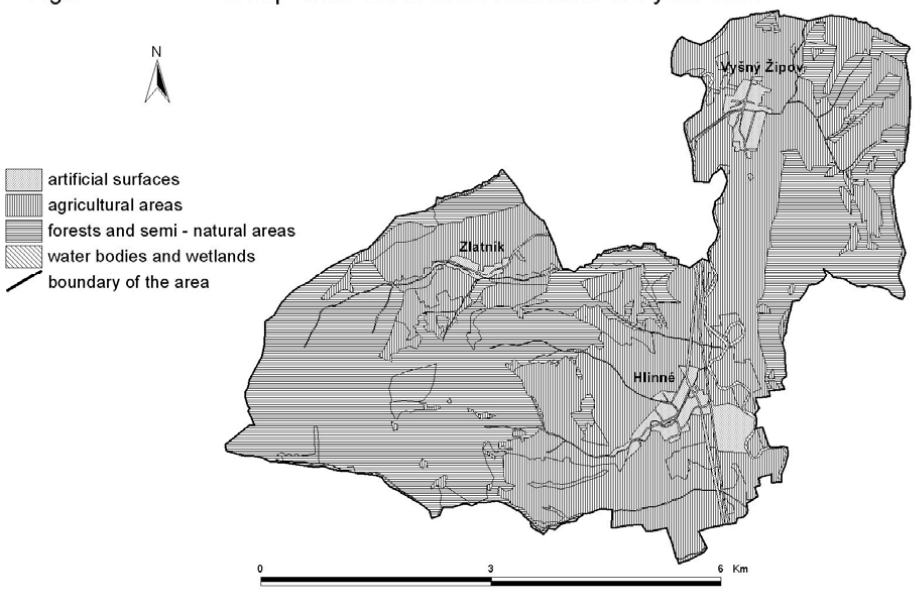
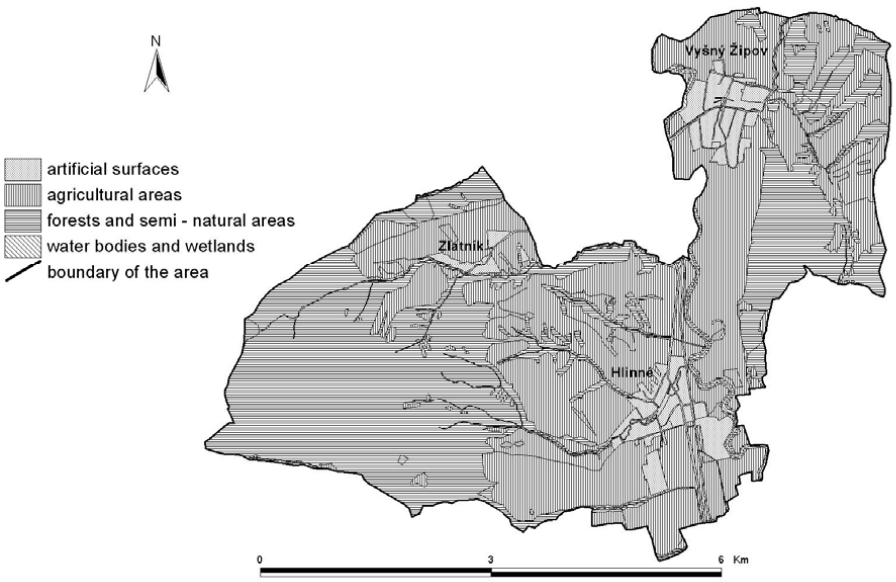
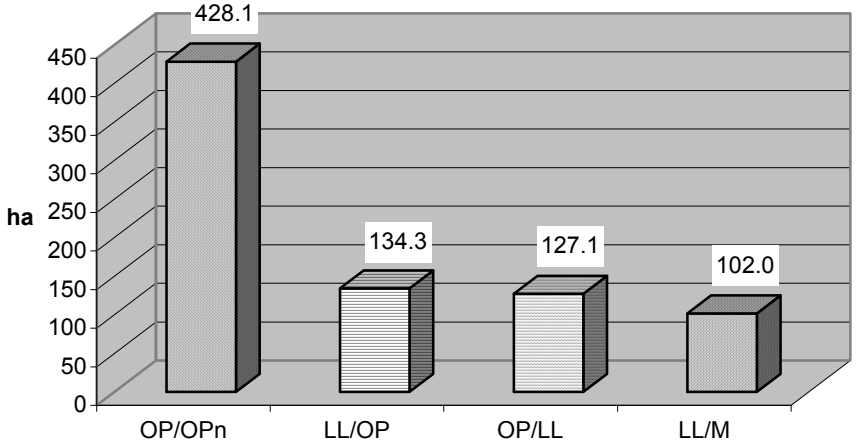


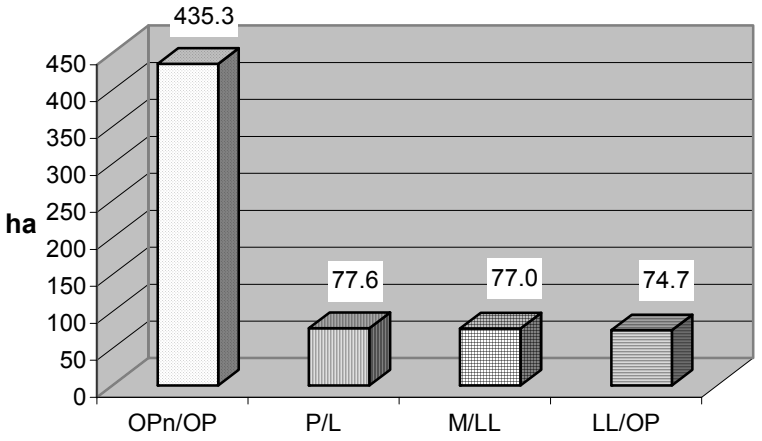
Fig. 3 Group of the Land cover classes in the year 1991



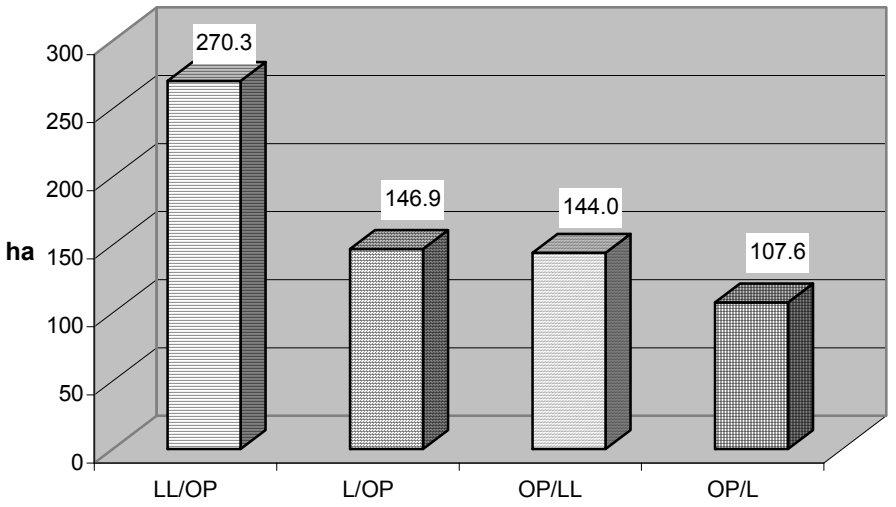
Graph 1 Changes in land cover in period 1826-1956



Graph 2 Changes in land cover in period 1956-1991



Graph 3 Changes in land cover in period 1826-1991



CONCLUSION

Landscape structure of the investigated area has kept balanced landscape character since 1826 by 50.7 % (year 1956) and 47.9 % (year 1991) share of agricultural areas and 48.6 % (year 1826) and 44.6 % (year 1956) share of forest, seminatural areas and water.

The increase of agricultural activity was slow till 1956, which did not effect the land cover changes significantly. More significant changes happened during the collectivization

from sixties to eighties of twentieth century. Agricultural development was interrupted after 1989, when changes in political and economic situation and a shift toward the market economy system caused different conditions for the agriculture. Disintegration of cooperatives and global decrease of agricultural utilization of land was noticed. Although its area was quite high in 1991 (47.9 %), in comparison to 1956 its share decrease in 2.8 %, thus it did not receive the level of 1826 year.

Residential area increased in 172.6 % from 1826 to 1991. There was a typological change of forest and structure and density of the river network.

Changes in land cover influenced functional orientation of the villages. Whilst villages Vyšný Žipov and Zlatník fulfilled during all investigated period only housing and agricultural function, there was also recreational function, except the function mention above, developed in village Hlinné, which was later substituted by natural-protecting function. When there was a textile plant for production linen thread and tows built in Hlinné in 1952, the village got its industrial character as well.

Acknowledgement: project Vega No. 1/4028/07 Research and geoecological evaluation of changes in the use of cultural landscape in the selected foothill regions in the Slovak Republic, Vega. No. 1/0317/09 Identification of environmental elements and utilization for management of agricultural restructuring and provide economic development of Košice-Prešov region.

References

BOLTIŽIAR, M., CHRASTINA, P. (2006): Využitie krajiny SV okraja Bakoňského lesa v Maďarsku. Lanscape utilization of the ne foothil of Bakony mts. (Hungary). Geografická revue, 2, 2, Banská Bystrica, FPV UMB, Katedra geografie, s. 49- 61. ISSN 1336 – 7072

BOLTIŽIAR, M. (2007): Štruktúra vysokohorskej krajiny Tatier – veľkomierkové mapovanie, analýza a hodnotenie zmien aplikáciou údajov diaľkového prieskumu Zeme. Nitra, UKF, 248s. ISBN 978-80-8094-197-0.

CEBECAUEROVÁ, M., CEBECAUER, T. (2004): Vývoj krajinnej pokrývky v južnej časti Záhorskej nížiny a malých Karpát v období 1954-1992. Geografické informácie 8, Nitra, FPV UKF, s. 60-67. ISBN 80 – 8050 – 784 – 8

CEBECAUEROVÁ, M. (2007): Analýza a hodnotenie zmien štruktúry krajiny (na príklade časti Borskej nížiny a Malých Karpát). Geographia Slovaca 11, Bratislava, 2007, Geografický ústav SAV, 136 s. ISBN 1210-3519.

DOBROVODSKÁ, M. (2000): Faktory formovania súčasnej krajinnej štruktúry marginálnych oblastí Slovenska na príklade obcí Liptovská Teplička, Osturňa a Malá Franková. Krajina, človek, kultúra. Zborník referátov. Banská Bystrica, SAŽP, s. 81-85. ISBN 80-88850-33-9.

FALŤAN, V. (2000): Krajinná pokrývka okolia Kysuckého Nového Mesta identifikovaná metódou Corine. Geografický časopis, 52, 4, Bratislava, Geografický ústav SAV, s. 363-376. ISSN 1335-1257.

HOFIERKA, J. (2008): Kultúrna krajina na Slovensku.Geografické práce 13, Prešov, FHPV PU, 93 s., ISBN 978-80-8068-921-6.

MAZÚR, E. et. al. (1986): Geomorfologické členenie SSR a ČSSR 1:500 000. Bratislava, Slovenská kartografia, 1986.

MICHAELI, E., HOFIERKA, J., IVANOVÁ, M. (2008a): Assessment of landscape structure changes over the last 50 years in the hinterland of Zemplínska šírava dam in Slovakia. In: Kabrda, J., Bičík, I. (eds.). Man in the landscape across frontiers: Landscape and land use change in Central European border regions. Conference Proceedings of the IGU/LUCC Central Europe Conference 2007. Praha, Karlova univerzita, p. 112-122. ISBN 978-80-86561-80-6.

MICHAELI, E., HOFIERKA, J., IVANOVÁ, M. (2008b): Transformation of physical-geographic structure of landscape of paradynamic system of northern hinterland of the Zemplínska šírava water reservoir. In: Folia geographica, 47, 2, Prešov, FHPV PU, s. 237-244. ISSN 1336-6157.

OLAH, B. (2003): Vývoj využitia krajiny Podpoľania: Starostlivosť o kultúrnu krajinu prechodnej zóny Biosférickej rezervácie Poľana. Zvolen, TU, 110 s. ISBN 80-228-1251.

OŤAHEĽ, et. al. (2004): Krajinná štruktúra okresu Skalica. Geographia Slovaca 11, Bratislava, Geografický ústav SAV, 123 s. ISSN 1210-3519.

PETROVIČ, F. (2005): Vývoj krajiny v oblasti štálového osídlenia Pohronského Inovca a Tribeča. Bratislava, ÚKE SAV; 209 s. ISBN 80-969272-3-X.

http://www.geomodel.sk/sk/download/downloadav.htm#make_vector_grid

Recenzovali: Prof. Ing. Jozef Vilček, CSc.
Doc. RNDr., PhDr. Martin Boltižiar, PhD.

GEOGRAPHY AND SOLAR ENERGY UTILIZATION

Ján KAŇUK[1]

Abstract: *Nowadays, the questions of energetic safety are frequently discussed issues. One of the possibilities is the diversification of production of energy with more utilization of renewable energy sources (RES). The most perspective is the utilization of solar energy directly in urban areas, typical for their biggest demand for energy. It is obvious that application of solar systems is dependent on qualitative analyses concerning a variety of relevant questions (amount of energy falling down to surface, atmospheric influences, economical questions etc.) Therefore many sciences deal with energetic utilization of solar energy. This paper tries to find the position of geography in energetic utilization of solar radiation.*

Key words: *solar energy utilisation, geography, geography of utilisation of solar radiation*

INTRODUCTION

Continuously increasing demand of energy, longtime improving of costs of energy sources and energy, many problems with transportation and geopolitical instability are the reasons, why we have to think about questions of energetic security. Additionally, in the last time, mainly since the nineties of 20 century, a negative impact of the energy segment of economy on the environment is also very often discussed issue, which is related primarily to ensuring ecologically sustainability of landscape. To avoid a possible energetic crisis, it is necessary to diversify energy production. One of the most perceptive possibilities is to give greater scope to renewable energy sources (RES). The issue of wider use of RES includes the priority themes of the European Union, which is included in several of its decisions and laws. New motion in energy policy of the European Union is to increase the proportion of energy derived from RES to 20% by 2020.

The basic starting point for finding the optimum solution of RES utilization is the fact that the most energy consumption is in urban country, with the highest concentration of population on a relatively small area. From the available RES the most beneficial in the urban country may be the solar energy, for several reasons - the energy has a significant and pervasive technological potential, low operating cost, zero negative environmental impacts during operation, it is not entitled to a newly built area, there are also the possibilities of interesting architectural buildings, it enables to produce electricity directly or it can be used for water heating, or even for cooling and so on. (Kaňuk, 2007) In terms of effective use of solar energy systems and the installation (equipment producing heat or electricity from solar radiation) the roofs of buildings seems to be very perspective.

1 **RNDr. Ján Kaňuk,**
Department of Geography and Regional Development, Faculty of Humanities and Natural Sciences, University of Prešov, ul. 17. novembra 1, 081 16 Prešov, e-mail: kanuk.jan@gmail.com

Although the price of solar energy systems and other related infrastructure has rapidly decreased in the last 10 years, massive installation of solar energy systems will undoubtedly require a significant financial investment. Therefore, significant role in a planning stage has the quality of analysis, which should be orientated to particular aspects of spatial and temporal distribution of solar radiation, sunshine spatial aspects of installations, technical and technological aspects of solar energy systems, energy requirements of population, investment and legislative support, etc.

These facts motivate researchers of many disciplines in various institutions that have proven as accurate as possible to reflect the technological, economic, and available potential of solar energy, as well as to streamline the actual production of energy from the sun radiation, try to find an optimal installation models, contribute to solution of energy security and attend to enquiries of other relevant aspects.

APPROACHES OF SOLAR RADIATION RESEARCH IN TERMS OF ENERGETIC EFFICIENCY

As noted above, the issue of energy use of solar radiation in the urban country is an actual topic of several scientific disciplines. Every science has its own object, research field, methodology, paradigm system and theory. Each of them has its own different view on solar energy utilization. This specialization of sciences has its importance, because it is necessary to deal with many phenomena related to solar energy utilization in the urban country (e.g., solar radiation, solar radiation transition through galactic environment and atmosphere, the position of the Sun as a source of solar radiation and the Earth and relevant temporal and spatial aspects, atmosphere and local climate, meteorological phenomena in the atmosphere, solar systems and the efficiency of conversion of solar energy, power and electrification system, construction and architecture, marketing, and demand for solar energy systems, legislative and investment promotion, energy consumption and psychological aspects of RES equipments - NIMBY syndrome). These aspects of solar radiation usage and installation of solar energy systems are vitally dependent on developing high-quality analysis.

In the research of solar radiation in terms of its energy utilization there are several disciplines included that could be categorized to:

1. natural sciences
2. technical sciences
3. social sciences

Natural sciences deal with research of energy utilization of solar radiation in terms of enquiry to the generation and spread of solar radiation, its immanent substance, energy value, solar radiation passage through the atmosphere, atmospheric phenomena affecting the energy value and distribution of solar radiation and the like. All these aspects of research could be covered by the **sciences with physical base**, which include the atmospheric sciences (climatology and meteorology), thermodynamics, optics and astronomy (astrophysics, astrometry). Climatology and meteorology are the sciences which have the largest share of the physical sciences participating on the utilization of energy especially solar radiation. Significant works in this area in the domestic literature include Hrvoľ and Tomlain (1992, 1997 a, 1997 b), Smolen (1980), Ostrožlík (2002), Kittler and Mikler (1986), Kittler and Pulpitlová (1988) and others, from foreign pointers

work Zelenka et al. (1992), Hulme et al. (1995) and others. In this context it is necessary to say that the physics constitutes the basic knowledge of energy utilization of solar radiation being an very important part, also transferred to other disciplines.

In the group of natural sciences, which are significantly involved in terms of energy of solar radiation, spatial relationships, modeling and statistical analysis of the attributes relevant to the energy utilization of solar radiation, there are also **mathematical sciences**, and especially geometry, mathematical analysis, topology and statistics. In scientific literature, we can find many works that use scientific methods based on modeling, statistical analysis and visualization in cyberspace, which is implemented in specialized information systems or into GIS. Documented to works for example Neteler and Mitasova (2004), Suri (2002), Dunlop et al. (2003), Hofierka (1997), Hofierka and Šuri (2004), Suri et al. (2007), Hengl and Reuter (2008), Muneer (2004) and others. The most significant share in this research has geostatistics and geoinformatics, which uses a whole range of instruments of GIS (Geographic Information System) (Hofierka, 2003). The latest trends are orientated to provide information about solar radiation and its energetic value on the internet in the form of web-database with interactive maps, tables and graphs of energy derived from sunlight, where it is possible to specify the parameters of the position, angle modules and orientation towards the cardinal points. (Šuri et al., 2005). Information and communication methods and tools, therefore allow us to create cyberspace, where it is possible to simulate the distribution of solar radiation as well as other aspects related directly to the estimated use of energy (digital model of topography, clouds, etc.).

Geoecology and environmetanlistic are included in the group of natural sciences having their research focused primarily on the issue of reducing CO_2 output as well as the creation of environmentally sustainable country (Laurman, 1979, Šenitková and Eštoková, 2002, Drdoš, 1997 and others).

Another important insight into the research of solar radiation for energy purposes are **technical sciences**, integrating architecture, construction, and electrical energy.

Architecture and Construction is devoted primarily to solar radiation as a phenomenon in the form of heat and light, which has greatly influenced the energy regime and the operation of apartment buildings as well as industrial buildings, and buildings with administrative, commercial leisure and other function (Littlefair, 2001), (Pereira et al., 2001), (Eifert a Kiss, 2002), (Garcia et al., 2007). Among the major investigators of this issue we include the authors, we have already mentioned in the physical sciences, but their work has a direct connection with the construction and architecture. They are Kittler and Mikler (1986), Kittler and Pulpitlová (1988), whose works have found an international response.

Electrotechnics and energetics focuses on the development of such systems that can convert sunlight to usable energy form as well as use of produced energy in the energy system. This issue is examined in many works, eg. Rybak, Tauš, Rybak (2001), Tauš et al. (2005), Ružinský and Šály (1996, 2005), Smola (1980), as well as numerous publications of foreign authors as Turrent and Baker (1983), Marks (1965), Quaschning (2003), Muselli et al. (1999) and others. Research activities in the field of development of technologies to generate energy from solar radiation and their testing is carried out in research institutions around the world (eg Join Reserch Center (JRC) in Italy - the EU, National Renowable Energy Laboratory (NREL) in the U.S.), in companies involved in the evolution of the solar

systems (eg ThermoSolar Žiar nad Hronom, ...), as well as at universities (in Slovakia, such as the Technical University of Kosice, STU Bratislava, Žilina University in Žilina, etc..) (Potocký and Hofierka, 2006).

Even the **social sciences** participate on the energy use of solar radiation particularly there are economics, marketing, sociology, urban planning, demography, and legal sciences. Economy gives answers to questions like - how much energy to produce; respectively what is the demand for energy, for whom to produce energy from the sun, what is the efficiency of energy production and thus whether the production is worthy, what is the return of invested funds and the like. These problems are also outlined in the works of Jäger-Waldau et al. (2006), Šúri (2006) and many internet sites devoted to the applications of solar systems (e.g. www.ozeport.sk, www.setri.sk and others). Marketing is linked directly to the applications in the country. Thus, together with the sociology it examines the behavior of the population in relation to the application of the solar systems and gives answers to questions like - which people are interested in these technologies to reach other population groups, as are mental barriers in the application of solar energy systems and how to remove them, etc. .

Law sciences participate in the application level, where they deal with questions like - how to remove the legislative barriers and create a challenging environment that would favor numerous installations. In this sense, we have to mention current legislative background supporting the use of energy from solar radiation, which is based on EU legislation (e.g. Directive 2001/77/EC on the promotion of electricity produced from renewable energy sources in the internal electricity market, Directive 2002/91/EC on the energy efficiency of buildings and strategic document COM/2007/723 European strategic energy policy) and Slovakia in the approximation adopted in its legal system (e.g. Act 656/2004 on energy and the change some laws, the Government Regulation No. 124/2005 laying down rules for the functioning of the electricity).

The following chart shows the participation of sciences on the solar energy utilization and the position of geography.

POSITION OF GEOGRAPHY

Geography has the assumptions to play a significant role in the research of solar energy utilization. Planning and solar energy use is largely dependent on the quality of temporal and territorial analyses. Basically, we can say that for geography is the space and its time regularities a phenomenon, which requires most of its attention and all the research activities are focused on it. To explore the space it is a geographical science that has a detailed methodological system for examining the attributes of temporal and territorial-relevant research on the solar energy use. In this context it is necessary to note that geography has not an ambition to compete with the sciences dealing with technical and technological attributes of the solar systems, respectively other related infrastructure, research solar radiation in terms of its spectral electromagnetic nature, nor a detailed examination of atmospheric phenomena, which also significantly affect the efficiency of conversion of sunlight to some form of energy and so on. Geography directs its research activities to the space and the potential valuation of landscape for application of solar systems.

Geography is seen in the works of Demek (1987), but also Paulov (1998), Matlovič (2006) and Hofierka (2006) as a synthesizing science, whose object of research is fully oriented on the whole landscape sphere. Therefore, its application in relation to the topic can be discussed also in the urban area in the interaction with the socio-economic activities of the population, which is directly related to energy consumption and possibilities of its production, energy saving and rationalization of the energy segment. In this context, a morphological-functional regionalization of urban space plays a significant role. Morphological-functional analysis of urban areas, demographic and socio-economic analyses are also important for planning and decision-making phase, whereas we give answers to questions like - where is the appropriate application of solar systems, what are the demands for energy by the population in carrying out their routine needs (in terms of daily, seasonal, annual operation), what is the potential for possible areas of energy production, how to optimize and fault energy production systems and the like. Moreover, the geography helps to solve the problem also through the GIS visualizations.

In Slovak geography there have already been the works on the use of geography in the field of energy, introduced primarily by Szőllőz (1998, 2006a, 2006b). The energy uses of solar radiation in terms of geography are described in the number of works for example by Hofierka and Cebecauer (2007, 2008), Šúri (2002), Šúri et al. (2002), Hofierka and Kaňuk (2008), Kaňuk, Rosic and Hofierka (2008), Kaňuk (2007, 2008) and others, concerning mainly with the territorial-temporal distribution of solar radiation and its modeling using GIS tools. In the geographical literature we can find also the works, which are devoted to clarification and specification of distribution of solar energy conversion to georelief, for example Krcho (1990) and Jenčo (1992). In recent years geographic focus of the research has shift from a regional perspective (e.g. the European Solar Radiation Atlas - (Scharmer and Grief, 2000)) to detailed studies of urban environments, for example by Robinson and Stone (2004), Arbois et al. (2008), Hofierka and Kaňuk (2008). In this context, it is needed to note the works dealing with the use of geographic information systems in order to estimate and review the potential use of solar radiation (Šuri et al., 2002), (Gadsden et al., 2003) etc.

From the relevant analysis it is clear that the massive solar energy systems will be applied particularly in the urban (or built-up) territories, where the most developed countries have more than 80% of the population. Some authors (eg, Jäger-Waldau et al., 2006, Šúri et al., 2007) emphasize that theoretically can be the consumption of electricity in many countries completely covered by using of solar radiation for a relatively small area (in some countries it is only 1% of their territory). According Kaňuk (2007) the potential of Slovak urban country is high. Urban country has approximately 22 000 hectares of flat roofs, to which it is possible to install solar systems, which represent approximately 0.44% of urban areas. The following analyses prove that in near future it is necessary to deal with the issue of spatial and time relations in the country as well as in urban country in more details, and therefore it is the geography that can apply its research methods in this issue.

CONCLUSION

The energy utilization of solar radiation is currently the issue with increasing attention of the public. The research of solar energy is interdisciplinary and its direct application in the country is very complicated. This is the reason why related sciences must participate

and focus their attention on those aspects of the research, which are incorporated in their methodology.

The main aim of this paper was to point out on the approaches participating on the utilization of solar radiation in the country for energy purposes, as well as to seek for the application of geography in the research of solar energy radiation from the energy aspect. It is also necessary to know the sciences which contribute to the study of solar energy utilization. Sciences can be divided into three groups according to various approaches to solar energy utilization. The natural sciences are the first group concerning mainly with the physical nature of solar radiation, its generation, and dissemination of the galactic and atmospheric environment, relations of time differentiation of its distribution, etc. as well as the mathematical expression of these patterns and relationships. Specific group of natural science is represented by geoecology and environmentalistics.

The second group consists of technical sciences as an informatics, architecture, construction, energy and electrical engineering. These sciences are devoted to solar radiation in terms of energy regime of buildings (architecture, construction), as well as the development of technologies that can most efficiently convert solar radiation to a suitable form of energy and exploit it (energy, electrical engineering). Informatics is closely linked on Geoinformatics, which uses GIS for analysis, modeling and visualization of the attributes relevant to the discussed issue.

Even the social sciences are applied in the energy use of solar radiation through the economics, marketing, sociology, urban planning, demography, and law. Economics analyzes the profitability and economic returns on installed systems, marketing and sociology in particular are involved in examining the behavior of the population and a positive perception of potential solar applications, because negative perception of the installations in some regions can be an obstacle for the installation of the solar systems (NIMBY syndrome). The law helps to create a favorable legislative background.

The application of geography in the solar energy utilization is carried out mainly by creation of spatial and time analysis of attributes, on which the sun application systems are based. Moreover, the position of geography is in the intersection of natural, technical and social sciences. Its object of study is based on comprehensive socio-economic activities, including population, and therefore it can use its full range of research methods in the energy use of solar radiation and communicate with other sciences participating in this research. Geography is not regarded to be a superior science, but rather one of several sciences participating on the solar energy utilization.

This paper tries to find answers to the questions, where is the real position of geography in terms of solar energy utilization.

Acknowledgment: This paper is a part of the solution of grant project VEGA č. 1/0355/09 Modeling of the distribution of solar radiation in urban areas and its potential use.

References

ARBOIT, M., DIBLASI, A., FERNA´ NDEZ LLANO, J.C., DE ROSA C. (2008): Assessing the solar potential of low-density urban environments in Andean cities with desert climates: The case of the city of Mendoza, in Argentina. Renew Energy, dostupné na internetovej stránke www.sciencedirect.com/ (navštívené 12.3.2008)

DEMEK, J. (1987): Úvod do štúdia teoretickej geografie. SPN. Bratislava, s. 248

DRDOŠ, J. (1997): Geoekológia a enviromentalistika, I.časť, Krajinná ekológia, krajina, životné prostredie, Fakulta humanitných a prírodných vied Prešovskej univerzity Prešov, 153 p., ISBN 80-88722-69-1

DUNLOP, E. D., ŠÚRI, M., HULD, T. A. (2003): Photovoltaic Potential Assessment to Support Renewable Energies Growth in 10 EU Candidate Countries. In Gottschalg, R.. (ed.) Proceedings of the Conference C79 of the Solar Energy Society CREST "Photovoltaic Science, Applications and Technology", Loughborough University (UK) 3.-4.4.2003, pp. 1007-1016.

EIFERT, P., KISS, G., J. (2002): Building Integrated Photovoltaic Designs for Commercial and Institucional Structures, A Sourcebook for Architects and Engineers. NREL/BK-520-25272 dostupné na internetovej stránke www.doe.gov/bridge (dokument 25272)

GADSDEN, S., RYLATT, M., LOMAS, K. (2003): Putting solar energy on the urban map: a new GIS-based approach for dwellings. Solar Energy 74, pp. 397–407.

GARCIA, J., O., GAGO, E., J., BAYO, A., J., MONTES, G., M. (2007): The use of solar energy in the buildings construction sector in Spain. Renewable and Sustainable Energy Reviews, Volume 11, Issue 9, December 2007, Pages 2166-2178

HENGL, T., REUTER, I., T. (2008): Geomorphometry, Concepts, Software, Applications. Institute for Enviroment and Sustainbility. Join Research Centre, Trento.

HOFIERKA, J. (1997): Direct solar radiation modelling within an open GIS environment. Proceedings of the Joint European GI Conference 1997, Vienna, 575-584.

HOFIERKA, J., CEBECAUER, T. (2007): Priestorová a časová distribúcia slnečného žiarenia na georeliéfe Slovenska. Zborník medzinárodnej vedeckej konferencie "Bioclimatology and natural hazards", 17.-20.9.2007, Poľana nad Detvou, Slovensko, Slovenská bioklimatologická spoločnosť, Technická univerzita vo Zvolene, ISBN: 978-80-228-1760-8.

HOFIERKA, J., CEBECAUER, T. (2008): Spatially distributed assessment of solar resources for energy applications in Slovakia. Acta Facultatis Studiorum Humanitatis et Naturae Universitatis Prešoviensis. Prírodné vedy, Folia Geographica 12, pp. 97-114.

HOFIERKA, J., KAŇUK, J.(2008): Assessment of Photovoltaic Potential in Urban Areas Using Open-Source Solar Radiation Tools. Submitted to Renewable Energy.

HOFIERKA, J., ŠÚRI, M. (2004): A New GIS-based Solar Radiation Model and Its Application to Photovoltaic Assessments. Transactions in GIS, 8, 175-190.

HOFIERKA, J. (2003): Geografické informačné systémy a diaľkový prieskum Zeme. Vysokoškolské učebné texty: FHPV PU v Prešove.

HOFIERKA, J. (2006): Problémy súčasnej Slovenskej geografie a možné riešenia Acta Facultatis Studiorum humanitatis et Naturae Universitatis Presoviensis, Folia Geographica. 9, s. 86 - 91

HRVOĽ, J., TOMLAIN, J. (1992): Globálne žiarenie na rôzne orientované sklonené plochy na území Slovenskej republiky. Štúdia X., roč. VI., Slovenská bioklimatologická spoločnosť pri SAV, Bratislava, 124 s

HRVOĽ, J., TOMLAIN, J., (1997 a): Globálne žiarenie na území Slovenska za obdobie 1961-1990. Bulletin Slovenskej bioklimatologickej spolocnosti SAV, XVI, 26, 3-17.

HRVOĽ, J., TOMLAIN, J. (1997 b): Žiarenie v atmosfére, Polygrafické stredisko UK Bratislava.

HULME, M., CONWAY, D., JONES, P.D., JIANG, T., BARROW, E.M., TURNEY, C.A., (1995): 1961-1990 climatology for Europe for climate change modelling and impact applications. International Journal of Climatology, 15, 1333-1364.

JÄGER-WALDAU, A., HULD, T., ŠÚRI, M., CEBECAUER, T., DUNLOP, E., OSSENBRINK, H. (2006): Challenges to Realise 1% Electricity from Photovoltaic Solar Systems in the European Union by 2020, 4th World Conference on Photovoltaic Energy Conversion, 7. – 12. 5. 2006, Waikoloa, USA.

JENČO, M. (1992): Distribúcia priameho slnečného žiarenia na georeliéfe a jej modelovanie pomocou komplexného digitálneho modelu reliéfu. Geografický časopis 44: 342-355.

KAŇUK, J. (2007): Analýza solárneho žiarenia pre urbánne územia. Zborník zo VIII. vedeckej konferrencie doktorandov a mladých vedeckých pracovníkov. FPV UKF Nitra, ISBN: 978-80-8094-106-2

KAŇUK, J. (2008): Analýza dostupného globálneho žiarenia v urbánnych územiach Slovenska pomocou GIS. Geografia Cassoviensis, ročník II., 1/2008, Ústav geografie, Prírodovedecká fakulta Univerzity P. J. Šafárika, Košice, str. 59 - 64

KAŇUK, J., ROSIČ, M., HOFIERKA, J. (2008): Mapovanie areálov bytových domov v mestách Slovenskej republiky z aspektu energetického využívania slnečného žiarenia. Submitted to Geografický časopis.

KITTLER, R., MIKLER, J. (1986): Základy využívania slnečného žiarenia. Bratislava, Veda.

KITTLER, R., PULPITLOVÁ, J. (1988): Základy využívania prírodného svetla. Bratislava, Veda.

KRCHO, J. (1990): Morfometrická analýza a digitálne modely georeliéfu. Bratislava, Veda.

LAURMAN, J., A. (1973): Climate change from fossil fuel generated CO_2 and energy policy. Environment International, Volume 2, Issues 4-6, Pages 461 – 473

LITTLEFAIR, P. (2001): Daylight, sunlight, and solar gain in the urban environment. Solar Energy 70, pp. 177-185.

MARKS, A. (1965): Energetika slonečna, Przeglad technicny, Warszawa

MATLOVIČ, R. (2006): Geografia - hľadanie tmelu (K otázkam autonómie a jednoty geografie, jej externej pozície a inštitucionálneho začlenenia so zreteľom na slovenskú situáciu). Acta Facultatis Studiorum humanitatis et Naturae Universitatis Presoviensis, Folia Geographica. 9, s. 6 - 43

MUNEER, T. (2004): Solar Radiation and Daylight Models (with software available from companion web site), Napier University, Edinburgh, Elsevier Butterworth – Heinemann, Oxford, ISBN 0 7506 5974 2, p. 345

MUSELLI, M., NOTTON, G., LOUCHE, A. (1999): Design of Hybrid-Phofovoltaic Power Generator, with Optimalization of Energy Mamagment, *Solar Energy* Vol. 65, No. 3, pp. 143–157

NETELER, M., MITASOVA, H. (2004): Open Source GIS: A GRASS GIS Approach, Kluwer Academic Publishers, Boston

OSTROŽLÍK, M. (2002): Time variability of global solar radiation in high-mountain region. Contributions to Geophysics and Geodesy, 32, 277-290.

PAULOV J. (1998): Niekoľko úvah o geografii na prelome 20. a 21. storočia a 2. a 3. tisícročia. Acta Facultatis Studiorum humanitatis et Naturae Universitatis Presoviensis, Folia Geographica. 2, s. 11 - 22

PEREIRA, F. O. R., SILVA, C. A. N., TURKIENIKZ, B. (2001): A methodology for sunlight urban planning: a computer-based solar and sky vault obstruction analysis. Solar Energy 70, pp. 217-226

POTOCKÝ, P., HOFIERKA, J. (2006): Potenciál využitia obnoviteľných zdrojov energie v regionálnom rozvoji Slovenska. Acta Facultatis Studiorum Humanitatis et Naturae Universitatis Prešoviensis. Prírodné vedy, Folia Geographica 10, pp. 426-432.

QUASCHNING, V. (2003): Technology Fundamentals. The sun as an energy resource. Renewable energy world

ROBINSON, D., STONE, A. (2004): Solar radiation modelling in the urban context. Solar Energy 77, pp. 295–309.

RUŽINSKÝ, M., ŠÁLY, V. (1996): Fotovoltaika na Slovensku, EE (Časopis pre elektrotechniku a energetiku), roč. II, 4. 5, s.36 - 37

RUŽINSKÝ, M., ŠÁLY, V. (2005): Fotovoltika v kontexte vývoja na začiatku 3. tisícročia a SR. Časopis pre elektrotechniku a energetiku, 2, s. 17 – 20.

RYBÁR, P., TAUŠ, P., RYBÁR, R. (2001): Alternatívne zdroje energie I. Slnečná energia. Vysokoškolské učebné texty. Technická univerzita v Košiciach

SCHARMER, K., GREIF, J., (eds) (2000): The European Solar Radiation Atlas. Vol. 2: Database and Exploitation Software. Paris, (es Presses de l'École des Mines).

SMOLA, A. (1980): Využitie slnečnej energie, Elektrotechnická fakulta SVŠT, Bratislava.

SMOLEN, F. (1980) Rozptýlené žiarenie a jeho podiel na globálnom žiarení v Bratislave. Geografický časopis, 32, 300-311.

ŠENITKOVÁ, I.; EŠTOKOVÁ, A. (2002): Zdroje energie a environmentálna záťaž. Acta Montanistica Slovaca Ročník 7, 4, 257-260

ŠÚRI, M. (2006): Slnečná elektrina a perspektívy jej výroby na Slovensku. Život. Prostr., Vol. 40, No. 3, p. 127 – 132, dostupné na internetovej stránke http://sunbird.jrc.it/pvgis/doc/paper/2006-zp03_suri_pv.pdf (navštívené 9.1.2009)

ŠÚRI, M. (2002): Modelovanie a kartografické zobrazovanie globálneho žiarenia. In Feranec, J. Pravda J., eds. Proceeding of the workshop "Aktivity v kartografii 2002", Bratislava (Slovak Cartographic Society and Institute of Geography SAS), 31.10.2002, 126-133.

ŠÚRI, M., JONES, A.R., DUNLOP, E.D. (2002): Mapping the potential of photovoltaic systems in urban areas of Slovakia. In Brebbia, C.A., Martin-Duque, J.F., Wadhwa, L.C. (eds.) The Sustainable City II, Urban Regeneration and Sustainability, WIT press (Southampton). pp. 1007-1016.

ŠÚRI, M., HULD, T.A., DUNLOP, E.D. (2005): PVGIS: a web-based solar radiation database for the calculation of PV potential in Europe. International Journal of Sustainable Energy, 24, 55-67.

ŠÚRI, M., HULD, T. A., DUNLOP, E. D., HOFIERKA, J. (2007): Solar resource modelling for energy applications. In: Peckham R.J., Jordan G. (eds.) Digital Terrain Modelling, Development and Applications in a Policy Support Environment, Series: Lecture Notes in Geoinformation and Cartography, Springer, pp. 259-273.

SZÖLLÖS, J. (1998): Geografická analýza energie a energetiky: teoretická báza a aplikácia na energetický systém Slovenska, Geographia Slovaca; 14, Bratislava, SAV, Geografický ústav.

SZÖLLÖS, J. (2006a): Analýza kontextu regionálneho rozvoja v predtransformačnom období: energetická infraštruktúra. In FALTAN, Ľubomír (editor) - STRBAVA, J. (editor). Regionálna diferenciácia Slovenska v podkladových štúdiách : regionálna diferenciácia, regionálny rozvoj v Slovenskej republike v kontexte integračných dosahov. - Bratislava : Sociologicky ústav SAV, 2006. ISBN 80-855-44-38, s. 451-475.

SZÖLLÖS, J. (2006b): Analýza vývoja energetickej infraštruktúry a dopadov systémových zmien (po roku 1989) na regionálne disponibility: energetická infraštruktúra. In FALTAN, Ľubomír (editor) - STRBAVA, J. (editor). Regionálna diferenciácia Slovenska v podkladových štúdiách : regionálna diferenciácia, regionálny rozvoj v Slovenskej republike v kontexte integračných dosahov. - Bratislava : Sociologicky ústav SAV, 2006. ISBN 80-855-44-38, s. 785-811.

TAUŠ, P., RYBÁR, R., KUDELAS, D., KUZEVIČ, Š., DOMARACKÝ, D. (2005): Potenciál obnoviteľných zdrojov energie na Slovensku z hľadiska výroby elektrickej energie. ATTP journal, 3/2005, 52 – 55 s.

TURRENT, D., BAKER, N. (1983): Solar Thermal Energy in Europe, D. Reidel Publishing Company, London

ZELENKA, A., CZEPLAK, G., D'AGOSTINO, V., JOSEFSON, W., MAXWELL, E., PEREZ, R. (1992): Techniques for Supplementing Solar Radiation Network Data, Technical Report, International Energy Agency, IEA-SHCP-9D-1, Swiss Meteorological Institute, Switzerland.

Nariadenie vlády SR č. 124/2005, ktorým sa ustanovujú pravidlá pre fungovanie trhu s elektrinou

Smernica č. 2001/77/ES o podpore elektrickej energie vyrábanej z obnoviteľných zdrojov energie na vnútornom trhu s elektrickou energiou

Smernica č. 2002/91/ES o energetickej efektívnosti budov

Strategický dokument COM/2007/723 Európsky strategický plán energetickej politiky

Zákon 656/2004 Z.z. o energetike a o zmene niektorých zákonov

www.ozeport.sk (navštívené 9.1.2009)

www.setri.sk (navštívené 9.1.2009)

GEOGRAFIA A ENERGETICKÉ VYUŽITIE SLNEČNÉHO ŽIARENIA

Zhrnutie

Energetické využívanie slnečného žiarenia je v súčasnosti témou, ktorej sa venuje čoraz väčšia pozornosť. Keďže výskum využívania slnečnej energie a jej priamej aplikácie v krajine je značne komplikovaný a má interdisciplinárny charakter, je nevyhnutné, aby jednotlivé vedy participovali a sústreďovali svoju pozornosť práve na tie aspekty výskumu, na ktoré majú orientovanú svoju metodológiu.

Cieľom práce bolo poukázať na prístupy k využívaniu slnečného žiarenia v krajine pre energetické účely, ako aj hľadať možností uplatnenia geografie pri výskume energetického využívania slnečného žiarenia z energetického aspektu.

Podľa prístupu k skúmaniu slnečného žiarenia z aspektu jeho energetického využívania by sme vedné disciplíny mohli začleniť do troch skupín. Prvou skupinou sú prírodné vedy, ktoré sa zaoberajú predovšetkým fyzikálnou podstatou slnečného žiarenia, jeho vznikom, šírením v medziplanetárnom a atmosférickom prostredí, zákonitosťami časovej diferenciácie jeho distribúcie a pod., ako aj matematickým vyjadrením týchto zákonitostí a vzťahov. Osobitú skupinu prírodných vied tvoria geoekológia a environmentalistika.

Druhú skupinu tvoria technické vedy ako informatika, architektúra, stavebníctvo, energetika a elektrotechnika. Tieto vedy sa venujú slnečnému žiareniu z hľadiska energetického režimu budov (architektúra, stavebníctvo), ako aj vývoju technológií schopných čo najefektívnejšie premeniť slnečné žiarenie na vhodnú formu energie a využiť ju (energetika, elektrotechnika). Informatika je veľmi úzko prepojená z geoinformatikou, ktorá využíva GIS na analýzu, modelovanie a vizualizáciu atribútov relevantných pre diskutovanú tému.

Aj spoločenské vedy sa uplatňujú pri energetickom využívaní slnečného žiarenia prostredníctvom ekonómie, marketingu, sociológie, urbanistiky, demografie a práva. Ekonómia analyzuje rentabilnosť a ekonomickú návratnosť inštalovaných systémov, marketing a sociológia sa podieľajú predovšetkým na skúmaní správania sa obyvateľstva a pozitívnej percepcie potenciálnych solárnych aplikácií. Otázky negatívneho vnímania inštalácií môžu v niektorých regiónoch tvoriť až bariéru pre samotnú inštaláciu slnečných systémov (syndróm NIMBY). Oblasť práva napomáha vytvárať priaznivé legislatívne zázemia.

Uplatnenie geografie pri energetickom využívaní slnečného žiarenia sa realizuje predovšetkým vo vytváraní časopriestorových analýz atribútov, od ktorých závisí aplikácia slnečných systémov. Navyše, samotná geografia stojí v prieniku prírodných, technických a spoločenských vied. Jej objekt štúdia je orientovaný komplexne na krajinu vrátane socioekonomických aktivít obyvateľstva, a preto môže využiť celú paletu svojich výskumných metód pri energetickom využívaní slnečného žiarenia a komunikovať s ostatnými vedami participujúcimi na tomto výskume. Geografiu nechápeme ako nadradenú vedu, ale ako jednu z viacerých vyššie uvedených disciplín, ktoré sa podieľajú pri energetickom využívaní slnečného žiarenia.

Tento článok sa snaží hľadať odpovede na otázky, s ktorými sa stretáme na rôznych fórach a teda, akú pozíciu má geografia pri využívaní slnečného žiarenia pre energetické účely.

Recenzovali: Doc. Mgr. Jaroslav Hofierka, PhD.
Prof. RNDr. Eva Michaeli, PhD.

REGIONAL DISPARITIES IN PREŠOV REGION ACCORDING TO THE STRUCTURE OF INDUSTRY

Radoslav KLAMÁR[1], Martin ROSIČ[2]

***Abstract**: The article discusses regional disparities in Prešov Region in terms of the industrial production development, structure and tendency. The industrial structure evaluation was based on several indicators, such as gross output, intermediate consumption, value added, average number of employees, average monthly wage and labour productivity per employee, at the level of the County as a whole to recognize its importance within the regional structure of industry in Slovakia, as well as at the level of districts in terms of displaying the internal differentiation of the County and indicating developing regional disparities. In the conclusion, attention is drawn to the prospects of the Prešov County industrial development based on available industrial sites.*
***Key words**: regional development, regional disparities, structure of industry, industrial site, turnover from industrial activity, value added, labour productivity*

INTRODUCTION

After the social changes in Slovakia in 1989 the process of democratization was implemented, accompanied by transformation in the political, economic, social, cultural and environmental spheres. The necessary changes which occurred during this process and immediately accompanied it, were not exclusively positive. Deepening of regional disparities occurred as well as the concentration of social and economic problems, which becomes evident in the profiling of developed and undeveloped regions. Gajdoš (2001) states that regional disparities are the product of the influence of several indicators; they depend on the quality and developing availability of potentials, but also on different positions from which individual regions entered the transformation process.

Arising and, unfortunately, also deepening regional disparities are the result of factors from several economic areas. In this report we train our attention on the field of industrial structure and its internal differentiation within the regions of Prešov County. In order to understand the wider framework of the issue of industry in the observed area, we compare Prešov County with the other counties of Slovakia.

1 **RNDr. Radoslav Klamár, PhD.,**
Department of Geography and Regional Development, Faculty of Humanities and Natural Sciences, University of Prešov, ul. 17. novembra 1, 081 16 Prešov, e-mail: klamar@unipo.sk
2 **RNDr. Martin Rosič,**
Department of Geography and Regional Development, Faculty of Humanities and Natural Sciences, University of Prešov, ul. 17. novembra 1, 081 16 Prešov, e-mail: rosmat@post.sk

THE POSITION OF PREŠOV REGION IN THE INDUSTRIAL STRUCTURE OF SLOVAKIA

Industry will henceforward remain the driving force for the economic growth in the development of Slovakia up to the year 2013, together with that part of the sphere of services which is closely linked with industrial activities (transport, financial, business services). Vehicle production, machinery and devices production, electrical and optical equipment production and furniture-making intended for use in vehicle production, will achieve the highest growth dynamics in sales production from among all the industrial branches. The growth tendencies of industry will be accompanied by raising its technological level. As a result of these changes, the level of industrial demand for materials and energy consumption will decrease, while the dynamics of value added creation will markedly accelerate. The main driver of the improvement in the technological level of industry in Slovakia will be the engineering industry and within it the automotive industry. Industry in the regions of West Slovakia and Central Slovakia will record the highest dynamics of labour productivity from sales. For Eastern Slovakia and Prešov Region, their marginal position in terms of location as well as structure results from this disadvantage, which is and will become more evident in disparities compared to the other regions of Slovakia (MH SR, 2007).

The situation of the industrial production in Prešov Region as a whole and its proportion of the national industrial production can be evaluated by means of the total gross output, intermediate consumption and value added indicators. In terms of retrospective comparison for a relatively longer time period, the years 1998 and 2006 were chosen for comparison (Vošta, 2004).

Tab. 1: *Gross output, intermediate consumption and value added in the counties of Slovakia in 1998, 2006*

Region	Gross output (mil. Sk)				Itermediate consumption (mil. Sk)				Value added (mil. Sk)			
	1998	%	2006	%	1998	%	2006	%	1998	%	2006	%
Bratislavský	172 965	*27,1*	662 320	*41,6*	140 389	*28,2*	530 389	*42,6*	31 847	*22,8*	131 931	*37,7*
Trnavský	53 900	*8,5*	232 381	*14,6*	36 968	*7,4*	190 676	*15,3*	16 931	*12,1*	41 705	*11,9*
Trenčiansky	69 542	*10,9*	144 412	*9,1*	49 061	*9,9*	107 947	*8,7*	20 481	*14,7*	36 464	*10,4*
Nitriansky	56 570	*8,9*	86 541	*5,4*	42 223	*8,5*	65 352	*5,3*	14 347	*10,3*	21 188	*6,1*
Žilinský	65 627	*10,3*	123 454	*7,7*	52 516	*10,6*	94 551	*7,6*	13 111	*9,4*	28 902	*8,3*
Banskobystrický	59 416	*9,3*	85 483	*5,4*	42 998	*8,7*	63 386	*5,1*	16 418	*11,7*	22 096	*6,3*
Prešovský	**44 374**	***7,0***	**71 902**	***4,5***	**33 493**	***6,7***	**57 831**	***4,6***	**10 881**	***7,8***	**14 071**	***4,0***
Košický	115 186	*18,1*	187 463	*11,8*	99 424	*20,0*	134 040	*10,8*	15 762	*11,3*	53 423	*15,3*

Source: Ročenky priemyslu 2000, 2007. Štatistický úrad SR, Bratislava

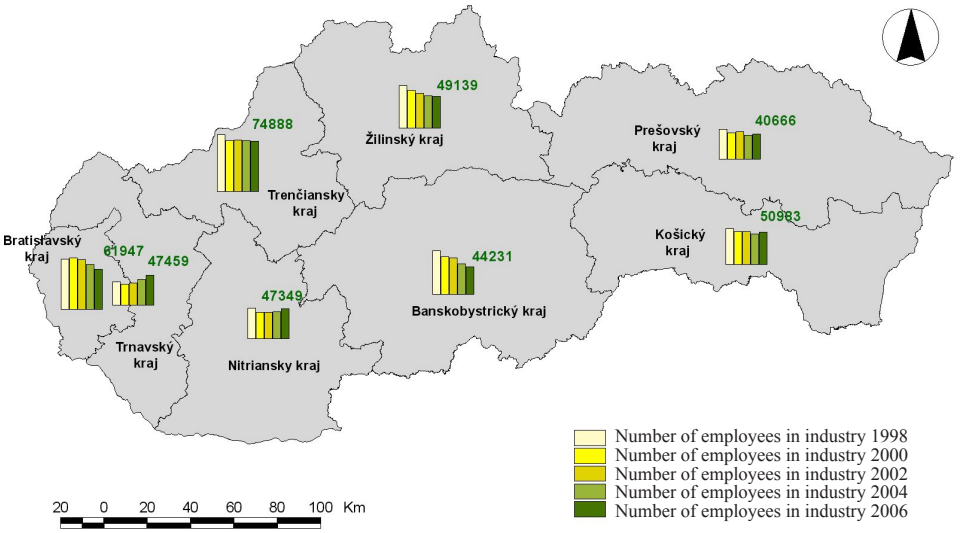
According to the absolute values of the total gross output, intermediate consumption and value added, Prešov Region occupies the last place in the inter-county comparisons in all the chosen indicators in 1998 as well as 2006. In addition, this proportion has markedly decreased in all the indicators (2.5% decrease in the gross output of Slovakia, 2.1% decrease in the intermediate consumption and 3.8% decrease in value added). This fact may be connected especially with the high increase in the evaluated indicators in

Bratislava and Trnava Region. As regards the individual indicators, in terms of absolute increase, this means 383% in gross output for Bratislava Region, 431% for Trnava Region, 250% for Slovakia as an average and only 162% for Prešov Region. It is similar for value added, where Bratislava County recorded an absolute increase by 414%, Trnava County by 246%, Slovakia as an average by 251% and Prešov Region only by 129%. In terms of industrial development, Prešov Region can be evaluated as a Region with lower than average dynamics of its efficiency increase.

The efficiency of Prešov Region, in comparison with the data for Slovakia, may be evaluated by means of the following analysis. The static situation of Prešov Region industry in 2006 was expressed by the mutual relations between gross output, intermediate consumption and value added. Out of each Slovak crown of produced gross output in Prešov Region, 0.804 SKK went on the intermediate consumption, and 0.196 SKK on value added. Prešov Region showed worse values than the average values of these indicators for Slovakia achieved in 2006, where out of each Slovak crown of produced gross output, 0.780 SKK went on the value consumption, and 0.220 SKK on value added. Comparison of the data about value added reveals that, in the observed period, the industrial efficiency of the Region decreased (value added decreased from 0.246 in 1998 to 0.196 in 2006), and moreover Prešov Region also fell behind the average values of efficiency adjusted to one county of Slovakia.

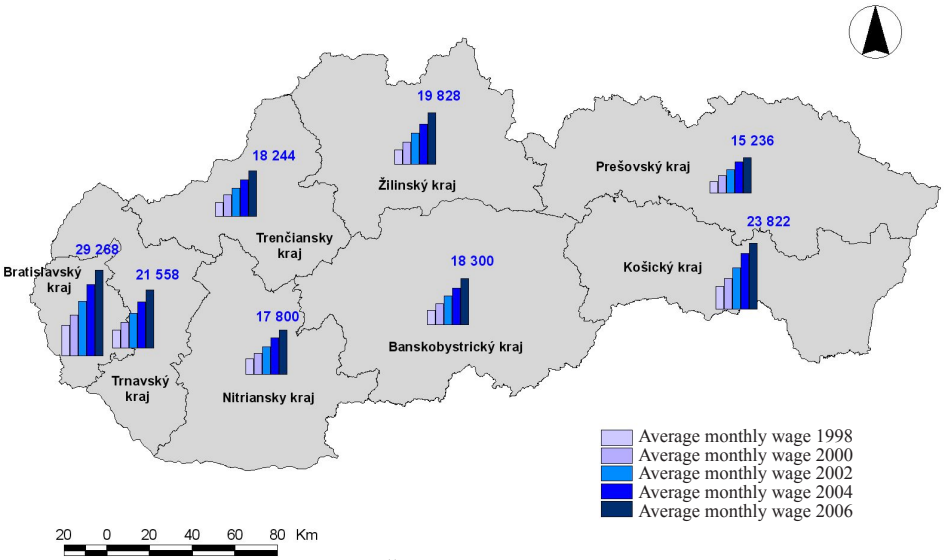
These basic indicators of industry are also more closely documented by other indicators such as average number of employees, average monthly wage, turnover from industrial activity and labour productivity per employee in industry. The enclosed maps document the situation in summary.

Map 1 *NUMBER OF EMPLOYEES IN INDUSTRY 1998 - 2006*



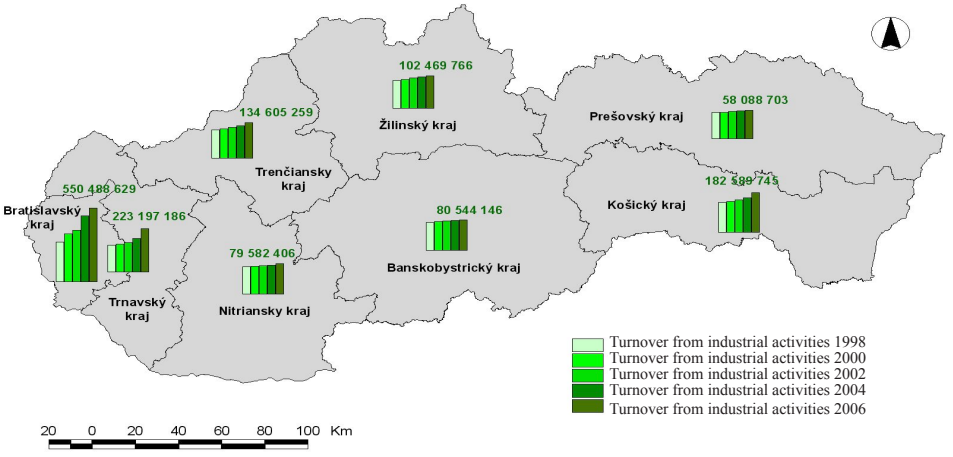
Source: Ročenky priemyslu 1999-2007. Štatistický úrad SR, Bratislava

Map 2 *AVERAGE MONTHLY WAGE (SKK) IN INDUSTRY 1998 - 2006*



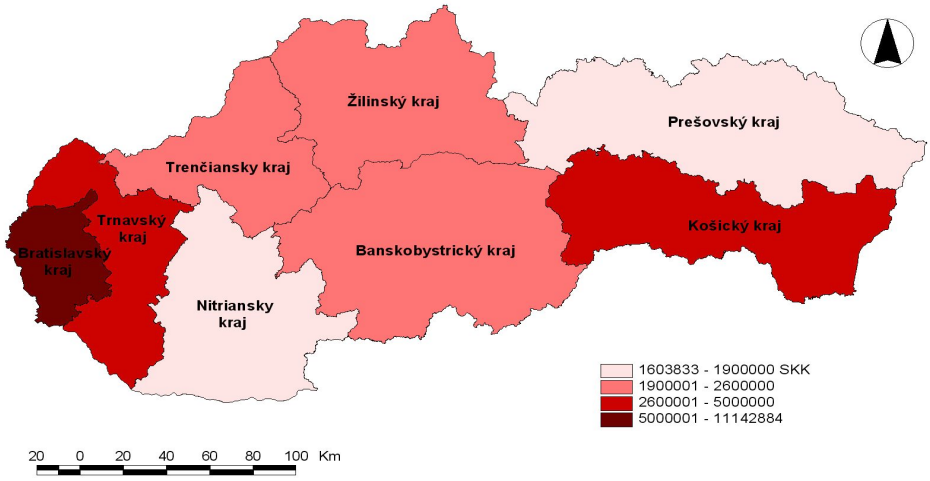
Source: Ročenky priemyslu 1999-2007. Štatistický úrad SR, Bratislava

Map 3 *TURNOVER (thousand SKK) FROM INDUSTRIAL ACTIVITIES 1998 - 2006*



Source: Ročenky priemyslu 1999-2007. Štatistický úrad SR, Bratislava

Map 4 *LABOUR PRODUCTIVITY (SKK) PER EMPLOYEE 2006*



Source: Ročenky priemyslu 1999-2007. Štatistický úrad SR, Bratislava

Tab. 2: *Indicators of industrial production in the Regions of Slovakia in 2006*

Region	Average number of employees	Average monthly wage	Labour productivity per employee	Turnover from industrial activities
Bratislavský	61 947	29 268	11 142	550 488
Trnavský	44 993	21 558	4 903	223 197
Trenčiansky	75 863	18 244	2 022	134 605
Nitriansky	47 349	17 800	1 894	79 582
Žilinský	49 139	19 828	2 550	102 469
Banskobystrický	44 231	18 300	2 027	80 544
Prešovský	**40 666**	**15 236**	**1 603**	**58 088**
Košický	50 983	23 822	3 927	167 599

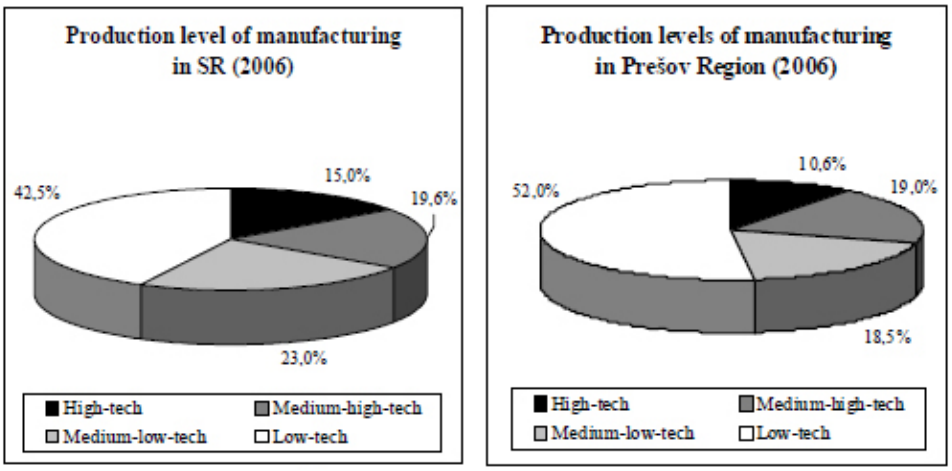
Source: Ročenka priemyslu 2007. Štatistický úrad SR, Bratislava

The data in the table and enclosed maps definitely confirm the above-mentioned facts about the weak position of Prešov Region in the industrial structure of the Slovak Republic. Despite the fact that the average monthly wage in industry in Prešov Region is lower almost by half than in Bratislava Region, there is almost 7 times lower labour productivity per employee, which is also proved by the turnover from industrial activity, which are almost 10 times higher in Bratislava Region. The degree of lagging behind other regions, such as Trnava and Košice Region, is considerable too (3 and 2.5 fold respectively).

All the mentioned indicators are, to a large extent, connected with the production level of manufacturing according to four basic qualitative degrees: High-technology (H-tech), Medium-high-technology (MH-tech), Medium-low-tech (ML-tech) and Low-tech

(L-tech). The average registered number of employees by individual branches of industry in the Slovak Republic and Prešov Region was used for the comparison.

Graphs 1, 2



Source: Ročenka priemyslu 2007. Štatistický úrad SR, Bratislava

Despite the fact that the share of H-tech production in Prešov Region increased by 1.5% in the years 1997-2006 and the share of L-tech decreased by 2.6%, the County´s lagging behind the average of the Slovak Republic is evident. The lag in H-tech is by 4.4% and the share of the Region in L-tech is 7.5% higher, which can be connected with the higher proportion of textile and food production with lower added value.

It is evident from the mentioned set of chosen indicators that Prešov Region represents a marginal area in terms of the industrial structure of the Slovak Republic. In addition, this lag is even deepening as the new strategic foreign investments are placed into already developed regions in the western part of the Slovak Republic. These aspects are negatively accompanied by the unfinished traffic infrastructure (motorway network) and thereby problematic accessibility, as well as the beginning economic recession accompanied by partial production decrease as well as notified redundancy.

INDUSTRIAL STRUCTURE OF PREŠOV REGION

Despite the fact that Prešov Region belongs among the weakest regions concerning the industry of the Slovak Republic, its industrial production at the level of districts is markedly differentiated. The strongest industrial companies are concentrated in the three districts of Poprad, Prešov and Humenné, which, by their industrial production, dominate highly over the other districts of Prešov Region in all the evaluated indicators. However, the importance of these companies on the national scale, compared to the strongest industrial entities, is negligible. None of the industrial companies from Prešov Region has achieved a position in the TOP 50 industrial companies of Slovakia.

Tab. 3: *The biggest industrial companies in Prešov Region in 2006, 2007*

No.	Industrial companies	Industry	Turnover (thousand SKK)		Value added (thousand SKK)		Number of employees	
			2007	2006	2007	2006	2007	2006
1.	Tatravagónka, a.s., Poprad	DK	4 012 897	2 672 253	820 750	458 866	1 510	1 421
2.	Kronospan SK, s.r.o., Prešov	DD	3 511 814	3 906 389	554 727	n	958	389
3.	Chemosvit, a s., Svit	DG	2 730 875	4 875 734	389 869	1 290 465	935	2 798
4.	Nexis Fibers, a.s., Humenné	DG	2 716 240	3 368 097	n	438 001	437	452
5.	Mecom, a.s., Humenné	DA	2 374 625	2 445 864	n	n	n	n
6.	Nylstar Slovakia, a.s., Humenné*	DG	n	3 169 847	n	415 710	n	649
7.	Tatranská mliekáreň, a.s., Kežmarok	DA	1 722 899	1 398 094	183 389	140 703	n	216
8.	Bukocel, a.s., Hencovce	DD	1 509 639	1 597 198	187 198	238 116	586	605
9.	Terichem, a.s., Svit	DG	1 490 597	1 548 810	105 289	123 561	182	178
10.	Sanas, a.s., Sabinov	DD	1 259 156	982 407	317 295	271 541	n	n
11.	Chemes, a.s., Humenné	E	1 146 621	1 186 148	319 022	293 007	447	450
12.	Tesla Stropkov, a.s., Stropkov	DL	778 882	551 326	277 366	262 545	n	n
13.	VSK, s.r.o., Humenné	DB	742 753	746 068	116 618	97 320	n	n
14.	Tatramat-ohrievače vody, s.r.o., Poprad	DK	706 482	553 921	179 367	119 841	434	380
15.	Tomark, s.r.o., Prešov	DK	690 802	590 635	166 820	80 407	243	182
16.	Baliarne obchodu, a.s., Poprad	DA	641 771	628 674	186 400	199 898	n	n
17.	Podtatranská vod. spoloč. a.s., Poprad	E	596 724	599 443	233 460	227 978	575	n
18.	Llemi Slovakia, s.r.o., Žalobín	DJ	581 866	604 203	173 601	164 561	n	n
19.	Schűle Slovakia, s.r.o., Poprad	DK	562 499	507 858	121 077	123 374	332	300
20.	Tytex Slovakia, s r.o., Humenné	DB	550 333	552 976	227 014	249 521	315	279

Source: Trend TOP 2008, 2007, * - Nylstar Slovakia v konkurze, n – date is not available

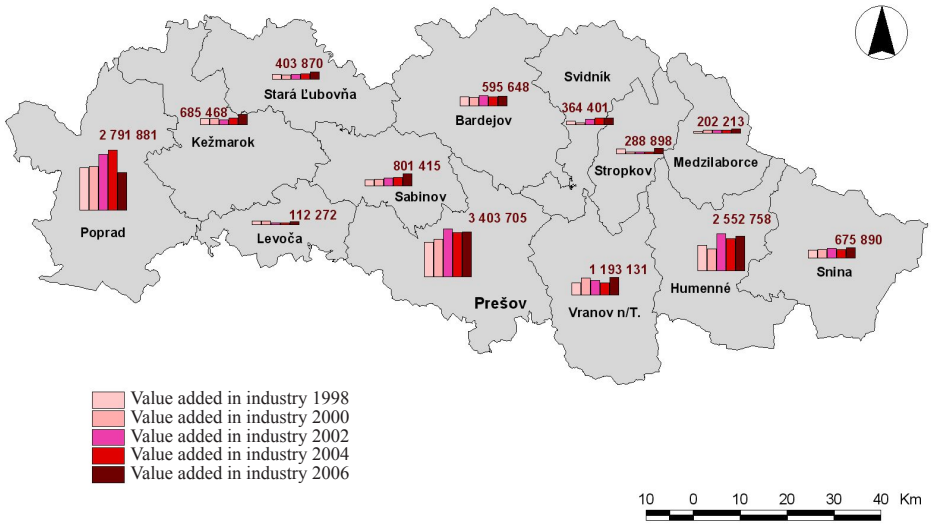
The Poprad, Prešov and Humenné Districts contribute to a considerable extent to the gross output (75.0%) and value added (62.2%) of the whole county.

Tab. 4: *Gross output, intermediate consumption and value added in the districts of Prešov Region in 1998, 2006*

Districts	Gross output (mil. SKK)				Intermediate consumption (mil. SKK)				Value added (mil. SKK)			
	1998	%	2006	%	1998	%	2006	%	1998	%	2006	%
Prešov	**7 414**	***16,7***	**13 136**	***18,3***	**4 836**	***14,4***	**9 733**	***16,8***	**2 578**	***23,7***	**3 403**	***24,2***
Bardejov	1 688	*3,8*	1 983	*2,8*	1 132	*3,4*	1 387	*2,4*	556	*5,1*	595	*4,2*
Humenné	**7 851**	***17,7***	**13 415**	***18,7***	**5 976**	***17,8***	**10 862**	***18,8***	**1 874**	***17,2***	**2 552**	***18,1***
Kežmarok	1 397	*3,1*	3 317	*4,6*	1 051	*3,1*	2 631	*4,6*	345	*3,2*	685	*4,9*
Levoča	617	*1,4*	321	*0,4*	456	*1,4*	209	*0,4*	161	*1,5*	112	*0,8*
Medzilaborce	147	*0,3*	548	*0,8*	107	*0,3*	346	*0,6*	39	*0,4*	202	*1,4*
Poprad	**17 960**	***40,5***	**27 391**	***38,1***	**14 799**	***44,2***	**24 599**	***42,5***	**3 160**	***29,1***	**2 791**	***19,8***
Sabinov	908	*2,0*	2 501	*3,5*	595	*1,8*	1 700	*2,9*	312	*2,9*	801	*5,7*
Snina	1 512	*3,4*	1 586	*2,2*	1 038	*3,1*	910	*1,6*	473	*4,3*	675	*4,8*
Stará Ľubovňa	919	*2,1*	1 916	*2,7*	687	*2,1*	1 512	*2,6*	232	*2,1*	403	*2,9*
Stropkov	549	*1,2*	645	*0,9*	325	*1,0*	356	*0,6*	223	*2,1*	288	*2,0*
Svidník	278	*0,6*	953	*1,3*	126	*0,4*	588	*1,0*	151	*1,4*	364	*2,6*
Vranov n/T.	3 128	*7,1*	4 184	*5,8*	2 358	*7,0*	2 991	*5,2*	770	*7,1*	1 193	*8,5*

Source: Ročenka priemyslu 2007. Štatistický úrad SR, Bratislava

Map 5 *VALUE ADDED (thousand SKK) IN INDUSTRY 1998 - 2006*



Source: Ročenky priemyslu 1999-2007. Štatistický úrad SR, Bratislava

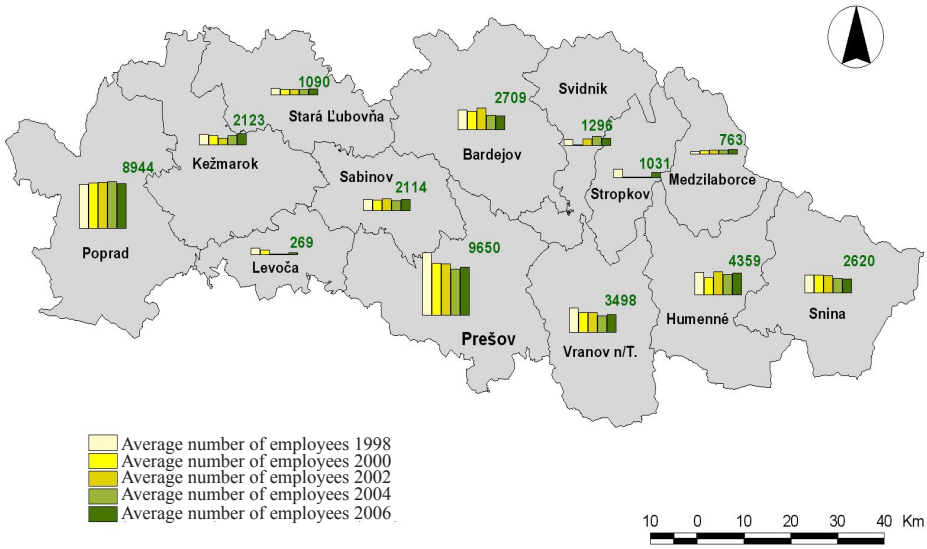
The Poprad, Prešov and Humenné Districts also have a dominant position in other indicators of industrial production, such as average number of employees in industry, turnover from industrial activity, labour productivity per employee in industry and average monthly wage in industry.

Tab. 5: *Average number of employees and turnover from industrial activities in the districts of Prešov Region in 1998, 2006*

Districts	Average number of employees						Turnover from industrial activities (thousand SKK)					
	1998	%	2002	%	2006	%	1998	%	2002	%	2006	%
Prešov	**12 518**	***26,3***	**10 315**	***24,7***	**9 650**	***23,8***	**6 773 843**	***19,0***	**10 779 350**	***23,7***	**13 848 071**	***23,8***
Bardejov	3 820	*8,0*	3 389	*8,1*	2 709	*6,7*	1 365 002	*3,8*	1 715 862	*3,8*	1 833 021	*3,2*
Humenné	**4 497**	***9,4***	**4 432**	***10,6***	**4 359**	***10,8***	**7 155 092**	***20,1***	**10 679 887**	***23,5***	**12 370 040**	***21,3***
Kežmarok	2 039	*4,3*	1 654	*4,0*	2 123	*5,2*	1 568 296	*4,4*	1 270 238	*2,8*	3 217 205	*5,5*
Levoča	1 096	*2,3*	-	-	269	*0,7*	416 242	*1,2*	-	-	134 527	*0,2*
Medzilaborce	397	*0,8*	700	*1,7*	763	*1,9*	125 170	*0,4*	432 820	*1,0*	539 752	*0,9*
Poprad	**8 772**	***18,4***	**9 504**	***22,7***	**8 944**	***22,1***	**11 635 928**	***32,7***	**13 014 267**	***28,6***	**15 513 749**	***26,7***
Sabinov	2 107	*4,4*	2 490	*6,0*	2 114	*5,2*	842 482	*2,4*	1 351 519	*3,0*	2 450 728	*4,2*
Snina	3 461	*7,3*	3 412	*8,2*	2 620	*6,5*	1 224 117	*3,4*	1 459 428	*3,2*	1 543 510	*2,7*
Stará Ľubovňa	1 310	*2,8*	868	*2,1*	1 090	*2,7*	756 853	*2,1*	840 862	*1,8*	1 749 184	*3,0*
Stropkov	1 668	*3,5*	-	-	1 031	*2,5*	544 084	*1,5*	-	-	566 051	*1,0*
Svidník	1 080	*2,3*	1 148	*2,7*	1 296	*3,2*	230 586	*0,6*	560 710	*1,2*	746 626	*1,3*
Vranov n/T.	4 831	*10,2*	3 900	*9,3*	3 498	*8,6*	2 977 136	*8,4*	3 402 128	*7,5*	3 576 239	*6,2*

Source: Ročenky priemyslu 1999-2007. Štatistický úrad SR, Bratislava

Map 6 *AVERAGE NUMBER OF EMPLOYEES 1998 - 2006*

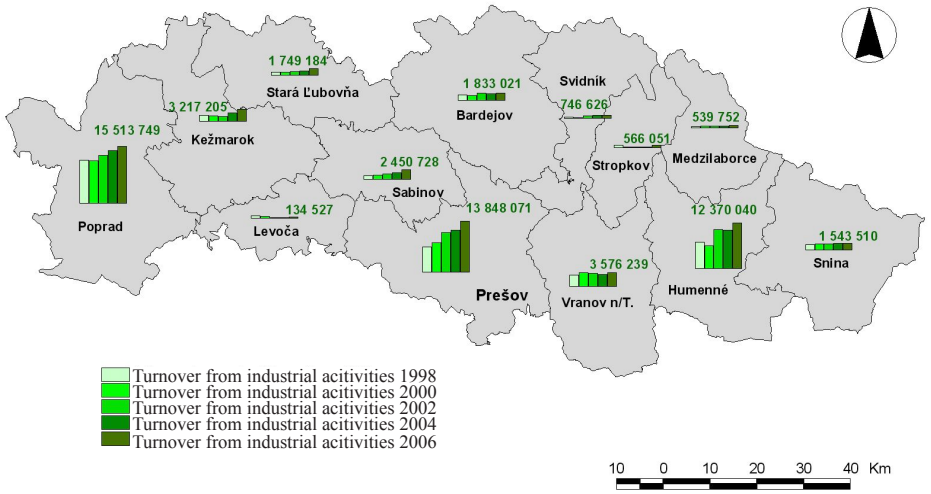


Source: Ročenky priemyslu 1999-2007. Štatistický úrad SR, Bratislava

In terms of the average number of employees, the Prešov and Poprad Districts have a crucial position. The number decreased quite rapidly by 2868 (23%) in Prešov between 1998 and 2006, and reached the level of Poprad (about 9 000). In turnover from industrial activity, the Prešov District lags behind Poprad District and is just a little stronger than Humenné District, where the average number of employees in industry is not even half as large as in Prešov. This fact is markedly reflected in the labour productivity per employee in industry, where Humenné District also clearly stands out above Poprad and Prešov Districts and is approaching the average of the Slovak Republic (3 948 869 SKK), the value of which is "pulled" by Bratislava, Trnava and Košice Region. The average monthly wage in industry is more balanced, whereby the highest values are in Poprad District (18 648 SKK) and Humenné District (16 939 SKK). From this point of view, the chemical, rubber and machinery industries are the major ones in Poprad, and chemicals and metals production are major in Humenné. Prešov District lags slightly behind (15 659 SKK) in metals production, vehicle production, clothing and food industries.

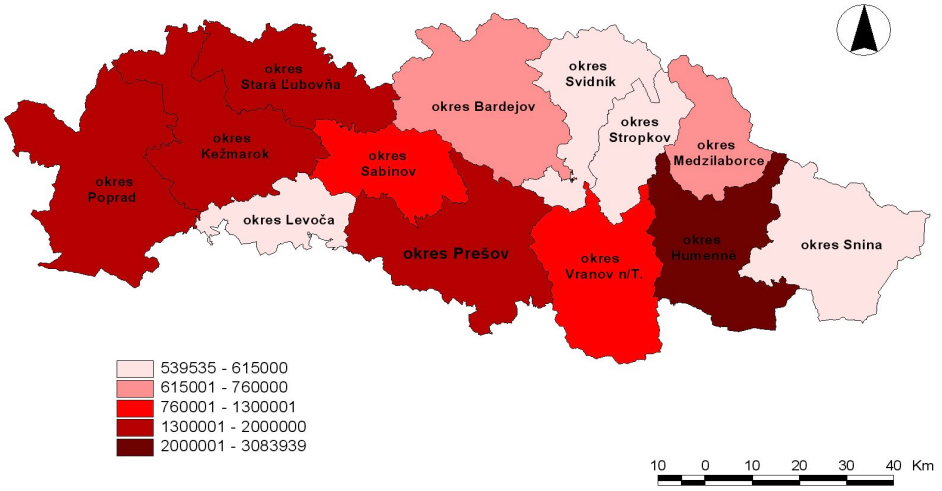
The mentioned facts are further documented by the maps showing the development of turnover from industrial activities, labour productivity per employee in industry, and the average monthly wage in industry in Prešov Region.

Map 7 *TURNOVER (thousand SKK) FROM INDUSTRIAL ACTIVITIES 1998 - 2006*



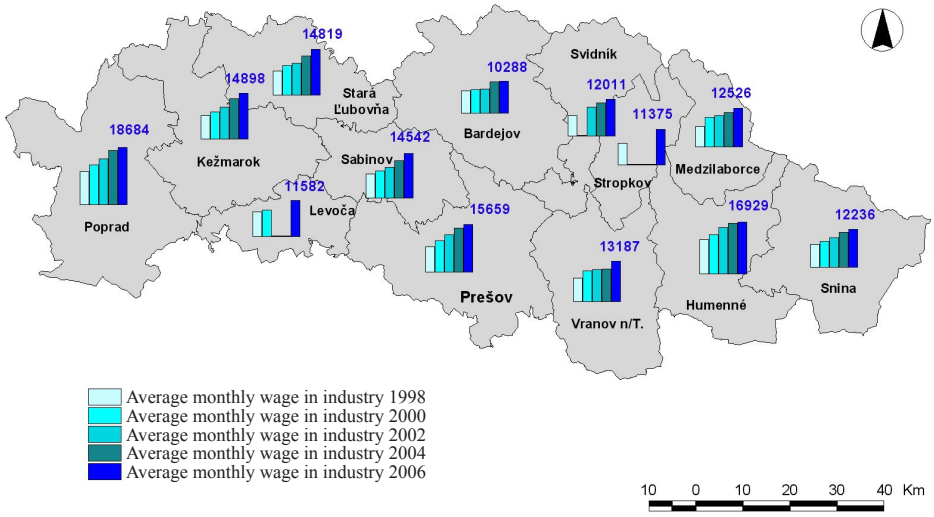
Source: Ročenky priemyslu 1999-2007. Štatistický úrad SR, Bratislava

Map 8 *LABOUR PRODUCTIVITY (SKK) PER EMPLOYEE 2006*



Source: Ročenky priemyslu 1999-2007. Štatistický úrad SR, Bratislava

Map 9 *AVERAGE MONTHLY WAGE (SKK) IN INDUSTRY 1998 - 2006*



Source: Ročenky priemyslu 1999-2007. Štatistický úrad SR, Bratislava

Tab. 5: *Labour productivity and average monthly wage in the Prešov Region districts in 1998 - 2006*

Názov okresu	Labour productivity (SKK)			Average monthly wage (SKK)		
	1998	2002	2006	1998	2002	2006
Prešov	**541 128**	**1 262 514**	**1 719 378**	**8 211**	**12 158**	**15 659**
Bardejov	357 330	421 035	758 536	7 200	7 708	10 288
Humenné	**1 591 081**	**2 494 208**	**3 083 939**	**11 105**	**15 075**	**16 929**
Kežmarok	769 150	1 313 206	1 653 939	7 420	10 267	14 898
Levoča	379 783	-	539 535	7 905	-	11 582
Medzilaborce	315 209	596 752	716 007	6 520	10 013	12 526
Poprad	**1 326 485**	**1 530 727**	**1 924 732**	**10 793**	**14 961**	**18 684**
Sabinov	399 849	618 584	1 269 716	7 741	9 927	14 543
Snina	356 781	551 265	611 506	7 358	9 619	12 236
Stará Ľubovňa	577 750	857 418	1 764 550	7 793	10 329	14 819
Stropkov	326 189	-	563 971	6 883	-	11 375
Svidník	213 506	472 622	584 317	6 486	9 288	12 011
Vranov n/T.	616 257	943 291	1 099 190	7 637	10 415	13 187

Source: Ročenky priemyslu 1999-2007. Štatistický úrad SR, Bratislava

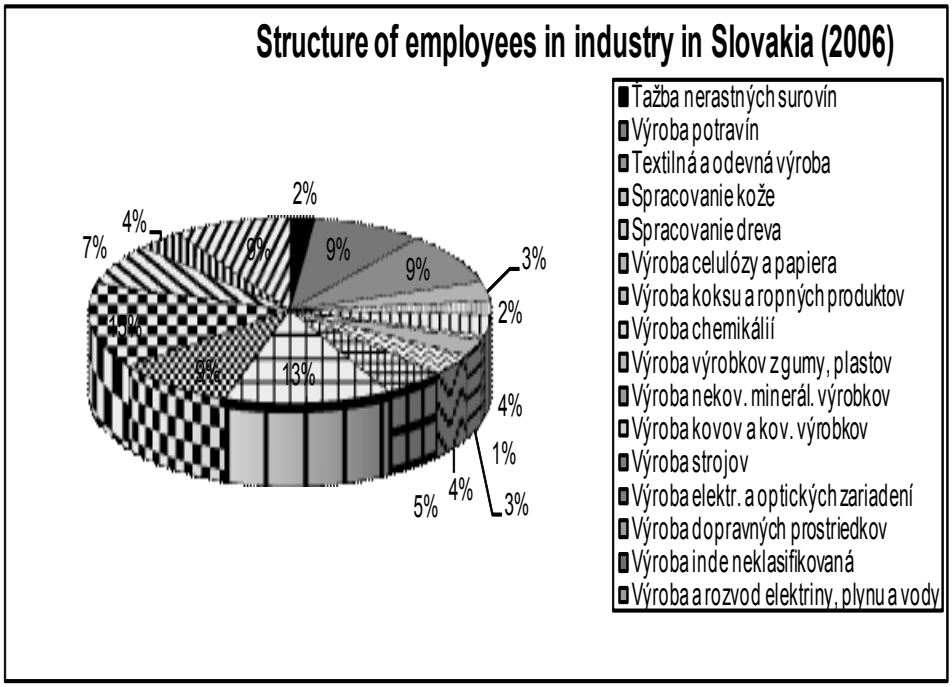
In contrast, among the weakest districts are the Levoča, Stropkov, Svidník and Medzilaborce Districts. Out of this weakest four, there promises to be a better future only in Levoča, which is situated in one of the main development zones of the region Slovakia – East, namely Poprad – Spišská Nová Ves, as well as in the immediate vicinity of the projected highway D1. The other three districts together with Bardejov, Snina and Stará Ľubovňa suffer mainly from bad traffic accessibility, peripheral frontier location and bankruptcy of the supporting industrial companies without acquiring necessary (mainly

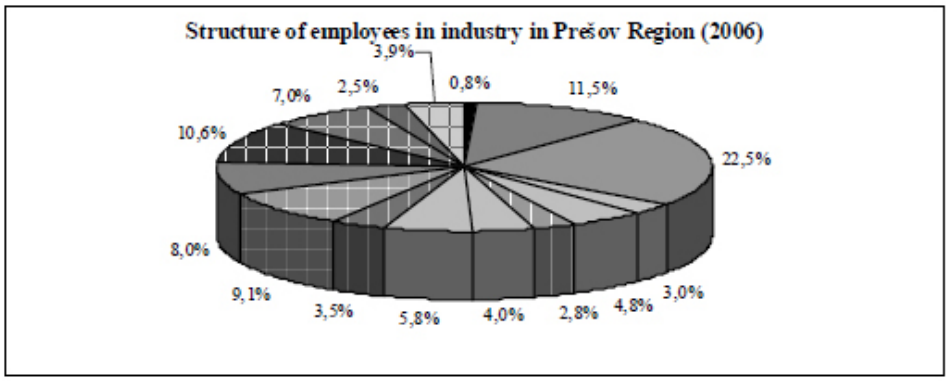
foreign) investments. We can crudely divide Prešov Region into "rich South" and "poor North".

THE STRUCTURE OF INDUSTRY

The structure of industry may be expressed by one of the statistically most observed indicators, namely the share of the individual branches of industry, by the average number of employess, on the total employment in industry. For comparison, Prešov Region and the Slovak Republic as a whole were evaluated.

Graphs 3, 4





Source: Ročenka priemyslu 2007. Štatistický úrad SR, Bratislava

C Ťažba nerastných surovín – Mineral resources extraction
DA Výroba potravín – Manufacture of food products and beverages
DB Textilná a odevná výroba – Manufacture of textiles and wearing apparel
DC Spracovanie kože – Tanning and dressing of leather
DD Spracovanie dreva – Manufacture of wood and of products of wood
DE Výroba celulózy a papiera – Manufacture of pulp, paper and paper products
DF Výroba koksu a ropných produktov – Manufacture of coke, refined petroleum products
DG Výroba chemikálií – Manufacture of chemicals and chemical products
DH Výroba výrobkov z gumy, plastov – Manufacture of rubber and plastic products
DI Výroba nekovových minerálnych výrobkov – Manufacture of other non-metallic mineral products
DJ Výroba kovov a kovových výrobkov – Manufacture of basic metals and metal products
DK Výroba strojov – Production of machinery and equipment
DL Výroba elektrických a optických zariadení – Manufacture of electrical and optical equipment
DM Výroba dopravných prostriedkov – Manufacture of motor vehicles, trailers and semi-trailers
DN Výroba inde neklasifikovaná – Production not classified elsewhere
E Výroba a rozvod elektriny, plynu a vody – Electricity, gas and hot water production and distribution

From both of the graphs shown, it is possible to deduce the following conclusions: Prešov Region is typical of a higher proportion of employment in the textile and food industries. Both these branches of industry rank as so-called Low-tech production, that is production of low value added, the proportion of which is almost 52% within Prešov Region and is higher by almost 10% than for the Slovak Republic. In contrast, a lower proportion of higher value added manufacturing, like for example production of electrical and optical equipment (4.6% less compared to the Slovak Republic), manufacture of metals and metal products (3.9% less) and electricity, gas and water production and distribution (5.1% less), is recorded in the Region. Such disadvantageous structure of industrial branches is consequently negatively reflected in the industry turnover, value added, labour productivity, average monthly wage, investments and innovations, which all results in the general lagging behind and low competitiveness of the Prešov Region industrial production.

EXTRACTIVE INDUSTRY, MINING

There are 337 employees working in extractive industry in Prešov Region. The average monthly wage is at the level of 19 984 SKK. Mineral resources extraction is carried out mainly in the Prešov, Poprad and Levoča Districts. The **Solivary, a.s., Prešov** company, which focuses its activities on producing, adjusting, refining and selling of white salt to the salt-based chemicals, cosmetics and food industries, is the biggest company in this branch. The company showed turnover amounting to 327 million SKK in 2007.

MANUFACTURE OF FOOD PRODUCTS AND BEVERAGES

A total of 4 668 employees work in the food industry in the Region, whereby the average monthly wage remains at the level of 16 704 SKK. The food industry is characterized in general by a relatively regular distribution in the area.

The **Tatranská mliekareň, a.s., Kežmarok** company with a total of 216 employees belongs among the biggest food companies in the Region according to the achieved

turnover amounting to 1.72 billion SKK. It focuses on the production of dairy products (milk, yoghurts, butter, curd, cheeses, gastro products). The company has carried out the reconstruction of the existing premises and the addition of new ones. The production of blue-mould cheese in the reconstructed premises, and the production of white-mould cheese in the additional building has been preserved. The total investment represented 175 million SKK and created 57 new work places.

The second company is the **Podtatranská hydina, a.s., Kežmarok** company producing chilled and frozen poultry, whole and portioned, poultry intestines, processed butcher chickens, hens and game, and poultry meat products.

In the neighbouring Poprad District there are located the Baliarne obchodu, a.s. and Pivovar Pilsberg, s.r.o. companies. The **Baliarne obchodu, a.s., Poprad** company focuses on coffee production under the name Popradská káva, on black, fruit, green and herbal tea and other seasoning additives production. The company showed turnover amounting to 641 million SKK with 240 employees. The **Pivovar Pilsberg, s.r.o.** company (100 employees) produces beer and malt, non-alcoholic barrelled beverages and non-alcoholic bottled beverages. The exports head to Poland, Hungary, Ukraine, Austria, Canada and the USA. The **Tatracon, s.r.o., Poprad** company with turnover amounting to 244 million SKK and 157 employees is also an important company. In the village of Baldovce in Levoča District, there is the **Minerálne vody, a.s., Baldovce** food company, which draws and bottles natural weak mineralized, calcium-magnesium acidulous water. The mineral waters named Baldovská, Drobček, Salvator and Savior are among its products.

From among the districts of Slovakia, the Prešov District especially is known for its food industry, and several such companies are situated here. The **Šarišské pekárne a cukrárne, a.s., Prešov** focusing on baking and confectionery production, frozen baking products and oven-ready goods production. There are 400 employees here and turnover are at the level of 344 million SKK. The Pivovar, a.s., Šariš and Fragopolis, a.s., Prešov companies are focused on alcoholic beverages production. The **Pivovar, a.s., Šariš** is a part of the biggest brewing company in the world SABMiller from the Republic of South Africa. It employs about 550 employees and produces 1.2 million hectolitres of beer per year. **Fragopolis, a.s., Prešov** employs 148 employees and focuses on alcoholic beverages production. Among other companies in Prešov are **Milk Agro, s.r.o., Prešov** with the production and sale of food products (milk powder, yoghurts, sour milk products, curd, creams and cheeses) in 35 SABI shops; **Mraziarne, a.s., Prešov** with the production and delivery of frozen food products, production of prepared meals andoven-ready goods, and processing and purchase of fruits and vegetables, and **Hydina Prešov – SZV, s.r.o., Prešov** (200 employees) focused on poultry reproduction, incubation and rearing.

The **Mecom, a.s., Humenné** company focuses on the production of meat and soft meat products, roasted meat products, raw salted meat, ham, bacon and cooked meat products. The company employs 557 employees and its annual turnover are at the level of 2.37 billion SKK. Mecom Trade, s.r.o., Mecom Bohemia, s.r.o. and Mecom Hungaria KFT also belong to the Mecom parent company. In the near future Danish capital is likely to come into the company. Other companies in Humenné are **Podvihorlatské pekárne a cukrárne, a.s., Humenné** (268 employees) with the production of bread, fresh baking and confectionery products and cakes, and **Humenská mliekáreň, a.s., Humenné** (203 employees) with milk and milk products processing. The **AGRIFOP, a.s., Stakčín** company is located

in Stakčín in Snina District. The company was formed from the agricultural production plants in Stakčín and Dlhé n/C. with basic agricultural processing, with Agriol oil, Mero bio-oil and forage mixtures production, and industrial production of the packaging material Flexikord, Anpela 5130 and Stakor, paper tubes and paper honeycombed ply-boards.

MANUFACTURE OF TEXTILES AND WEARING APPAREL

Textile and clothing production in Prešov Region represents the industrial branch with the largest number of employees (9 149), but the average monthly wage is only at the level of 10 945 SKK. Textile production together with food production belong in the group of so-called Low technology, that is the lowest producing level of industrial production. This industrial branch is concentrated mainly in Humenné, Prešov and Poprad Districts.

In the Chemes industrial park in Humenné are located the three strongest companies of this industry (VSK, Tytex and Twista). **VSK, s.r.o., Humenné** is a company with foreign capital from Italy focusing on pantyhose material production and sales. According to the year-end statements, its revenues represented 746 million SKK in 2006. **Tytex Slovakia, s.r.o., Humenné** with Danish capital is another textiles company. It produced turnover amounting to 550 million SKK with total of 315 employees. It focuses its production on special textile products for health purposes. The trinity is completed with **Twista s.r.o., Humenné** with annual turnover at the level of 435 million SKK, employing 120 employees. There is foreign (Italian) capital in the company - MarioBoselli Yarns from Milan, Siemest S.P.A. from Rome and Nylstar. The production is focused on fibre forming and cotton fibre spinning. The company has announced the extension of production by another 250 working places and investments into machine equipment valued at 300 million SKK. **Zekon, a.s., Michalovce – Humenné plant** (610 employees) focusing its production on denim working and walking-out ready-made clothing, is a smaller company in the town. Unlike the aforementioned companies, it cannot hold onto a foreign investor or its own trade-mark.

In the town of Svit in Poprad District there is another significant textile producer, **Tatrasvit Svit-Socks, a.s., Svit**, which employs 941 employees. The production in the company focuses on socks, knee-socks and tights production. Its revenues represented 391 million SKK, whereby it produced 19 million pairs of socks and 600 000 tights for children. Over 80% of its production heads to the countries of the European Union and mainly to Germany (cooperation with customers such as Falke, Kumert or Rogo). The **Tatraľan, s.r.o., Kežmarok** company produces soft furnishings, technical textiles, geotextiles and fabrics for clothing purposes, and operates in the neighbouring Kežmarok District. It is a subsidiary corporation of the Svitap J.H.J. spol. s.r.o., Svitavy company from the Czech Republic. Its annual turnover are at the level of 150 million SKK.

Several, mainly clothing companies operate in Prešov District. **OZKN, s.r.o., Prešov**, which employs 676 people, ranks among the most significant. These employees devote themselves to sewing custom-made garments. This concerns mainly high quality men´s suits, jackets, trousers, waist-coats and coats. The company cooperates with partners from Spain, France, Germany and Austria. **Gemor Fashion, s.r.o., Prešov** (185 employees) with Dutch capital (Manderley Fashion) focuses on the production of woollen and cotton men´s coats, La Coste designer clothes, uniforms for Dutch and Swiss policemen and German postmen. The exports head to the Netherlands, Austria, Germany and Switzerland.

Ozex, s.r.o., Prešov (185 employees, turnover worth 232 million SKK) is another Prešov company producing women´s and men´s clothing, out of which more than 90% heads to Western Europe. **Vzorodev, v.d., Prešov** (about 500 employees) focuses on the production of men´s and women´s walking-out clothing and the light and heavy off-the-peg clothing production. **Stomex, s.r.o., Ľubotice** (revenues worth 138 million SKK) producing working clothes and personal protective work aids, is situated on the outskirts of Prešov.

Odeva, s.r.o., Lipany (650 employees), focusing on a wide assortment of outer clothing (suits, dinner-jackets, jackets, trousers, waistcoats, skirts, costumes, wind-cheaters and coats) operates in the neighbouring Sabinov District. It occasionally also sews uniforms for army, police, customs officers and other organizations. It also offers small-lot and made-to-measure production. The tradition of clothing production is represented mainly by **Svik, s.r.o., Svidník** with its men´s ready-made clothing production. The **M.I.S. Slovakia, s.r.o., Vranov nad Topľou** clothing company with annual turnover at the level of 129 million SKK operates in Vranov nad Topľou District.

TANNING AND DRESSING OF LEATHER

This industrial branch in Prešov Region employs 1240 people with an average monthly wage of 10 625 SKK, which is the lowest of all types of industry. The branch has been through a marked transformation during the last decade, but its strong position mainly in Bardejov and Snina Districts in the form of the former, nationally significant JAS company, is likely soon to be just history. The companies which arose in the area of the former JAS company have problems with sales, which has resulted in the number of employees decreasing. The **Obuv-Špeciál, s.r.o., Bardejov** company focusing on the production of welted, flexible and quilted footwear, the production of walking, working, sports, dancing and army footwear, with turnover at the level of 251 million SKK, operates in Bardejov. **JAS Export, a.s., Bardejov**, probably the most significant successor of the original JAS, with the production of shoes using direct injected sole and bonding technologies, is the second company from Bardejov. It has a branch in Snina, **JAS Export, s.r.o., Snina**, which employs 660 people and produces women´s, men´s and children´s footwear. It actively cooperates with foreign companies Uvex-Arbeitschutz and GmbH Furth.

MANUFACTURE OF WOOD AND OF PRODUCTS OF WOOD

There are 3 127 employees altogether with the average monthly wage of 15 249 SKK employed in the wood processing and paper making industry. **Kronospan SK, s.r.o., Prešov**, which came into existence in 1997 as the Prešov subsidiary of the Austrian Kronospan corporation, is the strongest entity in this industrial segment. Its production is focused mainly on laminated floorings, rough and laminated flake boards and facade panels. Nowadays it employs 958 employees, whereby its turnover reached 3.51 billion SKK, and after Tatravagónka, a.s., Poprad, it is the second biggest company in Prešov Region from this point of view.

Bukocel, a.s., Hencovce in Vranov nad Topľou District, where the wood processing industry has a long-standing tradition, is the second biggest wood processing company in the Region. This company separated from the well-known wood-working Bukóza company. It is a commercial craft pulp mill for wood matter, processing the lowest quality material with annual turnover of 1.51 billion SKK and 586 employees. Other companies

are Bukóza Preglejka, a.s. – moulding plywood for various purposes, Bukóza Píla, a.s. – processing beech logs for cut timber, sleepers and blanks, Bukóza Progres, s.r.o. – making bonded large-area boards, Bukóza Invest, s.r.o. and Bukóza Export-Import, a.s. In 2006, Bukocel, a.s. invested in technology for the abatement of solid pollutants from the recovery of boiler emissions worth a total of 81 million SKK (50% was reinvested from the Structural Funds of the European Union).

This threesome of large wood-processing companies is completed by **Sanas, a.s., Sabinov**, which employs around 300 people and had turnover of 1.26 billion SKK. It focuses on serial production of laminated DTD, solid wood and plywood furniture and furniture made from honeycomb boards. This company has recently invested in modernization of its machine equipment and technology. In Tatranská Lomnica are the headquarters of the **Tatras National Park Forestry Company**, a state-controlled enterprise employing a total of 338 workers and producing turnover worth 186 million SKK. In Poprad District there is also the timber company **Samas Slovakia, s.r.o., Poprad**, which reported revenues for 2007 totalling 133 million SKK.

There is a large wood-processing firm in Snina called **Beky, a.s., Snina** (394 employees) with foreign capital, which apart from processing sawn beech timber also produces furniture components and bent and cut-out semi-products. The company had turnover of 294 million SKK, and as well as domestic sales it exports mainly to the Czech Republic, Italy, Denmark, Sweden and Poland.

The smaller wood-processing companies include **Fagus, s.r.o., Ubľa,** making wooden handles for tools, **R.J.R., s.r.o., Snina** (30 employees), making roof truss construction systems, classical rafters and jointed carpentry constructions, keyhole roofs and low-energy consumption, ecological houses, and **Drevop, s.r.o., Dlhé n/C**., processing coniferous and deciduous timber, producing sawnwood for construction and joinery, furniture pieces, parquet blocks and trimmings. Several other smaller timber firms have got into economic trouble in recent years, ending in most cases in receivership.

The only significant printing company in the Region is **Polygraf Print, s.r.o., Prešov**, which focuses on producing books (a large proportion of them foreign) and offset printing, with annual turnover of 363 million SKK.

MANUFACTURE OF CHEMICALS AND CHEMICAL PRODUCTS, RUBBER AND PLASTIC PRODUCTS

The total number of employees working in these industries in Prešov Region is 4006, with average monthly wage of 20 904 SKK, which is the highest for all industrial branches. This segment of industry belongs in the group of Medium-high Technology.

Regarding revenues and added value, the companies in this industrial branch, concentrated mainly in Poprad and Humenné Districts, rank among the strongest in Prešov Region – 3. Chemosvit, a.s., Svit, 4. Nexis Fibers, a.s., Humenné, 6. Nylstar Slovakia, a.s., Humenné and 9. Terichem, a.s., Svit.

Chemosvit, a.s., Svit is one of the largest Central European producers of packaging foils for food-processing products. The company also makes foils for the electrical industry, packaging machines, polypropylene fibres and plastic products. Some of the company's product lines have been moved to joint ventures with foreign partners in Italy, Finland and Israel. In 2007 it reported revenues worth 2.73 billion SKK with value added

of 370 million SKK, with a total number of 935 employees. Compared with 2006, when Chemosvit was the strongest company in the County, it has reported considerable decline in all indicators, which can be attributed to its separation into Chemosvit Folie, a.s., Svit and Chemosvit Energochem, a.s., Svit. Another chemical company in Svit is **Terichem, a.s., Svit**, which is a joint venture between Chemosvit, a.s., Svit and foreign partners AB Rani Plast Oy Teerijärvi. This firm focuses on products for the electrical industry and polypropylene foils for condensers (Terifilm EC, E, RERC). It has 182 employees, and finished the financial year 2006 with turnover amounting to 1.49 million SKK.

The company **Nexis Fibers, a.s., Humenné** is part of the group of world producers of synthetic fibres Nexis Fibers Switzerland, which was established in 1906 and apart from Slovakia also has branches in Germany, Latvia and Poland. The works in Humenné focuses on production of synthetic fibres and employs 437 people. The annual turnover came to 2.72 billion SKK. Another large chemicals producer in Humenné is **Nylstar Slovakia, a.s., Humenné**, which produces fibres for tights, warp-knit and tubular-knit fabrics, synthetic fibres and other textile materials. It employs around 600 people, and its annual turnover in 2006 came to 3.17 billion SKK. In 2007 it underwent restructuring, and like the company Chemes it was bought by Slavia Capital, who renamed it as SC Nylon, a.s., Humenné. For this reason no data are available for this company for the year 2007.

The large chemicals "foursome" are supplemented by smaller firms such as **MKW Prešov, s.r.o., Ľubotice**, making and selling WC seats and bathroom accessories. This company with Austrian capital had turnover of 317 million SKK in 2007, and employed 86 people. In Snina the company **Obalex, s.r.o., Snina** produces packaging, polyethylene foils, carrier-bags and tear-off microthene bags.

Pharmaceutical production is represented by the companies **Imuna, š.p., Šarišské Michaľany** with a long tradition (founded 1953) in this industrial branch producing vaccines, blood plasma products, diagnostic preparations, tablets and veterinary preparations; **Medicproduct, k.s., Lipany**, focusing on production of dry and liquid injections and special infusion solutions; and **MEDea pharmaceuticals, s.r.o., Prešov**, which distributes and sells medicines, pharmaceutical products and health-care consumables.

In Kapušany in Prešov District there is a fuel storage depot belonging to the company Slovnaft-Benzinol, a.s.

The chemicals industry is at present and will continue in the future to be one of the driving branches of industrial production in Prešov County. What is required is to direct the strategy for development of this industrial branch towards producing higher added value with reduced consumption demand for water, energy and raw materials.

MANUFACTURE OF BASIC METALS AND METAL PRODUCTS, PRODUCTION OF MACHINERY AND EQUIPMENT

Metals production provides employment for 3702 people, with an average monthly wage of 15 990 SKK, while the engineering industry employs 3255 people, with average monthly wage in this industrial branch reaching 17 636 SKK.

The metallurgical industry is represented in Prešov Region by two more significant companies: Llemi Slovakia, a.s., Žalobín and Zlievareň, a.s., Svit. The metalworking company **Llemi Slovakia, a.s., Žalobín** in Vranov nad Topľou District had turnover worth 582 million SKK and focuses its production on pressure-moulded aluminium

castings, cold-pressed sheets, chip metalworking and making casting moulds. The foundry **Zlievareň, a.s., Svit** with turnover of 166 million SKK focuses on production of castings from grey cast iron and cast steel, and modelling equipment.

The engineering industry is represented in several districts of the Region, but especially in Poprad, Prešov, Bardejov, Snina, Humenné and Stará Ľubovňa. The largest engineering firm, at the same time the strongest companz in Prešov Region in terms of revenues, is **Tatravagónka, a.s., Poprad**, focusing on development, manufacture and sales of railway vehicles for freight and passenger transport and their components, single-purpose versions of these vehicles, rail vehicle bogey sets, and metal crates and containers. In 2007 the company declared turnover amounting to 4.01 billion SKK and employed 1510 people. The company exports almost all of its production. Together with the accelerating growth in consumption of domestic electrical appliances, especially of the white type, the production of the company Whirlpool is also growing, with its European centre for washing-machine production here in Slovakia. Total turnover from sales came to 11.1 billion SKK in 2007. One of its subsidiaries is in Poprad, **Whirlpool Slovakia, s.r.o., Poprad**, located in the Matejovce industrial park, where several sub-contractors from Italy and the Czech Republic make appliances for the company. The Poprad works focuses on producing washing-machines, refrigerators, freezers, tumble-dryers, cookers, microwave ovens, coffee-makers, air-conditioners and professional appliances. The third company in Poprad is **Tatramat-ohrievače vody, s.r.o., Poprad**, making electric immersion heaters and combined gas and solar water-heaters. It employs 434 people, who made products worth 706 million SKK. Its production is intended for export to the Czech Republic, Germany, the Netherlands, Hungary, Poland, Ukraine and Russia. The metal-working company **Schűle Slovakia, s.r.o., Poprad** manufactures aluminium pressure-castings for the automobile industry and for pneumatic control systems.

Another engineering centre in the Region is the city of Prešov itself. One of the significant companies here is **Spinea, s.r.o., Prešov**, making prototype items of high-precision reducer bearings, with annual turnover of 419 million SKK. The company **ZVL Auto, s.r.o., Prešov** produces 137 types and dimensions of roller bearings. The third firm, **VAP, s.r.o., Prešov**, with 140 employees and turnover of 430 million SKK (in 2004), produces hydraulic drum brakes and components, telescopic shock-absorbers and metal components for air suspension. Its business partners are Volkswagen (Germany), Seat (Spain), Škoda Auto (Czech Republic) and Phoenix Airspring Technology Ltd. (Hungary).

One of the larger companies is **SB Inmart, a.s., Bardejov**, with revenues worth 530 million SKK. This focuses on producing hydraulic rollers in light, medium and heavy-weight categories, and automated manipulation technology. Its products are mostly exported to foreign countries (Abrham, 2005).

In Snina District there are the remains of the former engineering giant Vihorlat Snina, which employed over 6000 people in its heyday. After privatization it became the joint-stock company **Vihorlat, a.s., Snina**, which had 2450 employees in 1992. The decline in arms production, however, and the loss of its markets lead to increasing problems for the company and the laying-off of its employees. In 2006 another 373 workers were made redundant. The company now focuses on production, sales, installation and servicing of mechanical car-parking systems, UPVC windows and doors, aluminium garden seating sets

and central heating boilers. Product lines have frequently changed together with changes in ownership: VSŽ, a.s., Košice, Hubertus Gerlachov in cooperation with Dutch investors Cebuva, Aurys, s.r.o., and Siberia, s.r.o., Prešov. Another Snina company, **Sukmont, a.s., Snina**, is involved in sales and installation of gas appliances, steel constructions, chimney systems and boiler repair and reconstruction, but it is facing bankruptcy following a fall-off in orders, resulting in the laying-off of employees. Of its 134 employees in 2005, 78 have been let go and further redundancies are certain. There is a smaller engineering company in Medzilaborce, **Strojlab, s.r.o., Medzilaborce**, which employs 250 people producing catering equipment, containers and transporters and boilers, and general engineering products.

In Sabinov there is **ZŤS, a.s., Sabinov**, employing 250 people and reporting turnover of 284 million SKK. This is one of the leading producers of gearbox equipment in Slovakia, manufacturing cone, spur, steel-cone, threaded and planet gear systems. More than 80 per cent of its production goes for export mainly to the USA, Germany, the Czech Republic, Great Britain, China, the Netherlands and Poland. **Skrutkáreň-Exim, a.s., Stará Ľubovňa** (300 employees) produces nuts and bolts made from steel and non-ferrous metals using the method of cold forming without surface finish. These products are intended for the domestic market, but also for export to the Czech Republic, Poland, Spain, Hungary and Germany. There are two engineering firms operating in Stropkov, namely **Kovo Sipox, a.s., Stropkov**, making materials storage containers and winches, and **Komet, s.r.o., Stropkov**, making replacement machine parts for the steel, chemicals, engineering and construction industries, products made from construction-grade and refractory steels, and replacement parts for agricultural and road-going vehicles.

In Humenné there is the plant of **Strojárne Chemes, a.s., Humenné** (180 employees), focusing on piece production of rollers and conveyors. Finally, located in Svidník is the company **Potravinárske závody, a.s., Svidník**, making machines and equipment for the meat-processing, bottling and preserving and the wine-making industry. It employs 240 people, and 95 per cent of its production is exported to the USA, Russia, Romania, France, Denmark and Germany.

MANUFACTURE OF ELECTRICAL AND OPTICAL EQUIPMENT

After the textiles and clothing industry and the food-processing industry, this is the third most represented industrial branch in the Region, employing 4301 people. Similarly as in the textiles and clothing industry there is a relatively low average monthly wage here, amounting to only 13 122 SKK, despite the fact that in both economically developed and dynamically developing countries, this is one of the strategic branches in the industrial structure. The economically strongest electrotechnical company in the Region is **Tesla Stropkov, a.s., Stropkov** (1200 employees), with annual turnover of 779 million SKK. Although the company has had to get through a difficult period after losing its markets in the former USSR, and facing strong competition on the telecommunications technology markets, it has succeeded in establishing itself again quite positively on the foreign markets. Its production is focused on electrical and electronic products (telephone sets, doorbells, electrical materials and thermostats), plastic products (components for the automobile industry and domestic appliances), and metal products. In Stará Ľubovňa the company **MKEM, s.r.o., Stará Ľubovňa** has its operations, employing 100 people. It

produces electrical sets for towing equipment, cables with integrated plug and socket, spiral cables, testing instruments, and separate plugs and sockets, with annual turnover worth 393 million SKK.

The leading companies in Prešov are Křížik GBI and Regada. **Křížik GBI, a.s., Prešov** (in the past this company employed up to 1600 people) focuses on production of components for installation of single-phase and triple-phase electricity meters, and of calibration instruments, with annual turnover of 260 million SKK. The second company, **Regada, s.r.o., Prešov** (200 employees) makes and sells servo-drives with industrial fittings and electromagnetic valves. The company recorded turnover of 253 million SKK.

Another big employer is **Jas Elmont, s.r.o., Snina** with 550 employeers. Revenues from sales of this company's principal industrial products (electrotechnical equipment for motors and vehicles, cable bundles) were declared as amounting to 258 million SKK.

ELECTRICITY, GAS AND HOT WATER PRODUCTION AND DISTRIBUTION

In the power generating industry there are 1582 people working, with an average monthly wage of 19 720 SKK.

The strongest company in this industrial branch is **Chemes, a.s., Humenné**, with revenues of 1.15 billion SKK and 450 employees altogether. Its principal activity production and distribution of electrical power, and production and distribution of technical gases. These are supplied to the Chemes industrial park for 9 foreign investors (3500 employees) and to the Guttmanovo industrial park with 2 foreign investors (225 employees). This company was recently bought by Slavia Capital. The second company in Humenné is **Humenská energetická spoločnosť, s.r.o., Humenné**, with turnover of 220 million SKK. This focuses on purchasing, selling and distributing hot water and steam, purchasing drinking water, and trading in machines, boilers and radiators, and measuring technology.

In Prešov itself the company **Spravbytkomfort, a.s., Prešov** has its operations, producing, selling and distributing hot water and steam, hot non-drinking water, and administering residential blocks. In 2007 the company recorded revenues of 498 million SKK, with a total of 208 employees. **Dalkia Poprad, a.s., Poprad** focuses on administering and operating heating and technical infrastructure in the communal residential sphere, and producing and distributing hot water and steam, with turnover of 297 million SKK. In Bardejov there is the company **Bardterm, s.r.o., Bardejov,** which is wholly-owned by the municipality. It operates the town's central boilers and heat-exchange units, with turnover of 212 million SKK.

AVAILABILITY OF INDUSTRIAL LAND IN PREŠOV REGION

With regard to the further development of Prešov Region it is necessary to monitor not only the current state of its industrial structure, but also to direct attention towards industrial lands and locations which have the potential of attracting possible investors to the area of north-eastern Slovakia, and in this way to assist the overall economic development of this peripheral territory. The state of preparation of these available industrial localities, together with the progressive completion of the transport infrastructure and the offer of a cheaper, qualified workforce, may become future catalyzers for development of the industry and overall economy of the Region.

Within Prešov Region a total of 58 available industrial localities have been identified. Their names, locations and basic parameters are presented in the following Table 7.

Tab. 7: *Available industrial localities in Prešov Region*

Locality	Cadastral area	District	Area	Motorway connection	Connection to road I. triedy	Connection to raailway	Airport Accessability	Technical infrastructure
Priemyselný park Prešov Juh - Lominová - Široké	Prešov, Haniska	Prešov	134 ha (64 ha Prešov, 70 ha Haniska)	2 min, 1km	I/68, 1km	Prešov 2km	Košice, 45min, 45km	Elektr. - ČV, Plyn - V, Voda - ČV, Kanal - ČV
Priemyselný park Prešov - Grófske	Prešov, Kapušany	Prešov	260 ha (182 ha Prešov, 78 ha Kapušany)	15 min, 10km	I/68, 1km	Prešov Šebastová, 5km	Košice, 60min, 60km	Elektr. - V, Plyn - V, Voda - ČV, Kanal - ČV
Priemyselný park IPZ Prešov - Záborské	Záborské	Prešov	30 ha, rozšírenie až na 200 ha	2min, 1km	I/68, 4km	Prešov, 5km	Košice, 45min, 40km	Elektr. - V Plyn - V Voda - V Kanal - V
Záborské - Šírava, Konopiska	Záborské, Petrovany	Prešov	150 ha	diaľnica na Košice, cca 2min; 400m smer západ	cca. 2 min 350m, smer západ	5 km - ŽS Prešov	letisko Košice 30km, smer juhozápad	Elektr. - V, Plyn - V, Voda - ČV, Kanal - N
Haniska - Záturecká	Haniska	Prešov	25 ha	priamo pri diaľnici D1 (1min. a 200m)	5min; 1km	ŽS Prešov; 0,7km	letisko Košice, cca 1hod; 45km	Elektr. - V, Plyn - V, Voda - V, Kanal - V
Ortáše	Petrovany, Kendice	Prešov	130 ha	kontakt s D1	I/68 - 1 km	ZŠ Kendice - 1,5 km	Košice - 35 km, 28 min	Elektr. - ČV, Plyn - V, Voda - V, Kanal - ČV
Veľký Šariš	Veľký Šariš	Prešov	46 ha	10km diaľnica Prešov-Košice	št. cesta I/68 cca 20m	ŽS Veľký Šariš cca 500 m	letisko Košice 40km	Elektr. - V, Plyn - V, Voda - ČV, Kanal - ČV
Poprad - Matejovce	Matejovce, Spišská Sobota	Poprad	9,1 ha (navrho-vaná lokaita 42,44 ha)	trasa navrhovanej diaľnice D1, cca 2min, 800m	št. cesta I/67, cca 350m východným smerom	ŽS Matejovce pri Poprade, cca 2 km severo-východným smerom	Poprad -Tatry, cca 7min, 10km	Elektr. - V, Plyn - ČV, Voda - V, Kanal - V
Suchá hora	Humenné	Humenné	25,56 ha	80km, 80 min	I/74 - 0,5 km	ŽS Humenné 3km	Košice - 100km	Elektr. - V, Plyn - V, Voda - V, Kanal - ČV
PP Levoča	Levoča	Levoča	18 ha	navrhovaná D1, južne od PP, 2min a 500m	I/18 a 0,9km	ŽS Levoča, cca 500m	Poprad -Tatry, cca 30min, 30km	Elektr. - V, Plyn - V, Voda - V, Kanal - ČV

Stará Ľubovňa - medzi Lipníkmi	Stará Ľubovňa	Stará Ľubovňa	100 ha	1hod, 60km severozápadným smerom	lokalita vedľa štátnej cesty I/77 (smer SL-Poprad), 500m pripojenie na štátnu cestu I/68 SL-Mníšek nad Popradom	ŽS Stará Ľubovňa, 1km východným smerom	Poprad-Tatry 1hod, 53km	Elektr. - V, Plyn - V, Voda - V, Kanal - V
Priemyselný park Bardejov - Sever	Bardejovská Nová Ves	Bardejov	14,53 ha	smer Poprad diaľnica D1 cca 2,5hod 130km; smer Prešov 0,5 hod 42km	štátna cesta I/77 Poprad - Svidník cca 0,5km	ŽS Bardejov cca 2,5 km	Košice cca 2hod 96km, Poprad -Tatry cca 2hod 110km	Elektr. - V, Plyn - V, Voda - V, Kanal - V
Malý Šariš hon Úzke	Malý Šariš	Prešov	12 ha	vedľa plánovanej trasy budúcej diaľnice	vedľa št. cesty I/18	ŽS Prešov cca 5km, cca 20min	letisko Košice cca 45 km, cca 1hod	Elektr. - V, Plyn - V, Voda - V, Kanal - ČV
Nad mlynom	Záborské	Prešov	40 ha	kontakt s D1		ŽS Haniska - 4 km západne	Košice - 35 km, 28 min	Elektr. - ČV, Plyn - V, Voda - N, Kanal - ČV
Roveň	Petrovany	Prešov	27 ha	kontakt s D1		ŽS Kendice - 3 km západne	Košice - 32 km, 25 min	Elektr. - ČV, Plyn - V, Voda - V, Kanal - ČV
Sabinov - Orkucany	Orkucany	Sabinov	40 ha	25 min, 23km	I/68, priama odbočka z cesty I. tr.	Orkucany 0,3km, Sabinov 3km	Košice 1hod, 56km;	Elektr. - V, Plyn - V, Voda - ČV, Kanal - ČV
Petrovany - Vysielač	Petrovany	Prešov	Ľ 14 ha, P 15 ha, KEVEČ 100 ha	cca 5min, 500m severne	I/68 2-3km severným smerom	ŽS Prešov, 4km severne	Košice, 40km, 30min	Elektr. - ČV, Plyn - ČV, Voda - ČV, Kanal - ČV
Dolina	Kendice	Prešov	17 ha	D1 - 900 m	kontakt s I/68	ŽS Kendice - 1 km	Košice - 35 km, 28 min	Elektr. - ČV, Plyn - N, Voda - V, Kanal - V
Vranov nad Topľou - Ferovo	Vranov nad Topľou	Vranov nad Topľou	16 ha	50km, 40min	č.18, 0km	ŽS Vranov nad Topľou, 2km od PP	Košice, 65km, 1hod	Elektr. - V, Plyn - ČV, Voda - V, Kanal - V
PP Svidník - Juh	Svidník	Svidník	15 ha	50min, 60km	št. cesta I/73, 30m	Bardejov 35km	Svidník 10min, 4km	Elektr. - V, Plyn - V, Voda - V, Kanal - V
Priemyselný park Stropkov	Stropkov	Stropkov	25 ha	navrhovaná diaľnica D1 (Prešov-54km, 45 min)	I/73 prechádza cez mesto, 100m	Bardejov - 45km, 30min.	Košice - 100km, 1hod.	Elektr. - V, Plyn - V, Voda - V, Kanal - V
Potoky	Petrovany	Prešov	34,5 ha	kontakt s D1		ŽS Kendice - 3 km západne	Košice - 32 km, 25 min	Elektr. - N, Plyn - N, Voda - ČV, Kanal - ČV
Ličartovce	Ličartovce	Prešov	35 ha	napojenie k D1 cca 5min - 3km	I/68 - 0,5km	ŽS Ličartovce - 0,5km	letisko Košice 40min - 35km	Elektr. - V, Plyn - ČV, Voda - ČV, Kanal - ČV
Hora	Petrovany	Prešov	14,5 ha	kontakt s D1		ŽS Haniska - 4 km západne	Košice - 35 km, 28 min	Elektr. - ČV, Plyn - ČV, Voda - ČV, Kanal - ČV

Sever	Ličartovce	Prešov	9 ha	kontakt s D1	kontakt s I/68	ŽS Ličartovce - 0,5 km	Košice - 23 km, 15 min	Elektr. - ČV, Plyn - V, Voda - V, Kanal - N
Priemyselný park Snina	Snina	Snina	10,95 ha	cca 100km západaným smerom, cca 1,5hod	štátna cesta I/74, cca 500m západným smerom	ŽS Snina cca 200m južným smerom, možnosť využitia napojenia žel. trate vnútri areálu	lestiko Košice cca 100km	Elektr. - V, Plyn - V, Voda - V, Kanal - V
Cernina	Cernina	Svidník	1312,9 ha	55km, 75 min.	Svidník, 16km	Bardejov, 25km	Košice, 120min, 105km	Elektr. - V, Plyn - ČV, Voda - ČV, Kanal - N
Spišské Podhradie - Rybníček	Spišské Podhradie	Levoča	6,3 ha + možnosť 3 ha	trasa navrhovanej D1, 5min 4km	cesta I. triedy I/ E18 3km	ŽS Sp. Podhradie 1km	letisko Poprad-Tatry/ Košice - 50km/75km	Elektr. - V, Plyn - V, Voda - V, Kanal - V
Breziny	Svit	Poprad	19 ha	návrh D1	št. cesta I/18, cca 150m južným smerom	ŽS Svit v tesnej blízkosti	Poprad-Tatry, cca 15min, 15km	Elektr. - ČV, Plyn - V, Voda - ČV, Kanal - ČV
Tekeriš	Kendice	Prešov	9,5 ha	D1 - 1 km	kontakt s I/68	ŽS Kendice - 0,5 km severne	Košice - 35 km, 28 min	Elektr. - N, Plyn - V, Voda - V, Kanal - ČV
Drienov - Bývalý hosp. dvor PD	Drienov	Prešov	8 ha	15min, 3,5km	I/68 Prešov-Košice, 4km	ŽS Obišovce - 4,5km, Kysak - 5,5km, D.N. Ves - 5,5km	Košice 30min; 25,5km	Elektr. - V, Plyn - ČV, Voda - ČV, Kanal - N
Lipany Za traťou	Lipany	Lipany	10 ha		št. cesta I/68, cca 1,5km	ŽS Lipany, cca 2km	Košice cca 1hod 80km, Poprad cca 1,3hod 100km	Elektr. - V, Plyn - V, Voda - V, Kanal - V
Župčany	Župčany	Prešov	5,2 ha	trasa navrhovanej diaľnice D1cca 1min 400m	št. cesta I/18 cca 100m južne	ŽS Prešov cca 10km východným smerom	letisko Košice cca 50min 48km	Elektr. - ČV, Plyn - ČV, Voda - N, Kanal - ČV
Areál bývalého Lesostavu	Jasenov	Humenné	4 ha	Prešov cca 80km, 80min		ŽS Humenné cca 3km	letisko Košice cca 100min, 100km	Elektr. - V, Plyn - V, Voda - V, Kanal - V
Nižné dĺžavy	Udavské	Humenné	19,5 ha	Prešov - 76 km, 92 min.	I/74 - 6km(Humenné)	ŽS Udavské, cca 600m juhozápadným smerom	Košice, 90 min; 90 km	Elektr. - V, Plyn - ČV, Voda - V, Kanal - V
Pastviská	Nižný Kručov	Vranov nad Topľou	30 ha	50 km	2,5 km	1,5 km	Košice 1,5 hodiny 90km	Elektr. - V, Plyn - V, Voda - V, Kanal - ČV
Naklo	Nižný Hrušov	Vranov nad Topľou	37,2 ha	2hod 80km	E-50 15km	Nižný Hrabovec 5km	Košice 1,5 hod 80km	Elektr. - V, Plyn - V, Voda - V, Kanal - V

Giraltovce - Roveň	Giraltovce	Svidník	25 ha	navrhovaná R4 Prešov - Vyšný Komárnik, cca 5min, 2km severne	štátna cesta I/73, vjazd z PP	ŽS Nemcovce pri Prešove, cca 13km západne	letisko Košice, 60min, 70km	Elektr. - V, Plyn - V, Voda - V, Kanal - ČV
Pod Malgovcom	Lada	Prešov	49,49 ha	rýchlostná komunikácia, severným smerom cca 100m	št. cesta I/18, pri navrhovanej lokalite PP	ŽS Kapušany cca 3km, Lipníky cca 3km	Košice cca 1,5hod, 50km	Elektr. - ČV, Plyn - ČV, Voda - ČV, Kanal - N
Drienov - Bývalá kafiléria	Drienov	Prešov	4 ha	15min, 3,5km	I/68 Prešov-Košice, 4km	ŽS Obišovce - 4,5km; Kysak - 5,5km; D.N. Ves - 5,5km	Košice 30min, 25,5km	Elektr. - V, Plyn - V, Voda - ČV, Kanal - N
Švábovce-Baňa	Švábovce	Poprad	6 ha/10 ha	dialnica vo výstavbe 7km 10min	št. cesta E18 500m	ŽS Poprad 7km	letisko Poprad Tatry 10km 15min.	Elektr. - ČV, Plyn - V, Voda - V, Kanal - ČV
Myslina	Myslina	Humenné	1,98 ha	80km, 80 min	I/74 - 1,5 km	ŽS - Humenné 4km juhov-východným smerom	letisko Košice - 100km	Elektr. - V, Plyn - V, Voda - ČV, Kanal - ČV
Vyšný Žipov	Vyšný Žipov	Vranov nad Topľou	932 ha	navrhovaná D1 Prešov - 35km, 30min západným smerom	E18, 1km	Čierene nad Topľou, 3km	Košice, 75 km, 60min	Elektr. - ČV, Plyn - ČV, Voda - ČV, Kanal - N
Terňa a miestne časti Babin potok a Hradisko	Terňa, Babin potok, Hradisko	Prešov	6 + 13 ha	navr. diaľnice D1 cca 20min 15km, južným smerom	št. cesta 7km západným smerom	ŽS Veľký Šariš 10 km južným smerom	letisko Košice 50km cca 45 min	Elektr. - V, Plyn - ČV, Voda - ČV, Kanal - ČV
Benkovce	Benkovce	Vranov nad Topľou	824 ha	navrhovaná D1, cca 45 min. západným smerom	prechádza obcou č. 1/15	ŽS Vranov nad Topľou, cca 15km juhozápadným smerom	letisko Košice, cca 80 min, 90km	Elektr. - ČV, Plyn - V, Voda - ČV, Kanal - ČV
Šarišské Sokolovce	Šarišské Sokolovce	Sabinov	10 ha	30min, 20km	30min, 20km I/18	Sabinov, 7km	Košice, 90 min, 70km	Elektr. - V, Plyn - V, Voda - V, Kanal - N
Stará Ľubovňa - Továrenská 3	Stará Ľubovňa	Stará Ľubovňa	2,5 ha	1hod, 60km severozápadným smerom	1km od I/77 (smer SL-Poprad), 1km pripojenie na I/68 SL-Mníšek nad Popradom	ŽS Stará Ľubovňa 600m	Poprad-Tatry 1hod, 53km	Elektr. - ČV, Plyn - ČV, Voda - ČV, Kanal - ČV
Giraltovce - SAD	Giraltovce	Svidník	3 ha	navrhovaná R4 Prešov - Vyšný Komárnik, cca 6min, 2,5km severne	štátna cesta I/73, vjazd z PP	ŽS Nemcovce pri Prešove, cca 13km západne	letisko Košice, 60min, 70km	Elektr. - V, Plyn - V, Voda - V, Kanal - ČV
Podolínec - T. Vansovej	Podolínec	Stará Ľubovňa	8,5 ha	40/35	I/77 - 500m	Podolínec - 1km	Poprad - 50min - 38km	Elektr. - V, Plyn - V, Voda - ČV, Kanal - ČV
Dravce - Bukovina	Dravce - Bukovina	Levoča		diaľnica D1, cca 20min, 8km západne	cesta I.tr. cca 3min, 1km východne	ŽS Sp.Nová Ves, cca 16km východne	Poprad, cca 45min, 20km	Elektr. - V, Plyn - ČV, Voda - ČV, Kanal - ČV

Soľ	Soľ	Vranov nad Topľou	10,35 ha	40 km - 56 min.	št. cesta I/18 - hneď vedľa	ŽS Soľ - hneď vedľa	Košice 1,5 hod; 70km	Elektr. - V, Plyn - ČV, Voda - ČV, Kanal - N
Sačurov - Mentiovo	Sačurov	Vranov nad Topľou	16,06 ha	plánovaná D1, cca 50min, 55km	št. cesta I/79	ŽS v obci	letisko Košice, cca 50 min, 65km	Elektr. - ČV, Plyn - ČV, Voda - ČV, Kanal - ČV
Areál býv. Tehelne Peč. Nová Ves	Pečovská Nová Ves	Sabinov	3 ha	20 minút, 25km	I/68 - 0,5km	ŽS P.Nová Ves 1,5km	Košice, 60min; 70km	Elektr. - V, Plyn - V, Voda - ČV, Kanal - ČV
Sečovská Polianka-Záhumie	Sečovská Polianka	Vranov nad Topľou	28 ha	50km	št. cesta I/79 cca, 250m - napojená MK	ŽS Sečovská Polianka, cca 2km	letisko Košice, 60km cca 50min	Elektr. - V, Plyn - ČV, Voda - ČV, Kanal - N
Mníšek nad Popradom	Mníšek nad Popradom	Stará Ľubovňa	657,92 ha	1,5hod 60km smer východ - 2hod 80km západ	vedenie cez obec I/68	ŽS S.Ľubovňa 16km	Košice 2 hod 115km, Poprad-Tatry 1,5hod 65km	Elektr. - V, Plyn - N, Voda - ČV, Kanal - N
Hospodársky dvor	Brezovica	Sabinov	9 ha			ŽS Lipany, 11km	Košice 75km, Poprad 75km	Elektr. - V, Plyn - ČV, Voda - V, Kanal - ČV
Dlhé Kĺčovo	Dlhé Kĺčovo	Vranov nad Topľou	5 ha	diaľnica D1, cca 150min 200km západným smerom	št. cesta č.18, 3km	ŽS Sačurov, cca 3km západným smerom	letisko Košice, cca 60min, 65 km	Elektr. - V, Plyn - V, Voda - ČV, Kanal - N
Mengusovce	Mengusovce	Poprad	3 ha	trasa diaľnice D1, cca 700m, 1min	cesta 1. tr. I/18, cca 1min, 600m	ŽS Svit, 5km	Poprad 10min, 13km	Elektr. - V, Plyn - ČV, Voda - ČV, Kanal - ČV

Source: authors' classification

In evaluating the individual available industrial localities in Prešov Region, the starting-point was a set of five basic evaluation criteria: centres of population, zones of industrial development, size of industrial localities, motorway connection and connection to infrastructure.

Centres of population – this criterion is an indication of the hierarchical importance of individual residential structures. The categories of residential centres (i.e. towns) – 5 in all – were taken from the Prešov Region Territorial Plan, and are in line with the Territorial Development Plan for Slovakia 2001. The hierarchical ranking of towns is given by the number of X symbols, whereby the more important the town, the greater the number of X symbols. To express the spatial vicinity of towns with the lowest evaluation in the case of important residential centres (towns in categories I, II and III, and the Region capital separately), the auxiliary symbol + is used (this symbol is used in an auxiliary way for other criteria as well, and is intended to indicate spatial vicinity of an important structure). The evaluation of the categories of towns is presented in the following Table 8.

Tab. 8: *Evaluation of criteria – Centres of population*

Residential centre	Evaluation
1st category	**XXXXXX**
2nd category	**XXXXX**
3rd category	**XXXX**
4th category	**XXX**
5th category	**XX**
Uncategorized	**X**
Uncategorized within 5 km of the County capital	**X ++ +**
Uncategorized within 10 km of the County capital	**X + +**
Uncategorized within 5 km of a 1st, 2nd, 3rd cat. town	**X ++**
Uncategorized within 10 km of a 1st, 2nd, 3rd cat. town	**X +**

Source: authors' classification

Zones of industrial development – this criterion indicates the nucleus zones in this Region with regard to the existing spatial distribution of industrial production. This situation is of great significance from the point of view of external savings in production, the specific advantages of urbanization and the advantages of location, which is given by the incidence and proximity of other industrial sites and companies, as well as the existence of supporting technical infrastructure. The spatial range of development zones is in line with the Integrated Study of Regional Development NUTS II – Eastern Slovakia. This study defined two types of industrial development zone – primary development zones and secondary development zones. Evaluation of this criterion is presented in Table 9.

Tab. 9: *Evaluation of the criterion – Zones of industrial development*

Zones of industrial development	Evaluation
Primary zones of industrial development	**XXX**
Secondary zones of industrial development	**XX**
Outside the zones of industrial development	**X**
Outside the zones of industrial development, but within 10 km of a zone	**X +**

Source: authors' classification

Size of industrial locality – indicates the variety in the size structure of available industrial localities. The rule applied here is: the larger and more compact the site, the higher the evaluation. Industrial localities smaller than 5 hectares have poor prospects in terms of location of industrial production, and their development is very restricted. The size structure of industrial localities is categorized in the following Table:

Tab. 10: *Evaluation of criterion – Size of industrial localities*

Size of industrial site	Evaluation
30 hectares and more	**XXXX**
10 – 30 hectares	**XXX**
5 - 10 hectares	**XX**
less than 5 hectares	**X**

Source: authors' own classification

Connection to motorway - this is an indication of the importance and the flow potential of the transport infrastructure, and its basic skeleton formed by the motorway network. Linkage of industrial sites to the motorway is one of the most important factors supporting production from the point of view of supplying input raw materials and semi-products to industry, as well as the distribution of already produced and processed industrial goods intended for immediate consumption, or as inputs for processing in subsequent production.

Tab. 11: *Evaluation of criterion – Connection to motorway*

Link to motorway	**Evaluation**
within 1 km of motorway	**XXXXX**
within 10 km of motorway	**XXXX**
within 30 km of motorway	**XXX**
within 100 km of motorway	**XX**
more than 100 km away from motorway	**X**
within 1 km of proposed motorway	+++++
within 10 km of proposed motorway	++++

Source: authors' own classification

Connection to infrastructure – meaning connections to the mains electricity, gas, water and sewer networks. This criterion indicates the importance of the level of completion, or lack of it, of the technical and power infrastructure, which depending on its presence and parameters can influence to a considerable degree the location of industrial production and its character. The auxiliary symbol + in this case does not indicate proximity to an important structure, but the status of connection to infrastructure (specifically only partially suitable status).

Tab. 12: *Evaluation of criterion – Connection to infrastructure*

Connection to infrastructure	**Evaluation**
Connection status suitable	**X**
Connection status only partially suitable	+
Connection status unsuitable	blank box, no symbol
Position of evaluation symbol in 4 –place code:	
1st position – connection to electrical power	(1 _ _ _)
2nd position – connection to gas mains	(_ 2 _ _)
3rd position – connection to water mains	(_ _ 3 _)
4th position – connection to sewer network	(_ _ _ 4)

Source: authors' own classification

Tab. č. 13: *Evaluation of the availability of industrial localities in the Prešov Region in terms of selected criteria.*

Locality	Cadastral area	District	Centres of population	Zones of industrial development	Size of industrial site	Motorway connection	Connection to infrastrure	Nr. of points	Categ.
PP Prešov Juh - Lominová - Široké	Prešov, Haniska	PO	xxxxxx	xxx	xxxx	xxxxx	+x++	106	1
PP Prešov - Grófske	Prešov, Kapušany	PO	xxxxxx	xxx	xxxx	xxxx	xx++	99	1
PP IPZ Prešov - Záborské	Záborské	PO	x ++ +	xxx	xxxx	xxxxx	xxxx	96	1
Záborské - Šírava, Konopiska	Záborské, Petrovany	PO	x ++ +	xxx	xxxx	xxxxx	xx+	88	1
Haniska - Záturecká	Haniska	PO	x ++ +	xxx	xxx	xxxxx	xxxx	86	1
Ortáše	Petrovany, Kendice	PO	x ++ +	xxx	xxxx	xxxxx	+xx+	85	1
Veľký Šariš	Veľký Šariš	PO	xx ++ +	xxx	xxxx	xxxx	xx++	83	1
Poprad - Matejovce	Matejovce, Spišská Sobota	PP	xxxxxx	xxx	xx	+++++	x+xx	82	1
Suchá hora	Humenné	HE	xxxxx	xxx	xxx	xx	xxx+	82	1
PP Levoča	Levoča	LE	xxxxx	xxx	xxx	+++++	xxx+	82	1
Stará Ľubovňa - medzi Lipníkmi	Stará Ľubovňa	SL	xxxxx	x +	xxxx	xx	xxxx	82	1
PP Bardejov - Sever	Bardejovská Nová Ves	BJ	xxxxx	xx	xxx	xx	xxxx	80	1
Malý Šariš hon Úzke	Malý Šariš	PO	x ++ +	x +	xxx	xxxx +++++	xxx+	80	1
Nad mlynom	Záborské	PO	x ++ +	xxx	xxxx	xxxxx	+x +	80	1
Roveň	Petrovany	PO	x ++ +	xxx	xxx	xxxxx	+xx+	80	1
Sabinov - Orkucany	Orkucany	SB	xxxx	xx	xxxx	xxx	xx++	79	2
Petrovany - Vysielač	Petrovany	PO	x ++ +	xxx	xxxx	xxxxx	++++	79	2
Dolina	Kendice	PO	x ++ +	xxx	xxx	xxxxx	+ xx	78	2
Vranov nad Topľou - Ferovo	Vranov nad Topľou	VT	xxxxx	xx	xxx	xx	x+xx	77	2
PP Svidník - Juh	Svidník	SK	xxxx	xx	xxx	xx	xxxx	75	2
PP Stropkov	Stropkov	SP	xxxx	xx	xxx	xx	xxxx	75	2
Potoky	Petrovany	PO	x ++ +	xxx	xxxx	xxxxx	++	75	2
Ličartovce	Ličartovce	PO	x + +	xxx	xxxx	xxxx	x+++	75	2
Hora	Petrovany	PO	x ++ +	xxx	xxx	xxxxx	++++	74	2
Sever	Ličartovce	PO	x ++ +	xxx	xx	xxxxx	+xx	73	2
PP Snina	Snina	SV	xxxx	xx	xxx	x	xxxx	70	2
Cernina	Cernina	SK	x +	x +	xxxx	xx	xxx	69	2

Spišské Podhradie - Rybníček	Spišské Podhradie	LE	xxx	xxx	xx	++++	xxxx	68	2
Breziny	Svit	PP	xxx +	xxx	xxx	+++++	+x++	68	2
Tekeriš	Kendice	PO	x + +	xxx	x	xxxxx	xx+	66	2
Drienov - Bývalý hosp. dvor PD	Drienov	PO	x + +	xxx	xx	xxxx	xx+	66	2
Lipany Za traťou	Lipany	SB	xxx	xx	xx	xx	xxxx	65	2
Župčany	Župčany	PO	x ++ +	x +	xx	xxxx +++++	++ +	64	2
Areál bývalého Lesostavu	Jasenov	HE	xx ++	xxx	x	xx	xxxx	64	2
Nižné dĺžavy	Udavské	HE	x +	xxx	xxx	xx	x+xx	64	2
Pastviská	Nižný Kručov	VT	xx ++	xx	xxx	xx	xxx+	64	2
Naklo	Nižný Hrušov	VT	x +	x +	xxxx	xx	xxxx	64	2
Giraltovce - Roveň	Giraltovce	SK	xx	xx	xxx	xx	xxx+	62	2
Pod Malgovcom	Lada	PO	x + +	x +	xxxx	xxxx	+++	62	2
Drienov - Bývalá kafiléria	Drienov	PO	x + +	xxx	x	xxxx	xx+	61	2
Švábovce-Baňa	Švábovce	PP	xx ++	xxx	xx	++++	+xx+	59	3
Myslina	Myslina	HE	xx ++	xxx	x	xx	xx++	58	3
Vyšný Žipov	Vyšný Žipov	VT	x	x +	xxxx	xx	xxx	57	3
Terňa - Babin potok, Hradisko	Terňa	PO	x	xx	xxx	xxx	x+++	56	3
Benkovce	Benkovce	VT	x +	x +	xxxx	xx	+x++	55	3
Šarišské Sokolovce	Šarišské Sokolovce	SB	x	xx	xx	xxx	xxx	55	3
Stará Ľubovňa - Továrenská 3	Stará Ľubovňa	SL	xxxxx	x	x	xx	++++	53	3
Giraltovce - SAD	Giraltovce	SK	xx	xx	x	xx	xxx+	52	3
Podolínec - T. Vansovej	Podolínec	SL	xx	x +	xx	xx	xx++	51	3
Dravce - Bukovina	Dravce - Bukovina	LE	x +	xxx	xx	++++	x+++	51	3
Soľ	Soľ	VT	x +	x +	xxx	xx	xx+	51	3
Sačurov - Mentiovo	Sačurov	VT	x +	xx	xxx	xx	++++	50	3
Areál býv. Tehelne Peč. Nová Ves	Pečovská Nová Ves	SB	x	xx	x	xxx	xx++	49	3
Sečovská Polianka-Záhumie	Sečovská Polianka	VT	x	xx	xxx	xx	x++	49	3
Mníšek nad Popradom	Mníšek nad Popradom	SL	x	x	xxxx	xx	x +	47	3
Hospodársky dvor	Brezovica	SB	x	x +	xx	xx	x+x+	46	3
Dlhé Kĺčovo	Dlhé Kĺčovo	VT	x +	xx	x	x	xx+	39	3
Mengusovce	Mengusovce	PP	x	x +	x	+++++	x+++	38	3

Source: authors' own classification

On the basis of the 5 evaluation criteria presented above, all the available industrial sites (58) in Prešov Region were assessed. The evaluation symbols X and + were assigned point values – 5 points for the primary evaluation symbol X, and 2 points for the auxiliary symbol +. The ratio 5:2 between the evaluation symbols was chosen to ensure that the outcome value for two auxiliary symbols + could not be higher than the value of one primary symbol X, in other words to prevent the + values influencing the final evaluation in any significant way. The final evaluation for each individual industrial site is the sum total of all points values for primary X and auxiliary + evaluation symbols taking into account all the evaluation criteria. The outcome value gained in this way for a particular industrial locality e determined its placement in the ranking of sites in the Region. Then, based on the numbers of points gained, the individual industrial sites were divided into three categories: 1st category – 80 points and over, 2nd category – 60 to 79 points, and 3rd category – 59 points and under (see Table D in the Appendix).

Industrial sites in the **1st category** represent areas with the most suitable preconditions for development in terms of the criteria evaluated. This group contains 15 locations, most of them to be found in or near 1st, 2nd and 3rd category residential centres (towns), which provide industrial production with a set of external savings in the form of *location advantages* (existence of other industrial companies in the vicinity, i.e. potential for cooperation, but also for competition) and *urbanization advantages* (existence of technical and transport infrastructure in the town, presence of a market ensuring demand and supply of products, an education network, especially vocational schools, and other general services). Almost all of the industrial sites in this category are at the same time parts of the industrial development zones in Prešov and Košice Region, whether in the three primary ones (Prešov – Košice , Humenné – Michalovce, Poprad – Spišská Nová Ves) or the five secondary ones (Prešov – Lipany, Prešov – Bardejov, Svidník – Hanušovce nad Topľou, Humenné – Snina, Vranov nad Topľou – Trebišov). Furthermore these industrial localities are of the necessary size, and they have good access to the main transport corridor (particularly the existing and proposed motorways). There is also an appropriate level of connection to the infrastructure network.

The **2nd category** consists of industrial localities with worse location preconditions and preparedness for investment in the area of industrial production. This category contains 25 sites, which can be divided into two different sub-groups. The first sub-group is made up of industrial sites situated along the Prešov – Košice urbanization axis, which is the most important area in economic and urbanization terms in all of Eastern Slovakia. These industrial localities are sufficiently large, with good access to the existing motorway between Prešov and Košice or the propsed motorway linking Prešov – Levoča – Poprad – Svit. Their disadvantage is that they are located among rural residential centres (villages), which often lack the necessary parameters in terms of technical infrastructure. The second sub-group is made up of industrial localities which, although linked for the most part to a significant residential centre (town), have the great handicap of problematic transport accessibility and their distance from the main transport corridors.

The greatest location disadvantages are found in the last, **3rd category**. This comprises the industrial localities with relatively the least suitable preconditions for the involvement of investors. Altogether there are 18 industrial localities in this category. What these localities have in common is a combination of factors with poor prospects for development,

being located away from primary industrial development zones, having very problematic transport access, location in lower-category residential centres, and frequently insufficient size of industrial space.

CONCLUSION

The development of industrial production in Prešov Region lags considerably behind that in the other industrial regions of Slovakia. This undesirable state is moreover further aggravated by new strategic foreign investments coming into the already developed regions of western and north-western Slovakia. In terms of the important industrial indicators, such as number of employees in a particular industry, the average monthly wage in that branch, turnover from industrial activities and productivity of labour (see Table 2), Prešov Region has always found itself in 8th, i.e. last place. Compounding this situation, there are also very considerable disparities within the Region itself. On the one hand there are the distinct industrial districts of Poprad, Prešov and Humenné (with a 75.0 per cent share in gross output and 62.2 per cent in value added, and 15 of the County's 20 largest industrial companies located around them), while on the other there are the industrially under-dimensioned districts of Levoča, Stropkov, Svidník and Medzilaborce. The regional disparities between these two groups, moreover, are set to grow in the future, because as much as 93.5 per cent of direct foreign investment in 2006 headed for Poprad, Prešov and Humenné, and in addition the Poprad and Prešov Districts will be directly linked to the motorway which is being built.

These facts then have great impact on the further development of industry in the Region through investments into already existing production, as well as the availability of industrial localities which are for sale. In addition to the Region's well-known weak points, namely its excentric and peripheral location relative to the developed regions in the western parts of Slovakia, its incomplete transport infrastructure (especially motorways), and through these the investment "malnutrition" of the Region, other problems are rearing their heads, such as the uncoordinated nature of preparation of industrial localities and locations at Region level, because no coordinating body exists. The different areas are being prepared chaotically, especially around the outskirts of the larger towns, and while that preparation is the responsibility of the local councils, they suffer in this respect from lack of financial resources. Apart from the absence or insufficient capacity of infrastructure, the most restrictive factor is the ownership of land which could be available for industrial localities, which is legally not sorted out. For this reason it is vital that towns and villages, before offering land as a suitable industrial locality, have at least contractually agreed conditions with the owners for its sale to a potential investor.

If such a situation is allowed to continue, with its impact on industrial production and the economy as such in general, Prešov Region will be threatened with complete marginalization, not only economic but social s well, which will bring with it the latent danger of social instability and problems with the ever-growing proportion of the population living below the poverty line.

Acknowledgement: This paper we prepared with the contribution of the grants: VEGA 1/0210/08 „Špecifické postavenie regiónu Východné Slovensko v kontexte regionálnych disparít Slovenskej republiky" (ved. projektu R. Klamár) and VEGA č. 1/0045/09 Slovensko

– Poľsko – geopolitické, politologické a humánnogeografické súvislosti (ved. projektu R. Ištok).

References

ABRHÁM, J. (2005): OP průmysl a podnikání [CD-ROM]. In: KOKOŠKA, Vladimír et al. Aktuální praktický průvodce čerpáním finančních prostředků a podpůrné pomoci z programů státní podpory a Evropské unie. Praha : Verlag Dashöfer. 52 s. ISBN 80-86229-81-5.

ABRHÁM, J., VOŠTA, M. (2005): Možnosti rozvoje klastrů v ČR po vstupu do Evropské unie. Současná Evropa a Česká republika, roč. X, č. 1, s. 145–155. ISSN 1211-4073.

GAJDOŠ, P. (2001): K vybraným problémom transformácie sociálno-priestorovej situácie Slovenska v 90: rokoch. In: Sociológia. Bratislava : Sociologický ústav SAV, roč. 33, č. 2,

HAVLÍČEK, D., WZOŠ., I., MATLOVIČ, R., KLAMÁR, R., ROSIČ, M. (2008): Prešovský kraj – okresy a ich rozvojový potenciál. Poprad, s. 82, ISBN 978-80-970012-6-1

KLAMÁR, R. (2008): Slovakia and the analysis its disparities. In: Folia Geographica 12, Prešov, 145-163, ISSN 1336-6157

KLAMÁR, R., KROKUSOVÁ, J. (2005): Štruktúra priemyslu v Prešovskom kraji. Folia Geographica 8, Prešov, 34-65, ISSN 1336-6157

KOLEKTÍV (2007): Územná prognóza regiónu Prešov – Disponibilnosť územia Prešovského kraja pre vstup investorov. Prešovský samosprávny kraj – Odbor územného plánovania, tvorby a ochrany životného prostredia, Prešov, s.286

KOREC, P. (1995): Humánna geografia I. (metódy, priemysel, doprava, regióny). Prif UK, Bratislava, s.161

LORBER, L. (2005): Socio-economic disparities in regional development of Slovenia. V: New members – new challenges for the European regional development policy: 27th-30th September 2005 (i.e. 2005), Nový Smokovec – Vasoké Tatry: international conference proceedings

POPJAKOVÁ, D. (2001): Transformácia priemyslu v regióne Šariša. In: Geografické práce ročník 9, č.1, s. 241, ISBN 80-8068-033-7

POPJAKOVÁ, D. (1996): Geografia priemyslu. FHPV PU, Prešov, s. 141

SEDLÁKOVÁ, A., MATLOVIČ, R. (2005): Demografický vývoj Prešovského kraja hľadiska jeho regionálneho rozvoja.. Acta Facultatis Studiorum Humanitatis et Naturae universitatis Prešoviensis, Prírodné vedy, XLIII., Folia Geographica 8, PU Prešov, s. 180 – 191, ISSN 1336-6149, ISSN 1336-6157

VOŠTA, M. (2001): Restrukturalizace zpracovatelského průmyslu. 1. vyd. Praha: VŠE, 34 s. Aktuální otázky světové ekonomiky 4. ISBN 80-245-0179-1.

VOŠTA, M. (2002): Globální restrukturalizace zpracovatelského průmyslu. In: BERNÁŠEK, Václav et al.Globalizační procesy ve světové ekonomice. Praha : Nakladatelství Oeconomica, 2002, s. 204–220. Řada vědeckých publikací 2. ISBN 80-245-0265-8.

VOŠTA, M. (2004): Diferenciace nových členů EU: regionální aspekty (vybrané státy). Současná Evropa a Česká republika, 2/2004. Praha: VŠE. ISSN 1211-4073.

Ročenky priemyslu 1999, 2001, 2003, 2005, 2007. Štatistický úrad SR, Bratislava, 2000-2008

Štatistické bulletiny 4/1999, 4/2000, 4/2001, 4/2002, 4/2003, 4/2004, 4/2005, 4/2006,

4/2007, 4/2008 Prešov. Štatistický úrad SR, Krajská správa v Prešove, 1999-2008
MH SR (2007): Rozpracovanie zámerov, priorít a cieľov národnej stratégie rozvoja (NSTUR) v priemyselnej politike, Ministerstvo hospodárstva SR, http://www.economy.gov.sk/index/go.php?id=1738

REGIONÁLNE DISPARITY V PREŠOVSKOM KRAJI Z HĽADISKA ŠTRUKTÚRY PRIEMYSLU

Zhrnutie

Rozvoj priemyselnej produkcie v Prešovskom kraji značne zaostáva za ostatnými priemyselnými regiónmi Slovenska. Tento nežiaduci stav sa na viac ešte prehlbuje ďalšími strategickými zahraničnými investíciami v už rozvinutých regiónoch v západnej a severozápadnej časti Slovenska. V rámci dôležitých ukazovateľov priemyslu ako počet zamestnancov v priemysle, priemerná mesačná mzda, tržby z priemyselnej činnosti a produktivita práce (tab.2) sa umiestnil Prešovský kraj vždy na poslednom 8. mieste. Napriek tejto skutočnosti sú aj v rámci samotného kraja veľmi významné disparity. Na jednej strane vystupujú priemyselné okresy Poprad, Prešov a Humenné (na hrubom obrate sa podieľajú 75,0%, na pridanej hodnote 62,2% a z 20 najväčších priemyselných podnikov kraja je v nich lokalizovaných 15), na strane druhej sú to priemyselne poddimenzované okresy Levoča, Stropkov, Svidník a Medzilaborce. Regionálne nerovnosti medzi týmito dvoma skupinami budú do budúcnosti ešte narastať, pretože až 93,5% (rok 2006) priamych zahraničných investícií smerovalo do Prešova, Popradu a Humenného a na viac okresy Prešov a Poprad budú priamo napojené na budovanú diaľnicu.

Uvedené skutočnosti majú potom veľký vplyv aj na ďalší rozvoj priemyslu v kraji prostredníctvom investícií do už existujúcej výroby ako aj ponuky disponibilných priemyselných plôch. Okrem známych slabých stránok kraja v podobe periférnej polohy voči rozvinutým regiónom v západnej časti Slovenska, nedobudovanej dopravnej (najmä diaľničnej) infraštruktúry a tým aj investičnej „podvýživenosti“ kraja, sa pridružujú i problémy ako napr. nekoordinovanosť prípravy priemyselných lokalít a plôch úrovni kraja (neexistuje žiaden koordinačný orgán). Územia sa pripravujú chaoticky najmä na okraji väčších miest, pričom ich príprava je na samospráve, ktoré trpí v tomto smere nedostatkom finančných prostriedkov. Najlimitujúcejším nedostatkom sú okrem absencie infraštruktúry, prípadne jej nedostatočnej kapacity majetkovo – právne nevysporiadané pozemky pre disponibilné plochy. Preto je dôležité, aby obce a mestá, skôr než územie ponúknu ako disponibilnú plochu pre priemysel, mali minimálne zmluvne dohodnuté podmienky s vlastníkmi pozemkov o ich predaji prípadnému investorovi.

Ak aj naďalej bude pretrvávať takýto stav v oblasti priemyselnej výroby a celkovej ekonomiky vôbec, hrozí Prešovskému kraju nielen ekonomická, ale aj sociálna marginalizácia, ktorá so sebou prináša latentné nebezpečenstvo sociálnej nestability a problémov so stále sa zväčšujúcim podielom obyvateľstva pod hranicou chudoby.

Recenzovali: Prof. RNDr. René Matlovič, PhD.
Prof. RNDr. Viliam Lauko, CSc.

ASSESSMENT OF GULLY EROSION ACCORDING TO ADMINISTRATIVE UNITS OF SLOVAKIA

***Štefan KOCO*[1]**

Abstract: *Within the research of spatial organization of gully erosion in Slovakia, the most significant and unique (also from the international point of view) work of its kind is the "map of the density of gully erosion" by Bučko and Mazúrová from 1958. Since its publication there was not enough attention paid to this issue at all. This study proposes the assessment of the average density of gully network according to the regions and districts of Slovak republic on the basis of the results in the above-mentioned map. The whole presented method is based on integration of input data and final analysis by means of geographic information systems. Obtained results show, that Slovak territory is relatively evenly affected by gully erosion from the point of view of its territory classification to regions. The comparison of the districts shows greater differences which are caused mainly by smaller area of these administrative units and the district position within geomorphologic classification of Slovakia.*
Keywords: *gully erosion, geographic information systems (GIS), the region, the district*

INTRODUCTION

Erosion is one of the main processes influencing the degradation of soils and therefore it significantly participates on problems related to the nutrition of the world population. The most extended type of soil erosion is the water erosion because the water is everywhere all over the earth surface, it circulates on the land and causes the erosion in different ways. Within the water erosion the most widely spread is the rain erosion. Runoff of rain water flowing from the whole slope causes sheet erosion. By concentrating flowing water into the channels we can observe the linear erosion. One of the demonstrations of linear water erosion are the gullies, therefore the water erosion, which causes the gullies is called the gully erosion. Gully erosion is the erosion process whereby runoff water accumulates and often recurs in narrow channels and, over short periods, removes the soil from this narrow area to considerable depths (Poesen et. al., 2003). Nowadays, the intensive gully research is carried out in the area of the Myjava Highland by Stankoviansky, who characterizes the formation of the gullies as a result of runoff process activity. The runoff processes are understood as a geomorphologic processes caused by the overland flow of the water during the extreme rainfalls and snow thaw (Stankoviansky, 1998a). Runoff processes are regarded to be the equivalents of pedogenetic term of water erosion. The gully erosion is bound to the network of deep linear forms of the relief concentrating the runoff. In these linear forms there are concentrated the time limited rivers, the display of which is the

1 **RNDr. Štefan Koco,**
Department of Geography and Regional Development, Faculty of Humanities and Natural Sciences, University of Prešov, ul. 17. novembra 1, 081 16 Prešov,
e-mail: kocostefan@gmail.com

transport of the part or the whole cultivated layer in the horizontal axis of the natural and artificial linear elements and the creation of the shallow depression in their bottoms oblong in the direction of the temporary activity river. The main reason for forming the gullies is the enormous amount of the water. This condition can be caused either by the climatic change or by land use. In the conditions of the central Europe is the forming of the gullies determined mainly anthropologically, whereas the decisive factor controlling the location of the gullies is the original in, other words, pre-collectivization kind of the land use. Therefore the inevitable criterion for creating the gullies in our conditions is deforestation and agricultural exploitation of the original forest land having the attribute of a little resilience substratum and a deep mantle rock (Stankoviansky, 2003b). In general, the gullies are formed in a relatively short periods during several consecutive extreme events, but the process of forming the gullies is not finished and the gullies grow in the next period. It implies that the gullies are not formed in one single phase but in many stages (Zachar, 1970, Stankoviansky, 2003b). They often grow in a regressive way and at the end they have different height level, and in this extent they tend to be the most active. The gullies as a geomorphological forms cause the fragmentation of the slopes whereby they limit the agricultural soil by reducing its expanse, they degrade the unpaved field paths and forest roads, they form the communication barriers. The need for the stabilization of the gullies by the forest crops is the must for this.

Within the research of gully erosion in Slovakia the researchers aimed predominantly on the space organization and density of gullies (e.g. Bučko and Mazúrová, 1958), (Barabas, 1996, 1997). Harčár (1995) evaluated the relation of gullies to topography and geological underlay in Low Beskyds region. Nowadays, the research of gully erosion in the Myjava Highland is worked out by Stankoviansky (2003a, 2003b, 2003c), who deals mainly with causes and dating of the inception of gullies.

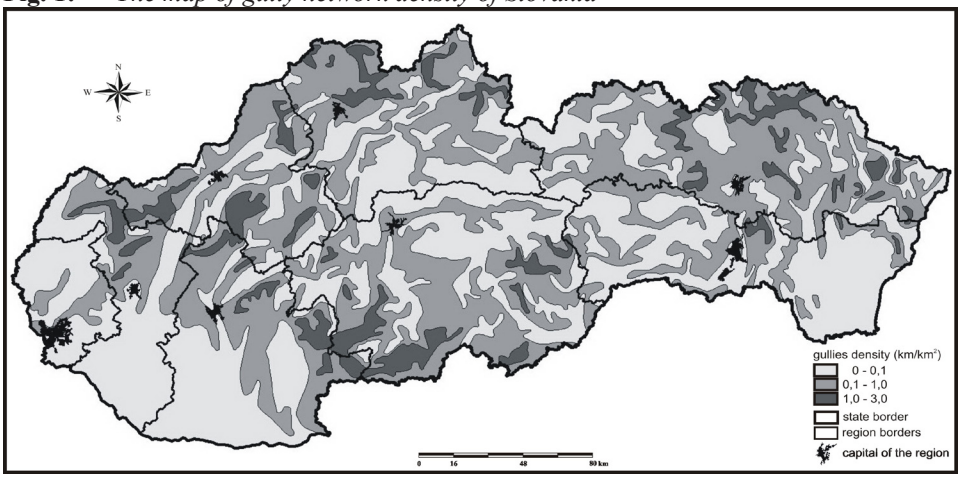
However, the spatial assessment of gully erosion according to administrative division of Slovakia was quite forgotten, up to now. The aim of this contribution is the gully erosion assessment according to regions and districts of Slovak republic. This assessment from this point of view can help the government in agricultural and environmental planning on lower administrative level. Furthermore, this generalization of the problem can help in the initial phases of the research of gully erosion processes in larger scales.

ASSESSMENT OF GULLY EROSION IN THE SLOVAKIA

Knowing the erosion as a surface forming process is important information for the practical purpose. Therefore, a lot of attention was given to this field in the early times of erosion research development. A favorable increase of erosion and soil eroded mapping began in the mid fifties of the 20th century when GÚ SAV started to deal with the gully erosion mapping intensively. After mapping some experimental regions (Mazúrová, 1955; Bučko, 1956) it was possible to propose complex assessment of gully erosion in Slovak standards developed in the "Map of gully erosion of Slovakia" (Fig. 1) by Bučko and Mazúrová from 1958 made in the map scale of 1:400 000 by planimetric evaluation of the area with different gully density ($km.km^{-2}$). Gully density was derived from topographic maps in the map scale 1: 25 000. On the basis of this map results, the most densest network of the gullies is bound to the upland and highland relief in which the favorable interplay of all the factors enormously affected the erosion activity of the runoff, because they

represent the transitional zone between the lowlands and the lower basin parts on one side and the mountains on the other side. This transitional zone is built mostly by the complex of rocks less resilient to the runoff processes. It is possible to assign some areas with the densest gully network. The large but discontinuous area is located in the west part of the upland relief and it covers the most parts of the Myjava Highland, the Javorníky, the Kysuce Upland and the Podbeskydská Upland; also the west part of the Strážov Mountains is joined to it. In the Easternbeskyd bend of the flysch belt there are located two important areas which cover the western and eastern part of the Ondava Upland and the Šariš Upland. Another typical area with the dense gully network is represented by the territory situated in the north part of the Nitra Highland, the Krupina Plain and the Ipeľ Basin. The smaller enclaves are in the parts of the Trnavská Highland, the Žitavská Highland, the Hornonitrianská Highland, the Košická Basin and the Revúcka Upland. Insignificant gully erosion is located in the area of the massive mountain chains with continual forest complexes, on the bottoms of hollow basin and on the alluvial floodplains due to the large amount of vegetation in the first case and relief declension in the other. However, the relevance of this map is limited by reliability of gully network described on this topographic map and of course the age of the map. Since its publication the gully network has overcome the 60 year evolution (Fulajtár and Jánský, 2001). Despite of this, the map is the most distinguishing and the only work addicted to complex assessment of the gully erosion in Slovakia up till now.

Fig. 1: *The map of gully network density of Slovakia*



Source: Zachar, 1960

METHODS AND INPUT DATA

The above mentioned map of gully erosion becomes the basis of our work in order to compare the gully erosion occurrence according to the particular regions of Slovakia. Due to time consuming digitalization of the original map we used its generalized version published in the work of Zachar (1960). The map shows the gully erosion expansion divided into three erosion areas that are furthermore divided into six levels of gully erosion (Tab. 1). In comparison to the original map the areas with the eolic erosion are excluded.

Tab. 1: *The classification of gully erosion according to map of gully network density*

Gully erosion area	Gully erosion level	Gullies density (km / km²)
None and insignificant gully erosion area	1. insignificant	under 0,1
Low and moderate gully erosion area	2. low	0,1 - 0.5
	3. moderate	0,5 - 1,0
	4. high	1,0 - 2,0
	5. very high	2,0 - 3,0
Intensive gully erosion area	6. very high	above 3,0

Source: Bučko and Mazúrová, 1958; Zachar, 1960

The scanned map was georeferenced out of the coordinate system S-JTSK in GIS ArcView 3.2. In the above GIS we vectored the gully erosion areas according to the analogue base. Each area was given the number for the density of the gullies in km/km^2. Because these values are for individual areas and level stated in a range, we set the average value statistically representing each area so that we could use the particular value for the calculation of the gully erosion state for defined spatial units.

Digital map prepared in this way, was the ground for the input data basis for further calculations performed in GIS GRASS. We imported the gully erosion map by the order *v.in.shape* together with the mentioned attribute of the average number of the gully density on km/km^2. In the same way we imported vector data layers of regions and districts areas of Slovak republic to GIS GRASS. Then we calculated the average values of gully density in chosen territory unit by *r.average* command (Neteler and Mitasova, 2002). For the use of our contribution we transformed these calculations to particular regions area of Slovakia and then to the districts areas within particular regions. Originally we wanted to distribute the result values to the ranges according to particular gully erosion levels by Bučko and Mazúrová, (1958), so that we would keep the unified methodic of gully erosion assessment in the whole work. However, the obtained average values for regions and districts are just in three original ranges (2nd – 4th gully erosion level), and 70% of the districts and 75% of the regions belong to 2nd low gully erosion level. Therefore we decided to edit and refine the range width, which would be more practical for our results especially because of the final visualization (Tab. 2). The transformation of results into the chosen ranges was performed by *r.recode* command in GIS GRASS (Neteler and Mitasova, 2002). Command *r.report* (Neteler and Mitasova, 2002) helped us for statistics calculation of the area expanse and of the proportion of particular gully erosion areas to whole region expanse from the map gully erosion (Zachar, 1960).

Tab. 2: *Adjusted classification of gully erosion for the needs of final visualization*

Gully erosion area	Gullies density (km / km²)
None and insignificant gully erosion area	under 0,2
Low and moderate gully erosion area	0,2 - 0,4
	0,4 - 0,6
	0,6 - 0,8
	0,8 - 1,0
Intensive gully erosion area	above 1,0

Source: Author

RESULTS

By the application of the above mentioned method we obtained the results, which enable us to compare gully erosion situation in the regions of Slovak republic and in the deeper analysis in particular districts within the regions themselves. The integration of the objective territories into our ranges and gully erosion levels according to Bučko and Mazúrová, (1958) does not propose complete information in comparison the territories of the same level of gully erosion. Therefore we propose the exact data of gully erosion density for all the regions and districts of the Slovak republic (Tab. 6).

If we compare the particular regions in their full scale area, then on the basis of gully erosion density we can include the regions into three intervals of gully erosion ranges from the total number of 7 ranges, specified by our own classification. The most of the regions (4) belong to range of 0,4 – 0,6 km/km^2 according to the gully erosion density network. Three regions belong to the range of 0,2 – 0,4 km/km^2 and just one region (the Bratislava region) belongs to range of gully network density under 0,2 km/km^2. All the regions are classified as the low and moderate gully erosion area (Tab. 3). In general, it allows us to claim that the area of Slovakia is affected by the negative consequences of the gully erosion quite equally. It is supported by the gully erosion map too.

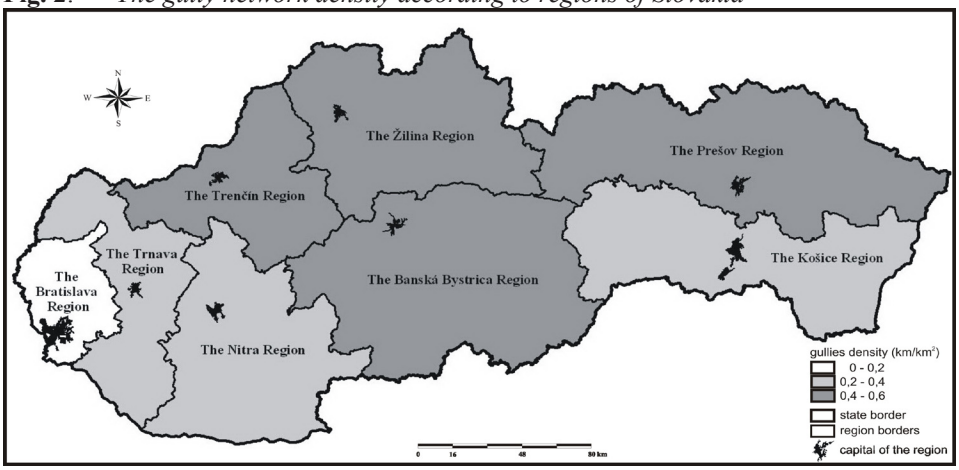
Tab. 3: *The gully network density according to regions of Slovakia*

The region	BA	TT	TN	NI	BB	ZA	KE	PO
Gullies density (km/km^2)	0,187	0,330	0,584	0,406	0,485	0,461	0,259	0,505

Source: Author

The gully erosion density expressed in absolute values proves, that the most affected by the gully erosion is the Trenčín region followed by the Prešov region. On the contrary, the least gully density is in the Bratislava region. The highest values of the Trenčín and the Prešov regions are related to the location of these regions in the western part of upland-highland relief of flysch-klippen belt (the Trenčín region) and in the Easternbeskyd bend of flysch belt (the Prešov region). These territories are the largest, although discontinuous areas with the highest occurrence of gullies in Slovakia (Bučko and Mazúrová, 1958). The lowest value of the Bratislava region is related to the fact that the largest part of region territory lies on the Záhorská Lowland and on the Danubian Lowland; lowlands are the areas with the least occurrence of gullies especially due to the low slope angle. The map of gully erosion according to the regions of Slovakia (Fig. 2) shows the dependence of the gully erosion on the geomorphologic classification of a territory. Regions with the densest gully network (the Trenčín region, the Prešov region, the Banská Bystrica region and Žilina region) are situated in the mountainous part of Slovakia. The Nitra region, the Trnava region and the Košice region are located in the transitional zone between mountainous and lowlands parts of Slovakia, whereupon the gully network density in these regions reaches lower values, depending on the proportions of mountainous and lowlands parts.

Fig. 2: *The gully network density according to regions of Slovakia*



Source: Author

Also, the expanse (Tab. 4) and the percentage (Tab. 5) of the gully erosion area from the total region area according to the map of gully erosion shows, that the regions, which are situated on the lowlands areas (the Bratislava region, the Trnava region, the Nitra region, the Košice region) are typical for their none or insignificant gully erosion, while the other regions (the Trenčín region, the Žilina region, the Banská Bystrica region and the Prešov region) show low and moderate gully erosion. Intensive gully erosion area covers the smallest area, with the highest value in the Banská Bystrica region. On the other hand the Bratislava region has not got this area at all. The comparison of the percentage ratio of particular gully erosion areas to total regions areas and the average value of gully network density within regions show, that especially the change of the mutual proportion of none and insignificant gully erosion areas and low and moderate gully erosion areas influences the final average value of gully network density for particular regions. The assessment of regions according to percentage ratio of gully erosion area shows again that the least effected region by the gully erosion is the Bratislava region, where 79% of the land area proves none or insignificant gully erosion. The most effected region is the Trenčín region. Although it has the lowest ratio in the range of none or insignificant gully erosion together with the Prešov region (34 %), it shows the highest ratio in the range of the intensive gully erosion (14 %), what is the highest value of all the regions in Slovakia.

We show the spatial character of this phenomenon within the internal regional division by the detailed analysis of the gully density in the particular regions. In this work we used the classification according to districts of the region.

Tab. 4: *The territory expanse of gully erosion areas in the regions of Slovakia (km²)*

Gully erosion level/ The region	BA	TT	TN	NI	BB	ZA	KE	PO
1. level	1618	2786	1516	3431	3947	2766	4527	3019
2. - 3. level	435	1149	2325	2395	4548	3526	2108	5133
4. - 6. level	0	290	660	517	960	582	118	839

Source: Author

Tab. 5 *The territory percentage of gully erosion areas in the regions of Slovakia (%)*

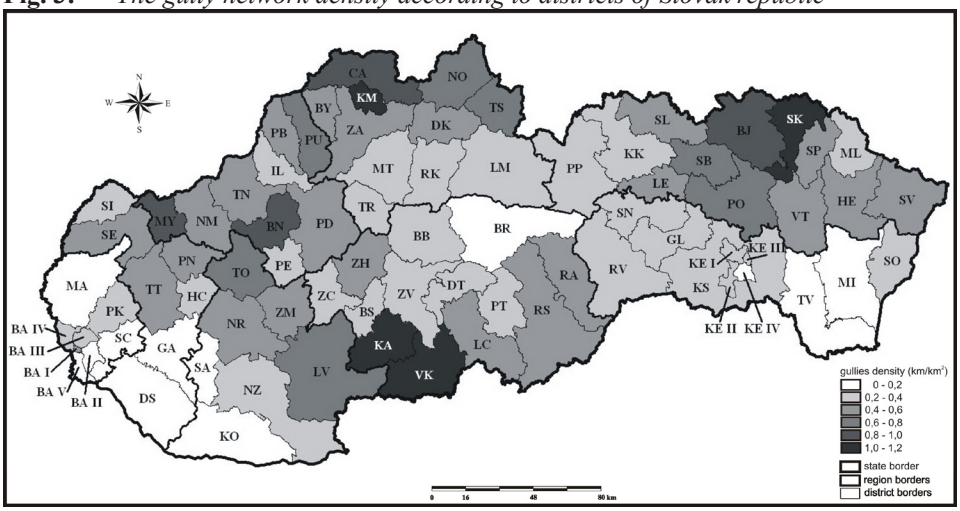
Gully erosion level/ The region	BA	TT	TN	NI	BB	ZA	KE	PO
1. level	79	66	34	54	42	40	67	34
2. - 3. level	21	27	52	38	48	51	31	57
4. - 6. level	0	7	14	8	10	9	2	9

Source: Author

The *Bratislava region* as the least effected region by gully erosion, has no intensive gully erosion areas and does not reach high values of gully erosion density in most of its districts. However there is a paradox that the highest value of gully density is found in the built up area of district Bratislava 1. It is necessary to point out that the methods used have the character of mathematical calculation of the data input and they do not take into consideration the other phenomena occurring on the earth surface. We need to regard also the small expanse of the district which causes that by the average value calculation logically the smaller areas have a tendency to reach the higher final value. These facts suppose that in similar future analyses we will have to exclude the built up areas to a minimum. The results of particular districts in the Bratislava region demonstrate the geomorphological influence on the gully erosion. The districts with higher values of gully network density are situated in the Malé Karpaty Mountains, whereas the districts in the area of Záhorská Lowland and Danubian Highland have lower values (Fig. 3). The district of Senica reaches the highest value of gully density within the *Trnava region*. It is caused mainly by the district location on the Chvojnická Highland and Myjavská Highand. The average values of gully network are decreasing towards the Danubian Plain. The *Trenčín region* belongs to the most effected regions by the gully erosion, so more then half of the districts of this region reach the third level of gully erosion. The Bánovce nad Bebravou district has the highest value of gully density. Districts of the *Nitra region* are situated on the northeast part of this region, so it is a transitional zone between Slovenské Stredohorie Mountains and Danubian Lowland. Districts on the Danube Lowland have just insignificant gully erosion. In the *Banská Bystrica region* there are two (Veľký Krtíš, Krupina) out of four districts, which belong to 4th level of gully erosion according to classification by Bučko and Mazúrová (1958). Generally, as in the previous cases, the results of the districts are related to the geomorphological division of the area. The mentioned districts with the highest values are located in the mid zone between the lowland and highland similarly to the districts of Rimavská Sobota and Revúca on the east of the region. The districts with the highest values within the *Žilina region* are situated in the northern part of the region.

Here is also the district of Kysucké Nové Mesto which is the one of the four districts in Slovakia in the fourth level of the gully erosion. It is not surprising, because there are situated the highest mountains of the flysch belt.

Fig. 3: *The gully network density according to districts of Slovak republic*



Source: Author

Districts on the western and more mountainous part of the *Košice region* have higher values of the average gully network density then the districts situated on the Východoslovenská (Eastern Slovak) Lowland. The exception is the Sobrance district, which is situated mostly on the Výchdodoslovenská (Eastern Slovak) Highland. The *Prešov region* is the second most effected region by gully erosion. It is supported by the fact, that more than half of its districts belong to third level of gully erosion (Bučko and Mazúrová, 1958) and the highest value has the Svidník district, because major part of the territory is covered by the flysch mountains.

CONCLUSION

Comparing the results of the average density of gully network in the regions and districts of Slovak republic we can claim, that on the basis of the methods used, the final values for administrative units depend on two main factors: the area of an administrative unit and its location within Slovak geomorphologic classification. When examining the regions, the region area has dominant role and therefore it reduces the influence of the region location within Slovak geomorphologic classification. From this point of view are the regions of Slovakia according to gully erosion relatively the same. Most of the regions belong to second level of gully erosion according to Bučko and Mazúrová classification (1958) with the gullies length from 0,1 to 0,5 km/km^2. Even the two regions (the Trenčín region, the Prešov region) belonging to the third level, are located just above the limit of 0,5 km/km^2. The final values of particular districts are influenced especially by the district location within the geomorphologic classification. Differences between the districts are

therefore greater than between the regions, however the most of the districts belong to second level gully erosion according to Bučko and Mazúrová classification (1958). The exceptions are only the districts of The Trenčín region and The Prešov region where the dominating districts are those in the third level of the gully erosion but only in minimal majority (55 % - the Trenčín region, 54 % - the Prešov region).

Tab. 6: *The gully network density according to districts of Slovak republic*

District	Average gully density (km / km²)	District	Average gully density (km / km²)
THE BRATISLAVA REGION		THE PREŠOV REGION	
Bratislava 1	0,412	Bardejov	0,778
Bratislava 2	0,105	Humenné	0,523
Bratislava 3	0,308	Kežmarok	0,331
Bratislava 4	0,306	Levoča	0,380
Bratislava 5	0,105	Medzilaborce	0,309
Malacky	0,147	Poprad	0,230
Pezinok	0,312	Prešov	0,573
Senec	0,138	Sabinov	0,608
THE BANSKÁ BYSTRICA REGION		Snina	0,510
Banská Bystrica	0,240	Stará Ľubovňa	0,530
Banská Štiavnica	0,389	Stropkov	0,401
Brezno	0,213	Svidník	0,974
Detva	0,373	Vranov n. Topľou	0,459
Krupina	1,056	THE TRENČÍN REGION	
Lučenec	0,483	Bánovce n. Bebravou	0,953
Poltár	0,350	Ilava	0,297
Revúca	0,512	Myjava	0,908
Rimavská Sobota	0,544	Nové mesto n. Váhom	0,581
Veľký Krtíš	1,057	Partizánske	0,359
Zvolen	0,347	Považská Bystrica	0,772
Žarnovica	0,250	Prievidza	0,522
Žiar n. Hronom	0,422	Púchov	0,463
THE KOŠICE REGION		Trenčín	0,457
Gelnica	0,269	THE TRNAVA REGION	
Košice 1	0,346	Dunajská Streda	0,103
Košice 2	0,226	Galanta	0,132
Košice 3	0,259	Hlohovec	0,348
Košice 4	0,216	Piešťany	0,462
Košice okolie	0,364	Senica	0,608
Michalovce	0,180	Skalica	0,336
Rožňava	0,260	Trnava	0,498
Sobrance	0,263	THE ŽILINA REGION	
Spišská Nová Ves	0,271	Bytča	0,423
Trebišov	0,167	Čadca	0,874
THE NITRA REGION		Dolný Kubín	0,395
Komárno	0,103	Kysucké Nové Mesto	1,001

Levice	0,627	Liptovský Mikuláš	0,269
Nitra	0,432	Martin	0,235
Nové Zámky	0,256	Námestovo	0,633
Šaľa	0,129	Ružomberok	0,248
Topoľčany	0,732	Turčianske Teplice	0,283
Zlaté Moravce	0,548	Tvrdošín	0,724
		Žilina	0,486

Source: Author

The accuracy of obtained results depends mainly on the accuracy and the quality of input data. Thus the precising of the results requires the updating of the map of gully erosion density (Bučko and Mazúrová, 1958), it means we need to take into consideration the sixty years development of gully network since the map publication. From the point of view of the calculation process it is necessary to sectionalize the map at least according to gully erosion levels and not just according to areas.

References

BARABAS, D. (1996): Erózne javy v povodí Hornádu. *Natura Carpatica*, 37, 63-68.

BARABAS, D. (1997): Erózne javy v povodí Bodvy. *Natura Carpatica*, 36, 9-14.

BORK, H., R. (1989): Soil erosion during the past millenium in central Europe and its significance within the geomorphodynamics of the Holocene. *Catena*, Supplement 15, 121-131.

BUČKO, Š. (1956): Výmoľová erózia v povodí Hornádu. *Geografický časopis* 27, 1, 5-15.

BUČKO, Š., MAZÚROVÁ, V. (1958): Výmoľová erózia na Slovensku. In Zachar, D., ed. Vodná erózia na Slovensku. Bratislava, Vydavateľstvo SAV, 68-101.

FULAJTÁR, E., JANSKÝ, L. (2001): Vodná erózia pôdy a protierózna ochrana. Bratislava, VÚPOP, 310 s.

HARČÁR, J., 1995, Výmoľová erózia v SZ časti Nízkych Beskýd – vzťah ku štruktúre a reliéfu. In.: Hochmuth, Z., ed. Reliéf a integrovaný výskum krajiny. Zborník referátov z konferencie. Pedagogická fakulta UPJŠ Prešov. 19 -31.

MAZÚROVÁ, V. (1955): Výmoľová erózia v povodí Ipľa. *Geografický časopis*, 7, 1 - 2, 102-104.

NETELER, M., MITASOVA, H. (2002): Open Source GIS: A GRASS GIS Approach. Boston, Kluwer Academic Publishers

POESEN, J., NACHTERGAELE, J., VERSTRAETEN, G., VALENTIN, C. (2003): Gully erosion and enviromental change: importance and research needs. *Catena*, 50, 91 – 133.

STANKOVIANSKY, M. (1998a): Geomorfologický efekt pôsobenia ronových procesov v poľnohospodárskej krajine. In.: Zborník referátov z odbornej konferencie v Nitre: *Trvalo udržateľná úrodnosť pôdy a protierózna ochrana*. Bratislava, 301 – 308.

STANKOVIANSKY, M. (1998b): Význam tvorby efemérnych výmoľov v súčasnej i dlhodobej morfogenéze. In. Acta Facultatis Studiorum Humanitatis et Naturae, Universitatis Prešoviensis. *Prírodne vedy, Fólia geographica* 2, 321 – 326.

STANKOVIANSKY, M. (2003a): Gully evolution in the Myjava Hill Land in the second half of the last millennium in the context of the central-european area. *Geographia Polonica*, 76, 2, 89 – 107.
STANKOVIANSKY, M. (2003b): Geomorfologická odozva environmentálnych zmien na území Myjavskej pahorkatiny. Bratislava, Univerzita Komenského.
STANKOVIANSKY, M. (2003c): Historical evolution of permanent gullies in the Myjava Hill Land, Slovakia. *Catena*, 51, 223 – 239.
ŠÚRI M., CEBECAUER T., HOFIERKA J., FULAJTÁR E. (2002): Soil erosion assessment of Slovakia at a regional scale using GIS. *Ekológia* (Bratislava), pp. 404-422.
VALENTIN, C., POESEN, J., YONG LI, (2005): Gully erosion: Impacts, factors and control. *Catena*, 63, 132 – 153.
ZACHAR, D. (1960): Erózia pôdy. Bratislava, Vydavateľstvo SAV, 308 s.
ZACHAR, D. (1970): Erózia pôdy. Bratislava, Vydavateľstvo SAV, 528 s.

HODNOTENIE VÝMOĽOVEJ ERÓZIE PODĽA ADMINISTRATÍVNYCH CELKOV SLOVENSKA

Zhrnutie

Erózia je jedným z činiteľov vplývajúcich na znehodnocovanie pôd, a preto sa významne podieľa na problémoch spojených s výživou obyvateľstva sveta. Jedným z prejavov líniovej vodnej erózie sú výmole, preto vodnú eróziu, spôsobujúcu vznik výmoľov, nazývame **výmoľová erózia**. Inicializácia výmoľovej erózie je spôsobená pôsobením ronových procesov, pod ktorými chápeme geomorfologické procesy iniciované povrchovým odtokom vody po svahoch počas extrémnych zrážok a topenia snehu (Stankoviansky, 1998a). Hlavnou príčinou vzniku výmoľov je nadmerné množstvo vody, pričom táto podmienka môže byť spôsobená buď klimatickou zmenou, alebo využitím zeme. Doteraz však bolo opomenuté priestorové hodnotenie procesu výmoľovej erózie vo vzťahu k administratívnemu členeniu Slovenskej republiky. Cieľom tohto príspevku je hodnotenie výmoľovej erózie podľa krajov a okresov Slovenskej republiky. Hodnotenie z tohto aspektu môže napomôcť štátnej správe pri poľnohospodárskom a environmentálnom plánovaní na nižšej administratívnej úrovni. V neposlednom rade takáto generalizácia tejto problematiky môže poslúžiť nástupnej fáze detailnejšieho výskumu výmoľovej erózie vo väčších mierkach.

Základným podkladom našej práce sa stala generalizovaná mapa výmoľovej erózie autorov Bučka a Mazúrovej (1958), uverejnená v práci Zachar (1960). Po zdigitalizovaní bola mapa spracovaná v GIS-e GRASS prostredníctvom príkazu *r.average,* na základe ktorého sme prepočítali priemerné hodnoty hustoty výmoľovej siete pre jednotlivé kraje a okresy Slovenska.

Ak navzájom porovnáme jednotlivé kraje v plnom rozsahu ich území, tak na základe hustoty výmoľov môžeme kraje zaradiť do troch nami zvolených intervalov výmoľovej erózie, z celkového počtu siedmych intervalov. Najviac krajov (4) patrí, podľa hustoty výmoľovej siete, do intervalu v rozsahu 0.4 až 0,6 km⁄km^2. Tri kraje sa nachádzajú v rozmedzí 0,2 až 0,4 km/km^2 a iba jeden kraj (Bratislavský) sa nachádza v intervale s hustotou

výmoľovej siete pod 0,2 km/km^2. Čo sa týka okresov, tak najviac (42 %) ich spadá do intervalu s hustotou výmoľovej siete 0,2 až 0,4 km/km^2, nasledovaný intervalom 0,4 - 0,6 km/km^2 (27 %). Aj preto až 84 % okresov patrí z hľadiska hustoty výmoľovej siete do oblasti miernej až stredne silnej výmoľovej erózie, zatiaľ čo do oblasti žiadnej až nepatrnej erózie patrí 13 % okresov a do oblasti intenzívnej výmoľovej erózie iba 4 % okresov (okresy Kysucké Nové Mesto, Krupina a Veľký Krtíš).

Porovnaním výsledkov priemernej hustoty výmoľovej siete v krajoch a okresoch Slovenskej republiky môžeme konštatovať, že na základe použitej metodiky konečné výsledné hodnoty pre jednotlivé administratívne celky závisia od dvoch hlavných faktorov, a to od rozlohy daného administratívneho celku a jeho polohy v rámci geomorfologického členenia Slovenska. Pri krajoch zohráva dominantnú úlohu rozloha krajov, ktorá je dostatočne veľká na to, že zatláča do úzadia vplyv polohy kraja v rámci geomorfologického členenia Slovenska. Z tohto dôvodu sú kraje Slovenskej republiky z hľadiska výmoľovej erózie na tom pomerne rovnako. Výsledne hodnoty pre jednotlivé okresy sú, naopak, ovplyvnené najmä polohou okresu v rámci geomorfologického členenia Slovenska vzhľadom na pomerne malú rozlohu týchto administratívnych celkov.

Recenzovali: Prof. RNDr. Eva Michaeli, PhD.
Doc. RNDr. Miloš Stankoviansky, PhD.

WHAT IS THE COLOUR OF PREŠOV?
AN ANALYSIS OF COLOUR ASSOCIATIONS IN THE POPULATION EVOKED BY A GEOGRAPHICAL AREA AS THE FUNDAMENT FOR CREATING AN ACCEPTABLE CITY BRAND

***Kvetoslava MATLOVIČOVÁ*[1]**

Abstract: *Focusing on visual components, such as creating a new logotype, is the most frequently used method of city branding applied. One of the six criterions recommended to be followed in the selection of brand components is rememberability that can be further supported by, inter alia, the choice of a suitable colour. In the process of selecting it, a rewarding approach may consist in knowing the population's existing colour associations tied to a particular place, which can contribute to a more rapid acceptance of a new brand, while, at the same time, it can decrease, to a certain degree, the risk of rejection. This paper analyzes the possible colour associations related to the area of the City of Prešov present among the city's residents. The aim is to determine one attribute for the creation of a new city brand.*
Keywords: *city branding, logotype, European Capital of Culture*

INTRODUCTION

The commencement of the era of so-called „entrepreneurial cities" brought the beginning of applying a whole variety of business companies' practices to cities to a far greater extent than ever before. One such practice is the process of creation and shaping the city's brand and logotype, i.e. the process of branding. It was the success achieved by some business trademarks that got some cities trying to imitate them and launch a new stage in their own development. Today, there is no doubt that geographical locations (places) can be a subject of branding, even though the names of such places are no longer changing (e.g. K. Keller, 2007, p. 59).

In Slovakia, recent years have seen an increased level of interest displayed by cities in presenting themselves through logos or symbols. The most vital interest could be seen in connection with the contest to win the title of European Capital of Culture (ECOC). The project has been running since 1985, during which period it went through many changes (the last change took place in 2007). The recently completed (September 2008) selection of the 2013 candidate proved that the project, as reflected in its current shape, appears to be an extremely useful tool in stimulating interest in place-marketing or place-branding techniques. This is even true for such European regions where the serviceability of such techniques' application to places has not yet been fully realized.

1 **RNDr. Kvetoslava Matlovičová, PhD.,**
Department of Geography and Regional Development, Faculty of Humanities and Natural Sciences, University of Prešov, ul.17. novembra 1, 081 16 Prešov, e-mail: kveta@unipo.sk

The concept of place branding alone should be understood, in a broader context, as a general branding process based on a place strategy. Its main goal is to distinguish a city by laying emphasis on those elements or components that make the city unique. This, however, is nothing new. From time immemorial, towns and cities have been brands in the most profound sense of that word. In the past, their unparalleled natures would be depicted in their coats of arms – the things that are now perceived as reflections of cities' or towns' glorious (more or less) history and fate. A current brand, however, should primarily reflect a promising future, i.e. "what the city is and what it wants to be". It is a reverberation of reality as it is perceived.

The most frequently used tool of branding applied to such places is focusing on its visual components, such as the creation of a new logotype, the incorporation of a new slogan, and the development of an advertising campaign related to said visual components.

A logotype itself – which forms, besides official heraldic symbols, the fundament of a city's uniform visual style – cannot be viewed as place branding as it is handled by marketing theory since it forms a very important part of brand components supporting a brand's easier rememberability and embedding it into people's subconscious minds. Then, through the brand, qualitative aspects of a place are perceived. It is exactly the subconsciously induced associations connected to a brand that make up the essential elements in the assessment of a brand's quality.

One of the six criterions recommended to be followed in the selection of brand components is rememberability[2] that can be further supported by, inter alia, the choice of a suitable colour. The way in which colours make people react and feel has been explored since the times of Pythagoras in ancient Greece (560 - 496 B.C.). Numerous attempts to obtain scientific or holistic evidence of colours' effects upon man can be found in archives (Kašová, 2007). We are therefore of opinion that the knowledge of the existing locality-related colour associations in population may, in a way, contribute to a more rapid acceptance of a new brand, while, at the same time, it can also decrease, to a certain degree, the risk of such brand's subsequent rejection.

SURVEY METHODOLOGY

In November 2007, taking into account Prešov City local government's aspiration to develop the city's brand strategy, we conducted a survey among the city's residents aimed at identifying the most powerful colour association evoked in Prešov's inhabitants' subconscious minds by the geographical area of their place of residence.

Due to the absence of an appropriate selection support for simple random selection (i.e., in this particular case, complete population databases), we had to chose the quota sampling method with three fixed quotas (gender, age[3], and the place of residence[4]). The sample of 1,004 respondents that we had made up was sufficiently, in its structure, identical to the

2 Brand component selection criterions: 1.rememberability, 2.meaningfulness, 3.po-pularity, 4. transferability, 5. adaptability, 6. protectability (Keller 2007, p. 204-210).

3 The target group was composed of residents of Prešov older than 19 years

4 According to urbanistic districts

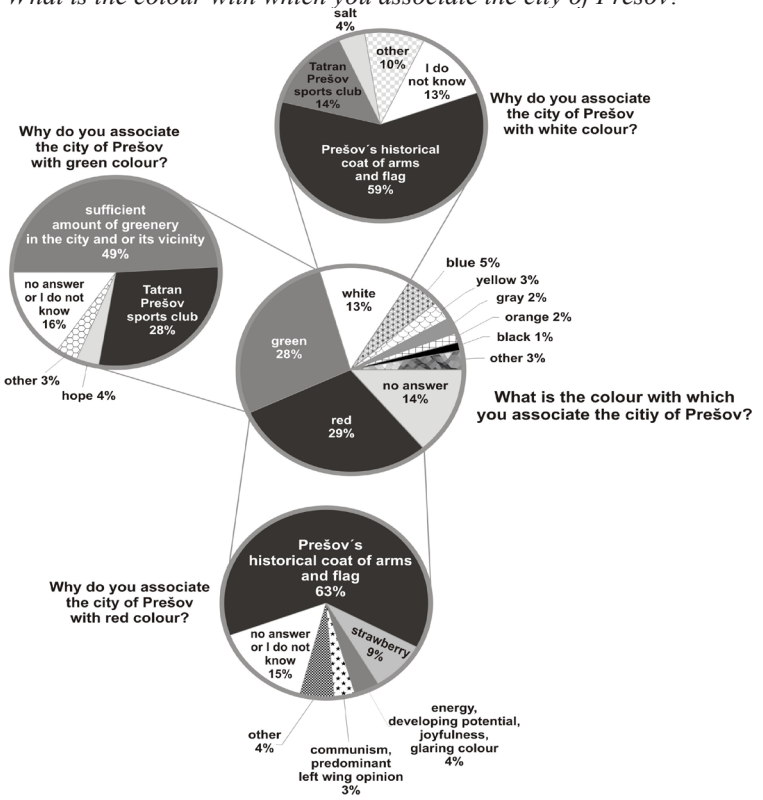
structure of the target population's distribution by gender, age and place of residence; therefore, the sample can be considered to be a statistically valid survey sample[5].

Our empirical research was solely carried out in the city of Prešov, within the city limits, and has not included the view of external environment (which, in many aspects, could certainly have been more interesting). Therefore, the results of our research only provide a partial picture of the phenomenon examined.

RESEARCH RESULTS

The results of our research have proven that the respondents show a strong association between the city and the red (29%) and green (28%) colours; and they also, to a certain degree, associate the city with the white colour (13%) (Chart1).

Chart 1: *What is the colour with which you associate the city of Prešov?*



Source: Proprietary empirical research

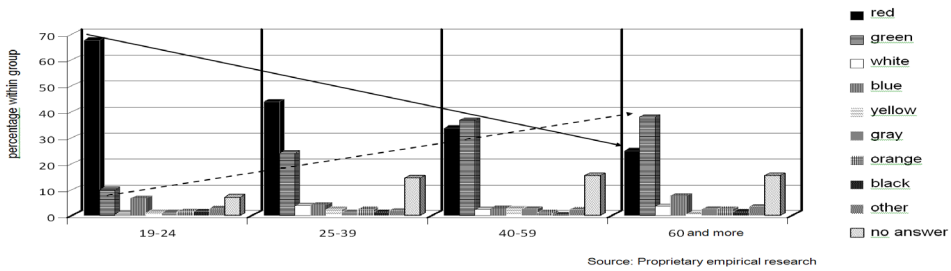
5 In the field of sociological research methodology, and in particular in the field of public opinion surveys, there is a lot of discussion revolving around the reliability of extending applicable findings to the entire target population using the method of quota selection. However, the results of numerous surveys they, had applied both methods do not significantly differ from each other; therefore, it can be stated that "*... not a single application of probability-based selection schemes does not guarantee that estimates will not diverge and that both of the approaches have similar attributes in their practical applications.* (Šubrt et al.) (1998, p. 110).

For many, the red colour is the colour of their city (Prešov), which primarily arises from the fact that the red colour prevails in the city's historical coats of arms as well as its flag, and the city has virtually adopted it on historical principles. The general acceptance of the said colour as Prešov's official colour has also been reflected in the creating of various institutions' emblems that are shaded in red (e.g. University of Prešov's official colour is purple and the University's emblem contains as constituents three heraldic roses borrowed from the city coats of arms). In the city coats of arms, the purple colour is mixed with the white or silver colour[6], which was one of the reasons why the respondents connected Prešov with these particular colours.

The other colour stated by almost the same number of respondents was green. As their reason for preferring that colour, nearly one-half of the respondents indicated a sufficient amount of greenery in the city or its vicinity; and more than one-fourth of them chose the green colour because they had it firmly planted in their minds in connection with the official colours of Tatran Prešov (the city's soccer team).

Chart 2 below shows that the connection between Prešov and the red colour dramatically decreases with increasing age. While the group ranging from 19 to 24 years of age indicated the red colour in over 70 percent of cases, for those over 60 years of age that proportion was only 25 percent. The associations connected with the green colour showed an inverse tendency, in terms of age distribution. Older respondents (over 40 years of age) preferred the green colour. Among the youngest age group, this preference was much weaker (barely 10 percent of the respondents). Thus, older respondents prefer the combination of their city with the green colour while those younger (primarily the age group from 19 to 24 years) unambiguously prefer the red colour.

Chart 2: *Which colour do you think best represents the city of Prešov? Answers evaluated by age categories.*



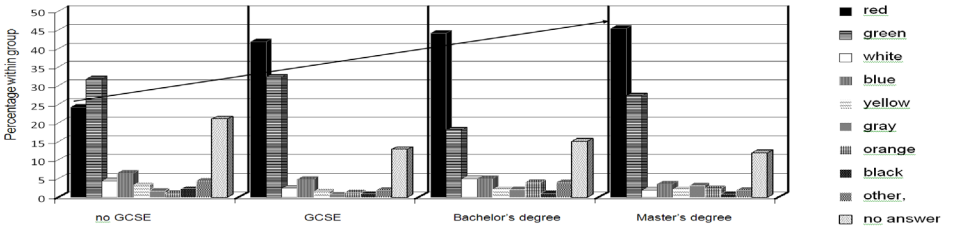
Source: Proprietary empirical research

The association of Prešov with the red colour is most frequently reported by respondents with higher education levels (bachelor's degree and higher) and it exhibits a slightly increasing trend from 22 percent for the respondents with lower education (elementary or junior high school completed) to 45 percent for respondents with a bachelor's degree or an advanced degree (Chart 3). Contrary to that, the proportion of the "green association"

6 In real life, the silver colour originally included in a coat of arms is ordinarily replaced by the white colour; this is why the white and red version became common rather than the silver and red version of a coats of arms. In the answers provided by our respondents, the group stating the silver colour as the colour of the city of Prešov represented mere 2 percent.

shows a rather decreasing tendency, i.e. it is more markedly the case with respondents with lower levels of education than with those with a university degree (including the respondents with a bachelor's degree). In this particular case, the inverse proportion is disturbed by the group of "bachelors" where the proportion of "green associations" is lower by almost 10 percent than for respondents with a master's degree. The analysis of answers in relation to education showed that the respondents with a lower level of education (elementary or junior high school, at the most) form the only group in which the proportion of answers preferring the "green association" prevails over association the city of Prešov with the red colour. At the same time, this is a group that showed the greatest proportion of those giving no answer (did not know what to answer or failed to indicate any colour). We have detected an unambiguous dominance of the "red association" in the respondents with a Bachelor's degree (43%) and the respondents with a Master's degree (45%).

Chart 3: *„What is the colour with which you associate the city of Prešov?" Answers evaluated by education levels.*

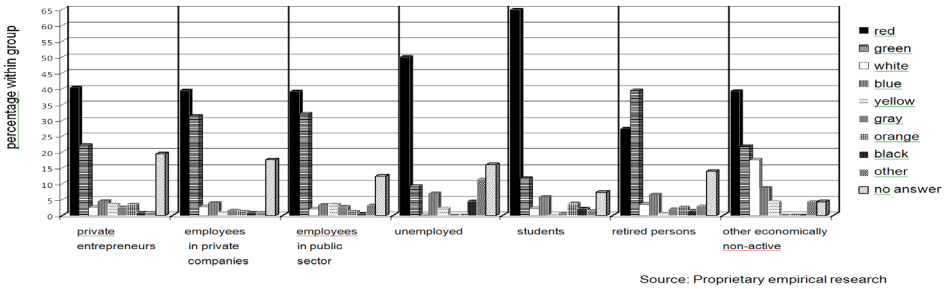


Source: Proprietary empirical research

For the group of "students", the evaluation of the colour associated with the city by respondents' occupation (Chart 4) is, to quite a high degree, identical with the results obtained from the age group ranging from 19 to 24 years (since most respondents of that age group are students); similarly, the group of retired persons gives results identical with the results obtained from the age group over 60 years (for the same reasons as the first mentioned). More than 40 percent of entrepreneurs perceive Prešov in connection with the red colour (only approximately half of that proportion, 21 percent, reported the green colour as their association). Prešov is felt as a "red city" among the unemployed (by 50 percent of them). The distribution of the "red" and "green" associations is relatively equal for employees of privately run companies vs. public sector employees, with the red colour slightly predominating. As for the rest of the colours that were indicated in the answers, one group denominated as "other economically active persons" composed mostly by mothers on maternity leave (75 percent) was particularly interesting. In this group, the proportion of "white population" (which is usually 1 to 2 percent in other respondent groups) represents as much as 18 percent, and the blue colour and its connection to Prešov was recalled by no more 9 percent (for the jobless and retired persons, this proportion was 7 and for students 6 percent). With respect to occupation, two contrasting groups have emerged: the group of pensioners who associate the city of Prešov with the green

colour (39 percent of the respondents) and the group of students[7] for whom Prešov is unequivocally linked to the red colour (65 percent of the respondents).

Chart 4: *"What is the colour with which you associate the city of Prešov?" Answers evaluated by occupation.*

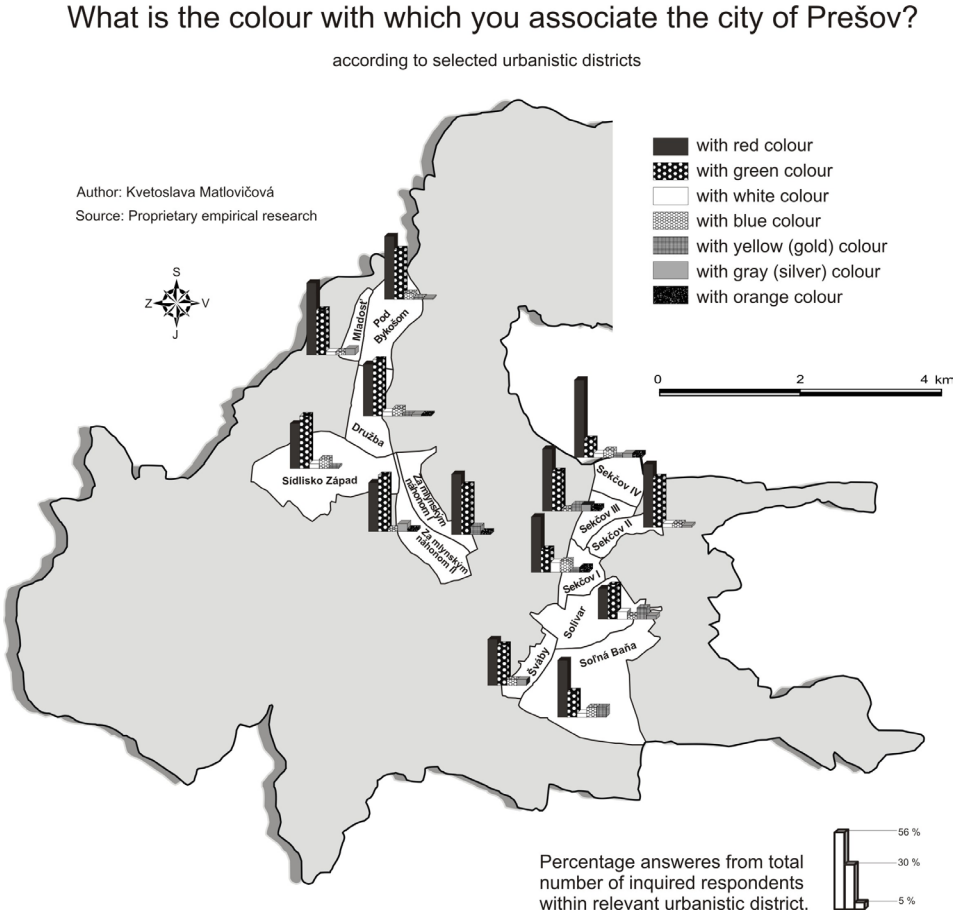


Source: Proprietary empirical research

One precondition for the development of a colour association is a visual interpretation of a sensory experience of an environment. In our case, respondents were mostly influenced by the environment of their particular neighbourhoods, i.e. the part of the city with which they are in everyday contact and by the centre of the city, too. For those respondents living in urbanistic districts (hereinafter referred to as "UO") with the densest greenery, the "green association" predominates (Map 1). This is true for the following UOs: Družba, Sídlisko II (west), the northern portion of the UO Za mlynským náhonom II, and the south-western quarter of Solivar. For the two latter districts, reasons such as "the green vicinity of Prešov" and "the green downtown" were stated. In Za mlynským náhonom I (a UO close to the centre of the city), the yellow colour is mentioned quite often. As stated by many, this colour is linked with the predominant colour of buildings located in downtown Prešov. Respondents living at the housing projects Sekčov and Šváby often indicated the gray colour as their colour association reasoning that they feel that colour due to the dismalness and drabness of their neighbourhood; often they also complained about dirtiness and the lack of greenery.

7 Similarly, there is a very significant proportion of the red association among the jobless (50 %). The proportion of the second, in terms of the number of answers, colour – green – was only 8 percent.

Map 1



A deeper qualitative analysis of answers given to the question "What is the colour with which you associate the city of Prešov?" also enables us to better comprehend the process of developing the city residents' attitude to their city. It can also be understood as a certain type of projection through which to obtain information of the city's dominant constituent(s). Provided that it is sufficiently intense and distinct, it becomes a sort of vehicle for subconscious information and the trigger for specific associations linked to a place. It therefore becomes part of a city's brand.

To illustrate and allow better comprehension of the construct of an answer given to the above-stated question, we list exact transcriptions of selected answers provided by our respondents (see Frame 1, Chart 1). We specifically selected answers other than those that had stated the red colour association with a brief reference to the "city coats of arms" or the green colour association with a brief reference to "Tatran[8]", "nature"; nor did we select the answers saying "don't know".

8 „Tatran" is the name of Prešov's soccer and handball teams (sporting club).

The content analysis of the rationalizations attached to answers given to the question "What is the colour with which you associate the city of Prešov?" showed that the residents of Prešov mostly link their city with the red colour which they consider to be the city's "proprietary" colour. Even those answers that did not exactly state the city's official symbols did indirectly refer to their portions such as strawberries, roses etc. Another group of respondents, much smaller in terms of their number, referred quite frequently to the Communist history that still, in their opinion, lingers in the minds of some city residents.

For the followers of the "green association", Prešov is a city with a sufficient amount of greenery, situated amidst the beauties of nature. Also those residents of Prešov link the city with the green colour who derive that colour from the local sporting club's official colours that has a long tradition in the city and has long participated in the promoting of the city's public image.

There were also different colour associations: let's mention the black colour where there was associations linked to negative perception of the present time due to social behaviour of culturally inassimilable Romany groups.

Other colours that appeared in the answers resulted from some elaborated marketing campaigns – such as the orange colour (the hue once chosen by the current city's Mayor for the colour scheme of his election campaign) and the blue colour (which resulted from the city's strong group of the Slovak Democratic and Christian Union's (SDKU) sympathizers as the SDKU, in 2002 parliamentary election campaign, had used a simple yet vacuous slogan saying that "blue is good" receiving much media attention. As is quite clear now, the discussion in the media was successful as, even after the passage of seven years, the linkage between the political party and the blue colour is still alive.).

Frame 1: *What is the colour with which you associate the city of Prešov?*
(A selection of respondents' answers)

- *Red – a strawberry town*
- *Red – the city's colour*
- *Red – the red tulips at the pedestrian zone*
- *Red – vigour, go-ahead – the typical traits of the Eastern Slovaks*
- *Red – just crossed my mind*
- *Red – a roofing tile, coats of arms, strawberries*
- *Red – it is present in the city's emblem, I just can't imagine any other colour*
- *Red – the colours prevailing on the city's Web page*
- *Red – the colour of blood, Caraffa, the colour of strawberries - Eperjes*
- *Red – strawberries used to be grown in the area*
- *Red – the Communists – members of the City Magistrate*
- *Red – the city is full of unused energy*
- *Red – because we have red buses*
- *Red – the city has it in its arms. It's a repugnant colour.*
- *Red – many left-leaning people*
- *Red – I don't know, just recalled the coat of arms*
- *Red – the city's arms and the Web page*
- *Black and White – the white colour: represents every nice thing we have and every nice thing that I hope awaits us*

- *Red and Black – just walk past post around the 20th day of a month, you'll see*
- *Red and Green – Communism, the nature around here*
- *Red and Green – the colour of roofs, greenery*
- *Purple – prevails in the University of Prešov's Web pages*
- *Green – since time immemorial it's the colour for this city*
- *Green – we have a lot of greenery (trees, green areas)*
- *Green – we had a lot of greenery here*
- *Green - FC Tatran, the handball team, they have the green colour it in their emblem, and entire city lies in the bosom of nature*
- *Green – because there is a lot of greenery in downtown Prešov*
- *Green – there is a lot of green around here, and I hope it will remain so*
- *Green – I don't know of any greener neighbourhood than the "Housing Estate No. III"*
- *Green – a traditional colour - soccer, handball, nature*
- *Green – a city of greenery*
- *Green – forests, parks, sportswear*
- *Green – a lot of greenery in the city, but NOT in Sekčov, much to my sorrow*
- *Green – the soccer and handball players' strips*
- *Green – hope, soccer, nature*
- *Green – I don't know of any other neighbourhood greener than the "Housing Estate No. III"*
- *Green and White – because of the sportsmen who build a good reputation for the city*
- *Green – hope for a brand new start personified by the City Mayor*
- *Red, Green and White – don't know why, perhaps it came to me subconsciously; the red and white from the coats of arms, the green and white from Tatran*
- *Green and Yellow - Tatran, parsons*
- *Green and Yellow – enough greenery, a lot of space*
- *Blue ... associations ...*
- *Blue – Christian*
- *Blue – the blue sky above Prešov*
- *Blue – Torysa River*
- *Blue – the city is blue at sunset*
- *Blue – cleanliness, stillness*
- *Blue and Yellow – the typical colour of Prešov's street light posts*
- *Blue – don't know, just crossed my mind*
- *Blue – the reason probably was because my native town Košice is red and it is colder in Prešov than in Košice*
- *Blue – because blue is a cold colour and the city of Prešov gives the impression of being a cold place.*
- *Blue – among all other colours, the blue colour provides the greatest satisfaction, it is the most favourite colour around the world. The life in the city of Prešov gives me a sense of peace and spiritual satisfaction, safety.*
- *Blue–Violet - Prešov is like a beautiful gemstone – quite cold for the time being, raw and waiting for skilled hands to cut it into a perfect jewel and show off its full beauty and brightness*

- *Dark blue – the city seems to have fallen asleep (development)*
- *Gray – because it is gray, too little green colour all around here, and it looks like it will be losing more and more greenery in the future…*
- *Gray – nondescript, dull and monotonous neighbourhoods*
- *Gray – the infrastructure is in a disastrous condition, there is shortage of cultural facilities, clubs and sports facilities*
- *Gray – Sekčov – just come to our place and you'll see*
- *Gray – this is a pretty dirty city*
- *Gray – too many automobiles, too much mess*
- *Gray – stagnation, a very high unemployment rate, traffic problems*
- *Gray – sleeping city*
- *Gray – low wages, no joy in life, just existing from day to day!*
- *Gray – dullness, people display little interest in local events, the city has been in the doldrums*
- *Gray – getting a bad feeling from the city*
- *Gray – a concrete jungle*
- *Gray – a dismal town - there is nothing here*
- *Gray and Green – one-half of the city consists of concrete, the other consists of greenery*
- *Brown, Gray – heaps pf dirt and garbage*
- *White – the smoke from Kronospan*
- *White – white is a indefinite colour, virtually no colour just like the city itself*
- *White – we have a salt cavern here*
- *White and Blue – the colour of salt, the colour of water (the old hydro-electric power station)*
- *White – to me, the city gives an impression of a clean place, I still like to be at home (in Prešov)*
- *White and Red, also White and Green – these are present in the city's coats of arms and historically proven, also they are in our soccer and handball teams' visual identity*
- *Pink – the colour of the pavement in the pedestrian zone*
- *Pink – the cherry trees that blossom in November 17 Street in May*
- *Pink – the trees blossoming in November 17 Street – super*
- *Orange – a varicoloured city, full of students, pretty vital*
- *Orange – changes after the election*
- *Orange – the colour of the city's Mayor*
- *Yellow – the centre of town shines with these colours*
- *Yellow – this crossed my mind first*
- *Yellow – there are many yellow buildings at Main Street*
- *Yellow – hope – I believe there will be some place to go, in addition to beauty*
- *Golden and White – the gold mine the salt works*
- *Golden and Blue – the colours once used by our hockey team*
- *Snuff-coloured – such an autumn town*
- *Black – the colour of sorrow: it represents all the negative things that we do not manage to solve in the long run: primarily the huge resettlement and the neigh-*

bourhoods that offer virtually nothing but satisfying the very basic needs to their inhabitants. ...
- *Brown - dirt, lack of culture, buildings sprayed with graffiti, unfinished projects*
- *None – dumb question*
- *None – it makes no sense to me to associate cities with any colours*
- *Rainbow – the housing projects – varicoloured blocks, the pedestrian zone, colourful buildings*
- *The colours of rainbow – for to me this city has so many faces*
- *Various colours, primarily those cheerful – downtown, Main Street*
- *Varicoloured – because there are small houses in many colours in the centre of town*
- *Violet – sorrow, haughtiness, immodesty*
- *Black – just for the hell of it, for Prešov is so boring.*

Source: Proprietary empirical research

Thus, the residents of Prešov perceive their city as a city of green surrounded by beautiful nature that "*gives them a sense of peace, harmony and safety"* (quoted from one respondent's answer). This type of assessment evokes a feeling of satisfaction among most respondents falling into the middle-age and senior age categories. For younger respondents, this sounds more like criticism as they widely perceive the phrase "*peace in Prešov"* as existing standstill or idleness, viewing their city as a place where nothing goes on.

CONCLUSION

The development of a new uniform visual identity for the city, and particularly the creation of Prešov's new logotype, the natural associations existing in people's minds should be taken into account, which can eventually contribute to increasing the probability of the visual identity's acceptance. In this connection, the results of the survey show that a useful approach might be to determine one of the required attributes of a new logo and construct it in hues of green. The green colour association does not generate any negative associations in respondents. It represents a suitable alternative to the other frequently cited colour – the red that is well-connected to the city through the city's historical attributes (the coats of arms and the flag). In that way, the green-colour orientation would appropriately follow up with the vision of the city's future development as an "environmental city", which was presented as part of the upcoming project for the city's candidacy for the 2013 ECC (European Capital of Culture) and which is also connected with the city's newly-born ambition to build its further development on "clean technologies" (such as an initiative begun by University of Prešov, the City of Prešov and a number of private companies towards the establishment of Biotechnology Park).

Acknowledgement: This paper was prepared with the contribution of the grant VEGA No. 1/0611/09 „The Construct of a Place in Regional Geographical Analysis and Synthesis Territorial Marketing: A Theoretical and Methodological Framework and Its Application to Selected Model Areas (Project Leader: Prof. R. Matlovič).

References

AAKER, D., A. (2003): Brand building. Budování obchodní značky. Computer Press, Brno, ISBN 80-7226-885-6, 312 p.

FLOREK, M. (2006): Podstawy marketingu terytorialnego. Akademia Ekonomiczna w Poznaniu, Poznań, ISBN 978-83-7417-154-0 187p.

FORET, M., STÁVKOVÁ, J., VAŇOVÁ, A. (2006): Marketingový výzkum. Znojmo: SVŠE, ISBN 80-239-7755-5

JEŽEK, J., JEŽKOVÁ, R. (2008): Mestský marketing a problémy jeho implementácie v Českej a Slovenskej republike . In Ekonómia a podnikanie. 2008, roč.2.. č.1, s.22-28, ISBN 1337-4990

KELLER, K. J. (2007): Stratégie řízení značky. Grada Publishing, a.s., Praha, ISBN 978-80-247-1481-3, 796 p.

KAŠOVÁ, M. (2007): Farby ako ich (ne)poznáme... . Život Prešova online. Zverejnené: 8. 2. 2007. Dostupné na: http://www.zivotpo.sk/portal/?c=12&id=8042

KLAMÁR, R. (2007): Strategické plánovanie rozvoja mikroregiónu Ptava. Geografické práce, číslo 12, Fakulta humanitných a prírodných vied Prešovskej univerzity v Prešove, ISBN 978-80-8068-604-8, 210 p.

MATLOVIČOVÁ, K. (2008): Marketing miesta v regionálnom rozvoji: teoretická báza a empirická aplikácia. Dizertačná práca. Katedra geografie a regionálneho rozvoja, Fakulta humanitných a prírodných vied, Prešovskej univerzity v Prešove, 346 p.

SLACH, O. (2008): Kreativní odvětví a jejich prostorová organizace. Zborník príspevkov z medzinárodnej vedeckej konferencie konanej 16.-17. októbra 2008 na Vysokej škole v Sládkovičove. Sládkovičovo: Vysoká škola v Sládkovičove, ISBN 978-80-89267-14-9, pp. 85-93.

ŠUBRT, J., A KOL. (1998): Kapitoly ze sociologie veřejného mínění. Teorie a výskum. Karolinum – nakladatelství Univerzity Karlovy, ISBN 80-7184-522-1, Praha, 241 p.

AKEJ FARBY JE PREŠOV?
ANALÝZA FAREBNÝCH ASOCIÁCII OBYVATEĽOV VYVOLANÝCH ÚZEMÍM, AKO ZÁKLAD PRE VYTVORENIE AKCEPTOVATEĽNEJ ZNAČKY MESTA

Zhrnutie

Pri vytváraní nového jednotného vizuálneho štýlu a najmä loga mesta Prešov by sa malo aj prihliadať na už existujúce prirodzené asociácie, ktoré vyvoláva u jeho obyvateľov, čo v konečnom dôsledku môže prispieť k zvýšeniu pravdepodobnosti jeho akceptácie. V tomto smere sa na základe výsledkov prieskumu ukazuje ako prospešné stanoviť jeden z požadovaných atribútov nového loga, jeho koncipovanie v odtieňoch zelenej farby. Zelená farebná asociácia nevyvoláva u respondentov negatívne konotácie. Predstavuje vhodnú alternatívu k inej často uvádzanej farbe – červenej, ktorá je dobre spojená s mestom na historickom princípe, prostredníctvom jeho symbolov (erb, zástava). Orientácia na zelenú farbu by tak veľmi dobre nadviazala na víziu ďalšieho rozvoja mesta ako „Eko-mesta“, ktorá sa objavila aj v pripravovanom projekte kandidatúry mesta na titul EHMK 2013

a ktorá súvisí aj s novou ambíciou ďalšieho rozvoja mesta založeného na „čistých technológiách“ (ako napr. iniciatíva Prešovskej univerzity v Prešove, mesta Prešov a ďalších súkromných firiem smerom k vytvoreniu Biotechnologického parku).

Recenzovali: Doc. RNDr. Zdeněk Szczyrba, PhD.
Dr. Magdalena Florek, PhD.

GEOECOLOGICAL STRUCTURE OF THE DUMP OF TECHNOLOGICAL WASTE (FE – CONCENTRATE) AT SEREĎ

Eva MICHAELI[1], Martin BOLTIŽIAR[2], Monika IVANOVÁ [3]

Abstract : *The area of the Nickel smelting plant s. p. (NSP s. p.) in Sereď, situated at the borders of cadastral territories of Sereď and Dolná Streda (in the former region Galanta, where are 57 old environmental ballast loads), so-called brown park - brownfield, presents a highly negative phenomenon form environmental point of view, which impacts extremely depressingly in the countryside structure. This area is strongly degradated, scattered with old ecological ballast loads, which still have not been solved in complexity for 45 years. Apart from the small exceptions, they were left to the natural self-cleaning landscape ability. The situation is more important as it concerns the region with the oldest settlement of the lowland landscape in Slovakia with the most productive, highly and very productive agricultural landscape, which fulfilled mostly agrarian function. The soil ownership was the matter of basic substitence reliability, but all such values were denied by forming of socialism. The soil was not value after liquidation of the private ownership yet, and motivation to make an investment and put work into the soil was lost. According to the statement of the existing governmental configuration the region with a backward agricultural production was changed into a agricultural-industrial region with „ great perspective". Present state of the landscape structure and environment does not confirm this statement after 30 years of metallurgical industry existence. Degradation of the region is the result of the non-conceptual socialist industrialization of Slovakia with reference to the distibution of labour in former economic association of socialist countries in RVHP (Council for Mutual Economic Assistance – CMEAS).*

Key words: *technological waste, Nickel smelting plant, primary and secondary landscape structure, pollymetalic dust, anthropogenic sediments and relief form, Sereď*

INTRODUCTION

Construction of Czechoslovak plant for nickel production in Sereď was decided by the government resolution number 1735/56. The main reason was embargo of the capitalist countries to export nickel and its increasing consumption not only in Czechoslovak metallurgical and engineering industry. The construction of the plant started in 1959 and

1 **Prof. RNDr. Eva Michaeli, PhD.,**
Department of Geography and Regional Development, Faculty of Humanities and Natural Sciences, University of Prešov, ul. 17. novembra 1, 081 16 Prešov, e-mail: michaeli@unipo.sk

2 **Doc. PhDr. RNDr. Martin Boltižiar, PhD.,**
Department of Geography and Regional Development FPV UKF Nitra, Trieda A. Hlinku 1, 949 74 Nitra, e-mail: mboltiziar@ukf.sk

3 **RNDr. Monika Ivanová, PhD.,**
Department of Geography and Regional Development, Faculty of Humanities and Natural Sciences, University of Prešov, ul. 17. novembra 1, 081 16 Prešov, e-mail: V8skrabu@unipo.sk

first nickel was produced in 1963. The main raw material began laterite iron-nickel ore which was imported from Albania. The building up of Nickel smelting plant was in the given period all-society contribution and impulse for the town Sereď and its surroundings development regarding infrastructure development, flat construction and new labour possibilities. It is understood, that interested did not consider the fact concerning the range of negative influences on environment of the town, its surroundings and the content of nickel, about 1 % in one tonne of imported ore. Manufacturing process in Nickel smelting plant in Sereď was stopped because of economic and ecological reasons in 1993 as it entered the liquidation which was finished on June 30th 1994.

METHODOLOGY

Methodology is oriented towards the research of the primay geoecological structure of the territory on the basis of the analysis of its individual components, further secondary landscape structure according to the corresponding categories of land use, where individual elements were identified by using the interpretation of colourful satellite orthophoto pictures from 2007 (pict.1) with high resolution. Digitalization of spatial data –individual elements were processed manually by method „on screen“ (directly on the PC screen) using software ArcView GIS 3.1 in scale 1: 3 000. Identified landscape elements were consequently categorized into purposefully arranged the legend according to their content characteristics. Obtained results were verified in the terrain research realized in 2008-2009.

STUDY AREA

The dump of technological waste is situated to the south of Sereď on the Váh flood-plain in the northest promontory of Danube plain, to the south-west of former Nickel smelting plant. It is bounded by railway Sereď – Galanta n.133 in the west, where steep dump slope formed by Fe-concentrate tower above. The south, east and north-east edge of the dump is similar.

The dump of technological waste - is situated to the south of Sereď on the Váh floodplain in the northest promontory of Podunajská rovina, to the south-west of former Nickel smelting plant. It is bounded by railway Sereď – Galanta n.133 in the west, where steep dump slope formed by Fe- concentrate tower above. The south, east and north-east edge of the dump is similar.

Fig. 1 *Satellite image of study area taken by LANDSAT in 2007.*

The dump material is overfloated and partially disrupted by present exploitation in the north and end practically at the level of the river Váh floodplain next to the siding rail, which is connected to the Nickel smelting plant objects in the west and joins the above mentioned railway. The dump is situated at the distance approximately 250 m to the important main road number 51 in the north, and in the east approximately 800 m to the road number 62.

CHARACTER OF THE PRIMARY LANDSCAPE STRUCTURE OF THE TERRITORY (PHYSICAL-GEOGRAPHICAL STRUCTURE)

Geological structure. Sereď town lies in the south end of Dolnovážska niva, which gradually continues into Danube plain. From tectonic point of view it is a dividing line of two neotectonic blocks with different moving tendency. (Maglay et al. 2005). The region at Sereď and to the north shows slightly positive vertical movement, the region to the south of the town shows slight neotectonic decrease (Maglay et al. 2005). These different moving tendencies reflect in different development of post-tertiary sediments and their forms. While in the northern parts there are developed terraces, to the south and south-west direction the post –tertiary sediments lie in superposition. The whole area is built by fluvial sediments of upper Pleistocene and Holocene discordantly bedded over Pliocene sediments of (Maglay et al. 2005). In the north they are developed in the coarseclastic

material, to the south they change into pelletic components with gravel locations (Maglay et al, 2005). They reach the thickness of 10 to 12 metres under the Fe-concentrate dump in the part of Dolnovážska flood-plain. Sediments of the upper Pleistocene present bottom accumulation in the Váh floodplain and they occur at the surface from under Holocene bottom land sediments only in artificially made gravel deposits at Dolná Streda (Maglay et al. 2005). Their thickness is variable within the limits 7 – 9 m, locally to 10 – 12 m. They are mostly covered incoherently with würm-holocene gravels, but mainly with Holocene flood-plain loams and sandy loams of aluvial flood-plain facies. Petrographical gravel structure of the Váh is polymict. There are dike quartzite, siliceous sandstone (34 – 50 %). The Váh flood-plain to the south from Sereď is made of the highest part of the middle complex of the Danube gravel series of upper Pleistocene. These are well selected and worked coarse sandy gravels and sands with thickness from 10 to 30 (Maglay et. al. 2005).

The last individual evolutional cycle of post-tertiaty sedimentation is presented by Holocene sediments. Substantial part of these sediments are clay-sandy, clay and flood loam sediments.Their thickness significantly varies (2 – 6 metres) due to recent vertical movements of the neotectonic blocks. Strata base is composed of gray flood-plain loams with concretion of $CaCO_3$ and clay sands (0.5 – 1.5 metres). On the strata base there was formed and retained significant dark gray to black humic horizon of decalcificated gley fluvisols – Gleyic Fluvisolswith high content of humus up to 17 – 19%, covered with upper holocene lithofacially undivided loams, which regarding their impermeability stimulate tense level of the ground water in some localities. The best developed is this soil horizon in the Váh floodplain, to the south of Sereď, where it reaches the thickness to 1 metre. It does not occur on the surface anywhere. (Maglay et. al. 2005). Supraincumbent layers are lithologically more variable, mostly flood-plain loams and humic clays sediments of flood-plain facies (0.5 – 2 m).

Regarding anthropogenic sediments there is a significant dump of technological waste –Fe-concentrate, which was originating at Nickel smelting plant s. p. during more than thirty years of its existence.. I t is a homogenuos formation from petrographic point of view. Fe-concentrate is granulometric very fine material, black colour, originated by grinding and washing Albanian laterite iron-nickel ore. The penetrantion of this mass is very high, so rainfall very quickly can reach to its down layers, big part is evaporated as Fe-concentrate absorbs sunshine intensivelly and overheats.

Relief. Regarding morphology the area is variable a little. The basic type of the relief is erosive-accumulating relief of fluvial plains. It is represented by the accumulation plain – flood-plain of Váh with minimal sloping, with the remains of the abandoned meanders and sandy aeolian dunes to the south of Dolná Streda. It was made gradually by depositing of young gravel layers, sand and floody sediments in the young tectonically decreasing morfostructure of the West Pannonian basin bordered with the pre-Post-Tertiary rille lines in the west and the east following by the young pre-Quternary faults in the direction northeast – southwest. It is bordered with the young pre-Quternary faults in the direction northwest – southeast. The most contrast forms of the relief are convex, concave and flat anthropogenic forms.The most remarkable of them is the dump of metallurgical technological waste – Fe-concentrate, which was originated by depositing on the Váh floodplain during the manufacturing process of nickel at Nickel smelting plant

in Sereď from 1963 to 1993. The dump contrasts sharply the accumulation plain area of the Váh flood-plain in vicinity. Its relative hight is about 30 metres in the south and in the west side, in the east and the northeast approximately 22 metres and in the north it is about 5 – 14 metres.The dump heel altitude ranges from 125.4 metres in the north to 123.4 metres in the south. According to the anthropogenic relief forms classification (Zapletal 1969, 1976, Lacika 1999, Hronček 2002) the Fe-concentrate dump is classified as industrial, matured, fireproof, surface, convex, accumulating, negative macroform. Its shape is partially terraced table with wide, slightly degraded surface which significantly predominates steep slopes of the dump (anthropogenic table). The biggest length of the dump is 750 metres and the width is 550 metres. It is slightly narrowed towards the top plain. The dump plan is the isosceles triangle .The dump area is 35 – 50 hectares according to the literature, recent area , according to our measurement is 27 hectares. Volume data does not correspond in the literature. (5.5 , 6.5, 8.5 mil. t, according to our calculation the dump volume was about 9.0 mil. t). Slope inclination of the dump is between 5 - 10° in the north and northeast and to 45° in the east, west and south.

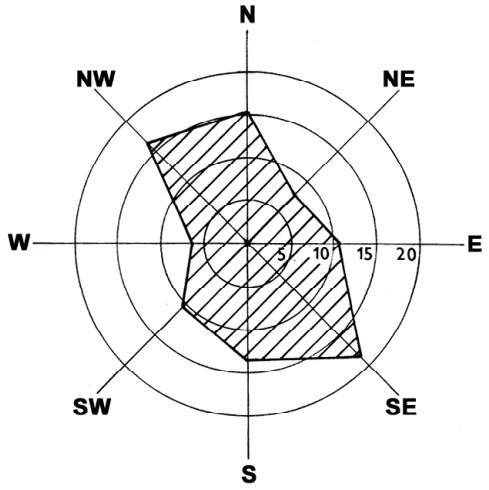
Fe-concentrate as a fine pelitic material is subject to recent fast natural erosive geomorphologic and anthropogenic processes as well. These ones change gradually the original shape of the dump, mostly at the places without vegetation cover, which presents the part of the plain and slope in the south and west side.

Regarding geomorphologic processes there are mostly following – slope rinsing, material creeping, deflation and anthropogenic processes, which accelerate all above mentioned. Gravitation component of moving is asserted here and dislocate Fe-concentrate parts in the direction of slope inclination. The same process is occuring on the dump plain, where is slower, especially on its slopes. The dump slope and its slightly leaning plain rinsing is done with rain water, melted snow water and sprinkling water. Water flows in thin threads over slopes and takes fine parts of Fe-concentrate. Both processes blend together. Creeping predominates in the upper part of the dump, rinsing intesity increases towards down parts. Rainfall water and sprinkling water concentrates gradually to the smaller or bigger streams in the direction of the biggest dump slope inclination and forms numbers of smaller and deeper (relief microforms) ditches and rilles in the fine material of Fe-concentrate. Their depth varies from 50 cm to 1 m on the dump slopes. They can be observed on the south and west slopes mostly. Their depth on the dump plain is about 30 – 40 cm. Surfaced material deposit at the dump heel in small cones. Deflation occurs on the dry, non-sprinkled and without vegetation overgrown dump body, mostly in the places, where the dump plain destroyed by mining process. Fine parts of Fe-concentrate are carried to the wide surroundings depending on the predominated wind circulation. The net of earth roads was originated on the dump for mining and transport purposes by anthropogenic activity (the dump owner mines Fe-concentrate for iron production).

Climate. The investigated area is in the warm climatic (Atlas of the Slovak republic countryside 2002, map 27). It lies in the bordery line of two climatic zones T1 and T2. T1 is a warm and very dry zone and T2 is warm and dry. Winter is very mild here with average temperature -3^0 C. This region reports a rainfall shortage from 100 to 150 mm per year. Total annual rainfall in Sereď is 550 mm, absolute monthly maximum is 200 mm, daily maximum is 70 mm. Average rainfall in July is 60 mm. Average annual air temperature is 9.5^0 C, average July temperature is 19^0 C. Average number of close weather days and

relatively low air humidity is from 20 to 30 per year. Average number of summer days is more than 60 per year. Average number of days with snow cover, which height is from 9 to 10 cm, is 40. Average number of foggy days si from 20 to 45 per year. The region is a significant number of sunshine hours, more than 2000 per year. The sunshine lasts 285 hours in average in July and 50 hours in December, during the vegetation period it is 1 450 hours. Predominated wind circulation is the southeast and the northwest wind (50.2 %). The region is aerated well, there is a dispersion of pollutants occured in the ground layers of the atmosphere, mostly by the wind systems of NW – SE direction (Graf. 1).

Graf. 1. *Wind direction and speed in study area.*



Waters. The region belongs to the river Váh (4-21-10) basin. The dump of technological Fe-concentrate waste lies between the river Váh and the brook Derňa. It is about 1 700 metres far from the river Váh and about 3 000 metres far from the brook Derňa. The last mentioned brook flows parallelly with the river Váh, approximately in the distance of 4 km from its river-bed. To the southwest direction from Dolná Streda the Váh river basin finishes in the water dam Kráľová. An annual average overflow of the Váh at Sereď is 152.6 $m^3.s^{-1}$. There is a rain-snow mode of the flow in the hilly-lowland region reaching maximum in February and and high wateriness in March and April and with minimum in September. An annual average specific flow is 1 l $.s^{-1}$ per km^2. The icy phenomena start to occur on the river Váh in the half of December and finish in the second decade of February in average .The area of the dam Kráľová is 12 km^2 and it influences the mode of the underground waters significantly. It prevents the region from flood waters sufficiently. The rest artificial water areas are placed in the localities of sands, gravel and clays exploitation at Sereď and Dolná Streda. The underground waters react to the river Váh mode. Their collectors are in the depth of 2 – 3.5 m under the surface. They are formed by infiltration of the river Váh water and partially by the damp penetration into the pre-Quaternary fluvial sediments. There is no occurence of common underground water springs or thermal or mineral waters.

Soils. Regarding the soil cover of the floodplain sediments in agraded mound of the river Váh there are Hapli – Gleyic Chernozems predominant. Calcaric fluvisols occur on the new Holocene floodplain sediments. Anthropo-Skeletic Leptosols, or technosoils (soil on anthropogenic substrates of technogenous origin) occur on the Fe-concentrate dump and in the area of Nickel plant itself. There are Urbi-Anthropic Regosols on the residential terrace of habitual area in Sereď and Dolná Streda, and Hortic Anthrosols occur in the gardens of houses vicinities . The soil reaction of Chernozems and Fluvisols is slightly or medium alcalic. Regarding granulosity they belong to the group of clayic and sandy-clayic soils. The humus contant ranges from 2.3 to 5 % (Šály 2000). Soils on technogenous substratum are not suitable for agrosystems. The dump surrounding is utilized agriculturally but soils in industrial Nickel smelting plant vicinity is soil chemically degraded.

Vegetation. According to the phytogeographic classification of the Slovak Republic territory (Futák 1972) the Sereď surrounding belongs to the region of Pannonicum flora, subregion of own Eupannonicum flora into the district of Danube lowland. Primary vegetation was formed by forest-steppe and steppe phytocoenose , however, dominant were phytocoenose of lowlands and phytocoenose of soft willow-poplar forests along the river Váh.There were formed oak-hornbeam Pannonian forests over the agrading mound of the Váh.

Danube lowland has changed into cultural steppe and plenty of primary specieses lost their stands. The largest areas are taken by arable land , small area of meadows occur in the wettest places. Permanent vineyards can be found in smaller areas to the east from Sereď and to the south from Dolná Streda. Forest communities have been kept in the form of game refuges. Bushes occur sporadically, ruderal and synantropic communities occur often. The dump of technological waste Fe-concentrate shows specific vegetation, which is classified as metahemerobic vegetation with minimal biogeneous processes (Jurko 1990) on the areas of toxic and industrial waste from hemeroby (vegetation authenticity) point of view. Polyhemerobic to metahemerobic type of vegetation can be observed in inhabited terraces and industrial areas. Euhemerobic type of vegetation occurs in vineyards, gardens, fruit orchards and in arable land (Jurko 1990). No protected area or protected zone interfere the locality directly. Regarding nature protection from types point of view, no permanent occurence of protected plants or animals was noted. The coeficiet of ecological stability is low, up to 0.2 in the cadastral regions of Sereď and Dolná Streda.

Animals of the given territory belong to the region of Danube lowland, into its West Pannonian basin province with very significant steppe and forest-steppe fauna character, which most of varieties were decimated by agrarian and industrial activity. Corridors for animal migration, regarding industrial and agricultural utilization, are not observed in this locality. A *Lepus europaeus, Capreolus capreolus*, *Phasianus colchicus,* predator as *Buteo buteo*, that was able to adjust to intensivelly utilized agricultural landscape and reaches high density also in such conditions, live in the broader dump surroundings. Regarding the *Molusca* occurence there are plenty of sniles like *Helix pomatia* and *Xerolenta obvia*.

The region is utilized polyfunctionally (industry, agriculture, inhabiting, transport). It is represented by geoecologic countryside type of the intermountanious lowland countryside of temperate zone (Mazúr, Krippel, Porubský, Tarábek 1980) localized on the flood-plain of the Váh, strongly modified by industrial activities. The dump locality in the south and partially in the east interferes the arable land of Sereď and Dolná Streda cadastral region

with open relief of accumulation plains with good visibility, without any obstacles in the terrain. The dump itself presents significant anthropogenic barrier. The surroundig of the dump is utilized above average with significant disruption of natural values.

CHARACTER OF THE SECONDARY LANDSCAPE STRUCTURE

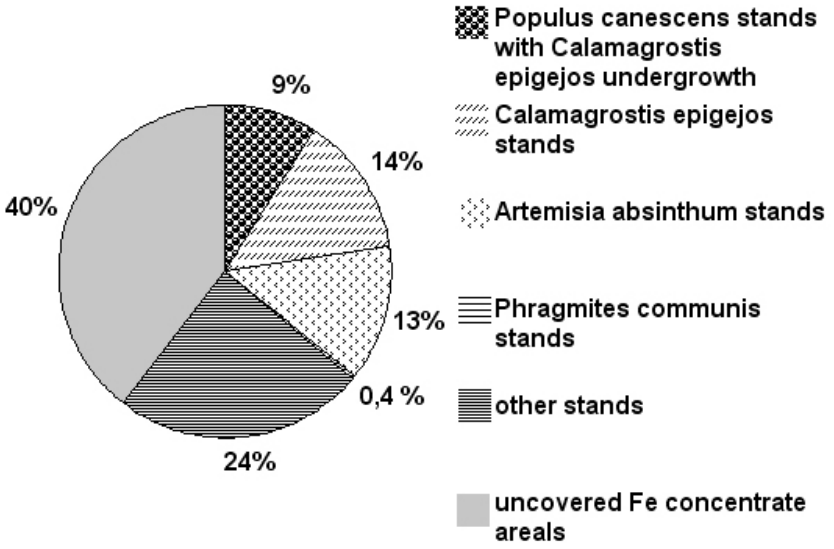
More detailed map of the secondary landscape structure (SLS) of the territory under investigation has not been elaborated yet. Mapping SLS was done, inter alia, for purposes of substantial and detailed analysis of given landscape space. Recent studies solved only partial problems in frame of the broader area, however, to know the present day dump condition of SLS, as its significant influence to the life quality in the region, is consider as very important. SLS map presents relevant basic document for further landscape characteristics evaluations (e.g. evaluation of vulnerability, heterogenity, evaluation of landscape changes and their prediction etc.) and preparation for territorial planning documentations as well. According Ružička (2000) there were identified almost 200 landscape elements of the territory under investigation and regarding the specific character of the region, these were classified into 6 undergroups and 3 groups (table 1):

1. Group of forest and non-forest vegetation elements
   1.1. *Populus canescens* stands with *Calamagrostis epigejos* undergrowth
2. Group of tallus-herbaceous stands elements
   2.1. *Calamagrostis epigejos* stands
   2.2. *Artemisia absinthum* stands
   2.3. *Phragmites communis* stands
   2.4. other stands
3. Group of uncovered substrate elements
   3.1. uncovered Fe concentrate areals

Tab. 1 *Landscape elements area and number of patches in 2009.*

Landscape elements	**area in ha**	**number of patches**
Populus canescens stands with *Calamagrostis epigejos* undergrowth	2,5	117
Calamagrostis epigejos stands	3,8	21
Artemisia absinthum stands	3,7	1
Phragmites communis stands	0,1	1
other stands	6,8	17
uncovered Fe concentrate areals	11	32
Total	**28**	**189**

Graf. 2 *Landscape elements proportion of study area in %*

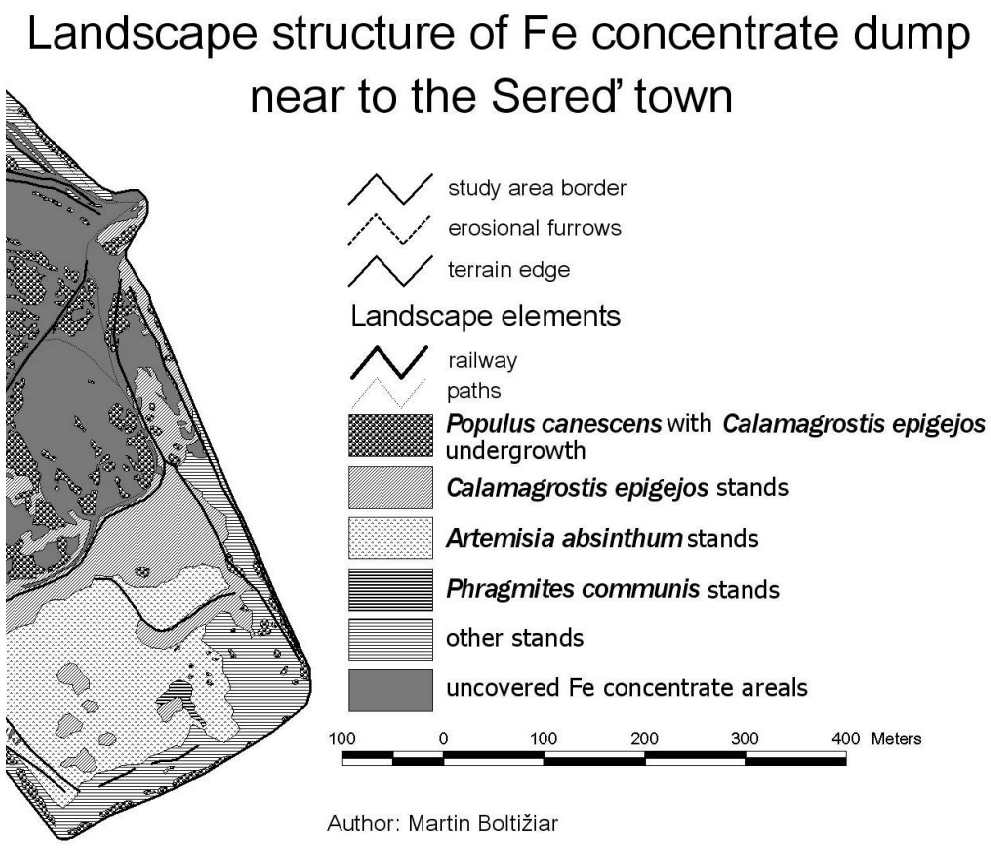


Analyzing visual (map 1, graph 2) and followingly statistic (table 1, graph 2) thematic SLS map, created by ourselves, depicting the territory under investigation and analyzing knowledge received during the field investigation it was found out, that the region is formed by 189 areas of landscape elements, which are further characterized in more details regarding their content and spatial expansion.

Regarding the area of individual units of landscape elements the biggest share is presented by grass vegetation. The dump vegetation presents completely new specific type. Its variety composition is not similar to any overgrown occuring at the similar stands of another dumps (Banásová, Hajdúk, 1984). The highest number of plant varieties grows from its foothill to the height approximately 2 metres. Fe-concentrate is thinner in these parts to the excavated and imported soil and gravel-sands, which made a dam during tank building for Fe-concentrate in the past. Increased seeds transport from nearby fields and specific microclime of this contact zone have a big contribution for the overgrown at the slope basis. Total overgrow is 60-80 % here and and varieties show higher abundance and dominance. Plants with taproots, where are e.g. hoary cress, *Cardaria draba*, *Carduus acanthoides* and *Convolvulus arvensis*. There are another ruderal varieties as *Agropyrum repens*, *Reseda lute*a and mainly wormwood *Artemisia absinthum* above this margin. *Bromus inermis, Cynodon dactylon,* and *Arrhenatherum elatius* occur there as well.

Vegetation, concentrated into clusters, occurs sporadically in the upper parts of the slopes, which are formed by pure Fe-concentrate. Vegetation can be seen in the small cavities mostly in the oldest dump parts. Regardingthe area, they occur only in very little places as species monotonous incoherent. There can be found grasses as *Dactylis glomerata*, *Poa pratensis, Festuca rubra* which occur on pure Fe-concentrate as relics after unsuccessful hydro-seeding by Rašelinové plants during 1976-1978 and in 1980.

Map 1. *Landscape structure of the Fe-concentrate dump.*



The two last mentioned species grow scattered, they do not form inflorescence and dikes. The most vital species with relatively high seed germinative activity (78 %) is *Dactylis glomerata* as was confirmed by research experiments realized in the past (Banásová, Hajdúk, 1977, 1984).

Among the plants of spontaneous succession there are following plants occuring predominantly on the pure Fe-concentrate spotted *Centaurea stoeb*, which grows mostly on the foothill *Carduus acanthoides* and *Salsola kali*. The occurence of this variety was noticed also on the asbestos dumps in Dobšiná (Banásová, 1970).

Tree vegetation is presented mostly by *Populus canescens*, which forms scattered overgrow mainly in upper horizontal positions in the central and south parts of the dump, its undergrow is formed mostly by *Calamagrostis epigejos*, which forms wide overgrow as regards the area mostly in the terrain edge towards the east, where the slope lower. Other species are sporadically presened by *Prunus spinosa*, *Crataegus monogyna*, *Pinus sylvestris* and bush representant *Rosa canina*.

The big part of the southeast dump part is covered with herbaceous-grass vegetation presented by monocenosis of *Artemisia absinthum*, which also represnts significant allergen together wiht another species occuring in the dump.Close to the east margin of the dump there is a smaller shallow depression fulled with water and overgrow of *Phragmites communis*. *Uncovered Fe-concentrate areals (no overgrown with vegetation*) take more than 7 ha of the dump area,which presents 40 % of its total area.

THE DUMP INFLUENCE UPON ENVIRONMENT

The Nickel smelting plant s.p.Sereď was processing in hydrometallurgic way (Carron) Albanian laterized iron-nickel ore during the plant existence since 1963. The principle of this process was to change nickel and cobalt into their soluble form and then lime them in the selective liming solution, and the rest of the ore left the process in the form of mud. There were made 3 000 t of nickel in the form of metal and salt, 60 t of cobalt in the form of metal per year and the waste was made of 300 000 t reduced ore – Fe-concentrate. 2 800 t of ammonia, 1 200 t Na_2S, 144 t Na_2SO_4, 611 t HCl, 1013 t H_2SO_4 were used at process per year. Detailed chemical-technological research of Fe-concentrate at Sereď has shown, that material contains about 50 to 80 % of iron, 2.5 – 3.5 % Cr_2O_3, 6 – 8 % SiO_2, 6 – 8 % Al_2O_3, 2.5 – 3.5 % CaO, 0.6 – 0.18 % P_2O_3, 0.28 – 0.3 % Ni (Kalebáč, Souček, Had 1987). Fe-concentrate presents medium rich waste, which is with its iron content close to iron ore used for batch into the blast furnace. Problematic is, however, high level of chrome and Fe-concentrate texture, which restrict its wider utilization in metallurgy (Koudelka, Drabina, Vítek, Schmidt, Benoni, 1985). The concentrate, processed into pelets in 1984, was used for chrome iron production , where was 96% of chrome reduced into raw iron. The next attempt for pellet production consisting of 62 % Fe-concentrate , 22.6 % sinter ore from Krivoj rog and 15.3 % dolomite as batch into the blast furnace did not bring expected results. According to Kalebáč, Souček, Had (1987) the processing of given material would not be effective (high energy consumption and forming of new waste, low sale of chrome iron).There was processed 146 968 t of Fe-concentrate in Czechoslovak metallurgic industry during period of 1985 – 1987, which did not presented a half of its annual supply to the dump.The evaluation of the smelting resuls shows the use of Fe-concentre in one ton of fusing iron maximum to the weight of 50 kg, in which the

quality of produced steel would be without the change, that is very low need regarding the material amount in the dump (Kalebáč, Souček, Had 1987).

The utilization of Fe-concentrate for ferochromium is is not real, according to the information of Orava feroalloy plants in Istebné, because it does not contain the sufficient amount of chromium. The high contentent of Si and Al oxids causes the increased production of slag and increases the electricity consumption. (Kalebáč, Souček, Had 1987).

Fe-cnocentrate offtaking for building material indutry, as cement additive was stopped, because it contains chromium remnants, which is non – permissible as additive into building materials according the European legislation. It is used for brown coal washing process only in non-significant amount, but it is not suitable for all coal cleaning plants.

The dump presents a kind of anthropogenic bearing at present. Present owner of the dump, Ferroport company Bratislava, exploits Fe-concentrate as a raw material, obtaining iron from it. Conditions of Fe-concentrate exploitation are given by District Environmental Office in Galanta. Environmental effect of the company approach is mainly in old ecological ballast disposal, although very slowly and with a risk of air polluting by polymetallic dust from exploiting areas. Regarding exploitation safety point of view there does not occure sinking of exploiting mechanisms. Fe-concentrate was transported to the dump hydraulically, but gradually it was disposed of liquid component – transporting medium – by percolation to the Váh floodplain and partially by the evaporation.

According to the environmental regionalization of the Slovak Republic by the Department of the Environment (2008) the territory after investigation belongs to strongly disturbed environs according to the environmental quality. The problem is more important as there occured unsuitable fusion of landscape potential for agricultural production with metallurgy of non-ferrous metals and urbanization process. The most important environmental problem concerning the Sereď surroundings (except another phenomena) is old environmental ballast load, althouhg nickel and cobalt production was stopped. The dump of Fe-concebtrate, which still influences environment actively, causes significant ecological problems in the Sereď surroungings at present days.

The pollution of base rocks, underground waters, soils and in connection with wind system acceleration, as well, air pollution was noticed during Nickel smelting plant operation. The pollution continues at present days in the area of processing simplex itself (area 60 – 70 ha), at the dump of Fe-concentrate, and in the rest of accessoric premises of former Nickel smelting plants and in their vicinity.

As regards georelief point of view , there is a lowland scenery and the dump, with its physiognomic shape, affects as significantly allochthonous, barrier element – convex form of the relief, which form the integration into the country point of view, as results from many suggested solutions, but mainly regarding the length of a human life, could be considered as incontrovertible phenomenon. There is another consecutive ecological balast load in the territory under investigation and its mutual interconnection – territorial interlock, shows significant contribution to landscape structure devaluation, e.g. the area of the industrial plant, where the basement has not been investigated as regards its influence to the subbase, water and soil.

The dump of metallurgical technological waste in approximately of 6.5 – 8.5 million tons at the area of 27 hectares was forming during 30 years of manufacturing process in the

floodplains of the river Váh. As to granulometry this is very fine-grained material, where 97% form elements smaller than 0,1 mm (contains a large amount of iron and ist oxids, nickel remnants, cobalt and NH_4+ and another alloys). Fe-concentrate from the beginning of it depositing in 1963 till present days has been the source of the secondary dustiness – escape of the polymetallic dust into the air. This wast must be kept at a certain level of humidity to avoid its spreading to the surroundings during stronger wind circulation and while it is manipulated (e.g. during mining). Fe-concentrate areas, which are not covered , and where the vegetation was not able to spread itself by spontaneous succession not even during decennaries in order to avoid spreading of the toxic dust into the surroundings, present nowadays serious problem concerning the life quality in the region. During dry weather and strong gust wind the dump is a significant emitter of dustiness, which influence was observed and still is mostly in the south part of Sereď and in Dolná Streda, in spite of sprinkling the dump body with water.To avoid spreading of polymetallic dust, regarding the transporting medium (air) is practically impossible. At present it is carried mainly from the parts of the dump, which are not overgrown by vegetation (annual compensation by Ferroport company 20 000 Sk for Sereď, Dolná Streda is without compesation). Emissions are presented at meso and mainly at microclimatic level. The final result is resedimentation of the polymetallic dust on the soil cover, water and settled areas of the region and on the vegetation. There is no monitoring station dealing with air pollution observation in the given locality so data concerning secondary dustiness and another emissions are missing.

The worst water quality occurs in the river Váh at Sereď, according to the long-lasting observations of the state observing net. The main source of the pollution is industry, agricultural production, municipal water waste and ecological ballast produced by nickel production. Water contamination was conditioned by industrial technological and sewages releasing until the munufacturing finish in 1993, without any cleaning to the waste dump and directly to the inundation area of the river Váh, where it penentrated or passed the system of abandoned meanders and artificially formed dredging basins and directly to the river.The river pollution occured in the underground water quality, where increased content of heavy metals, nitrogen, chloride and disulphate compounds were measured. Indication drillholes for underground water quality investigation were built in the dump vicinity in 1990 (after 27 years of Nickel smelting plant manufacturing). Results of sample analysis showed unsuitable quality of the underground waters. High concentration of disulphates, ammonium ions, nitrates and nitrites exceeded border limit of the state standards. Their content showed increasing tendency. Harmful pollutants concentration presented emergency pollution of underground water in the dump vicinity and also near another objects of Nickel smelting plant – historical pollution of underground waters (Klaučo, Filová, Kovařík 1998). This pollution is hard to classify as emergency, as it was a continuous process lasting 30 years during activity of Nickel smelting plant and there was nobody to pay attention to it. Finally, in 1990 on the basis of underground water samples analysis showing its pollution, an expert team was created. This team recommended Nickel smelting plant to accept particular arrangements for underground water protection in given locality: to elaborate a project so called hydraulic screen and removal pumping and cleaning water mouthing to the Váh.

On July 1st 1993 started liquidation process of Nickel smelting plant s.p. in Sereď. Liquidator ensured to elaborate final report and expertise study by December 1993. The

aim of the expertise was to state, on the basis of available materials, the condition and extension of pollution of the environment in wider vicinity of NSP s.p. Sereď and design the relation to the above mentioned removal and protective, unfortunately, not realized arrangements.

The District Environmental Office in Sereď issued a resolution in 1993, and stated compulsory special conditions for the dump operator regarding the law, according to which a project of the Fe-concentrate dump recultivation should be elaborated, ensured this process and observe the influence to the environment for 50 years after finishing the unloading. To avoid unloading of another companies in its area, that means to ensure closing of the approach roads and their checking and do not allow new enterprise subjects any activities which could lead to the wet processes, consequently which could lead to the forming of sewerage industrial waters without building of sewerage plant (ČOV) for particular typ of sewerage waters. To ensure possible customer for Fe-concentrate utilization and observe the dump influence upon underground waters. Until recultivation dump period ensure water sprinkling of the dump, as a protection against deflation and ensure the protection of underground waters in the dump surroundings. The liquidater of s.p. NSP stated, that these tasks, dealing with environmental protection, will be transmitted to succession enterprise subjects. Company ABH – BEL s.r.o. Bratislava, which bought the Fe-concentrate dump, introduced the suggestion of the dump removal and its biological recultivation in 1994. All responsibilities , resulting from arrangements for former s.p. Nickel smelting plant Sereď in 1990, should be assumed, but the company did not agree with taking responsibility. NSP s.p. offered 2 millions Sk for covering the Fe-concentrate dump and settled obligation 11 millions Sk to environment. All attemps of NSP s.p. Sereď led to the cancellation of the arrangements stated by DEO in Sereď.

In 1994 an expertise study to evaluate the quality and prognosis of underground water in wider vicinity of dump was elaborated and also a suggestion to protect the territory at s.p. NSP SKOV – Bratislava (Klaučo 1994). The first areal photo of underground water quality concerning former production of Nickel smelting plant was taken in the same year. The study states pollution decrease in the area of source depending on stopping production of smelting plant, in spite of it, the content of ammonium iones in the dump vicinity exceeds several times allowed limit concetration. Underground water flow caused tearing off „polluted water cloud“ from the source area and proceeded towards the southeast, west and southwest to the distance of more than 1000 m to the inundation area of Derňa. The next factor is adulteration of pollution concentration by the river Váh water or water of the water dam Kráľová. The colmatage of the dump subbase and its body is reported by the authors at the Fe-concentrate dump. At the end of the study it is stated that to build sealing underground wall, or hydraulic screen round the dump would be unreal and too expensive regarding the contaminant dispersion into the wide surroundings of evident sources of pollution. The suggestion to use this water after suitable adulteration for watering is considered as extremely inadequate. To build a canal or another melioration measure, which could avoid the penentration of contamined waters towards from Sereď to Dolná Streda, Váhovce, Gáň, Galanta and Veľká Mača is not real because of slight slope of of the territory, agraded mound of the Váh, protective dikes, soil engagement, high costs of investment and operating costs (Klaučo 1994).

Areal and concetration decrease of ammonium pollution mainly in dump occured in 1997. The highest concetrations of ammonium iones are on surface of the watered layer. After 30 year, so in 2027 it will be possible to expect gradual penentration of polluted, but dilluted underground water into the Derňa water stream. The final average ammonium ions concetration in the creek would range about 2.07 mg. l^{-1}. The period of increased ammonium ions concetrations was estimated for approximately 10 years by the authors. Concentrations should gradually fade by natural dillution after this period.For this purpose the water stream basin of the Derňa is necessary to clean and operating buildings make functional.

Resulting from the suggested solution, the pollution of underground and surface waters was left to its natural elimination by dispersing and diffusive processes without artificial hydraulic influence of underground waters flow.The realization of this solution is not possible without systematic monitoring and finishing to build observation net in the line of supposed movement of the pollution.

The territory does not belong to the water management protected areas, there are not any active collectors of underground waters suitable for supplying of inhabitants, but it does not mean that they can be wasted and ignore their pollution. Water does not serve only for population supply. Their function is irreplaceable in frame of the country structure. 100 % defective samples regarding physical-chemical water pollution results from the investigation of water quality in natural bathing areas (gravel deposits and abandoned meanders). There is V.degree of cleanliness (very strongly polluted water) according to the micropollutants pollution of the river Váh at Sereď. At present days the severage waters are emitted to the Váh by subjects , which settled in the former Nickel smelting plant after 1994 , without sewerage plant (ČOV). The amount of the sewerage industrial waters decreased and thereby pollution of surface and underground waters by risk elements was partially limited.The dump was formed on floodplain sediments without isolation against subbase, that is why risk elements under its bottom and at the edges migrate into the soil, geological subbase and waters, in spite of supposed colmatage of the dump bottom with pelitic material of Fe-concentrate (Klaučo 1994).

Agricultural landscape and soils under permanent cultures in near south, southwest and northwest Sereď and Dolná Streda vicinity were and are highly influenced by industrial activities, agriculture and old ecological balast. The river Váh waters are significantly polluted at Sereď, in spite of it they have a function of an irrigation source. Large irrigation equipment influence the soil profiles secondary by clogging and diffusion of contained contaminants (cumulation effect – risk elements deposition in the soil).

According to the findings of National Health Department in Galanta, the content of the risk elements in the soils cover near Sereď is below the high allowed concetration but for example, the nickel content is 7 – 8 times higher than its phon values in the surroundings of Trenčín. It is estimated, that the agricultural landscape acreage, which is affected with pollutant emission influence, presents in the territory under investigation the area approximately 1500 ha. Deflation of the dump material significantly participates at this state.

Primary agroclimatic conditions of the region indicate the development of present modern directions of ecological agriculture, but soil contamination and general devastation of the region exclude such trends.

CONCLUSION

The presented contribution was focused on the character of the original physical-geographical structure of the landscape, which was significantly disrupted by anthropogenic activity and on the detailed characteristics of escondary landscape structure of the territory. The special attention was given mainly to floristic composition of vegetational communities on the Fe-concentrate dump. Physical and chemical Fe-concentrate characteristics preconditioned origin and development of a very specific ecosystem, which cannot be found in any natural landscape and these factors also significantly influence organization of individual landscape elements. More than a half of the dump is covered by herbaceous-grass formations of larger monocenosis of wood small-reed *(Calamagrostis epigejos) and* wormwood, green ginger *(Artemisia absinthum)*. The tree vegetation is presented mostly by gray poplar *(Populus canenscens)*, which grow it the highest places of the dump. 40% of the dump area take uncovered material.

There were several directions in liquidation solution of the Fe-concentrate dump at Sereď: to use Fe-concentrateas a material Cor-Ten steel production, for production of oxide pellets, for direct batch into the blast furnace, the dump recultivation (searching the possibilities of the dump recultivation, the experimental investigation to find out grow abililities of chosen grass varieties on this toxic waste was realized and the most perspective grass varieties were accepted for seeding the dump, Banásová, Hajdúk, 1984), the dump irrigation , building of green polyfunctional zone in its vicinity, using Fe-concentrate in cement factories, for brown coal washing process. Project documentation was elaborated for each of these Fe-concentrate removal form, but except monitoring sound of the underground water pollution, partial recultivation of the dump and Fe-concentrate exploitation for metallurgical industry, all these suggestions remains on the level of projects and pollution elimination, mainly of underground and surface waters, was left to the self-cleaning ability of natural structure. All mentioned form of dump liquidation were, and still are ineffective and process of its liquidation is very slow. At present rate of Fe-concentrate exploitation and export (company Ferroport), according to the estimation of environment department workers in Sereď , it is possible to liquidate the dump in approximately 600 years. The environment devastation of the given region, caused by old ballast loads, presents a key problem for foreign investors to enter this area and it is an obstruction to modern trends in agriculture development. This region is utilized above average with sigificant disruption of the natural structures. The region belongs among unstable regions with low quality of environment.

Resulting from this investigation, the issue concerning environment conservation was necessary to solve „ex ante“ at the premise building, not „post factum“ that is after 27 or 30 years of s.p. Nickel smelting plant full operation and with a scenario which is significantly pessimistic for the landscape, hence relying on the self-cleaning ability of the landscape. To finish the nickel and cobalt production in NSP s.p. meant the decay of the main source of contamination, but the pollution definetely does not decay itself, it still persists.

References

Atlas krajiny Slovenskej republiky. Hrnčiarová, T. (Ed.), 1. vydanie. Bratislava Ministerstvo životného prostredia SR, Banská Bystrica: Slovenská agentúra životného prostredia 2002, 344 s., mapa 27.

BANÁSOVÁ, V. (1970). Vegetácia dobšinských azbestových háld. Biológia (Bratislava), roč. 25, č. 10. s. 699-708.

BANÁSOVÁ, V., HAJDÚK, J. (1977): Der Gehalt an Fe, Cr, Ni, Ca, Al, Mg, Ti und S in Pflanzen und Boden der Abfallhalden von der Nickelhutte. Biológia, (Bratislava), roč. 31, č. 4. s. 279-288.

BANÁSOVÁ, V., HAJDÚK, J. (1984): Vegetácia na skládke lúženca pri niklovej huti v Seredi. Zborník IV. Zjazdu SBS Nitra: Slovenská botanická spoločnosť pri SAV, VŠP, ÚEBE, Agrokomplex. s. 329-335.

HRONĆEK, P. et al. (2001): Charakteristika a prognózy vývoja banských háld v Juhoslovenskej hnedouhoľnej panve z hľadiska ich geneticko-morfologických vlastností, pôd a vegetácie. In: Geografické štúdie Nr. 8, Banská Bystrica: FPV UMB s. 226 – 232.

JURKO, A. (1990): Ekologické a socioekonomické hodnotenie vegetácie. Príroda, Bratislava, s. 41 – 52.

KALEBÁČ, O., SOUČEK, V., HAD, A. (1987): Výroba chrómového surového železa z lužencového aglomerátu. Hutnícke listy č. 10 s. 705 – 711.

KLAUČO, S. (1994): Súčasný stav a prognóza kvality podzemných vôd v širšom okolí skládky lúženca a popolčeka Niklovej huty š. p. v Seredi. Expetízna štúdia SkOV – Bratislava.

KLAUČO, S., FILOVÁ, J., KOVAŘÍK, K. (1998): Niklová huta v Seredi: Historické znečistenie z výroby niklu. Podzemná voda, roč. 4, č. 2

KOUDELKA, Z., DRABINA, J., VÍTEK, V., SCHMIDT, H., BENONI, V. (1985): Zpracovaní pelet z albánskeho loužence ve vysoké peci, časť II. Hutnícke listy č. 11 s. 762 – 767.

LACIKA, J. (1999): Antropogénna transformácia reliéfu ako indikátor trvalej udržateľnosti. Banská Bystrica, FPV UMB 304 s. ISBN 80-8055-471-4

MAGLAY, J., PRISTAŠ, J., NAGY, A., FORDINÁL, K., ELEČKO, M., BUČEK, S., HAVRILA, M., KOVÁČIK, M., HÓK, J., KERNÁTSOVÁ, J., BARÁTH, I., KUBEŠ, P., KUCHARIČ,Ľ., MALÍK, P., ZUBEREC, J., KLUKANOVÁ, A., ONDRÁŠIK, M., ČURLÍK, J., ŠEFČÍK, P., TKÁČOVÁ, H. & TKÁČ, J. (2005): Vysvetlivky ku geologickej mape regiónu Trnavská pahorkatina v M 1: 50 000. Záverečná správa č. 86 508/1,Geofond, Bratislava (manuskript).

MAZÚR, E., KRIPPEL, E., PORUBSKÝ, A., TARÁBEK, K. (1980): In: ATLAS SSR Geoekologické (prírodné krajinné) typy, mapa 1, Kapitola VIII. Fyzickogeografické – geoekologické krajinné jednotky, SAV a Slovenský úrad geodézie a kartografie, Bratislava.

RUŽIČKA, M. (2000). Krajinnoekologické plánovanie - LANDEP I. (Systémový prístup v krajinnej ekológii.). Nitra: Biosféra. 120 s.

ŠÁLY, R. (2000): Morfogenetický klasifikačný systém pôd Slovenska. Bazálne referenčná taxonómia. Bratislava, s. 63 – 68.

ZAPLETAL, L. (1969): Úvod do antropogénní geomorfológie. Olomouc UP.

ZAPLETAL, L. (1976): Antropogénní reliéf Československa. In: Acta Universitatis Palackianae Olomoucensis Facultas Rerum Naturalium, Tom 50, Geographica – Geologica XIV, Praha SPN, s. 1555 – 176.

GEOEKOLOGICKÁ ŠTRUKTÚRA HALDY TEHNOLOGICKÉHO ODPADU LÚŽENCA PRI SEREDI

Zhrnutie

V príspevku sme sa zamerali na charakter pôvodnej fyzickogeografickej štruktúry krajiny, ktorá bola vo veľkej miere narušená antropogénnou činnosťou ako aj na podrobnejšiu charakteristiku druhotnej krajinnej štruktúry skúmaného územia, pričom zvláštnu pozornosť sme venovali najmä floristickému zloženiu rastlinnych spoločenstiev na halde lúženca. Fyzikálne i chemické vlastnosti lúženca podmienili vznik a vývoj veľmi špecifického ekosystému, ktorý nemá v prírodnej krajine obdobu, pričom tieto faktory výrazne ovplyvňujú aj usporiadanie jednotlivých krajinných prvkov. Viac ako polovicu haldy pokrýva vegetácia zastúpená bylinnotrávnymi formáciami rozsiahlejších monocenóz *Calamagrostis epigejos* a *Artemisia absinthum*. Stromová vegetácia je zastúpená najmä *Populus canenscens*, ktoré porastajú najvyššie položené miesta haldy. Odkrytý materiál lúženca zaberá 40 % rozlohy haldy.

Riešenie likvidácie haldy lúženca pri Seredi sa uberalo niekoľkými smermi: využitie lúženca ako materiálu pre výrobu nízkolegovaných ocelí, pre výrobu oxidických peliet, pre priame vsádzkovanie do vysokých pecí, rekultivácia haldy, zavlažovanie haldy, vybudovanie zelenej polyfunkčnej zóny v jej okolí, využitie lúženca v cementárňach a pri prepieraní hnedého uhlia. Pre všetky tieto formy sanácie lúženca bola vypracovaná projektová dokumentácia, ale okrem monitorovacích sond znečistenia podzemných vôd, čiastočnej rekultivácie skládky a ťažby lúženca pre hutnícky priemysel, všetky návrhy ostali na úrovni projektov a eliminácia znečistenia, najmä podzemných a povrchových vôd, bola ponechaná na samočistiacu schopnosť prírodných štruktúr. Uvedené formy likvidácie haldy lúženca boli a sú z aspektu množstva lúženca neúčinné a proces jeho likvidácie je veľmi pomalý. Pri súčasnom tempe ťažby a exportu lúženca (spoločnosť Ferroport), podľa odhadov pracovníkov oddelenia životného prostredia v Seredi je možné haldu zlikvidovať zhruba až za 600 rokov. Znehodnotenie životného prostredia starými environmentálnymi záťažami v predmetnom regióne predstavuje v súčasnosti kľúčový problém pri vstupe zahraničných investorov do tohto priestoru a je brzdou rozvoja moderných trendov v poľnohospodárstve.

Z toho vyplýva, že otázky ochrany životného prostredia bolo potrebné riešiť „ex ante“ pri výstavbe závodu, nie „post factum“ teda po 27 až 30 rokoch plnej prevádzky š. p. Niklovej huty a to variantom, ktorý je značne pesimistický, teda ponechaním na samočistiacu schopnosť krajiny. Ukončením výroby niklu a kobaltu v NHS š. p. zanikol síce hlavný zdroj kontaminácie, ale znečistenie určite nezanikne samo, pretrváva.

Recenzenti: Prof. h. c. prof. Ing. Ondrej Hronec, DrSc.
Prof. Ing. Jozef Vilček, PhD.

SKI TOURISM IN THE POLISH CARPATHIANS – PRESENT STATE AND ISSUES OF DEVELOPMENT

***Mirosław MIKA*[1]**

Abstract: *The development of ski resorts is presently one of the most dynamic tourism processes in the Polish Carpathians. It is taking place not only in mountainous areas but also in suburban zones. The main factor for this process is constantly growing demand for ski tourism form on the Polish national market. The conditions of competition with Slovak and Czech resorts forces modernizations of Polish resorts, improvement of its service quality and specialization. The ski tourism development in Polish Carpathians is affected by many legal, proprietary, functional and natural barriers.*
Key words: *Polish Carpathians, ski tourism, resorts development*

INTRODUCTION

The Carpathian Mountains belong to the most important tourism regions in Poland due to their high natural and cultural values that enable many forms of tourism through the whole year (Warszyńska 1985, 1995; Kurek 2008). Traditionally, this region was used for long stay holidays, but nowadays tourism here is strongly influenced by agglomerations located at the foot of the Carpathians: the ones of Upper Silesia, Krakow, and Rzeszów. This influence involves short-stay tourism forms.

A great social interest and fashion trend towards winter sports have contributed to the increase of winter tourism flow at traditional ski resorts. The Polish society's increasing activeness in the field of winter recreation has generated favourable conditions for mountain towns previously little visited by tourists or lacking skiing infrastructure to develop their tourism function. Presently, the interest in skiing and in the satisfaction of broadly defined health needs form one of the most important factors for modernization and innovation in the tourism sector of tourist resorts in the Polish Carpathians and Sudetes.

SKIING TRADITIONS IN THE POLISH CARPATHIANS

Traditions of skiing in Poland date back to the interwar period and they are related to the popularization of Nordic skiing. The development of alpine skiing started at the turn of the 50's and the 60's of the 20th century, and it grew up to mass scale in the 70's of the 20th century. The first ski lifts have been established in the Polish Tatras during the 60's of the 20th century.

The highest numbers of skiing investments have been carried out in the 70's and 80's of the 20th century in the Silesian and Żywiec Beskids as well as in the area of Zakopane, accompanying the development of company's social recreational centres. At that time, the

1 **Dr. Mirosław Mika,**
Department of Tourism and Health Resort Management, Institute of Geography and Spatial Management, Jagiellonian University, 30-387 Kraków, ul. Gronostajowa 7,
e-mail: mika@bb.onet.pl

ski run system in Szczyrk has been established, the town called then the "Polish skiing capital" (Mika 2004). Also the infrastructure on the slopes of Pilsko in Korbielów has been developed, as well as ski lifts and ski runs networks in Wisła and Zakopane. By the end of the 80's of the 20th century, the best developed ski region was the area of Silesian Beskid Mountains with 65 functional ski lifts and 76.9 km of ski runs. Before 1989, there were about 200 ski lifts in total in the Carpathians, most of them of low quality, located mainly in the Tatra Mountains region as well as in the western part of the Beskids Mountains (Kurek 2008). The first half of the 90's of the 20th century has been the time of property status transformation and of the beginning of modernisation in most ski resorts.

THE PRESENT STATE OF DEVELOPMENET OF SKIING INFRASTRUCTURE

The development of ski resorts is now one of the most dynamic tourism processes in the Polish part of the Carpathians. According to the stocktaking conducted by the end of 2008, the infrastructure for downhill skiing in the Polish Carpathians includes 557 ski lifts and 587 ski runs with total length of 370.9 km (tab.1). It means that since the beginning of the 90's of the 20th century the skiing infrastructure, regarding the number of ski lifts, has increased by three times. From the technical point of view, surface lifts are most common (T-bar lifts and platter pulls) – 509 establishments (91.4%) and two funicular railways (in Zakopane on Gubałówka and in Międzybrodzie Bialskie on Góra Żar); the other lifts are chairlifts (43), two gondola lifts (to Szyndzielnia Mountain in Silesian Beskids and to Jaworzyna Krynicka in Sądecki Beskids) and one aerial tramway (to Kasprowy Wierch Mt. in the Tatras).

Among all Carpathian tourism regions, the most developed skiing infrastructure can be found in the area of Zakopane (the Tatras and Subtatra region) as well as in the Silesian Beskid Mountains. However, with regard to skiing equipment infrastructure, the importance of Sądecki Beskid Mountains has significantly increased because of intensive investments carried out in the recent years.

Tab.1. *Ski tourism infrastructure in tourist regions of the Polish Carpathians*

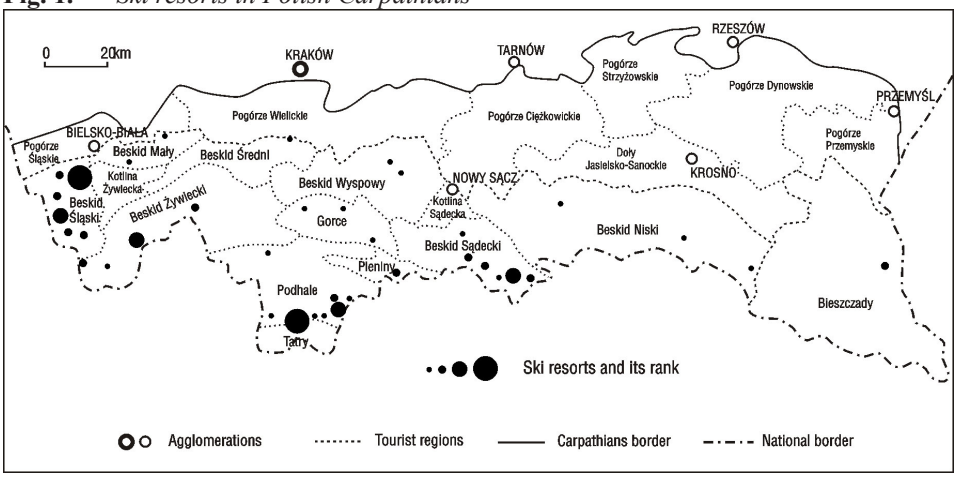
Tourist regions	Number of ski lifts	The length of ski lifts (km)	Number of ski runs	The length of ski runs (km)
Carpathian Foothills (Pogórze)	31	10,1	31	11,7
Żywiec Basin (Kotlina Żywiecka)	1	0,3	1	0,3
Silesian Beskids (Beskid Śląski)	110	53,7	108	88,1
Żywiec Beskids (Beskid Żywiecki)	58	28,7	69	51,0
Little Beskids (Beskid Mały)	12	4,7	14	7,3
Maków Beskids (Beskid Średni)	6	3,9	6	4,3
Island Beskids (Beskid Wyspowy)	11	6,3	10	8,1
Gorce Mts. (Gorce)	26	10,7	28	16,8
Sądecki Beskids (Beskid Sądecki)	87	40,0	94	47,7
Lower Beskids (Beskid Niski)	28	12,1	31	21,7
Bieszczady Mts. (Bieszczady)	29	15,4	35	21,6
Pieniny Mts. (Pieniny)	13	5,0	15	9,9
Tatras and Podhale (Tatry i Podhale)	145	59,8	145	82,3
Total	**557**	**250,7**	**587**	**370,9**

Source: own study.

Since the beginning of the 90's of the 20th century, numerous establishments of skiing infrastructure have been created in the Carpathians. Concurrently to developing new areas, the already existing infrastructure has been modernised. Along with the development of such infrastructure the rank of some resorts has changed and new resorts have emerged. The biggest newly established ski resorts in the Polish part of the Carpathians are located in the Sądecki Beskid Mountains. It is the „Jaworzyna Krynicka" resort (gondola lift, 10 ski lifts, 7.5 km of ski runs) and the „Two Valleys Muszyna-Wierchomla" (10 ski lifts, 15 km of ski runs). Smaller new resorts have been opened in Szczawnica, Kluszkowce near Czorsztyn, in Białka Tatrzańska, in Limanowa, Laskowa near Limanowa and in Jurgów. Some small resorts have opened in the Bieszczady and Lower Beskids Mountains. In the recent years, a network of small ski lifts in the Carpathian Foothills region (31) has been developed, located mainly in suburban zones of cities at the foot of the Carpathians. The development and maintenance of ski slopes beyond mountainous areas are enabled by the widespread use of snowmaking devices of high efficiency.

In the Polish Carpathians, ski lifts can be found in 133 locations, only 37 of which can be described as a ski resort. These resorts have different ranks, depending on the stage of development of their skiing infrastructure and accommodation facilities. The leading resorts are Zakopane and Szczyrk, since the 70's of the 20th century offering the best skiing infrastructure. It is worth emphasizing that the ski areas in the Tatras are the only areas in Poland offering alpine conditions, where the snow cover enables skiing activities from October till the end of April. Due to the relatively high incoming tourism flow from Russia and Ukraine, these resorts have gained on importance from the 90's of the 20th century and became international ski resorts.

Fig. 1. *Ski resorts in Polish Carpathians*



Source: own study.

A highly developed skiing infrastructure can be found also in Wisła (Silesian Beskids), Korbielów (Żywiec Beskids), Krynica (Sądecki Beskids) and Bukowina Tatrzańska (Podhale region). These towns can be considered the main regional ski centres of national importance and a serious competition to Szczyrk and Zakopane. With regard to tourism,

Wisła and Krynica are multifunctional. The development and modernisation of skiing infrastructure in the 90's of the 20th century have significantly contributed to the increase of tourism flow during winter season and to the more efficient usage of accommodation facilities and thus to the growing economic benefits from tourism development.

Important positions in the system of the Carpathian ski resorts belong also to Brenna, Istebna, Koniaków, Ustroń, Zwardoń, Zawoja, Piwniczna, Tylicz, Wierchomla, Szczawnica, Białka Tatrzańska and Ustrzyki Dolne. The ski tourism development in these locations is limited by orography, climate, transportation or other local conditions such as nature protection areas (Zawoja).

Complementary to the above mentioned resorts, the following 19 locations have usually several ski lifts each: Myślenice, Laskowa, Spytkowice, Rycerka Dolna, Międzybrodzie Żywieckie, Rzyki, Limanowa, Kluszkowce, Niedźwiedź, Rabka Zdrój, Rytro, Szczawnik, Chyrowa, Karlików, Małastów, Jurgów, Małe Ciche, Murzasichle and Witów. Their skiing offer is local or regional, for inhabitants and visitors of the neighbouring towns; they can also profit from the neighbourhood of bigger ski resorts, i.e. in the Podhale region.

The vast majority of all locations with ski lifts (72%) offers only a limited service, mainly for local societies. They have one or two devices to transport the skiers up the slope, mainly T-bar lifts.

MAIN ISSUES OF SKI TOURISM DEVELOPMENT

Factors and development directions

Along with the development of skiing devices and resorts' quantity, their function and quality also undergoes a process of transformation. From all spatial, social and economic processes related to the development of skiing infrastructure in the Polish part of the Carpathian Mountains, the following affect the development's character, extend and directions:

- development of skiing infrastructure in new localities with no previous skiing traditions
- establishment of new ski lifts in suburban areas
- establishment of new high quality devices and modernisation of old devices for skiers' up slope transportation
- the prolongation of winter tourism season's peak, due to administrative decisions regarding the freedom of choice of the winter school holidays' time
- some of ski resorts functioning in competitive conditions to other national and international ski centres
- extending the offer of ski resorts by SPA services, some using geothermal water
- popularisation the usage of snowmaking devices on ski slopes
- ski tourism development being considered as the stimulus for economic activity in mountainous areas' small towns struggling with the effects of socio-economic transformation
- creating new ski resorts based on initiatives of local communities

The popularity of skiing and skiboarding is the reason why every year new localities develop areas for these recreation forms. Investing in downhill skiing infrastructure in Poland is taking place not only in mountainous areas with good orography and snow cover conditions but increasingly also in suburban areas or even within agglomerations (such

as Bytom, Warsaw, Poznań, Lublin). Such trends in investments‘ location, improving the accessibility of skiing areas for potential users, make all forms of active winter recreation even more popular and they change their time scheme – turning the weekend-and-holiday leisure into an every-day and after-work activity. This development direction is reinforced by the popularisation and usage of the snowmaking technology for "artificial snow cultivation and production".

The property transformation process conducted in the 90's of the 20th century in ski resorts can be considered finished but the changes in the quality of skiing infrastructure are still under process. Modernisation is undertaken mainly for the depreciated, low quality T-bar lifts and platter pulls, in many cases replaced by their modern versions or by chair-lifts capable of carrying many persons at one unit. The ski runs are being widened and joined, if possible; a system of season tickets is being introduced. An important factor contributing to the improvement of skiing facilities was the law regulation, enforced in 2003, regarding technical conditions of new ski lifts construction, where their high quality and safety of the users are made a priority. The second crucial stimulus for modernisation is the competition of other resorts. One of the greatest modernization investments of recent years was the redevelopment of the funicular railway from Zakopane (Kuźnice) to Kasprowy Wierch Mt.

The use of tourism infrastructure in ski resorts has been positively affected by the prolongation of winter school holidays' time. In the 90's of the 20th century, during winter season, two peaks of tourism flow could be observed. The first, relatively short period around the Christmas and New Year holiday, and the second related to winter school holidays in February. The possibility of choosing different time for winter holidays for children and school youth in individual voivodeships, enforced by the end of the 90's of the 20th century, has positively affected the usage of tourism infrastructure in terms of quantities and seasonality. Now, winter season lasts uninterruptedly from Christmas until the end of February, which means the peak of winter season has been prolonged up to 2.5 months.

Newly established skiing devices become seriously competitive to traditional resorts. Although the attractiveness of big and traditional ski resorts is the result of their varied and scenic ski runs, with diverse difficulty levels and of their well developed accommodation and dining facilities, the newly established resorts have the advantage of modern equipment, such as "snow parks" for snowboarders, as well as good accessibility, no crowds on the slopes and free parking spaces. In order to attract tourists, entrepreneurs in charge of the management of ski lifts have to conduct intensive marketing activities.

Nowadays, the issue of ski resorts functioning in the Polish part of the Carpathians, within the free-market competition, must be considered also in an international context. From this perspective, the issue of the highest importance is the question of competitiveness or complementarity of Slovak resorts' offer, where the modern skiing infrastructure is being developed and mainly intended to attract tourists from Poland (Klamár, Mika, Rosič, 2009). These issues have not been studied yet. Already a preliminary analysis indicates that an improvement of accessibility of Slovak resorts from Poland (shorter travel time) can cause the interception of a significant number of Polish skiers. However, with such accumulation and diversity of skiing infrastructure (133 localities in the Polish part of the Carpathians and circa 100 in the Slovak part) the demand behaviour of ski-tourists will

be influenced by many factors. Similar issues concern the Polish-Czech borderland in the Carpathians and in the Sudetes.

One of the methods of establishing a competitive predominance by a resort is to unite skiing offer with other recreation forms, mainly SPA&Wellness. This process fits into global trends of winter tourism development. Spa and wellness services are either offered as a supplement of the offer for skiers or recreation on snow is one of the elements of a health package (Mika, Pawlusiński 2006). Many resorts begin to specialise in this new sort of Ski&Spa offer, for example Szczyrk, Wisła, Wierchomla, Rytro, Krynica, Zakopane. From the beginning of the 21st century, geothermal waters are exploited to a higher extend in Poland. Easily accessible resources of geothermal waters can be found in Podhale and a growing number of tourist resorts in this region considers a union of skiing and geothermal water services the basis of their development (for example Zakopane, Bukowina Tatrzańska). Models of functioning Slovak resorts are of high importance for the development of similar Polish resorts.

Experiences from European ski resorts indicate that investments in alpine skiing infrastructure pay off relatively quick. The economic success of these investments makes them highly interesting for potential investors. Also local self-governments of communes in mountainous areas in Poland are visibly interested in these investments. Mass ski tourism is considered the stimulus for socio-economic development, increasing the income from tourism sector during winter season. According to one of ecological non-governmental organisations involved in monitoring local governments' activities regarding skiing infrastructure development in the Polish Carpathians, in 2006, new ski investments were planned in 50% of Carpathian communes.

The interest in investing in ski tourism as profitable tourism form, in recent years, has been taking shape of social initiatives by local communities. New ski resorts established by groups of local entrepreneurs have emerged mainly in Podhale, in Jurgów and Czarna Góra. However, these investments are not on a big scale; in Jurgów, the cost of an investment with 240 persons involved was 12 million PLN. As comparison, the value of all investments in skiing infrastructure in Zakopane from 1990 amounted to circa 450 million PLN, which is why there is always a need for investors capable of high expenditure and for the support of European Union's funds. The biggest private investment of recent years was the redevelopment of the ski resort Muszyna-Wierchomla in Sądecki Beskids with the value of 40 million PLN, where the share of European funding reached circa 33%.

Barriers for development

The development of skiing infrastructure could be much faster if not for many legal, proprietary, functional and natural barriers. To main limitations for the development of this tourism sector in the Carpathian region belong:

- development of the protection areas network Natura 2000,
- not enough financial resources in communities' budgets to invest in skiing and accompanying infrastructure,
- conflict situations regarding skiing in big resorts,
- no legal regulations organizing relations between land owners and skiing facilities' managers,
- instability of snow cover.

Areas Natura 2000 have been introduced in the polish law as nature protection form in 2004. Till the end of 2008, 364 habitat areas have been approved, with a total area covering 8,1% of country's area, including a substantial part of the Polish Carpathians. Besides them, potential areas for protection have been listed (the so called „shadow list") where protection procedures are also applied. As a result of the legal approval of this area protection form, several big skiing investments in the Silesian Beskids, Żywiec Beskids and Sądecki Beskids have been withheld or limited. In this context, one should indicate the high activity of ecological non-governmental organisations working against the expansion of the ski runs' and ski lifts' system in precious natural areas and their vicinity. A similar situation takes place in the Czech Beskids.

Traditional ski resorts often struggle with many unsolved problems that have been building up over years, which lowers their attractiveness in the eyes of tourists and which threatens the further development of ski tourism. In many cases, these take form of conflicts between land owners and the ski lifts management (Szczyrk, Zakopane-Gubałówka), as well as problems related to environmental restrictions for ski tourism investments, especially conflicts between the investors or local authorities and ecological organisations.

A good illustration of the problems, which ski resorts in the Polish Carpathians must face, is the situation in one of the biggest Polish ski resorts – Szczyrk (Mika, Krzesiwo, Krzesiwo 2007). In this resort, the management of two large skiing centres is responsible for service standards and functioning of the system in the area. Proper preparation and efficient operation of ski lifts belonging to those two entities condition the satisfaction of skiers and tourists and as the result – the income of other tourism facilities such as accommodation and dining facilities. In the recent years, the not regulated property status of skiing areas – the remnant of the past socio-economic system – negatively affects the ski development in Szczyrk. The solution for this social conflict regarding the legal and proprietary status of these areas is sought for by establishing new structures managing ski centres, in which the shareholders will be the owners of ski lifts' and ski runs' areas. No agreement and operational disturbances of these two ski centres make the image of Szczyrk as a ski resort worse; strengthen negative stereotypes in tourists' opinion and cause winter tourism flow moving to different localities – mainly to Korbielów and Wisła. The image of the city among tourists is also negatively affected by several other controversial issues and spatial and functional conflicts relating skiing, such as:

- general bad conditions of internal and external accessibility for traffic,
- discrepancy between the capacity of ski lift devices and tourism flow rates,
- conflicts between skiers and snowboarders coexisting on the slopes and the issue of safety,
- degradation of natural environment on slopes.

Functional, spatial and organizational problems take different course of events and have different intensity in various tourism resorts. They largely depend on specific local conditions and on the role played by tourism in the functional structure of the resort. But they regard the vast majority of resorts with developed or developing skiing infrastructure in Poland. An important fault is the lacking political agreement regarding the so called mountain law or the so called snow act which could regulate the issues of using the lands for skiing purposes. The last public debate on this topic in Poland was held in 2006.

A serious obstacle and threat for further down-hill skiing development in the Polish Carpathians are changing climate conditions and the resulting instability of snow cover, as well as the lack of suitable slopes (with regard to their inclination and length). Most of investments in the Polish part of the mountain range are located under 1500 metres above the sea level where, in the recent years, problems with the snow cover durability are observed. Detailed climate studies on this subject have not been conducted yet. However, it seems that, considering the widespread use of artificial snowmaking devices on skiing slopes, climatic and orographic conditions for the temperature to stay under 0ºC are much more important that the size of snowfall by itself. The instability of the weather and the cost of snowmaking affect the profitability of ski resorts and the level of cost for using skiing facilities by skiers.

CONCLUSION

In the system of European ski resorts, the Polish Carpathian locations will never be able to rival with skiing areas in the Alps and thereby they will have no significant meaning in the reception of international ski tourism. The development of skiing infrastructure in the Polish Carpathians will be still conducted mainly due to the constantly growing demand for this form of tourism on the national market. Therefore it can be assessed, that despite the new resorts growing at a fast rate, the development state of skiing infrastructure in the Carpathians is still unsatisfactory. The competition from Slovak and Czech ski resorts impels the construction of modern facilities and the modernization of old ones, as well as the introduction of innovative solutions such as connecting skiing with health tourism and the commercial use of ski areas during summer season, for example through constructing other sport – and recreation devices attractive for tourists such as summertime bobsled runs, opened year-round, or roller coasters, bicycle routes, motocross routes, view platforms, ropes courses etc. Such precursory establishments have been recently opened in Ustroń (the Silesian Beskids), in Międzybrodzie Bialskie (the Little Beskids), in Kluszkowce (the Gorce Mts.), as well as in the Slovak Kysucke Beskids (on Wielka Racza) and the Czech Silesian-Moravian Beskids (in Mosty k/Jablonkova) (Havrlant 2001, 2007; Mika 2008). They will be surely followed by other ski resorts.

It seems that despite many limitations and barriers, the further development of ski tourism in Poland will be mainly supported by its commercial importance and on a regional scale – its strong connections to other sectors of tourism and local economy as well as the economical and social benefits expected by local authorities. Whereas the situation of unavoidable competition with Slovak and Czech resorts, the result of the European integration, will force the management to conduct further modernization, contribute to an improvement of service quality and intensify the process of service specialization.

References

HAVRLANT, J. (2001): The Beskydy euroregion as an area of travel and recreation, Moravian Geographical Report, 9, 2, 15-23.

HAVRLANT, J. (2007): Współczesne trendy w rozwoju funkcji turystyczno-rekreacyjnej Beskidów Czeskich, [in:] W. KUREK, M. MIKA (ed.), Studia nad turystyką. Tradycje, stan obecny i perspektywy badawcze. Geograficzne, społeczne i ekonomiczne

aspekty turystyki, Instytut Geografii i Gospodarki Przestrzennej, Uniwersytet Jagielloński, Kraków, 281-288.

KLAMÁR, R, MIKA, M., ROSIČ, M. (2009): Regionalne aspekty rozwoju turystyki na Słowacji, na przykładzie Preszowskiego kraju, [in:] B. DOMAŃSKI B. W. KUREK (ed.) Gospodarka i przestrzeń, Instytut Geografii i Gospodarki Przestrzennej UJ, Kraków (in press).

KUREK, W. (2004): Turystyka na obszarach górskich Europy. Wybrane zagadnienia, Inst. Geogr. i Gosp. Przestrz. UJ, Kraków.

KUREK, W. (2008): Tourism in Polish Carpathians in the political transition time, [in:] WYRZYKOWSKI J. (ed.), Conditions of the foreign tourist development in Central and Eastern Europe, Tourism in geographical environment, 10, UW, Wrocław, 295-302

MIKA, M. (2004): Turystyka a przemiany środowiska przyrodniczego Beskidu Śląskiego, IGiGP UJ, Kraków.

MIKA, M. (2008): Tourism on the Polish-Czech-Slovak borderland in the light of contemporary development trends, [in:] WYRZYKOWSKI J. (ed.), Conditions of the foreign tourist development in Central and Eastern Europe, Tourism in geographical environment, 10, UW, Wrocław, 325-334.

MIKA, M., KRZESIWO, K., KRZESIWO, P. (2007): Współczesne problemy rozwoju ośrodków narciarskich w Polsce – przykład Szczyrku [in:] PTASZYCKA-JACKOWSKA D. (ed.) Polska przestrzeń turystyczna, Prace Geograficzne IGiGP UJ 117, 63-78.

MIKA, M., KUREK, W. (2008): Miejscowości turystyczne w dobie konkurencji (na przykładzie Polskich Karpat), [in:] G. GOŁEMBSKI (ed.), Turystyka jako czynnik wzrostu konkurencyjności regionów w dobie globalizacji, Wyd. AE Poznań, Poznań, 219-228

MIKA, M., PAWLUSIŃSKI, R. (2006): Some problems of the development of spa & wellness services in the Polish Carpathian Mountains [in:] WYRZYKOWSKI J. (ed.), Conditions of the foreign tourist development in Central and Eastern Europe, Contemporary Models of Spa Tourism, 9, Institute of Geography and Regional Development UV, Wrocław, 61-73.

PTASZYCKA-JACKOWSKA, D. (2007): Gospodarowanie przestrzenią turystyczną w Polskich Karpatach, Prace Geogr. IGiGP UJ, 117.

WARSZYŃSKA, J. (ed.) (1995): Karpaty Polskie. Przyroda, człowiek i jego działalność, Uniwersytet Jagielloński, Kraków.

WARSZYŃSKA, J. (1985): Funkcja turystyczna Karpat Polskich, Folia Geogr., Ser.Geogr.-Oecon., 18.

ZAWILIŃSKA, B. (2007): Turystyka w działalności parków krajobrazowych w Karpatach [in:] W. KUREK, R. FARACIK (ed.), Studia nad turystyką. Prace geograficzne i regionalne. Geograficzne, ekonomiczne i społeczne aspekty turystyki, Instytut Geografii i Gospodarki Przestrzennej, Uniwersytet Jagielloński, Kraków.

TURYSTYKA NARCIARSKA W POLSKIEJ CZĘŚCI KARPAT – STAN OBECNY I WYBRANE PROBLEMY ROZWOJU

Streszczenie

Jednym z najbardziej dynamicznych zjawisk w polskiej części Karpat jest rozwój turystyki narciarskiej. Stan zagospodarowania dla narciarstwa, pod względem liczby wyciągów, w porównaniu do początku lat 90. XX w. wzrósł prawie trzykrotnie. W końcu 2008 r. obejmował on 557 wyciągów oraz 587 tras zjazdowych, o łącznej długości 370,9 km. Spośród karpackich regionów turystycznych najlepiej rozwinięta infrastruktura narciarska występuje w regionie zakopiańskim (Tary i Podhale) oraz w Beskidzie Śląskim. Pod tym względem znacząco wzrosła ranga Beskidu Sądeckiego, gdzie od kilkunastu lat prowadzone są duże inwestycje narciarskie.

Wyciągi narciarskie zlokalizowane są w 133 miejscowościach karpackich (górskich i pogórskich), z których jedynie 37 można przypisać charakter stacji narciarskiej. Stacje te, w zależności od poziomu rozwoju infrastruktury narciarskiej i noclegowej mają różną rangę. Pierwszoplanowe miejsce wśród nich zajmują Zakopane i Szczyrk, które od lat 70. XX w. dysponują najlepszą bazą dla uprawiania narciarstwa.

Oprócz rozwoju ilościowego urządzeń i ośrodków narciarskich następuje także proces ich transformacji funkcjonalnej i zmiany jakościowej. Z ogółu zjawisk przestrzennych, społecznych i gospodarczych związanych z obecnym rozwojem bazy narciarskiej w polskiej części Karpat można wskazać te, które decydują o jego charakterze, zakresie i kierunkach, są to:

- rozbudowa infrastruktury narciarskiej w nowych miejscowościach, bez tradycji narciarskich,
- lokalizacja nowych wyciągów w strefach podmiejskich miast,
- tworzenie nowych wysokiej jakości i modernizacja starych urządzeń do transportu narciarzy po stokach,
- wydłużenie szczytu turystycznego sezonu zimowego w wyniku administracyjnych decyzji o swobodzie wyboru terminu szkolnych ferii zimowych,
- funkcjonowanie części stacji narciarskich w warunkach konkurencji ze strony innych ośrodków krajowych i zagranicznych,
- rozszerzanie oferty ośrodków narciarskich o usługi odnowy biologicznej, m.in. z wykorzystaniem wód geotermalnych,
- upowszechnienie stosowania urządzeń do sztucznego dośnieżania tras narciarskich,
- upatrywanie w rozwoju turystyki narciarskiej czynnika pobudzenia aktywności gospodarczej w miejscowościach górskich borykających się ze skutkami transformacji społeczno-gospodarczej,
- tworzenie nowych ośrodków narciarskich na podstawie wspólnotowych inicjatyw lokalnych.

Tempo rozwoju bazy dla narciarstwa byłoby znacznie szybsze gdyby nie wiele barier o charakterze prawnym, własnościowym, funkcjonalnym i przyrodniczym. Wśród głównych ograniczeń rozwoju tego sektora turystki w regionie karpackim można wskazać:

- rozwój sieci obszarów chronionych Natura 2000,

- brak wystarczających środków finansowych w budżetach gmin na inwestycje w narciarstwo i infrastrukturę towarzyszącą,
- sytuacje konfliktowe wokół narciarstwa w dużych stacjach narciarskich,
- brak regulacji prawnych porządkujących relacje między właścicielami gruntów a gestorami urządzeń narciarskich
- niestabilność pokrywy śnieżnej.

Mino ograniczeń i barier, rozwój bazy dla narciarstwa w Karpatach Polskich będzie nadal zachodził. Decydującą rolę w tym względzie będzie odgrywało komercyjne znaczenie turystyki narciarskiej, zaś w aspekcie regionalnym jej silne powiązania z innymi sektorami turystyki i gospodarki lokalnej oraz oczekiwane przez władze samorządowe korzyści gospodarcze i społeczne. Konkurencja ośrodków słowackich i czeskich, „wymusi" na gestorach dalsze zabiegi modernizacyjne, przyczyni się do podniesienia jakości oferowanych usług i zintensyfikuje proces ich specjalizacji.

Recenzovali: RNDr. Kvetoslava Matlovičová, PhD.
RNDr. Radoslav Klamár, PhD.

THE POPULATION DEVELOPMENT OF VEĽKÝ ŠARIŠ IN THE CONTEXT OF SUBURBAN PROCESSES IN 1991 – 2006

***Barbora NÉMETHYOVÁ*[1]**

Abstract: *This contribution deals with the development of inhabitants in Veľký Šariš in the period 1991 – 2006 and the perspective of population development in the town of Veľký Šariš for the year 2015. It proposes a brief outline of the number of inhabitants throughout its development in history and it analyses population dynamics including natural and mechanical processes in the period 1980 – 2006. The characterization of inhabitants` development perspective is based on synthetic knowledge about the development of the number of inhabitants and the influence of suburbanisation on this process. The aim is to show, whether the suburbanisation processes occurring in close hinterland of Prešov, are directly related to the population development of Veľký Šariš and whether the expanding suburbanisation will influence the number of inhabitants in 2015.*

Key words: *population dynamics, suburbanization, natality rate, mortality rate, immigration, emigration.*

INTRODUCTION

It is possible to examine the perspectives of population development by means of several methods depending on data availability, relevant sources and also the factors influencing all the processes related to population dynamics. Therefore, it is necessary to take into consideration all the geographic coherence that could somehow participate on the development. In the article we treat the analysis of population dynamics in the conceptual framework of suburbanisation, regarding also the wider time span of the inhabitants` development in history.

THE DEVELOPMENT OF THE NUMBER OF INHABITANTS SINCE 1869 UP TO THE PRESENCE

We can study the development of the number of inhabitants in Veľký Šariš since 1869, in other words, since the first reliable census that occurred in the former state of the Austro-Hungarian Empire, up till the census that took place in 2001. It is not possible to provide complete assessment of population development before 1869 because there were no accurate inhabitants` summations and the information are based only on an account so they are incomplete.

The first census in 1869 states there were 2778 people living in the town. In the following period the number of people was gently decreasing to 2476 inhabitants in 1910. On the other hand, since 1910 the number of inhabitants was slowly increasing. The

1 **Mgr. Barbora Némethyová,**
Department of Geography and Regional Development, Faculty of Humanities and Natural Sciences, University of Prešov, ul. 17. novembra 1, 081 16 Prešov,
e-mail: barbora.nemethyova@gmail.com

highest increase was recorded in the period after the World War II., when the number of inhabitants between 1950 and 1961 increased about 873 people. This growth was caused by the overall population growth in Slovakia due to the baby boom in the after-war period, but mainly by the industrialization of the town. At the break through of 1952/53 the Šariš mill was renewed and enlarged, and in 1965 the Šariš brewery was established. In the following decade the number of inhabitants varied around 4000 people. A mild decrease was recorded in the eighties and mainly in 1996, when the number of inhabitants decreased for about 500 people during 5 years. It was the consequence of the political-economical transformation after 1989. Furthermore, the emigration to the regional capital of Prešov and abroad influenced the decrease in the number of inhabitants too.

On the contrary, since 1997 we can characterize a new phase in the population development of Veľký Šariš. It was partially conditioned by the latter urban phenomenon – suburbanisation. It is the migration of the inhabitants from Prešov to the surrounding municipal parts and villages in order to improve their quality of life, while it involves mainly the actors with the higher social-economical status (Matlovič, Sedláková, 2004). Veľký Šariš has become one of the recipients of such migration processes. In 2001 the town returned to its original number of inhabitants and it outnumbered the limit of 4000 people and in 2006 there lived 4796 people (Table 1). In October 2008 the municipal authorities resolved the resolution, in which they offered a financial grant of 5000 Sk for the citizen that will be enrolled in the list of inhabitants with permanent residency in Veľký Šariš as the five thousandth (4965 inhabitants at the end of October). According to the new statistic data, the limit was successfully overcome and on December 31st, 2008 the town had 5002 people.

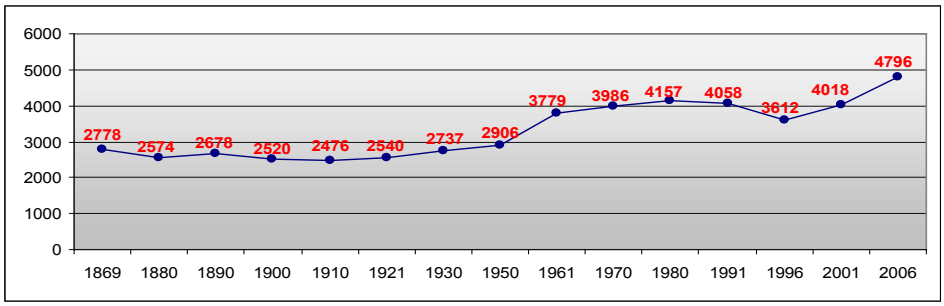
From the first census in 1869 to the last one in 2001, the number of inhabitants increased from 2778 to 4796, what is almost a double value, accurately 2018 people. The overall population development since 1869 up to the presence was not even (Table 2).

Tab. 1: *Development of the number of inhabitants in Veľký Šariš in the period between 1869 – 2006*

Year	1869	1880	1890	1900	1910	1921	1930	1950	1961	1970	1980	1991	1996	2001	2006
Number of Inhab.	2778	2574	2678	2520	2476	2540	2737	2906	3779	3986	4157	4058	3612	4018	4796

Source: Statistic institute in Prešov

Graph 1: *Development of the number of inhabitants in Veľký Šariš in the period between 1869 – 2006*



Source: Statistic institute in Prešov

Tab. 2: *Absolute and relative increase of inhabitants in comparison to previous period.*

Year	1869	1880	1890	1900	1910	1921	1930	1950	1961	1970	1980	1991	1996	2001	2006
Abs.increase	*	-204	104	-158	-44	64	197	169	873	207	171	-99	-446	406	778
Relat.incr.(%)	*	-7,9	3,9	-6,3	-1,8	2,5	7,2	5,8	23,1	5,2	4,1	2,4	-12,3	10,1	16,22

Source: Worked out by author according to the data from Statistic institute in Prešov

The highest total inhabitants` increase was recorded at the census in 1961 reaching 23,1% growth (873 people). The present total increase is caused by the immigration as the consequence of the suburbanisation processes and partly by the natality and immigration of Romas from the surrounding villages. The highest inhabitants` decrease by means of emigration –12,3% was recorded in the period 1991 – 1996.

POPULATION DYNAMICS

The overall state of inhabitants in a region is defined as the result of natural and mechanical development. As the additional data we also use a marriage rate, a divorce rate and an abortion rate. We examined the objective data of the overall dynamics and its partial indicators in Veľký Šariš for the period of years 1980 – 2006 (Table 3).

Tab. 3: *Population dynamics in the period between 1980 - 2006*

Year	Natality	Mortality	Natural sum	Immigration	Emigration	Migration sum	Overal increase	Overal decrease	Overal sum	Marriage rate
1980	57	43	**14**	100	96	**4**	157	139	**18**	
1981	64	38	**26**	95	137	**-42**	159	175	**-16**	
1982	77	41	**36**	67	109	**-42**	144	150	**-6**	
1983	76	31	**45**	87	127	**-40**	163	158	**5**	
1984	64	37	**27**	62	101	**-39**	126	138	**-12**	
1985	66	48	**18**	52	135	**-83**	118	183	**-65**	
1986	70	34	**36**	91	78	**13**	161	112	49	
1987	49	47	**2**	98	140	**-42**	147	187	**-40**	
1988	62	55	**7**	68	109	**-41**	130	164	**-34**	
1989	53	59	**-6**	61	175	**-114**	114	234	**-120**	
1990	61	53	**8**	85	167	**-82**	146	220	**-74**	94
1991	74	57	**17**	104	115	**-11**	178	172	**6**	53
1992	53	42	**11**	74	122	**-48**	127	164	**-37**	53
1993	62	39	**23**	119	100	**19**	181	139	**42**	56
1994	44	44	**0**	112	100	**12**	156	144	**12**	40
1995	48	39	**9**	85	46	**39**	133	85	**48**	30
1996	53	34	**19**	95	63	**32**	148	97	**51**	38
1997	51	45	**6**	77	44	**33**	128	89	**39**	37
1998	52	37	**5**	109	45	**64**	161	82	**69**	43
1999	54	51	**3**	61	45	**16**	115	96	**19**	33
2000	53	26	**27**	118	57	**61**	171	83	**88**	39
2001	47	47	**0**	116	68	**48**	163	115	**48**	17
2002	53	49	**4**	154	70	**84**	207	119	**88**	39
2003	60	37	**23**	174	39	**135**	234	76	**158**	40
2004	61	42	**19**	185	51	**134**	246	93	**153**	27
2005	68	49	**19**	206	46	**160**	274	95	**179**	31
2006	62	50	**12**	197	65	**132**	259	115	**144**	33

Source: Town council in Veľký Šariš

NATURAL DYNAMICS OF INHABITANTS

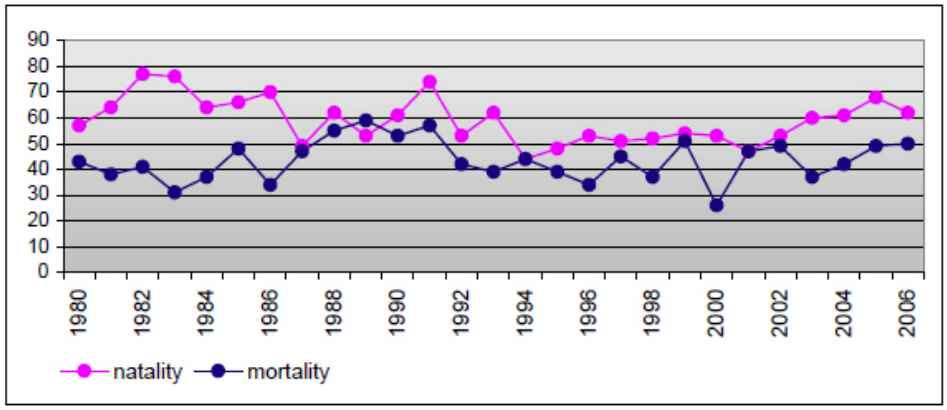
Natural dynamics balance is, except for the natality and mortality, influenced also by other indicators: a marriage rate, a divorce rate and an abortion rate. Due to the unavailability of data, we introduced only the marriage rate for the last 17 years (Table 3).

The average natality rate in Veľký Šariš over the period 1980 – 2006 was 59 people per year. Totally, there were 1594 people born. The highest natality rate was recorded in 1982 – 77 children born and in 1983 – 76 children. The minimal natality rate was recorded in 1994 – 44 children. Quite low natality rate was also in 1987 and 2001 (Graph 2).

The amplitudes of natality rate values are closely related to marriage rate. Absolutely the highest marriage rate was recorded in 1990 – 94 marriages per year, which is almost a double value of the long-term averages that prove about 41,4 marriages per year. Until 1993, the marriage rate was almost always above the level of 50 marriages per year, however then it started to decrease to about 30 – 40 marriages per year. Absolutely lowest marriage rate was recorded in 2007, the number of marriages was only 17. In an observation of the marriage rate we can state a long-term decrease of the number of marriages, caused mainly by the change in social-economical sphere and preferring of co-habitation relations in partnerships.

Another indicator of natural dynamics of inhabitants is mortality rate influenced by the age of inhabitants. The average mortality in Veľký Šariš over the period 1980 – 2006 was 43,5 people per year, absolutely 1174 people died in this time (Graph 2). The highest mortality was recorded in 1989 and 1991 – 59 and 57 of dead and the lowest mortality rate was recorded in 2000 – 26 people. The long-term development of mortality proves quite high amplitudes. Between 1987 -1991 it was permanently increasing and it maintained over the level of 50 people, however then it was alternatively increasing and decreasing.

Graph 2: *Natality and mortality development in the period between 1980 – 2006.*

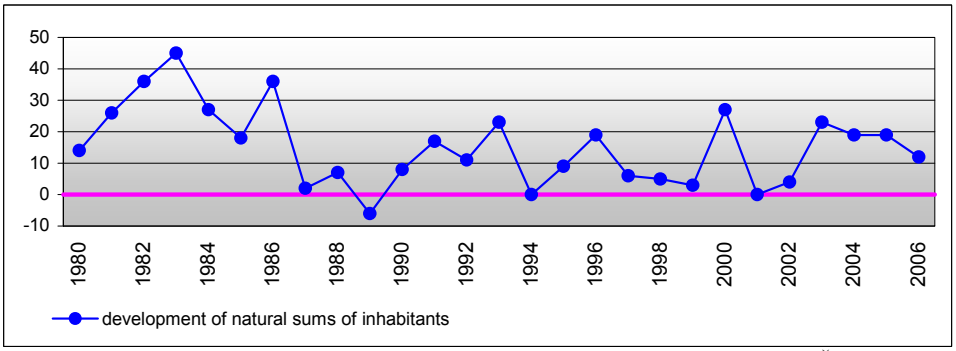


Source: Worked out by the author according to data from the Town council in Veľký Šariš

The average annual inhabitants increase in Veľký Šariš over the period between 1980 -2006 was 15,5 people, totally it was 410 people. The maximal value of the natural sum, 45 people, was recorded in 1983. On the contrary, the minimal value was recorded in

1989, when the number of dead overwhelmed the number of born for about 6 people. In the objective period, there were no more natural decreases, however two times there was a value of 0, when the number of born and dead was equivalent. It happened in 1994 and 2001. As seen on the graph, the natality markedly outnumbers the mortality especially in the initial periods of 1980 – 1987, then it lowers and we mark the natural decrease of inhabitants in 1989. In the following period, the natality almost always outnumbers the mortality (exceptions – 1994 and 2001) (Graph 3).

Graph 3: *Development of the natural sums of inhabitants in the period between 1980 – 2006*

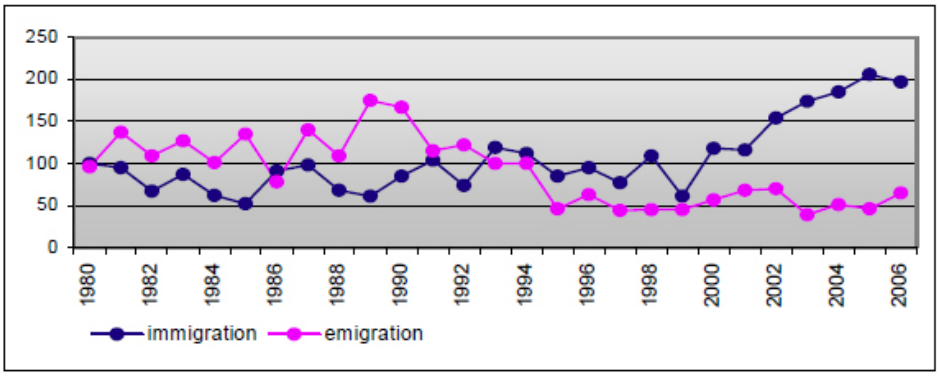


Source: Worked out by the author according to data from the Town council in Veľký Šariš

MECHANICAL DYNAMICS OF INHABITANTS

Average annual immigration over the period 1980 – 2006 reached the value of 105,6 people per year. Totally there were 2852 inhabitants that moved to the town of Veľký Šariš in the mentioned period. The highest immigration rate was in 2005, when 206 people moved to the town. It was almost a double value of the long-term average. The reason of the movement was mainly the obtaining of permanent residency in the ward of Kanaš in newly built houses and also in the town itself. Significant migration flows come from Prešov due to the suburbanization processes, but also from the surrounding villages (Šarišské Michaľany, Gregorovce, Sabinov). High value of immigration was recorded in 2006 – 197 immigrants and also in next 5 years, when the number of immigrated kept permanently above 150 inhabitants per year. Lower immigration was recorded in the first decade, it did not exceed the value of 100 people. The absolute minimum was recorded in1985, when only 52 inhabitants moved to the town (Graph 4).

Graph 4: *Development of annual immigration and emigration in the period between 1980 – 2006*

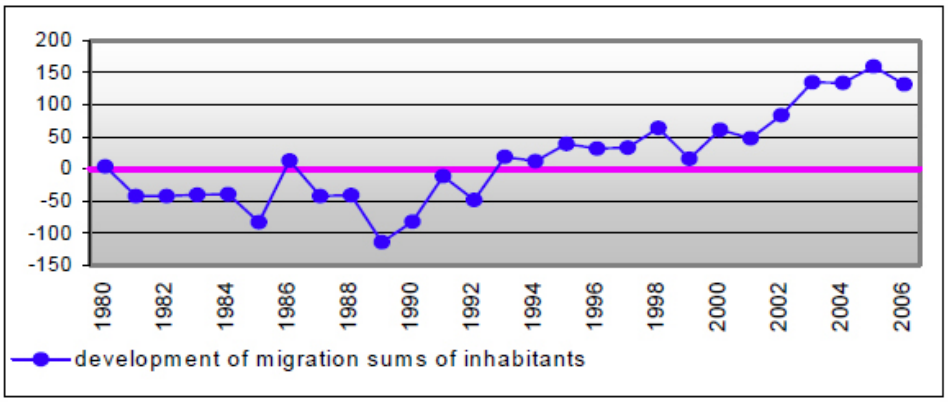


Source: Worked out by the author according to data from the Town council in Veľký Šariš

Average annual emigration over the objective period reached 90,7 people; totally 2450 inhabitants emigrated from Veľký Šariš. The highest emigration rate was recorded in 1989 – 175 people and in 1990 – 167 emigrating inhabitants. The lowest emigration rate was recorded in 1997 and 2003, counted 44 and 39 people. While during the period between 1980 – 1994 there were about 120 inhabitants emigrating from Veľký Šariš, later on in between 1995 – 2005 there were only about 50 emigrants annually. Lower number of emigrants still lasts. This development was closely related to the emigration of inhabitants to Prešov at the end of the eighties and at the beginning of nineties because of better economical conditions and more job opportunities. Decrease of emigration in the last period is related to the preferring of living outside big cities and providing opportunities for individual residential construction in these areas. The biggest emigration flows from Veľký Šariš are directed to Prešov and surrounding villages. The emigration to the western parts of Slovakia and abroad also contributes to the emigration processes.

Average annual migration increase over the period between 1980 – 2006 was 14,9 people. In this way, the town gained by the migration processes 402 people totally. The development was not balanced, but it showed quite remarkable amplitudes (Graph 5). In the period of 1981 -1992, except for the year 1986, the migration sum proved permanently negative values. It means that the migration decrease of inhabitants was prevailing. However, since 1993 up to the presence, the migration sum proved permanently positive values and furthermore it is still increasing. Absolutely the highest migration decrease was recorded in 1989 – 114 people. On the other hand, absolutely the highest migration increase was recorded in 2005 – 160 people (Graph 5).

Graph 5: *Development of migration sums in the period between 1980 – 2006*

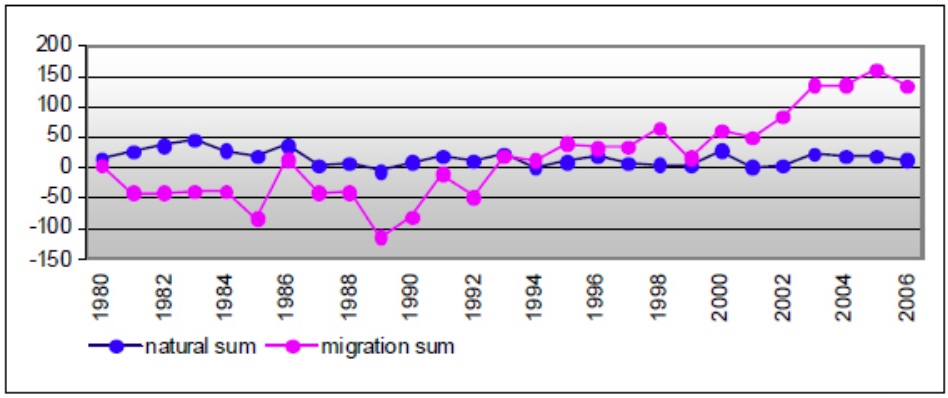


Source: Worked out by the author according to data from the Town council in Veľký Šariš

TOTAL DYNAMICS OF INHABITANTS

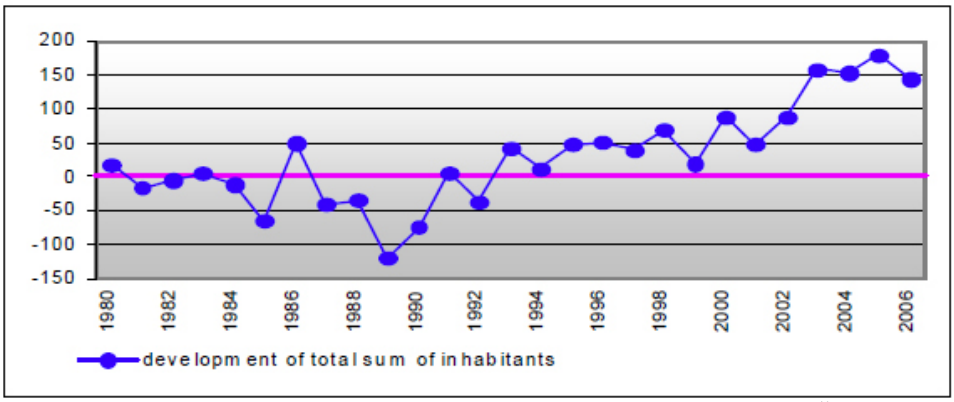
Total state of the inhabitants is directly dependent on natural and mechanical increase or decrease (Graph 6). The population of Veľký Šariš has increased during objective period for about 812 inhabitants, in average 30 people per year. Total sum reaches its highest value in 2005 counted 179 people, which is almost 6 times more than the long-term average. The lowest total sum was recorded in 1989. It was caused by very low natural decrease of -120 people. In generally, we can conclude the migration dynamics was so strong that until 1992 it was causing the total decrease of inhabitants, however in the last decade and mainly in last 5 years, it started to grow and caused the total increase of inhabitants (Graph 7). The migration processes contribute more intensively to the overall development of the number of inhabitants than the natural dynamics of inhabitants, which shows relatively steady values from 0 to 50 people, while the migration processes show the higher amplitudes from -120 to 179 people. We assume that the main reason of the increasing significance of the migration processes on the overall development of inhabitants is mainly the process of suburbanization.

Graph 6: *Development of natural and migration sums in the period between 1980 – 2006*



Source: Worked out by the author according to data from the Town council in Veľký Šariš

Graph 7: *Development of the total sums in the period between 1980 - 2006*



Source: Worked out by the author according to data from the Town council in Veľký Šariš

THE RELATION OF SUBURBANISATION AND MIGRATION TENDENCIES IN THE TOWN

According to Matlovič and Sedláková (2004), the process of suburbanisation is regarded to be as one of the most significant transformational processes of the intra-urban structures in post-communist cities. It is related to the fact that the changes occur predominantly in those parts, where the use of space does not satisfy the new social-economical conditions. The suburbanisation interferes predominantly the peripheral parts of the cities and a peripheral zone that surrounds the compact city directly, in other words, the suburban zone. The most common definition of suburbanisation says that it is the process of relocation of inhabitants and institutions from inner town to its edge and to the suburban zone. In our case it is the regional city of Prešov, as a starting point of residential

suburbanisational tendencies and the contiguous town of Veľký Šariš, which becomes a recipient of suburbanisational processes by means of its increasing number of inhabitants. According to Sýkora (2001) the residential suburbanisation is manifested by several forms. It causes the build-up of massive compact residential zones with individual residential houses, siting of the land for the building plots with the addition of infrastructure and then selling them for the individual residential constructions. This is the way, how new luxurious zones of living are formed on the edges of rural villages, but also in the open space. The suburbanisation occurs also on the free plots inside the villages. Aforesaid processes can be characterized also in Veľký Šariš. For the last 10 years, there were provided numbers of building plots with the infrastructure and in the period 1998 – 2008 the town council issued 392 building permits. Thus, many luxurious squares were formed in the town.

Since 1996 a new period of immigration of inhabitants mainly from Prešov begins, as the consequence of the suburbanisation processes. It is related predominantly to the people from higher society who prefer higher standard of living conditions and they make use of better prices of the land in comparison to those in Prešov (Matlovič, Sedláková, 2004). By terrain research we identified several luxurious areas indicating the presence of this group of people. Due to the motorization they are able to overcome the distances to work and other activities of their daily life. Veľký Šariš, as the little, but from the point of view of its infrastructure, very well equipped town, offers very good and satisfying living conditions for the objective group of inhabitants. In the town itself, number of houses, streets and even the squares of individual resident houses were built. They are located in the southern part of the town close to the sewage tank and in the northern part of the town along Torysa river. The most significant recipient of the residential suburbanisation is the ward of Kanaš, where the number of inhabitants increased rapidly and most of the immigrated people are from Prešov.

Matlovič and Sedláková (2004) say that the analysis of the development of inhabitants in Prešov proved that during the whole period, the numbers of annual total sums of inhabitants were continually decreasing. Since 1996, there were intensive emigration processes in the town and we record the migration loss, which continually deepens.

At the basis of what was said, we can conclude that the connection between the beginning of migration decrease in Prešov and beginning of migration increase in the suburban zone represented by Veľký Šariš, is not random. The comparative analysis of migration sums of objective areas proved that the continuous growth of inhabitants in Veľký Šariš, correlates directly to the migration decrease of inhabitants in Prešov (Table 4).

Tab. 4 : The migration sums in Prešov and Veľký Šariš in the period between 1996 – 2007

Year	**1996**	**1997**	**1998**	**1999**	**2000**	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**
Prešov	-12	-70	-24	-111	-127	-207	-366	-471	-558	-338	-207	-292
Veľký Šariš	32	33	64	16	61	48	84	135	134	160	132	130

Source: Statistic institute in Prešov, Town council in Veľký Šariš

While the migration sum in Prešov decreases since 1996 and we mark even the migration loss, on the contrary it increases significantly in Veľký Šariš, where we record migration gains. Therefore we can claim, that the migration and the development of inhabitants in Veľký Šariš is directly dependent on the suburbanisational processes and mechanical

dynamics of inhabitants in Prešov, it means it is directly related to its immigration from Prešov to Veľký Šariš.

THE ORIGIN OF IMMIGRANTS AS THE INDICATOR OF THE SUBURBANISATION PROCESSES

One of the indicators of residential suburbanisation is the origin of immigrants moving to the target destination, in our case to Veľký Šariš. Based on the assumptions of the mutual correlation between the total sum of immigrated and emigrated from Prešov, it is possible to suppose the significant increase in the number of immigrants from Prešov (Table 5).

From the overall analysis we can conclude that the ratio of immigrants coming from Prešov from the total number of immigrants coming to Veľký Šariš, is continually increasing especially in the last time.

However, by the end of eighties and at the beginning of nineties its relative value was up the 50%, nowadays the ratio of inhabitants immigrating from Prešov has reached 70%. On the other hand, the analysis of emigrated inhabitants from Veľký Šariš to Prešov proves exactly the opposite tendency. The ratio of inhabitants migrating to Prešov is continually decreasing. While at the beginning of the period was Prešov regarded as the attractive place of living for almost 70% of emigrated people from the total sum of emigrated, in last years it was a preferable place of living only for 33% of inhabitants from the total sum of emigrated people of Veľký Šariš (Table 5)

Tab.5 : *The origin of migrants taking part on the migration processes in Veľký Šariš in the period between 1987 – 2008*

Year	Imigrated	from PO	from PO	Emigrated	To PO	To PO
		Absolute values	Relative values		Absolute values	Relative values
1987	98	40	41%	140	92	66%
1988	68	31	46%	109	80	73%
1989	61	33	54%	175	121	69%
1990	85	42	49%	167	118	71%
1991	104	53	51%	115	63	55%
1992	74	44	59%	122	61	50%
1993	119	84	71%	100	59	59%
1994	112	82	73%	100	66	66%
1995	85	53	62%	46	27	59%
1996	95	52	55%	63	33	52%
1997	77	61	79%	44	20	45%
1998	109	60	55%	45	28	62%
1999	61	34	56%	45	21	47%
2000	118	77	65%	57	23	40%
2001	116	61	53%	68	30	44%
2002	154	101	66%	70	38	54%
2003	174	123	71%	39	21	54%
2004	185	135	73%	51	16	31%
2005	206	146	71%	46	19	41%
2006	197	141	72%	65	27	42%
2007	198	137	69%	57	19	33%
2008	191	123	64%	40	13	33%

Source: Worked out by the author according to data from the Town council in Veľký Šariš

From the immigration point of view Veľký Šariš is extremely lucrative in the last periods of time. Its most significant part is the ward of Kanaš, where the number of inhabitants continually increases. There are mainly the inhabitants with the higher social-economical status. The number of people immigrating to Kanaš is continually increasing on the total sum of the immigrated to the town (Table 6).

Tab.6: *The ratio of immigrated inhabitants in the ward of Kanaš in comparison to the total number of immigrated inhabitants in the town in the period between 1987 – 2008*

Year		1987	1988	1989	1990	1991	1992	1993	1994	1995	1995	1997
Number of immigrated		98	68	61	85	104	74	119	112	85	95	77
From them to Kanaš	Abs.values	14	4	15	9	12	11	14	11	7	2	13
	Relat.values	14%	6%	25%	11%	12%	15%	12%	10%	8%	2%	17%
Year		1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
Number of emigrated		109	61	118	116	154	174	185	206	197	198	191
From them to Kanaš	Abs.values	16	7	22	10	36	37	36	35	73	46	63
	Relat.values	15%	11%	19%	9%	23%	21%	19%	17%	37%	23%	33%

Source: Worked out by the author according to data from the Town council in Veľký Šariš

Another indicator of residential suburbanisation is the number of building permits issued by the town of Veľký Šariš. We observed this feature on the bases of data from the town council in short period of time since 1998. Even this period is sufficient to prove that the number of building permits is growing continually. While in 1999 there were only 18 building permits issued by the town council, in 2004 there were 33 of them and in 2008 they issued 32 building permits. From the total number of permits issued in this period, more than 80% of them were issued for the immigrants coming from Prešov. As the result of this, the number of inhabitants in Veľký Šariš is increasing and we assume that it will raise further mainly because of the expanding individual residential construction.

Undistinguished, but very advantageous position of Kanaš, its technical infrastructure and ecologically and aesthetically positive environment gives all the proposals for its further development within the town itself.

PROGNOSIS OF THE POPULATION DEVELOPMENT FOR THE YEAR 2015 REGARDING THE PREVIOUS DEVELOPMENT INFLUENCED BY THE SUBURBANISATION

On the basis of the previous development it is possible to determine the prognosis of the number of inhabitants of Veľký Šariš for the year 2015 and then we will be able to confront the calculation with the reality. It is irrelevant to work with the data from the censuses of 1991 and 2001, because the phenomenon of suburbanisation started to influence the population dynamics mainly after the 1996. Therefore there we used two time spans for our prognoses.

If we mark the year 1991 for the initial number of inhabitants in time t_0 and the following number of inhabitants in time t_1 in the year 2001, then on the basis of the formula for the prognosis of inhabitants:

$$PO_{t'} = PO_{t0} + \frac{PO_{t1} - PO_{t0}}{t} \cdot (t'-t_0)$$

we will find out that the hypothetic number of inhabitants for the year 2015 is 3962 people, which is absolutely unreal, because even today the sum of the inhabitants was outnumbered and it reached more than 5000 people. Furthermore, this calculation is influenced mainly by the excessive emigration and low natality rate in the first half of the nineties however it does not reflect the increasing immigration rate and slowly increasing natality rate of the second half of the nineties. For more effective and relevant prognosis we therefore worked with the data from the censuses in 1996 and 2006. According to the identical formula, the hypothetic number of inhabitants for the year 2015 is 5862. The result is much more real, taking into consideration all the instant demographic processes such as the increasing immigration due to the suburbanisation, slowly growing natality, and mildly decreasing mortality rate and emigration rate.

On the basis of this prognosis it is possible to assume that the town of Veľký Šariš, as the suburban zone of Prešov, will be expanding in close future and from the point of view of its inhabitants it will grow continually. Regarding the conditions it proposes, it will become a final destination for the growing clientele of the actors with higher social-economical status, who do not find these advantageous conditions in the regional city of Prešov.

CONCLUSION

The aim of this contribution was to show the influence of the suburbanisation in close hinterland of Prešov on the concrete example of Veľký Šariš, which has become the more and more attractive immigration sphere mainly for the inhabitants with higher social-economical status. As the consequence of this phenomenon there are several significant changes in the development of inhabitants, the number of immigrants and also the total number of inhabitants increases what makes a positive perspective for its potential expansion in near future. Therefore also in our prognoses of the population development we have to take into consideration not only the long-term historical development, but also the contemporary demographic and geographic tendencies that influence all the processes related to population dynamics to much extend.

Except for these characteristics it is necessary to point out that the view of the town is changing too, because it is permanently re-created and transformed by the developing individual residential construction.

This synthetic knowledge about the suburbanisation processes in the suburban zone of Prešov and about the population dynamics in Veľký Šariš can be used in practice as a base and a framework for various analyses in urban systems, for the placement of various social-economical activities in the region as well as for the general town plan which the town misses nowadays.

References

KRAJSKÁ SPRÁVA ŠÚSR. (2001): Demografický vývoj v Prešovskom kraji v rokoch 1996-2000. Prešov, 2001.

MANÍK, M. et al. (1998): Územný plán sídelného útvaru mesta Veľký Šariš. Prešov, 1998.

MATLOVIČ, R. (1998): Geografia priestorovej štruktúry mesta Prešov. Prešov, 1998.

MATLOVIČ, R., SEDLÁKOVÁ, A. (2004): Suburbanizácia – transformačný proces priestorovej organizácie postkomunistických miest. Folia geographica 7, Prešov, s.75-103, ISBN 80-8068-270-4, Prešov, 2005.

MATLOVIČ, R., MATLOVIČOVÁ, K. (2005): Vývoj regionálnych disparít na Slovensku a problémy regionálneho rozvoja Prešovského kraja. Folia geographica 8, Prešov, 66-88, ISSN 1336-6157 Ministerstvo výstavby a regionálneho rozvoja SR (2006): Národný strategický referenčný rámec, 2007-2013 (3 verzia). Bratislava.

MICHAELI, E., KANDRÁČOVÁ, V. (1998): Ľubotice. Prešov.

MICHAELI, E. et al. (1997): Urbánne a krajinné štúdie Nr. 2. Prešov.

Štatistický úrad SR. Bratislava, available at http://www.statistics.sk visited on January 8, 2009

VÝVOJ POČTU OBYVATEĽOV V MESTE VEĽKÝ ŠARIŠ AKO JEDNEJ ZO SUBURBÁNNYCH ZÓN PREŠOVA V ROKOCH 1991 – 2006

Zhrnutie

Cieľom tohto príspevku bolo charakterizovať obyvateľstvo vo Veľkom Šariši s ohľadom na jeho doterajší historický vývoj, súčasné mechanické a prirodzené procesy a tiež vplyv suburbanizácie v zázemí Prešova. Výsledkom týchto procesov sú početné zmeny, ktoré sú pozorovateľné tak v štruktúre obyvateľstva, v jeho počte, ako aj v sídelnej štruktúre.

Údaje o celkovom pohybe a jeho čiastkových ukazovateľoch sme vo Veľkom Šariši skúmali za obdobie rokov 1980 – 2006. Priemerný ročný prirodzený prírastok obyvateľov vo Veľkom Šariši za obdobie rokov 1980 - 2006 dosiahol 15,5 osoby, celkovo pribudlo 410 obyvateľov. Natalita výrazne prevyšuje mortalitu najmä v počiatočnom období rokov 1980 – 1987, potom výrazne klesá a v roku 1989 nastáva prirodzený úbytok obyvateľstva. V nasledujúcom období takmer vždy natalita mierne prevyšuje mortalitu. Priemerný ročný migračný prírastok za obdobie rokov 1980 - 2006 dosiahol 14,9 osôb ročne. Takto migračným pohybom pribudlo v meste 402 obyvateľov. Vývoj však nebol rovnomerný, ale zaznamenával značné rozdiely a výkyvy. V období rokov 1981 – 1992, s výnimkou roku 1986, malo migračné saldo trvalo záporné hodnoty, teda prevažoval migračný úbytok obyvateľstva, od roku 1993 až po súčasnosť migračné saldo dosahovalo výlučne kladné hodnoty a má neustále stúpajúcu tendenciu.

V meste Veľký Šariš došlo za skúmané obdobie k nárastu populácie o 812 obyvateľov, teda priemerne 30 osôb za rok. Celkové saldo dosiahlo najvyššiu hodnotu v roku 2005 a to až 179 osôb, čo je takmer 6 krát viac ako dlhodobý priemer. Najnižšie celkové saldo bolo v roku 1989, kedy bol v meste zaznamenaný prirodzený úbytok obyvateľstva –120 osôb.

Celkovo možno zhodnotiť, že migračný pohyb bol tak silný, že do roku 1992 spôsoboval celkový úbytok obyvateľstva, ale v poslednom decéniu a najmä za posledných 5 rokov zaznamenávame vplyvom migračného pohybu celkový prírastok obyvateľstva. Na vývoji počtu obyvateľov sa v oveľa väčšej miere podieľajú migračné procesy než prirodzený pohyb obyvateľstva, ktorý má relatívne stabilné hodnoty a pohybuje sa v rozmedzí 0 – 50, kým migračné procesy majú oveľa väčšie výkyvy –120 až 179 osôb. Predpokladáme, že dôvodom stúpajúceho významu migračných procesov na vývoji celkového počtu obyvateľov je aj proces suburbanizácie.

Tá dáva predpoklad pre ďalší rozvoj mesta, ktoré sa stáva čoraz lukratívnejším miestom bývania najmä pre obyvateľov s vyšším sociálno-ekonomickým statusom. V samotnom Veľkom Šariši boli okrem solitérov vybudované celé ulice a štvrte individuálnej bytovej výstavby, konkrétne v južnej časti mesta pri čističke odpadových vôd a v severnej časti pozdĺž Torysy. Najvýznamnejším recipientom rezidenčnej suburbanizácie bola prímestská časť Kanaš, kde sa počet obyvateľov značne zvýšil, pričom väčšina imigrovaného obyvateľstva pochádzala z Prešova.

Pri prognózovaní obyvateľstva je teda potrebné zohľadniť okrem historického vývoja aj všetky súčasné demografické a geografické tendencie, ktoré ovplyvňujú populačnú dynamiku obyvateľstva. Na základe prognózy je možné predpokladať, že mesto Veľký Šariš bude ako prímestská suburbánna zóna v blízkom časovom horizonte expandovať a z hľadiska počtu obyvateľov neustále rásť.

Recenzovali: Prof. RNDr. Viliam Lauko, CSc.
RNDr. Alena Lukáčová, PhD.

TOURISM POTENTIAL AND POSSIBILITIES OF ITS EXPLOITATION IN THE SUBCARPATHIAN (PODKARPACKIE) VOIVEDESHIP

Robert PAWLUSINSKI[1], Bartosz PIZIAK[2]

***Abstract**: The Subcarpathian (Podkarpackie) Voivodeship belongs to the country's regions of more than average tourism attractiveness. Although the area has a high potential for tourism, its local economy in the tourism sector is not well developed yet. The authors have attempted to present factors influencing tourism development possibilities in the region, as well as to indicate the directions of development of its tourism product.*
***Key words**: development of tourism in Poland, the Subcarpathian(Podkarpackie), Voivodeship, south-eastern Poland*

INTRODUCTION

The Supcarpathian Voivodeship belongs to the country's regions of more than average tourism attractiveness which can be confirmed by marketing research results conducted by the market research company Synovate (commissioned by the Polish Tourism Development Agency). The results show that the Subcarpathian Voivodeship comes second on the ranking list of Poland's most attractive voivodeships for tourism, just after the Pomeranian Voivodeship. Although the area has a high potential for tourism, its local economy in the tourism sector is not well developed yet. Presently, there are numerous actions undertaken to develop this economy sector and use it as the stimulus for social and economical changes in the Subcarpathian region.

The authors of the paper have attempted to identify the factors influencing the potential of tourism development in the region, as well as to indicate the directions of development of its tourism product. Planning documents that had been created at the regional planning level and statistics data of the Central Statistical Office (GUS) have been used in the article.

TOURISM VALUES

The attractiveness of the Subcarpathian Voivodeship is mainly shaped by the values of its natural environment. Circa 50% of the area is covered with some nature protection form. There are two national parks in the region (Bieszczadzki, Magurski), 10 landscape parks (Cisna-Wetlina LP, Czarnorzeki-Strzyżów LP, San River Halley LP, Słonne

1 **Dr. Robert Pawlusinski,**
Department of Tourism and Health Resort Management, Institute of Geography and Spatial Management, Jagiellonian University, 30-387 Kraków, ul. Gronostajowa 7
2 **Mgr. Bartosz Piziak,**
Department of Tourism and Health Resort Management, Institute of Geography and Spatial Management, Jagiellonian University, 30-387 Kraków, ul. Gronostajowa 7

Mountains LP, Jaśliska LP, Janów Forests LP, Pasmo Brzanki LP, Pogórze Przemyskie LP, South-Roztocze LP, Puszcza Solska LP) as well as more than 80 nature reserves (such as Gołoborze, Kołacznia, Krępak, Prządki, Przełom Hołubli, Sołokija, Zwiezło, Źródliska Jasiołki). In the south-eastern part of the voivodeship, a transborder Eastern Carpathian Biosphere Reserve has been created in 1993. It encompasses fragments of mountain ranges in Poland, Slovakia and Ukraine.

The most precious natural areas can be found in the mountains and piedmont regions, mainly in the Bieszczady Mountains and in the Lower Beskids. The mountainous part of the Subcarpathian region is poorly transformed by human, with a richness of flora and fauna. It has a potential for development of long-stay tourism, active tourism and cognitive tourism (Warszynska 1995).

The most attractive mountains are the Bieszczady, which form the easternmost range of the Polish Carpathians. A typical feature of the Bieszczady is the alpine meadow called polonina (i.e. Carynska Polonina, Wetlinska Polonina), non-existent in other parts of the Polish Beskids. The Bieszczady Mountains are also distinguished by the richness of their wildlife. Here live such species as wolf, lynx, brown bear, wisent, Carpathian red deer. The most popular parts of the Bieszczady Moutains are the Halicz and Tarnica range (the highest peak of the Bieszczady is Tarnica with 1346 metres above the sea level), the Wielka Rawka massif and the above mentioned Poloninas' ranges. The western part of the Bieszczady, that is the area of Cisna and Komańcza, is less popular; however some landslide lakes are worth mentioning (i.e. Duszatyńskie Lake). At the foot of the Bieszczady Mountains there is an artificial lake of Solina – the most important region for long-stay tourism in the Subcarpathian Voivodeship. The artificial lake has been created on the San River in 1968. With an area of 21 square kilometers it is one of the biggest water reservoirs in the Polish Carpathians. There are many holiday resorts around the lake, the most important are: Polańczyk and Solina. Neighbouring the Bieszczady Mts, there are the Sanocko-Turczańskie Mts. with their picturesque landscapes and the super-positioned system of mountain ranges.

The Lower Beskids have highly attractive landscapes. They are low mountains (with maximal height of 1000 metres above the sea level) with mild forms, covered with beech forests. Similarly to the Bieszczady Mts., the area's population density is low. The most attractive parts of the Lower Beskids are covered with the Magura National Park. The Lower Beskids are distinguished by reach resources of mineral waters. Two of four Subcarpathian health resorts are located here; these are Iwonicz Zdrój and Rymanów Zdrój.

The piedmont areas are of lower natural value. In this part of the Voivodeship, areas with the more than average attractiveness are considered to be small, individual locations such as the Prządki Rock Nature Reserve near Krosno. The least attractive areas are within the Sandomierz Basin. Most of this area has been significantly transformed by human activity. The only exception is the San River Valley along with the Sandomierz Wilderness (Puszcza Sandomierska).

The San River is the main river of the voivodeship and one of the most attractive places, where a river route has been marked out (the "Blue San River Route" – Błękitny San). The river is suitable for kayaking and boating. The tourist water trail of the San River stretches in the area from Sanok to Przemyśl, which is rich in picturesque mountains

and piedmont landscapes as well as natural river gorges. The upper river section is also usable – for proficient kayakers – and there are many camping sites and holiday resorts along the river route that enable a good planning of the trip.

According to Warszyńska (1980), the natural environment values of the Subcarpathian Voivodeship have a great potential for holiday tourism. There are good conditions to develop long-stay tourism during the summer season on more than 90% of the voivodeship's area and the highest ranking in this regard concerns circa 40 % of the area. The most attractive areas for summer holidays can be found in the mountain ranges of Bieszczady and Lower Beskids. Also the Dynowskie Piedmont (Pogórze Dynowskie) and the San River Valley have extraordinary values for summer holiday tourism. The least favourable conditions for long-stay tourism during summer season can be found in the central part of the voivodeship.

Most of the studied area can be also used for winter tourism. According to Warszyńska et al. 1980, good conditions for winter sport activities can be found in 55% of the area of the Subcarpathian Voivodeship, however the 1. class of attractiveness covers only 4.3% of the area and the 2. class - 11.1% of the area.

The figures 1 and 2 show the spatial diversity of the synthetic indicator of natural environment's attractiveness for tourism in the general recreation season as well as in the winter season in the Subcarpathian Voivodeship.

Beside the natural environment, cultural values play an important role for the potential of tourism development in the Subcarpathian Voivodeship. The rich and diversified historical heritage of this area is reflected in the diversity of cultural values in the region. In the southern part of the region, the most important element for the cultural potential is related to the remnants of the local existence of Lemko and Boyko people. These cultural elements are visible in the landscapes of the Lower Beskids and of the Bieszczady Mts., for example the settlements' patterns, the wooden orthodox churches. Most of wooden buildings – both sacred and secular – in the Subcarpathian region have been included in the Wooden Architecture Trail leading through three Subcarpathian voivodeships in Poland (the Silesian, the Lesser Poland and the Subcarpathian). Their special importance and international rank have been confirmed by entering the most precious ones onto the UNESCO Natural and Cultural Heritage List. Two out of six Polish wooden sacred buildings entered on this list are in the Subcarpathian Voivodeship (Blizne, Haczów). The cultural and material heritage of the Boykos and Lemkos is being presented in the heritage park in Sanok – one of the most important cultural tourism centres in the region. No less importantly, their spiritual heritage is being cultivated and alive. Every year in Zyndranowa village, there is a great cultural event called Watra cherishing the culture of Lemko people.

Some of the Subcarpathian cities have a great cultural potential, for example: Przemyśl (the old town architecture, the royal castle, the archdiocese basilica, fortifications of the Przemyśl stronghold), Krosno (historical tenement houses from the 15th-17th century, the Franciscan monastery complex from the 15th-17th century), Jarosław (historical tenement houses, an underground tourist trail), Leżajsk (the Bernadine monastery complex with the baroque organ from the 17th century). Equally precious historical monuments are the castles and residential complexes, especially those in Baranów Sandomierski, Krasiczyn and Łańcut.

Another important element of the cultural potential consists of places of religious cult. The most important and most visited centres of Catholicism are Leżajsk (Marian cult), Kalwaria Pacławska (Passion misteries, Marian cult), Dukla (cult of St. John of Dukla), Dębowiec (sanctuary of Our Lady of La Salette), as well as Borek Stary, Jasień (in Ustrzyki Dolne) and Stara Wieś. Other important Christian cult places of other denominations (the Greek Catholic Church and the Eastern Orthodox Church) are in Jarosław, Jaśliska, Góra Jawor and Ujkowice. An important group of sacred places are the pilgrimage centres of Judaism, mainly Leżajsk and Lesko.

There are more than 30 museum establishments in the Subcarpathian Voivodeship, where numerous historical objects of supraregional rank are collected. Traditions, culture and folk customs are presented by heritage parks in Sanok and Kolbuszowa as well as by the Ethnographic Museum in Rzeszów. There is a biographical museum of Maria Konopnicka in Żarnowiec and a carriage museum in Łańcut. There are also non-typical sorts of museums, such as the Doll Museum in Pilzno and the Petroleum Industry Museum in Bóbrka.

The list of cultural events offered by the region is also relatively well developed, although many of them are of a local character. To the most important cyclic cultural events belong the following: music festivals in Łańcut, Leżajsk, Krosno, Sanok and Przemyśl, poets' competitions in Krosno, A. Didur festival in Sanok, as well as the Theatre Meetings in Rzeszów, the Backyard Band Festival (Przegląd Kapel Podwórkowych) in Przemyśl and the Country event in Lesko.

TOURISM INFRASTRUCTURE AND TOURISM FLOWS

The Carpathian Voivodeship, despite its extraordinary tourism values, is relatively underdeveloped with regard to tourism infrastructure. It concerns the basic elements of tourism infrastructure, such as accommodation facilities and dining places as well as the elements of accompanying infrastructure. An important barrier for tourism development is the underdeveloped transportation infrastructure, which regards not only the road network but also the railways and air transport (Pawlusinski 2006-2007; Sobala-Gwosdz 2005).

According to the Central Statistical Office, in 2007, there were 336 accommodation establishments for collective accommodation in the Subcarpathian Voivodeship, which formed only 7.3 % of the total number of accommodation establishments in Poland. The total capacity of those accommodation facilities reached the level of 20.7 thousand of accommodation places (3.6% of the total number in Poland). The structure of the accommodation establishments was dominated by year-round facilities. Seasonal use is offered by 89 establishments with the total number of 5283 accommodation places. In 2007, 1.8 million accommodation nights have been sold in the Subcarpathian Voivodeship and the average exploitation rate of accommodation facilities was at 32.9%.

The spatial structure of the accommodation establishments shows a great concentration of this phenomenon (tab). More than 44.0% of accommodation establishments and 48.6% of the accommodation capacity concentrates in the southern part of the voivodeship (the powiats: Bieszczady, Jasło, Krosno, Lesko, Sanok). The highest number of accommodation places in this part of the voivodeship can be found in the following gminas (communes): Solina (3044 accommodation places), Iwonicz Zdrój (1292), Cisna (1055), Ustrzyki Dolne

(880) and Lutowiska (746). Much lower number of accommodation places can be found in gminas (communes) of the northern and central part of the voivodeship. Many of them have no accommodation establishment at all. More than 25% of accommodation places are concentrated in big cities. The highest numbers of accommodation places are found in: Rzeszów (1360 accommodation places) and Przemyśl (973 accommodation places).

The structure of accommodation facilities is dominated by traditional hotels (135 establishments) with 6.1 thousands of accommodation places. Usually, they are of low standards, mainly two and three stars hotels. No four or five star hotel has been established in the voivodeship so far.

The reception facilities for holiday tourism consist of 82 establishments with nearly 33.3% of region's accommodation places. Most of them are open seasonally, only during the summer season. Holiday resorts are usually located in the area of the artificial Solina Lake as well as around the main urban centres in the voivodeship. Health tourism offer consists of 10 facilities with the total potential of 1.7 thousand accommodation places.

An important type of accommodation establishments are boarding houses, mountain shelters and youth hostels (55 establishments in total). They are mainly intended for accommodation of excursion groups and organised touring and their reception capacity is 3.3 thousand of accommodation places, however 60% of them are available only in the summer.

In the type structure of the accommodation facilities, a substantial share belongs to unclassified establishments. In 2003, 50 such accommodation establishments in the Subcarpathian Voivodeship offered a total number of more than 2.5 thousand accommodation places (12.1 of the total number in the voivodeship). The service profile of those establishments is highly diversified and it depends on their location. Some of them are typical transit accommodation establishments located along main transportation routes, called highway lodge (pol. gościniec), wayside inn, small hotel; other are specific establishments of special type or with limited services, functioning in bigger tourism resorts, such as pilgrim's houses, guest rooms etc.

In recent years, an important role in the reception of tourism, especially long-stay tourism, belongs to agritourism farms. These establishments are not obliged to report statistical data, thus it is difficult to determine their exact numbers. According to estimations based on the data from the Institute of Tourism and on the information from gminas, there are more than 700 agritourism farms in the Subcarpathian Voivodeship, offering a total number of nearly 4 thousand accommodation places (Pawlusiński).

The numerous cultural and natural values of the Subcarpathian Voivodeship, despite its often underdeveloped tourism infrastructure, contribute to the growing tourists' interest in this region. As estimated by the Institute of Tourism, in 2007, the Subcarpathian Voivodeship has been visited by 3.2 million persons, out of which 2.2 million (69%) were domestic tourists and 1 million (31%) tourists came from abroad. A growing trend of long-stay tourism (59%) can be observed among domestic tourists. It is worth mentioning, that the Subcarpathian Voivodeship is one of the four most preferred voivodeships by Polish tourists, along with the Pomeranian, West-Pomeranian and Lesser Poland.

Tab.1: *Accommodation facilities in the Subcarpathian Voivodeship and their exploitation by powiats (data from 2007)*

The powiat	The number of accommodation establishments	The number of accommodation places	The number of customers		Sold accommodation nights	
			Total	Foreigners	Total	Foreigners
Bieszczady	34	1980	30864	1633	116754	6221
Brzozów	3	146	3 680	87	14566	99
Dębica	14	895	17377	655	84549	2486
Jarosław	13	717	18617	3294	51345	5431
Jasło	9	237	3646	86	7558	100
Kolbuszowa	6	265	2675	20	7140	27
Krosno	27	1829	31877	566	261385	4078
Lesko	62	4971	127996	6662	566360	54598
Leżajsk	5	192	5248	674	9491	1317
Lubaczów	18	1442	10386	352	84453	1357
Łańcut	9	472	14832	2567	23321	3004
Mielec	8	462	16000	3709	30567	10852
Nisko	6	251	7830	340	14109	351
Przemyśl	11	655	22334	1789	33071	2676
Przeworsk	4	190	4930	826	8102	1343
Ropczyce	8	388	11507	977	17513	1399
Rzeszów	16	726	30864	4335	70015	18375
Sanok	16	1005	30432	2122	51656	5148
Stalowa Wola	8	520	18956	3236	60847	11381
Strzyżów	5	268	6003	264	11699	428
Tarnobrzeg	5	213	12117	1108	17263	2154
Krosno City	3	158	9859	2387	10892	2726
Przemyśl City	14	973	43951	10821	71079	14646
Rzeszów City	21	1360	88409	16976	168057	40182
Tarnobrzeg City	11	337	13811	746	22407	1317
Total	336	20652	584201	66232	1814199	191696

The source: Central Statistical Office (GUS)

According to the Central Statistical Office data, regarding the number of persons who spent at least one night in a collective accommodation establishment, in 2007, the Subcarpathian Voivodeship was visited by 592.6 thousand tourists, out of which 12.6% came from abroad. This result is by more than 5% better than in the previous year. The biggest groups among foreign tourists were Ukrainians (21.1 thousands) and Germans (11.1 thousands). Important shares belong to citizens of United Kingdom (3.3 thousand), Italy (2.4 thousand) and France (2.4 thousand).

The spatial arrangement of tourism in the Subcarpathian Voivedeship is uneven. The by far most frequently visited areas in the voivodeship are the Bieszczady Mts. and the Lower Beskids where the diversified relief and natural values enable different tourism forms (mainly active tourism: many hiking trails, bicycle trails, several skiing resorts; as well as recreation tourism and nature tourism: the Solina Lake).

The domination of the southern part of the region is also related to its cultural values; the cultural richness is the effect of many nationalities and religions coexisting in this area

from the very beginning of the Polish state. This situation is the reason why cognitive purposes belong to main motivations for visiting this part of Poland. There are many thematic trails (such as the Wooden Architecture Trail, the Military Trail, the Hassidic Trail, the Icons Trail) and religious destinations (such as Dukla, Dębowiec, Tarnowiec and pilgrimage destinations for the Jews: Lesko, Rymanów).

The diversified relief of the Subcarpathian Voivodeship was the basis for winter tourism development in the southern part of the region. Beside the numerous tracks for cross-country skiing, there are more than 30 ski lifts, most of which are in the Bieszczady Mts. and in the Lower Beskids. The most frequently visited localities by skiers are the following: Ustrzyki Dolne (the biggest skiing centre of the voivodeship, skiing resorts of Gromadzyń and Laworta), Karlików, Weremień, Puławy and Rymanów Zdrój. Because of their borderland location, these ski lifts become a destination for Ukrainian tourists, just as the skiing slope with a chairlift in Przemyśl, opened in 2006. Most of the Subcarpathian slopes have illumination, snowmaking guns and snowgrooming tractors, as well as ski rental facilities. However, apart from Ustrzyki Dolne, the voivedship is clearly lacking a big, real skiing centre of the region, attracting tourists from Poland and Ukraine.

Important spots on the tourism map of the Subcarpathian Voivodeship are the health resorts: Rymanów Zdrój, Iwonicz Zdrój, Horyniec Zdrój and Polańczyk. They are well developed, opened year round and most important tourist centres in the region.

In the recent years, the role of the biggest cities in south-eastern Poland has risen significantly (such as Rzeszów, Przemyśl, Krosno). Because of their strategic location, they became the destinations for business tourism (including fairs and conferences). However, their main function is still bound up with the transit traffic which means most tourist stays are limited to several hours.

The northern, central and western parts of the Subcarpathian Voivodeship are far less visited. In these areas the main tourism forms are weekend recreation of local inhabitants: at artificial lakes, at river banks or in the woods of the Sandomierz Wilderness, still rich in forest undergrowth fruits. There are also places visited by tourists all year round such as castles and palaces in Baranów Sandomierski, Łańcut, Rzeszów along the tourist route of Lubomirscy Family Nests.

The data about the numbers of visitors in the most important museums and national parks in the Subcarpathian Voivodeship confirm the great interest of tourists. In the Bieszczady National Park, the tourist traffic on tourist trails amounted to 290 thousand people in 2007 (during the monitoring period, which is the time when entrance tickets are sold, from the end of April till the middle of November). The total number of tourist flow in the Bieszczady National Park is estimated to be circa 0.5 million visitors per year. The Magura National Park, the less known one, is by far less visited by tourists. The numbers are estimated to be circa 50 thousand visitors per year.

Many tourists decide to visit the Folk Architecture Museum in Sanok, which is the biggest establishment of this type in Poland. In 2007, the heritage park in Sanok was visited by 88 thousand people, which was by 25% more than in the previous year. A similar situation is observed in the Castle Museum in Łańcut, which is the second best known tourism destination in the Subcarpathian Voivodeship, after the Bieszczady Mts. In 2007, it was visited by 400 thousand people.

DEVELOPMENT DIRECTIONS FOR TOURISM PRODUCT IN THE SUBCARPATHIAN VOIVODESHIP

Tourism development in the Subcarpathian Voivodeship is an important issue regarding the economical development in the region, as this region is one of the most underdeveloped areas in Poland. Serving this purpose*, the Strategy of Tourism Development in the Subcarpathian Voivodeship for years 2007-2013* has been created. Its supplement, the Concept of tourism products in the Subcarpathian Voivodeship, presents several projects of tourism products whose implementation already begun. In both documents, the development of the region in the direction of tourism has been described as one of the main pillars of the economic growth.

Planning of tourism development in this region takes into account the spatially diversified tourism potential of the voivodeship, which reflects in designation of three main zones of tourism development and in indication of main directions for their tourism products' development.

The first zone – the southern part of the voivodeship – includes the powiats: Bieszczady, Jasło, Krosno, Lesko, Sanok, Brzozów, Strzyżów. It has good conditions for active and qualified tourism, cultural tourism and tourism on rural areas. The region should have a broad tourist offer, including both individual recreation (such as holidays with children) and group tourism (such as school excursions). Motivation tourism, based on active forms of recreation, should be paid a lot of attention.

The zone II – the central part of the voivodeship – consists of following powiats: Dębica, Ropczyce, Rzeszów, Łańcut, Kolbuszowa, Leżajsk, Przeworsk, Jarosław, Przemyśl, Lubaczów. The zone should develop as marshalling area for tourism flow as well as transit area of tourism flows going to Eastern Europe. The tourism product's creation strategy presumes a necessary improvement of tourism infrastructure, para-tourism infrastructure and transportation infrastructure, including the expansion of the airport Rzeszów-Jasionka and the technical condition improvement of main road transportation routes.

The zone III – the northern part of the voivodeship – consists of following powiats: Mielec, Tarnobrzeg, Stalowa Wola and Nisko. It has good conditions for the development of cultural tourism, as well as active and qualified tourism.

Tourism development in the Subcarpathian Voivodeship can be founded on a highly important combination of natural and cultural values, which can become the basis for a future distinction of the region's offer on the competitive tourism market. The development programme for regional tourism products includes the following important ideas for tourism activation in the region (Strategia rozwoju województwa 2007):

„Prehistoric Routes – following the tracks of first settlers" - a tourism product related to ancient trade routes and archeological discoveries of ancient settlements from thousands of years ago ("Tatar mound" in Przemyśl, "the Carpathian Troy" in Trzcinica), as well as to traditions and customs (such as Midsummer festival called "Kupala's Night")

1. „Routes of Nations – peoples of this land" – the idea of the product comes directly from the multireligion and multinational heritage of culture, it is based on numerous thematic tourist routes in the region and many individual attractions (The Wooden Architecture Route, the Bieszczady's Orthodox Churches Route, The Karol Wojtyła Beskids Route, the Route of Icons, the house of zaddik Elimelach, etc.)

2. „Old Polish Route – in the land of wooden stones, magnate – nobleman – peasant" – this idea inspired by cultural heritage of the 1st and 2nd Rzeczpospolitas (hist. Polish Republic), by magnate culture (the Lubomirscy Family Nests Route), nobleman culture (The Aleksander Fredro Route) and peasant culture (The Museums of Folk Architecture in Sanok and Kolbuszowa).
3. „Urban Culture Routes" – presenting the cultural heritage and contemporary culture of Subcarpathian cities, as well as craftsmanship and artisanship, displayed in museums and city's parks: artistic glas (in Krosno), bell-founding (Przemyśl), Michał Mięsowicz National Clock Factory in Krosno, the Subcarpathian Museum in Krosno with its paraffin lamps collection, the Dolls Museum in Pilzno, the underground tourist route in the basements of tenement houses in the Market Square in Jarosław and Rzeszów (merchants' cellars), the basements of Przemyśl Stronghold, church cellars.
4. „Technics and Science Routes" - presenting well known and less known prominent persons and scientists of the region such as Ignacy Łukasiewicz, A. Ostaszewski, J. Szczepanik and technical historical monuments, such as the narrow gauge railway Przeworsk-Dynów, the Przemyśl Stronghold, the heritage park and museum of Petroleum Industry in Bóbrka.
5. „Blue San River Routes" – the concept created by the Association "Partnership for the Environment" (Stowarzyszenie Partnerstwo dla Środowiska) as a network of Greenways connected to the river San, which forms a special cultural route (the culture of cities and villages located along its banks) and at the same time an important natural route.
6. „Contemporary Culture Routes" - universal cultural projects, based on contemporary culture resources of the region and forming a complementary offer to the other projects.

Many institutions and organisations get involved in tourism development in the Subcarpathian region. At the moment, the most important entities undertaking pro-tourism actions, with regard to creating a positive image of the Subcarpathian Voivodeship, are the Marshall Office of the Subcarpathian Voivodeship, powiats' authorities, gminas' (communes) authorities and non-governmental organisations. The most active of the latter ones are: the Subcarpathian Regional Tourism Organisation, the Local Tourism Organisation the "Lower Beskids", the Local Tourism Organisation "Bieszczady Mts", and the Association for Development and Promotion of the Subcarpathian Region "Pro Carpatia", the Bieszczady Foundation "Partnership for Environment" and the Agritourism Association "Galicia Guest Farms Bieszczady"

A model example of cooperation of several entities – regarding tourism – is the cooperation of Krosno's authorities, the Association "Portius" and the Polish wine manufacturers with Hungarian partners. This cooperation results in organization of cultural events (such as the Hungarian Day in Krosno on March, 24th 2009, with presidents of both countries as guests) and in attempts to reestablish the historical Hungarian Route – that is the route from Hungary to Poland on which such commodities as Tokaji wine were transported. In 2007, it has been decided to attempt a reactivation of railway from Krosno to Sarospatak and to organise railway trips between Hungary and Poland with a historical train "Portius", as well as to renovate and reopen the historical basements under

the market square in Krosno, with their former function as Hungarian wine storage, which used to be their function in the 16th and 17th centuries. Maybe in the near future, thanks to such actions, vineyard tourism, a tourism form slowly gaining more and more attention in Poland, will bring economic profits in the Subcarpathian Voivodeships to both wine manufacturers and tourism managers. There are already more than 10 vineyards in the region, producing grape wine of good quality.

Now, another project „On vineyards' trails of the Subcarpathian region" is being implemented (years 2007-2009), which mainly aims at supporting small farms in their efforts to find alternative income sources, such as production and trade of grape wines and agritourism, as well as at creating a special offer of vineyard tourism.

The example of vineyards' initiative and the implementation of other concepts aiming at the revival of old professions (such as the Pottery Route) and traditional food, as well as the project of the Association "Pro Carpathia" called "Subcarpathian Treasures – tracking three cultures" (co-financed by the European Regional Development Fund) will entail new initiatives that could be co-financed by structural funds of the European Union. The most interesting projects being now in the implementation or planning phase are:

- the „Carpathian Troy" – called also the "Carpathian Biskupin" – the fortified settlement and the heritage park under construction in Trzcinica near Jasło (years 2006-2009)
- the "Green Bicycle" Route - Greenway Eastern Carpathians (marked out on the Ukrainian side)
- the project „Eco Museum Art Deco" in the area of Stalowa Wola
- the transborder bicycle route project "Museums in the Beskid Mountains" which is supposed to connect museums of Krosno with museums in the region of Svidnik in Slovakia
- the project of a retro railway, called "Tramway to Lviv" connecting Przemyśl and Lviv
- the project of the Knight Traditions School
- the project of the Galicia Narrow Gauge Railway

An important role in the development of tourism offer belongs to the Carpathian Euroregion, founded in 1993 (cooperation between Poland, Slovakia, Hungary, Rumania and Ukraine). Beside economic, educational and cultural activities, many actions in the tourism sector are undertaken, with many accomplished international projects, such as marking out transborder tourist trails, common publications for promotion and education (maps, promotion brochures), international fairs and folk and culture events, as well as training for integration and activation of the tourism sector. Especially in the context of regional tourist cooperation with Presovsky region (Klamár, Mika, Rosič, 2009). Most importantly, actions have been undertaken since 2000, in order to plan together the development of tourism products and services offered in the transborder region (Piziak 2007). These issues are discussed by local authorities' representatives, scientists and tourism sector representatives at regular meetings and conferences organised in partner states.

CONCLUSIONS

Tourism is a powerful instrument of regional politics, which enables to level socio-economic discrepancies between central and peripheral regions by moving the demand from rich regions to the less wealthy and less developed ones.

The development of tourism is strongly influenced by fashion and trends, either economic or social or lifestyle trends, either on the local, regional or international scale. It is crucial for the tourism sector to recognize these shifting trends in good time. In the Subcarpathian Voivodeship, the factors that will be shaping future tourism development are certainly the following (Strategia rozwoju turystyki 2007):

- the growing awareness of health and ecological issues, which will surely influence decision making when choosing travel destinations and the behaviour of the customer during his travel time
- education, which can affect the choice of artistic, cultural and historical events, that is the events with higher educational and spiritual values
- transportation development, both of road transport (the construction of express roads and of the A4 highway) and of air transport (expansion of the airport Rzeszów-Jasionka and construction of the new terminal, that should be accomplished in 2011), which will increase the accessibility of the region and will directly affect the increase of tourism flow

At the same time, barriers and obstacles for tourism development should be eliminated. In the Subcarpathian Voivodeship these are (Strategia rozwoju turystyki 2007):

- lacking tourism infrastructure and low quality of services offered (actions must be undertaken in order to rise the standards of existing accommodation facilities and to develop new establishments with standards suitable for customers of average and high wealth, as well as to modernize the health resorts infrastructure)
- lacking infrastructure especially transportation infrastructure (insufficient or poor accessibility of even most attractive parts of the voivodeship even during summer, few transborder connections with Slovakia and Ukraine)
- institutional limitations - the poor and slow information flow between departments, their limited competences, lacking qualifications of people responsible for tourism in regional governments or their low activity in establishing of cooperation, all these factors cause many interesting ideas and initiatives never see the light of day
- insufficient, chaotic and antiquated promotion of local, regional and cross-border tourism
- scant exposure and promotion of cultural values or interesting thematic routes

Despite the fact that the actual tourism attractiveness of the Subcarpathian Voivodeship is very high, it is definitely less regarded by tourists, especially foreigners who are still not familiar with this part of the country. Thus all promotion actions can significantly contribute to creating a new image of south-eastern Poland and to changing the false one among potential visitors. They will certainly help increase the number of domestic and foreign tourists visiting the Subcarpathian Voivodeship, lengthen the time of their stay and increase their expenditure level. To achieve these goals, it will be necessary to widen the tourist offer by new elements and products and to offer integrated, comprehensive tourist products by local tourism managers. It is also advisable for tourism sector's entities to

cooperate with the government of the voivodeship and with tourism organizations and to prepare this offer so as it will come up to customers' expectations.

Beside the promotion of the most popular tourism forms practiced in this area such as active tourism, sightseeing or recreation, new trends of world tourism market should be followed. In the near future the brand products of the region and at the same time the most profitable tourism products will be:

- an offer directed at business and transit tourists
- the special offer for foreign tourists, mainly for the elderly people, based on natural and cultural values (such as thematic tourist trails, cuisine tourism, vineyard tourism, ethnical tourism)
- the offer of health tourism in a broad sense
- rural tourism and agritourism
- new specialized and niche tourism forms, such as bird-watching or military tourism

In the Subcarpathian Voivodeship, it is also necessary to refer to the idea of *tourism diffuse* (Mika 2005). It assumes a deconcentration and a diffusion of tourists flow from tourism centres to places off the beaten track, through creation of an attractive complementary tourism offer (festivals, concerts, picnics, folklore parties).

References

JACKOWSKI, A. (2000): Turystyka religijna na Podkarpaciu, [w:] Kierunki aktywizacji gospodarczej przez turystykę na obszarach granicznych, Urząd Marszałkowski Woj. Podkarpackiego, Starostwo Krośnieńskie, Krosno, s. 88-94.

KLAMÁR, R., MIKA M., ROSIČ, M. (2009): Regionalne aspekty rozwoju turystyki na Słowacji, na przykładzie Preszowskiego kraju, [in:] B. DOMAŃSKI B. W. KUREK (ed.) Gospodarka i przestrzeń, Instytut Geografii i Gospodarki Przestrzennej UJ, Kraków (in press).

MIKA, M. (2005): Możliwości rozwoju uzdrowisk Beskidu Niskiego i Bieszczad w świetle obecnych uwarunkowań, [w:] E. Rydz. (red.) Kształtowanie funkcji turystycznych w miejscowościach uzdrowiskowych, PAP Słupsk, s. 308-317.

PAWLUSINSKI, R. (2006-2007): Turystyka w województwie podkarpackim, Folia Geographica, Series Geographica Oeconomica, PAN, Kraków – w druku.

PIZIAK, B. (2007): Współpraca w dziedzinie turystyki w Euroregionie Karpackim na przykładzie wybranych powiatów polsko-słowackiego obszaru trans granicznego, [w:] W. Kurek, R. Pawlusinski (ed.) Studia nad turystyką, Prace ekonomiczne i społeczne, IGiGP UJ, Kraków.

SOBALA-GWOSDZ, A. (2005): Ośrodki wzrostu i obszary stagnacji w województwie podkarpackim, Wyd. IGiGP UJ, Kraków. Strategia rozwoju turystyki dla województwa podkarpackiego na lata 2007-2013 wraz z Koncepcją produktów turystycznych w województwie podkarpackim, Rzeszów.

Strategia rozwoju województwa podkarpackiego na lata 2007-2020, Urząd Marszałkowski województwa podkarpackiego, Rzeszów

WARSZYNSKA, J. ed. (1995): Karpaty Polskie. Przyroda, człowiek i jego działalność, UJ, Kraków.

WARSZYŃSKA, J. KOLIBA, A. ŚRODOŃ, E. (1980): Model atrakcyjności turystycznej obszarów Makroregionu Południowo-Wschodniego, opracowanie w ramach Programu Rządowego 7, temat 08.02.05 – związki między planowanym rozwojem systemu wodno-gospodarczego Makroregionu Południowo-Wschodniego, a formowanie układów rekreacyjnych oraz rozwojem bazy turystycznej, maszynopis w zbiorach ZGTiU IGiGP UJ.

Fig. 1: *Natural environment's attractiveness for tourism in the general recreation season the Subcarpathian Voivodeship.*

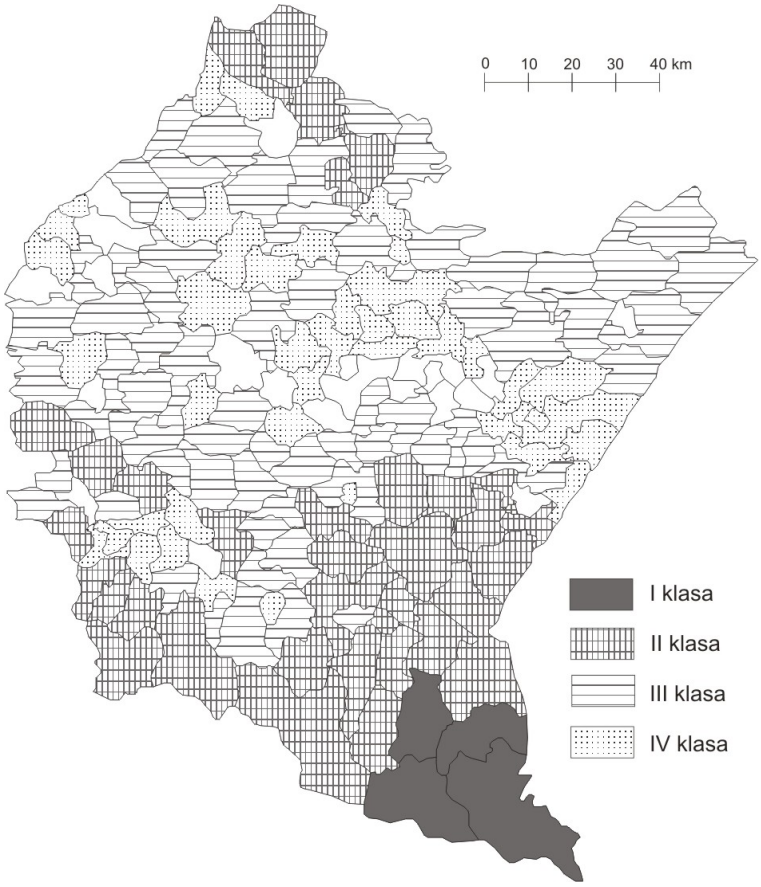
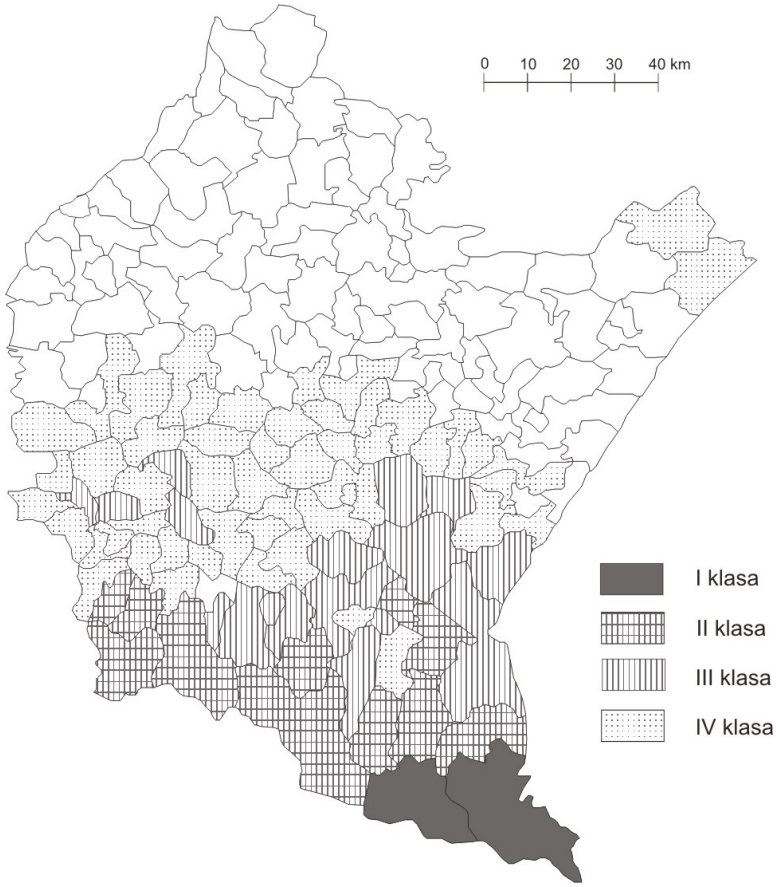


Fig. 2: *Natural environment's attractiveness for tourism in the winter season in the Subcarpathian Voivodeship.*



Source (Fig. 1, Fig. 2): own study.

POTENCJAŁ TURYSTYCZNY WOJEWÓDZTWA PODKARPACKIEGO I MOŻLIWOŚCI JEGO DALSZEGO WYKORZYSTANIA

Streszczenie

Województwo podkarpackie zaliczane jest do grona województw Polski odznaczających się ponadprzeciętną atrakcyjnością turystyczną. Podstawowym elementem składowym jego atrakcyjności turystycznej jest bogate i różnorodne środowisko przyrodnicze. Najatrakcyjniejszą przyrodniczo część województwa stanowią pasma górskie Bieszczad i Beskidu Niskiego, których znaczne fragmenty objęte zostały ochroną w formie parków narodowych.

Na potencjał turystyczny województwa podkarpackiego w istotny sposób wpływają walory kulturowe, w tym m.in. zabytkowe zespoły miejskie: Przemyśla, Leżajska,

Krosna, zespoły zamkowe w Baranowie Sandomierskim, Krasiczynie i Łańcucie, liczne zabytkowe drewniane obiekty sakralne. Swoistymi walorami kulturowymi odznacza się południowa część województwa, którą przed II wojną światową zamieszkiwała odrębna kulturowo i religijnie ludność bojkowska i łemkowska. Tradycje i budownictwo tych grup etnicznych prezentowane są obecnie w parku etnograficznym w Sanoku.

Pomimo znacznego potencjału turystycznego województwo podkarpackie jest stosunkowo rzadko odwiedzane przez turystów. Corocznie odwiedza go około 3,2 milionów turystów, z czego około 1 mln stanowią turyści zagraniczni. Głównymi celami przyjazdów są: wypoczynek i zwiedzanie oraz odwiedziny krewnych i znajomych. Ruch turystyczny ma charakter sezonowy i ogranicza się głównie do okresu letniego. Najczęściej odwiedzane są obszary górskie województwa, stosunkowo rzadziej turyści odwiedzają część północną i środkową.

Pomimo dużego potencjału turystycznego, turystyka nie odgrywa obecnie istotnej roli w strukturze społeczno-gospodarczej regionu. Jedynie w przypadku kilkunastu gmin można wskazać na powiązania lokalnej gospodarki z sektorem turystyki. Dalszy rozwój turystyki wymaga zintensyfikowania działań zarówno na rzecz poprawy stanu zagospodarowania turystycznego, jak i w zakresie promocji turystycznej w kraju i za granicą. Powinien on nawiązywać do głównego zasobu regionu, tj. bogactwa i różnorodności przyrodniczej i kulturowej. Turystyka bazująca na dziedzictwie kulturowym oraz turystyka przyrodnicza mają szansę stać się jednymi z markowych produktów turystycznych województwa podkarpackiego, poprzez które region ten będzie wyróżniał się nie tylko na tle kraju, ale także państw europejskich. Uzupełniającymi produktami turystycznymi mogą być: turystyka uzdrowiskowa, turystyka aktywna, turystyka poznawcza oraz turystyka tranzytowa.

Recenzovali: RNDr. Kvetoslava Matlovičová, PhD.
RNDr. Radoslav Klamár, PhD.

THE INFLUENCE OF THE POPULATION AGE STRUCTURE AND SIZE CATEGORY OF SETTLEMENTS ON THE ELECTORAL PREFERENCES OF POLITICAL PARTIES IN THE NATIONAL COUNCIL ELECTION IN 2006 IN PREŠOV DISTRICT

***Beáta PUSTÁ*[1]**

Abstract: *In the article we focus on the research of electoral support of the political subjects in the communities of Prešov district. Research was made with the help of statistic data about the elections into the National Council of SR executed on 17th June 2006. The aim was to find out the area differences of political decisions of residents in Prešov district and determine geographical aspects, which cause them.*
Key words: *Electioneering, political subject, election preferences, grading category, over-productive age.*

INTRODUCTION

The article is focused on the relation between selected demographic indicators, it means the portion of population in productive age, the size of the settlements, and the level of electoral support of selected political subjects in Prešov district. From all the political parties participated in the election into the NC of SR in 2006 we have chosen for this article those, which have been elected into the parliament: SMER-SD, SDKÚ- DS, SNS, ĽS-HZDS, KDH, SMK. We have achieved the analysis of the issue based on the data gained from the Statistic department of Slovak republic, the Regional administration in Prešov. From the above mentioned sources we achieved also the data about population in Prešov district, exactly the data from the summation of population of houses and flats in 2001. Theoretical part of the article is made by assistance of bibliography. In the article we propose only the primary results of this research.

AGE AND SIZE STRUCTURE OF POPULATION IN PREŠOV DISTRICT

Election perliamentary were executed on 17th June in 2006. The parliament passed the constitutional law regarding the reduction of its election period. Based on this the new election perliamentary were announced. It has happened the second time in the history of Slovak republic and the sixth voluntary and democratic elections after political changes in 1989.

We can select many aspects by the election issue, which effect the voters to vote for particular political parties. Here belong e.g. the size of settlements, age, religious,

1 **Mgr. Beáta Pustá,**
Department of Geography and Regional Development, Faculty of Humanities and Natural Sciences, University of Prešov, ul. 17. novembra 1, 081 16 Prešov,
e-mail: beata.pusta@gmail.com

knowledge structure of voters, the structure of voters according to gender, the living standard of population, residence structure etc.

We assess in the article the influence of the portion of population in post-productive age and size categories of settlements on electoral preferences for the most important political subjects in 2006.

By the age structure we can divide the population from the point of view of economic activity into three age categories. The youngest category of population 0-14 years we select as the pre-productive part. Regarding the economic activity is the productive part much more essential. It is specified for men and women from 15 to 62 years. Less importance for the economic activity represents the population in the post-productive age, which is specified achieving into the retirement, it starts after reaching the age limit of 62 years.

Based on the summation of population from 2001 recorded Prešov district 165 059 residents, of whose 51,3% represent women and 48,7% men. The major portion on the economic activity, but also the most quantitative part of the population present the productive part, which means 63,34%. Post-productive part of population presents 17,79% and the pre-productive part has only more portion, of which 18,70% belong to the age structure in Prešov district. This part regarding the effect on the preferences of political parties is irrelevant, because the suffrage has only the citizens of Slovak republic after achieving the age limit 18 years. From these parts we have chosen for the article the post-productive one, exactly we have researched the affect of residents in the retire age on political preferences of political parties in Prešov district.

In case of size structure of the settlements, the determining factor effecting the electoral support of political parties is the amount of population in particular communities.

The major method used in this article is the method of comparative analysis of indicators. With the help of it we have analysed the support of particular parliamentary parties on the level of communities in Prešov district.

ELECTORAL PREFERENCES

21 political parties took part in the elections into the National Council of Slovak republic during the researching period. Every political party had the same conditions for presentation its electoral programme. These were mainly focused on the reforms in different parts of society. It was registered into the election list 123 533 voters in Prešov. The election took part 54,56%, which means 67 407 voters. From all the amount of submitted votes were 1,28% cancelled.

Tab. 1: *Electoral preferences of the parliamentary parties in 2006 in Prešov district*

Prešov district	**Amount of valid votes altogether**	**Valid votes (amount/portion %)**					
		SMER-SD	**SDKÚ-DS**	**ĽS-HZDS**	**SNS**	**SMK**	**KDH**
	66 489	19 164	15 066	4 693	8 078	338	10 605
		28,82%	22,65%	7,05%	12,14%	0,50%	15,95%

Source: The Statistic department of SR, the Regional administration in Prešov

In the table 1 we can see that the electoral preferences according to the results into the National Council in 2006 showed the major advance of political party SMER-SD before the second major political subject, it means SDKÚ-DS. Winning party reached in Prešov district the voters´ support 28,82%, by which it made sure of 6,17% advance before party SDKÚ-DS, which support was 22,65%. The third most successful political party of mentioned elections, party KDH reached 15,95% of the voters´ support in Prešov district. The forth most successful political party SNS reached the support of 12,14%. The support of 7,05% recorded ĽS-HZDS and the less successful political subject, party SMK, reached only the support of 0,50%. This fact is not so surprising in Prešov district, concerning that the party SMK has the major political support especially in the south parts of Slovakia.

POPULATION IN THE POST-PRODUCTIVE AGE AND ELECTORAL REFRENCES

In the next part of the article we have focused on the portion of population in the post-productive age in the settlements of Prešov district. The lowest portion of this part of population has the village of Malý Slivník, it means 8,24%, otherwise, the highest one is the village of Klenov with 33,33%. Based on these facts we have produced three categories of settlements:

- first category: the settlements with the low portion of population in the post-productive age up to 15%
- second category: the settlements with the middle portion of population in the post-productive age from 15% to 20%
- third category: the settlements with the highest portion of population in the post-productive age over 20%

Tab. 2: *Division of settlements in Prešov district according to the portion of population in the post-productive age*

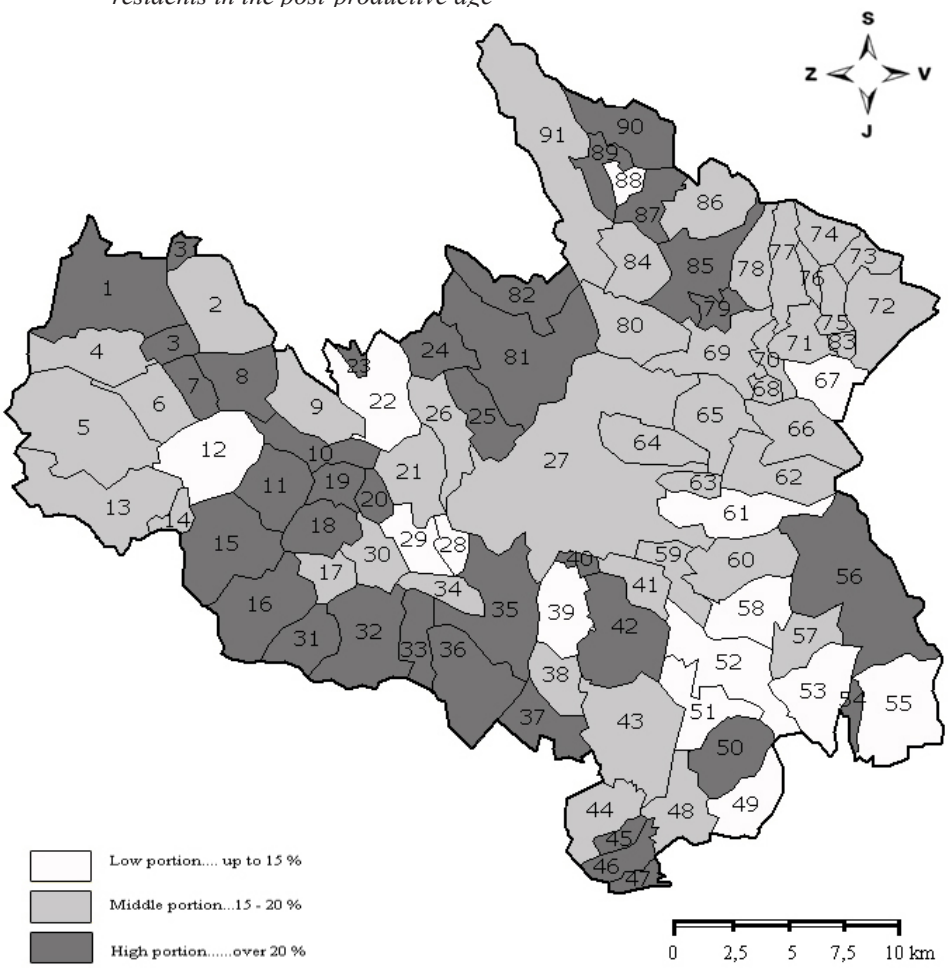
Portion of population in the post-productive age	Settlements
Up to 15%	Abranovce, Bzenov, Červenica, Chminianske Jakubovany, Kendice, Malý Slivník, Mirkovce, Rokycany, Ruská Nová Ves, Svinia, Šarišská Poruba, Tuhrina, Varhaňovce, Žehra
15 – 20%	Bardejov, Čelovce, Demjata, Drienov, Drienovská Nová Ves, Dulová Ves, Fintice, Fričovce, Hermanovce, Chmeľov, Chmeľovec, Chminianska Nová Ves, Janov, Kapušany, Kojatice, Kokošovce, Kvačany, Lada, Lemešany, Lesíček, Lipníky, Ľubotice, Nemcovce, Okružná, Ovčie, Podhorany, Podhradík, Proč, Pušovce, Šarišská Trstená, Šarišské Bohdanovce, Šindliar, Široké, Teriakovce, Terňa, Trnkov, Víťaz, Vyšná Šebastová, Záborské, Záhradné, Župčany, Prešov
Over 20%	Bertotovce, Brestov, Bretejovce, Brežany, Fulianka, Geraltov, Gregorovce, Haniska, Hendrichovce, Hrabkov, Chmiňany, Janovík, Klenov, Križovany, Lažany, Ličartovce, Lipovce, Lúčina, Ľubotice, Malý Šariš, Medzany, Miklušovce, Mošurov, Ondrašovce, Petrovany, Radatice, Sedlice, Seniakovce, Suchá Dolina, Štefanovce, Tulčík, Veľký Slivník, Veľký Šariš, Zlatá Baňa, Žipov

Source: The Statistic department of SR, the Regional administration in Prešov, author´s calculations

Into the produced cetegories we have gradually added the settlements of Prešov district with the portion of valid votes for particular parliamentary parties.

In the map 1 we can see that the highest amount of settlements of Prešov district belongs to the category of middle portion of population in the post-productive age. It represents 42 settlements, which are concentrated especially into the east and north-east part of the district. The other settlements involved into this category we can scatterly find also in the other parts of district. Settlements included in the 3rd category, thus with the high portion of population in the post-productive age are concentrated mainly in the south-west and northern part, with smaller presentation also in the southern part of district. Into this category we have added 35 settlements of examined district. We have integrated 14 settlements into the category with the low portion of population in the post-productive age. Located are mainly in the south-eastern part, but few of them are also in other parts of Prešov district.

Map 1: *Age structure of the residents of Prešov district according to the amount of residents in the post-productive age*



1 Lipovce, 2 Hermanovce, 3 Štefanovce, 4 Šindliar, 5 Široké, 6 Fričovce, 7 Hendrichovce, 8 Bertolovce, 9 Chminianska Nová Ves, 10 Chmiňany,11 Križovany,12 Chminianske Jakubovany,13 Víťaz, 14 Ovčie, 15 Hrabkov, 16 Klenov, 17 Kvačany, 18 Žipov, 19 Ondrašovce, 20 Brežany, 21 Kojatice, 22 Svinia, 23 Lažany, 24 Medzany, 25 Malý Šariš, 26 Župčany, 27 Prešov, 28 Bzenov, 29 Rokycany, 30 Bajerov, 31 Miklušovce, 32 Sedlice, 33 Suchá Dolina, 34 Janov, 35 Radatice, 36 Ľubovec, 37 Ličartovce, 38 Drienovská Npvá Ves, 39 Kendice, 40 Haniska, 41 Záborské, 42 Petrovany, 43 Drienov, 44 Lemešany, 45 Janovík, 46 Bretejovce, 47 Seniakovce, 48 Šarišské Bohdanovce, 49 Vatrhaňovce, 50 Brestov, 51 Mirkovce, 52 Žehňa, 53 Tuhrina, 54 Lúčina, 55 Červenica, 56, Zlatá Baňa, 57 Lesíček, 58 Abranovce, 59 Dulová Ves, 60 Kokošovce, 61 Ruská Nová Ves, 62 Podhradík, 63 Teriakovce, 64 Ľubotice, 65 Vyšná Šebastová, 66 Okružná, 67 Šarišská Poruba, 68 Trnkov, 69 Kapušany, 70 Lada, 71 Nemcovce, 72 Chmeľov, 73 Pušovce, 74 Proč, 75 Čelovce, 76 Šarišská Poruba, 77 Chmeľovec, 78 Podhorany, 79 Fulianka, 80 Fintice, 81 Veľký Šariš, 82 Gregorovce, 83 Lipníky, 84 Záhradné, 85 Tulčík, 86 Demjata, 87 Veľký Slivník, 88 Malý Slivník, 89 Mošurov, 90 Geraltov, 91 Terňa

The relation between the portion of population in the post-productive age and the electoral preferences of examined political parties table 5 below.

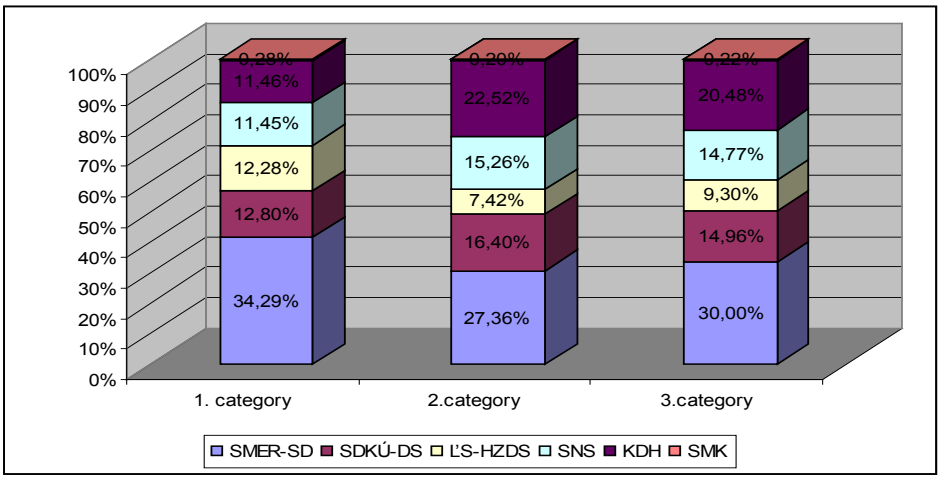
Tab. 3: *Portion of valid votes of the parliamentary parties in 2006 in Prešov district in relation to the portion of poplation in the post-productive age*

Political party	1. category	2.category	3.category
SMER-SD	34,29%	27,36%	30,00%
SDKÚ-DS	12,80%	16,40%	14,96%
ĽS-HZDS	12,28%	7,42%	9,30%
SNS	11,45%	15,26%	14,77%
KDH	11,46%	22,52%	20,48%
SMK	0,28%	0,20%	0,22%

Source: self-made

Preferences of the political parties SMER-SD, ĽS-HZDS and SMK have the decreasing tendency to the second category, thus to the category of middle portion of population in the post-productive age. Consequently, they increased again in the category with the high portion of population in the post-productive age. The opposite situation has recorded the political parties SDKÚ-DS, SNS and KDH, which preferences had the increasing tendency up to the 2nd category. In the third category they slowed down. This relation schematically depicts the following graph below.

Graph 1: *Portion of valid votes of the parliamentary parties in 2006 in Prešov district in relation to the portion of population in the post-productive age*



Source: self-made

Political party SMER-SD reached the highest amount of valid votes, 34,29%, in the category with the low portion of population in the post-productive age. On the other hand, the lowest amount, 27,36% of valid votes the party recorded in the second category, thus in the category with the middle portion of population in the post-productive age. Party SDKÚ-DS reached the highest preferences 16,40% in category of middle portion of population in the post-productive age and the lowest portion 12,80% of valid votes in the first category. The highest amount of valid votes 12,28% ĽS-HZDS recorded in category with the low portion of population in the post-productive age. The lowest references, only 7,42% of valid votes reached in the second category. In case of political party SNS, we have recorded the highest preferences, it means 15,26% in the second category, thus the category of middle portion of population in the post-productive age. The lowest preferences, 11,45% the party reached in the first category. Political party KDH reached the highest amount of valid votes, as for 22,52% in the second category, otherwise, the lowest amount, only 11,46% in category of the low portion of population in the post-productive age. The preferences of last parliamentary party SMK are generally very low in all the categories. The highest amount, thus 0,28% of votes the party reached in category with the low portion of population in the post-productive age, on the other hand, the lowest 0,20% reached in the second category.

THE SIZE CATEGORY OF SETTLEMENTS AND ELECTORA PREFERENCES

In the case of size categories of settlements we have examined, whether the amount of residents in the settlements of Prešov district effects on the electoral preferences. 91 settlements come under the Prešov district, in which two are towns. Consequently, we have divided, based on the amount of residents in particular settlements, 4 size categories. The settlement with the highest amount of residents, it means 91 650, is the town of

Prešov. Otherwise, the less of residents has Ondrašovce village, it means 62. To each size category we have added the settlements of Prešov district and the portion of valid votes of particular political parties. Selected size categories are:

1. category: from 1 to 499 residents
2. category: from 500 to 1999 residents
3. category: from 2000 to 4999 residents
4. category: the town of Prešov

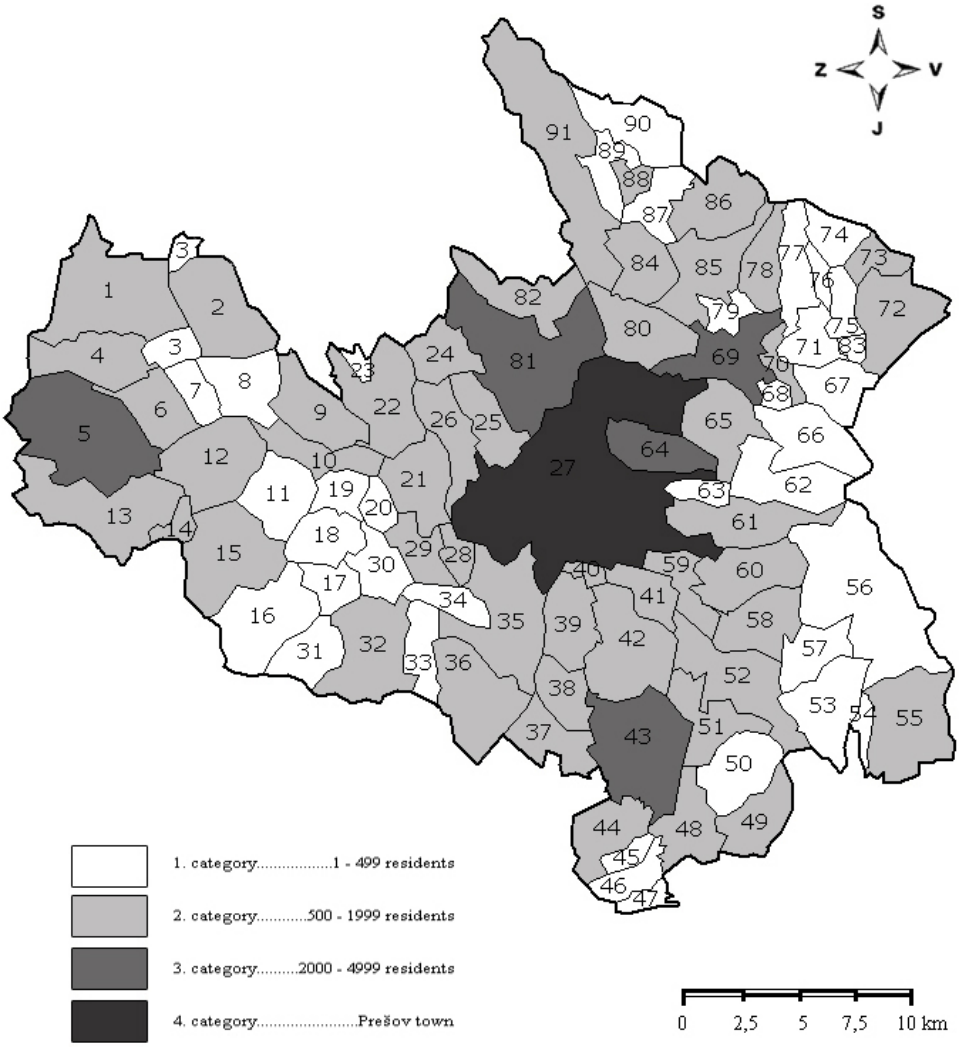
Tab. 4: *Division of settlements in Prešov district into the size categories*

Size category	Settlement
1. category	Bajerov, Bertotovce, Brestov, Bretejovce, Brežany, Čelovce, Fulianka, Geraltov, Chmeľovec, Janov, Janovík, Klenov, Križovany, Kvačany, Lažany, Lesíček, Lipníky, Lúčina, Mošurov, Nemcovce, Okružná, Ondrašovce, Podhradík, Proč, Seniakovce, Suchá Dolina, Šar. Poruba, Šar. Trstená, Štefanovce, Teriakovce, Trnkov, Tuhrina, Veľký Slivník, Zlatá Baňa, Žipov, Miklušovce, Hendrichovce
2. category	Abranovce, Bzenov, Červenica, Demjata, Drienovská Nová Ves, Dulová Ves, Fintice, Fričovce, Gregorovce, Haniska, Hermanovce, Hrabkov, Chmeľov, Chminianska Nová Ves, Chminianske Jakubovany, Chmiňany, Kendice, Kojatice, Kokošovce, Lada, Lemešany, Ličartovce, Lipovce, Ľubovec, Malý Slivník, Malý Šariš, Medzany, Mirkovce, Ovčie, Petrovany, Podhorany, Pušovce, Radatice, Rokycany, Ruská Nová Ves, Sedlice, Svinia, Šarišské Bohdanovce, Šindliar, Terňa, Tulčík, Varhaňovce, Víťaz, Vyšná Šebastová, Záborské, Záhradné, Žehňa, Župany
3. category	Drienov, Kapušany, Ľubotice, Široké, Veľký Šariš
4. category	Prešov

Source: self-made

In the map 2 we can observe that the majority of settlements of examined district belongs to the 2nd size category, thus in the category of settlements from 500 to 1999 residents. From all the amount of 91 settlements we have added into this category 48 settlements. Into the category with the amount of residents from 1 to 499 belongs 37 settlements. The general part is located into the eastern and south-western part of the district. In the 3rd size category are 5 settlements. It means the settlements with the amount from 2000 to 4999 residents. Three of them are located very close to the town of Prešov, thus Veľký Šariš, Kapušany and Ľubotice. There is Drienov settlements in the south part and Široké settlement in the west part, which come under this same size category. Because of too high amount of residents in comparison with other settlements in the district, we have selected the town of Prešov as an individual size category.

Map 2 *Size structure of settlements in Prešov district according to the amount of residents*



1 Lipovce, 2 Hermanovce, 3 Štefanovce, 4 Šindliar, 5 Široké, 6 Fričovce, 7 Hendrichovce, 8 Bertolovce, 9 Chminianska Nová Ves, 10 Chmiňany,11 Križovany,12 Chminianske Jakubovany,13 Víťaz, 14 Ovčie, 15 Hrabkov, 16 Klenov, 17 Kvačany, 18 Žipov, 19 Ondrašovce, 20 Brežany, 21 Kojatice, 22 Svinia, 23 Lažany, 24 Medzany, 25 Malý Šariš, 26 Župčany, 27 Prešov, 28 Bzenov, 29 Rokycany, 30 Bajerov, 31 Miklušovce, 32 Sedlice, 33 Suchá Dolina, 34 Janov, 35 Radatice, 36 Ľubovec, 37 Ličartovce, 38 Drienovská Npvá Ves, 39 Kendice, 40 Haniska, 41 Záborské, 42 Petrovany, 43 Drienov, 44 Lemešany, 45 Janovík, 46 Bretejovce, 47 Seniakovce, 48 Šarišské Bohdanovce, 49 Vatrhaňovce, 50 Brestov, 51 Mirkovce, 52 Žehňa, 53 Tuhrina, 54 Lúčina, 55 Červenica, 56, Zlatá Baňa, 57 Lesíček, 58 Abranovce, 59 Dulová Ves, 60 Kokošovce, 61 Ruská Nová Ves, 62 Podhradík, 63 Teriakovce, 64 Ľubotice, 65 Vyšná Šebastová, 66 Okružná, 67 Šarišská Poruba, 68 Trnkov, 69 Kapušany, 70 Lada, 71 Nemcovce, 72 Chmeľov, 73 Pušovce, 74 Proč, 75 Čelovce, 76 Šarišská Poruba, 77 Chmeľovec, 78 Podhorany, 79 Fulianka, 80 Fintice, 81 Veľký Šariš, 82 Gregorovce, 83 Lipníky, 84 Záhradné, 85 Tulčík, 86 Demjata, 87 Veľký Slivník, 88 Malý Slivník, 89 Mošurov, 90 Geraltov, 91 Terňa

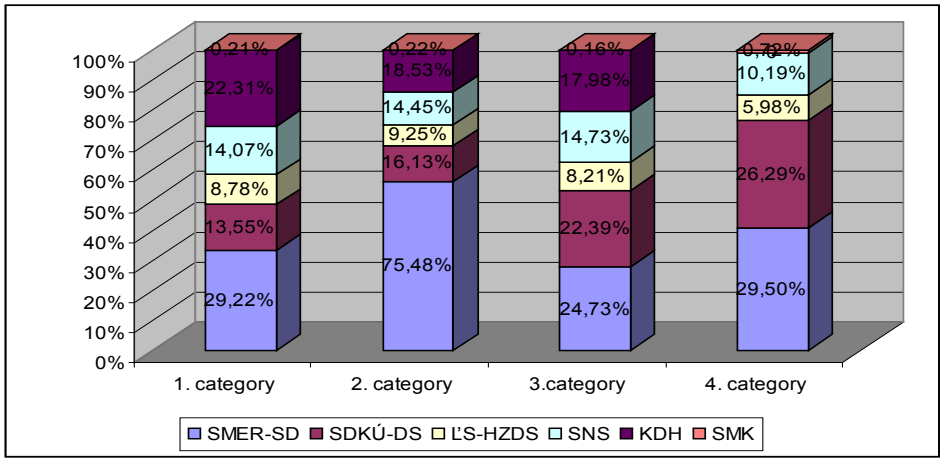
Tab. 5: *Portion of valid votes for parliamentary parties in 2006 in relation to the size categories of settlements in Prešov district*

Size category	SMER-SD	SDKÚ-DS	ĽS-HZDS	SNS	SMK	KDH
1.category	29,22%	13,55%	8,78%	14,07%	0,21%	22,31%
2. category	75,48%	16,13%	9,25%	14,45%	0,22%	18,53%
3. category	24,73%	22,39%	8,21%	14,73%	0,16%	17,98%
4. category	29,50	26,29%	5,98%	10,19%	0,72%	13,30˘%

Source: The Statistic department of SR, the Regional administration in Prešov

The dependency of electoral support from increasing amount of residents in the settlements has been confirmed in case of political party SDKÚ-DS. By the parties SMER-SD and SMK we can observe the increasing tendency in the portion of valid votes with rising amount of residents only to the 2nd category, so within the settlements to 1999 residents. Furthermore, the preferences of these political parties in the 3rd category decrease and this retrogressive feature has again by the 4th category, thus in the town of Prešov. Concerning the party SNS we can see the dependency to the 3rd category, however in the 4th category the preferences slow down. ĽS-HZDS preferences has the rising tendency to the 2nd category, in the 3rd and 4th we have recorded the opposite tendency. The electoral preferences of political party KDH decrease with the rising amount of residents in particular settlements of Prešov district. The highest preferences within the all size categories have the political party SMER-SD. In the following graph we can schematically see the affect of size categories on the electoral preferences of settlements for the electoral preferences of political parties. We have divided each political party into 4 size categories with the portion of valid votes included.

Graph 2: *Portion of valid votes for parliamentary parties in 2006 in relation to the size categories of settlements in Prešov district*



Source: self-made

Political party SMER-SD has the highest electoral support, it means 75,48% in the 2nd size category, thus in the group of settlements from 500 to 1999 residents. Otherwise, the smallest support, 24,73% has the party in the 3rd size category with the amount of residents from 2000 – 4999. Political party SDKÚ-DS records the results in the 4th category, it is 26,29%, at least successful was in the 1st category, thus in the group of settlements up to 499 residents. In case of the political party KDH, the standard feature of small settlements regarding the high level of religion has been confirmed. It has resulted into the fact of high portion of support of KDH in the categories of settlements with the smallest amount of residents. Party has reached the least support in the town of Prešov, thus in the 4th size category. We can see in the graph that ĽS-HZDS has almost the same support in the whole area of Prešov district, which moves from 8,21% to 9,25%. Except for the 4th size category, which support reaches only 5,98%. Preferences for political party SMK are relatively the same in the first three size categories, where achieve the support from 0,16% to 0,22%. Except for the 4th category again, where the support is a little bit higher, it means 0,72%. The party SNS is represented also by the similar results in the 1st, 2nd, and 3rd category from 14,07% to 14,73%, a smaller support has reached in the 4th category, it means 10,19%.

CONCLUSION

In the democratic society the elections manage the legal competition of political parties. By this issue we can select many aspects, which affect the voters when submitting the votes for political subjects. There are, e.g. the size of settlements, age, religious, knowledge structure of voters, structure of voters according to the gender, living standard of population etc. For this article we have chosen age and size structure of population, exactly we have examined how the size of settlements represented by the number of residents and the portion of inhabitants in post-productive age influence the electoral preferences of selected political parties in Prešov district in 2006.

The dependency of electoral support from the amount of residents in the settlements of Prešov district has been confirmed in case of political parties SDKÚ-DS and KDH. SDKÚ-DS has recorded an increasing tendency of electoral support with the rising amount of of population in settlements of Prešov district. Opposite dependency has confirmed the political party KDH, thus the electoral preferences decrease with the rising amount of population in particular settlements of Prešov district. In case of the other political parties, this dependency has been partly confirmed.

We have recorded two situations by examining the effect of portion of population in the post-productive age. The first one is related to political parties SMER-SD, ĽS-HZDS and party SMK, for which has got the preferences an decreasing tendency up to the second category, consequently they have increased again. The second situation is related to the parties SDKÚ-DS, SNS and KDH. Their preferences have got the rising tendency up to the middle portion of population in the post-productive age, but in the category with high portion of population have decreased again.

We assume that these outcomes can have a practical meaning for the activity of particular political parties and movements. Results, we have achieved, can help the members of political subjects assess their operation in the settlements of examined area. Based on these results are political parties able to balance their support and also can focus on the increase of their preferences in the settlements with the low electoral base.

References
BRÚDER, T., SULE, P. (2005): Encyklopédia miest a obcí Slovenska. Lučenec: PS-Line.
HYNČICA, P. (2007): Volby 2006 a změna vlády na Slovensku. In: Politická revue, 2007, 1.
KLÍMA, M. (1998): Volby a politické strany v moderních demokraciích. Praha: RADIX,
KOREC, P. a kol. (1999): Kraje a okresy Slovenska. Bratislava: Q 111, 1999.
KOSTELECKÝ, T. (1993): Volby očima geografa, in L. Sýkora (ed.) Teoretické přístupy a vybrané problémy v současné geografii, Praha, Přírodovědecká Fakulta University Karlovy
MARIOT, P. (2003): Regionálne aspekty volieb do SNR uskutočnených v roku 2002. In: Geografia, 1.
MESEŽNIKOV, G., KOLLÁR, M. (2006): Voľby 2006. Analýza volebných programov politických strán a hnutí. Bratislava: IVO – Inštitút pre verejné otázky
PETOCZ, K. (1997): Základy demokratických volebných systémov. Bratislava: Inštitút pre verejné otázky
VLČKOVÁ, V. (1995): Geografické aspekty výsledkov volieb do SNR a Národnej rady SR (1990, 1992, 1994). Bratislava: ELITA, 1995.
Štatistický úrad SR. Bratislava, http://www.statistics.sk
Štatistický úrad SR. Krajská správa v Prešove.

VPLYV VEKOVEJ ŠTRUKTÚRY OBYVAREĽSTVA A VEĽKOSTNÝCH KATEGÓRIÍ OBCÍ NA VOLEBNÉ PREFERENCIE POLITICKÝCH STRÁN VO VOĽBÁCH DO NR SR V ROKU 2006 V OKRESE PREŠOV

Zhrnutie

Podiel obyvateľstva v poproduktívnom veku ale aj veľkosť obcí na konkrétnom území predstavujú faktory, ktoré značným spôsobom ovplyvňujú spoločensko-politické dianie.

Pri skúmaní vplyvu podielu obyvateľstva v poproduktívnom veku sme zaregistrovali dve situácie. Prvá sa vzťahuje na politické strany SMER-SD, ĽS-HZDS a stranu SMK, pre ktoré mali preferencie klesajúcu tendenciu po druhú kategóriu, následne v tretej kategórii znova stúpli. Druhá situácia sa vzťahuje na strany SDKÚ-DS, SNS a KDH. Ich preferencie mali rastúcu tendenciu po kategóriu stredného podielu obyvateľstva v poproduktívnom veku, ale v kategórii s vysokým podielom obyvateľstva znova klesli.

Závislosť volebnej podpory od počtu obyvateľov v obciach okresu Prešov sme potvrdili v prípade politických strán SDKÚ-DS a KDH. Strana SDKÚ-DS zaznamenala stúpajúcu tendenciu volebnej podpory so zvyšujúcim sa počtom obyvateľov v obciach skúmaného okresu. Opačnú závislosť potvrdila politická strana KDH.

Výsledky, ku ktorým sme dospeli, môžu pomôcť zástupcom politických strán prehodnotiť svoje pôsobenie v jednotlivých obciach okresu Prešov. Na základe týchto výsledkov môžu politické strany bilancovať svoju podporu na skúmanom území a zároveň sa môžu zamerať na zvýšenie svojich preferencií v obciach s nízkou volebnou základňou.

Recenzenti: Prof. RNDr. Robert Ištok, PhD.
RNDr. Stela Lovacká, PhD.

THE POTENTIAL OF TOURISM IN THE PREŠOV COUNTY REGIONS

Martin ROSIČ[1], Radoslav KLAMÁR[2]

Abstract: *Slovakia has suitable natural and cultural-historical conditions for tourism that could help the economic situation to improve here. The article is concerned with the potential of tourism in the Prešov County regions. The potential is evaluated in the medium-term and long-term horizons for particular activities of tourism, but also for each region of tourism in Prešov Region. The second part of the report is concerned with the evaluation of basic indicators of accommodation facilities, which are the part of the material and technical basis of tourism and a precondition for implementation of tourism.*

Key words: *potential of tourism(t), activity of t, form of t, type of t, regionalization*

INTRODUCTION

Tourism has become an inseparable part of the inhabitants' lifestyle and standard of living. It fulfills a priority function in providing for the recuperation of human physical and spiritual powers by means of recreational and other social activities performed in people's free time.

The recreational-health function, representing one of the significant forms of useful free time utilization, is important and even principal for participants in tourism. Its position increases in proportion to the inhabitants' participation in tourism on the one hand, and to the worsening quality of the environment on the other hand. Besides this function, tourism is also characterized by a cultural-cognitive function and, with the development of science and technology, also a scientific-information function. (Mariot, 1983).

Nowadays, tourism at international level is evaluated as a significant economic branch with a powerful influence on the economy of the state and its individual regions. Its economic function has been highlighted as an activating factor of the economy and developing factor for the regions. According to the possibilities and preconditions of our country for tourism, in several regions it could be this very branch that could help the economic situation to improve.

The area of Prešov Self-governing Region, which in terms of the country´s potential (represented mainly by circumstances of natural and cultural-administrative localization), has very good preconditions for tourism development, could become one of these regions in the future.

1 **RNDr. Martin Rosič,**
Department of Geography and Regional Development, Faculty of Humanities and Natural Sciences, University of Prešov, Ul. 17.novembra 1, 081 16 Prešov, e-mail: rosmat@post.sk

2 **RNDr. Radoslav Klamár, PhD.,**
Department of Geography and Regional Development, Faculty of Humanities and Natural Sciences, University of Prešov, Ul. 17.novembra 1, 081 16 Prešov, e-mail: klamar@unipo.sk

MOST PRODUCTIVE FORMS OF TOURISM

According to the "Concept of Tourism Development in Slovakia" document approved by the resolution of the Government of the Slovak Republic No. 923 from 23rd November, 2005, and the National Programme of Tourism Development in the Slovak Republic, the development of tourism provision must be carried out at two levels – central and regional. The objective of the centre is to support those forms of tourism and its products which are preferred in terms of the country´s foreign visit rate. However, in the first place the product of tourism has regional character. The objective of the regions will be to develop those products for the supply and sale of which they have the best conditions.

The most productive forms of tourism for which Slovakia together with Prešov Region has the best preconditions and which need to be supported, developed and improved in preference in the course of the nearest years, are (Uznesenie vlády, 2005a):

- town and cultural tourism
- spa and health tourism
- winter tourism and winter sports
- summer tourism and waterside stays
- rural tourism and agrotourism

Their capacity means they are significant for our tourism as a whole and for its economic gains in the first place in terms of their size and proportion. Nevertheless, they seem to be crucial in terms of foreign as well as domestic tourism, and their dominancy is even more marked in the case of the former.

Within these forms this will concern the availability of individual urban units and settlements (e.g. 18 historical town reserves) in their original form with their architecture, culture, history, customs, folklore, crafts, gastronomy (**town and cultural tourism**), which distinguish us from our surroundings and make Slovakia unique. Various cultural events, festivals, fairs and the presentation of world cultural and natural heritage in Slovakia will have special importance. A number of castles andstately homes, with their potential of utilization for tourism, can potentially be utilized after reconstruction and modernization as cultural and accommodation facilities. Since tourism in Slovakia still has markedly seasonal character, the opportunity for growth in weekend stays will lie in town and cultural tourism development, within which foreigners can get acquainted with the most attractive towns of Slovakia, during so-called "city – breaks" (Uznesenie vlády, 2005b).

Within the cultural heritage, three basic goals can in principle be distinguished:

- getting to know the monumentstock, that is national cultural monuments (immovable and movable) and monumental areas (monument reserves and monument zones), i.e. secular architectural monuments (such as castles, stately homes, palaces, fortresses and forts, town halls, historical town and village centres with burghers´ houses and traditional folk architecture), or religious architectural monuments (e.g. churches, monasteries, calvaries, synagogues, cemeteries), archaeological sites, historical parks and gardens, monuments of science, manufacturing and technology (e.g. historical mining works, ironworks, textile mills),
- visiting of cultural amenities (e.g. museums, including open-air museums, galleries, libraries, archives),
- participating in cultural and religious events (e.g. festivals, exhibitions, theatre performances, concerts, folklore feasts, pilgrimages) (Uznesenie vlády, 2005b).

Natural richness in thermal springs and a number of healing spas (**spa and health tourism**) gives Slovakia, and thus also Prešov Region, a chance to attract clientele to our country who are looking for health, relaxation and rehabilitation individually for each target group. Besides traditional spa services, a new worldwide trend of fitness-wellness stays is a challenge for the preparation of new products for clients of all age categories. Spas need to be modernized as soon as possible, and intensively propagated abroad. In spa tourism, even the smallest investments can bring returns with maximum effectivity, i.e. with high profit.

For Prešov Region, **winter tourism and winter sports** are no less important forms for which our country has very good natural conditions. Ski resorts must guarantee enough snow for the accommodated clientele. Artificial snowing, in terms of sustaining the visit rate of winter resorts and prolonging the season, will therefore have increasing importance in respecting the environmental capacity, especially hydrological conditions and nature protection. It is necessary to focus mainly on the guests from those countries where the possibilities for skiing self-realization are not great and their inhabitants, albeit with exceptions, mostly do not belong in the category of demanding skiers either (Hungary, Poland, the Czech Republic, Russia, Ukraine, Croatia, Latvia, Lithuania, Estonia, Bulgaria and Romania). It is necessary to prepare a comprehensive offer of capacities, services and sports facilities for these target groups to support regular and repeated visits.

In our geographical conditions, summer tourism and waterside stays have good conditions for their development. Interest in thermal swimming pools, new aquaparks, open water spreads, lakes, reservoirs and rivers is increasing in terms of both domestic and foreign clienteles. Mainly the facilities with year-round utilization can lead to a significant decrease in so far marked seasonality, a higher utilization of accommodation capacity, the extension of the summer season and stabilization of employees in new professions.

The development of rural tourism and within it of agrotourism brings with it the possibility of using the great potential of the Slovakian countryside to offer products to tourists.

Rural tourism can be defined as the use of free time in the countryside with various recreational activities, with the possibility of accommodation with families, in country houses or specialized commercial accommodation facilities built in these environs.

Besides the offer of accommodation capacities this will involve visiting a farmyard with preserved, typically rural architecture, various recreational activities connected with farm work, for example collecting the harvest or forest crops, and the study of folklore and local customs. The importance of rural tourism and agrotourism for the stabilization and economic security of the rural population which decides for such business, which may have a positive influence on a partial decrease of high unemployment in some regions of Slovakia, is notinconsiderable.

The benefit of rural tourism development can be defined from several points of view:

- it enables the character of the rural environment to be utilized and appreciated, namely at relatively low financial demand,
- it creates new job opportunities for businesspeople and their families, and potentially for the employees of a cooperative in taking care of visitors,
- it stabilizes the inhabitants in the rural environment, and eliminates the uselessly high everyday job mobility to bigger habitations and towns,

- it creates conditions to preserve the traditional and typical settlement of the countryside according to local customs, to preserve the typical environment, land-forming and ecological functions of villages and the region,
- it enables, after modification, the existing material basis owned by private persons, villages and agricultural cooperatives to be used, which would otherwise not be utilized,
- it enables the conversion of people´s own products into cash for catering and care of visitors,
- it supports village renewal and development in terms of gaining financial resources from the income from tourism services,
- it creates an interesting possibility of preparation of meals from freshly-grown agricultural products for visitors,
- it has a positive influence on the regional development, also on the balance of payments and tourism development in Slovakia (Uznesenie vlády, 2005a).

The compiled Regionalization of Tourism in the Slovak Republic is a significant document which divides the area of the Slovak Republic into individual regions on the basis of the tourism potential determination in the medium-term horizon, and the unemployment rate.

It will not be possible to develop all the potential of the regions at the same time, and all the regions cannot be, in terms of tourism, developed at the same rate either. It is therefore important to determine priorities. Prioritization will concern the medium-term horizon and, in the more distant future, it will be able to change depending on its development. The support of tourism development in the individual regions should be connected with those activities which show the highest potential in the given region, are in accordance with nature protection goals and the environmental capacity, and there is a real possibility of sufficient demand on the part of visitors.

THE POTENTIAL OF TOURISM IN THE REGIONS OF PREŠOV REGION

The system of preconditions for tourism has been used to evaluate regions in terms of the potential for tourism for a longer time. According to Mariot (1983), this system is divided into three groups of preconditions:

- localization,
- selection,
- implementation;

- localization conditions - natural and cultural-historical conditions for the given tourism localization, whereby their improvement enables the country potential for tourism to be expressed, as well as the capability of the area to provide conditions for tourism expansion – its potential character;
- selection conditions - this basically indicates the competence of the inhabitants to participate in tourism (settlement, demographic, sociological, political factors) – its potential character;
- implementation conditions –enabling tourism to be carried out; they indicate the real state in the country (communication conditions, the material and technical basis for tourism);

For the needs of this work, the groups of localization and realization conditions are essential in the first place. The localization conditions of tourism are further divided into natural (relief, climate, water, flora and fauna, protected territories), and cultural-administrative (cultural-historical monuments, central institutions and organized events).

Subsequent to the National Programme of Tourism Development in the Slovak Republic, implemented in the years 2002-2003, a new form of the Regionalization of Tourism in the Slovak Republic was compiled as an indicative and supporting document which reclassified the territory of Slovakia into 21 areas in terms of their tourism potential, in each of which it also suggested the most productive forms and types of tourism.

At the national level, this Regionalization of Tourism can be used as a supporting document for the regional policy in tourism, to evaluate the influence of the economic policy arrangements and public investments, as well as arrangements and tools within the tourism policy. It enables those involved to appraise, evaluate and prognosticate the influences and effects of decisions on individual regions, and on this basis to determine the goals of such decisions while knowing their impacts. From among the current objectives, the approaches in focusing and goals of supporting programmes can be mentioned.

This regionalization and the individual regions potential evaluation enable various approaches and their exposure in the area to be considered and evaluated. If the mentioned tools prefer achieving increases in economic gains and the highest evaluation of sources, their regional impact will be different from in the case when tourism development is used as a tool for balancing the economic level of individual areas of Slovakia. The evaluation of such variants or approaches is enabled by regionalization with the appraisal of the individual regions' potential, also in combination with other data, e.g. the unemployment rate. The regionalization of tourism in the Slovak Republic can also be a basis for determining priorities and development strategies at the local territorial and regional level, with the possibility of evaluating the external competitive environment.

In the Regionalization of Tourism in Slovakia study, the whole territory of the state was divided into regions according to the suitability for tourism. The regions' importance was evaluated on the basis of several criteria. In the first place, it was the value of potential expressed in a numerical form. However, since a summarized numerical formulation cannot express the real importance of the potential without remainder, this criterion was important, but not the only one. The more objective classification into categories was therefore also affected by other factors (P. Weiss et all, 2005):

- number, size and importance of subregions in the area
- intensity of tourism and achieved results (proportion of stays, long-term and short-term tourism)
- position of tourism in the economy of a region, its prosperity
- visit rate structure
- competitiveness on domestic and foreign markets
- degree of attractiveness – aesthetical level of the country, atmosphere, image

On the basis of the above mentioned, the categorization of regions into four groups according to a territory's potential for tourism was compiled (P. Weiss et all, 2005):

1st category – regions of international importance

2nd category – regions of national importance

3rd category – regions of supraregional importance

4th category – regions of prevailing importance at local level

Regarding the fact that the existing state in created conditions for tourism leaves space for possibilities of significant changes, especially in the long-term horizon, there were also formed two time horizons of evaluation – medium-term and long-term (P. Weiss et all, 2005).

Based upon this evaluation, Prešov County was divided into four regions, namely the Tatra Region, the Šariš Region, the Upper Zemplín Region and the Spiš Region, the latter being represented in the area of the county only by the towns of Levoča and Spišské Podhradie with their immediate environs.

In each of the mentioned regions, the specific forms and activities of tourism for which the region had the required conditions were defined. For each activity, particular evaluation criteria were determined. For most activities and facilities evaluation, four levels or degrees of a territory's suitability for practising individual tourism activities were established:

- basic degree of potential – suitability of a territory for a given activity can be registered, but it remains at low level and does not exceed regional importance – point value 1
- average degree of potential – suitability of a territory for a given activity is increased, it reaches average level, it is important from a regional point of view – point value 2
- good degree of potential – suitability of a territory for a given activity is important at national level – point value 3
- high degree of potential – suitability of a territory for a given activity is very important and comparable to significant localities abroad – point value 4 (Weiss et all, 2005).

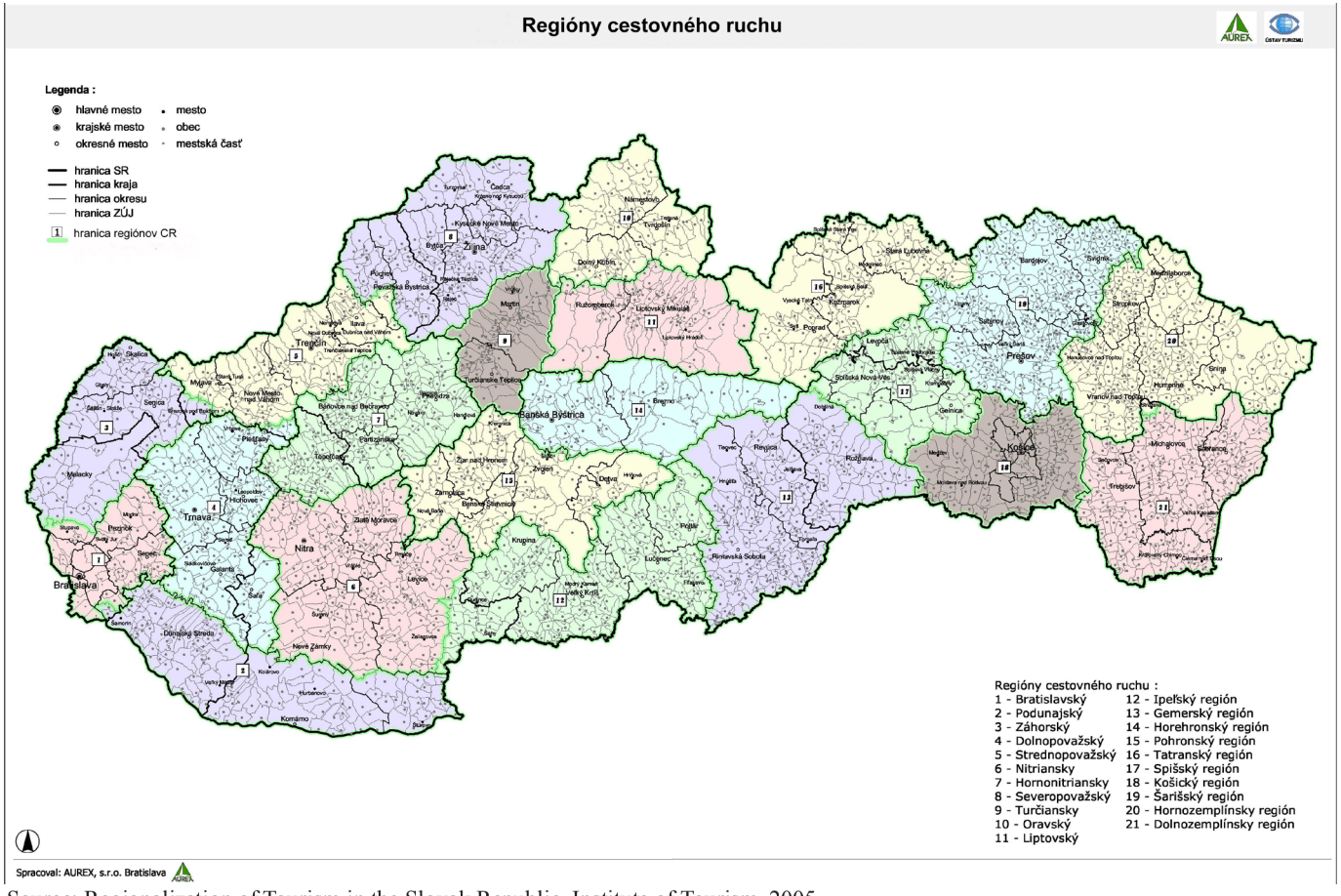
For the classification of activities into individual degrees, criteria were determined on the basis of which activities were evaluated and classified into one of the four degrees (basic, average, good, high). In some activities only the appearance of potential was evaluated, in others the two-level evaluation – basic and increased potential – was applied. Criteria for individual activities in the medium and long-term horizons can be found in the document Regionalization of Tourism in the Slovak Republic, published by the Ministry of Tade and Industry and compiled by the Institute of Tourism in 2005, whereby activities are divided into these groups:

- activities with prevailing relation to the natural environment
- activities bound to the created, anthropogenic environment
- availability of facilities for tourism.

The value of the potential of regions is expressed by a point value. Individual tourism activities were evaluated on the basis of the established criteria, and according to quantitative and qualitative characteristics classified into degrees (1-4). The long-term (natural) and medium-term potentials were evaluated, where the availability of facilities for a given activity, the visit rate, the range of services, etc. were taken into account.

Point values for each of the activities were thereafter modified by weighted values, which express the importance of individual activities within tourism in Slovakia. The achieved values were then adjusted for the influence of modifying factors which can emphasize or decrease the potential. Values from 1 to 10 were allotted to the weights.

Picture No.1: *Regionalization of Tourism in the Slovak Republic*



Source: Regionalization of Tourism in the Slovak Republic, Institute of Tourism, 2005

In the following tables we can see the potential of the County regions according to individual activities, and their point evaluation: (T – Tatra Region, S – Spiš Region, Š – Šariš Region, UZ – Upper Zemplín Region).

Tab.1: *Point values of the potential for individual tourism activities according to regions of tourism in Prešov County*

	value of potential				weights				weighted value of potential				resultant value of potential			
region	T	S	Š	UZ	T	S	Š	UZ	T	S	Š	UZ	T	S	Š	UZ
activity																
long-term potential																
stay/recreation by water	1	1	1	3	10	10	10	10	10	10	10	30	9	6	8	25
water sports	2	2		3	3	3	3	3	6	6		9	7	2		4
water tourism/watermanship	2	1			3	3	3	3	6	3			11	5		
stay/recreation by thermal/mineral water	4		4		7	7	7	7	28		28		32		32	
stay in forest/mountain environment	4	4	3	3	5	5	5	5	20	20	15	15	21	17	16	12
hiking	4	4	3	3	10	10	10	10	40	40	30	30	39	36	29	26
cyclotourism	4	3	3	2	6	6	6	6	24	18	18	18	22	13	16	14
paragliding	1				1	1	1	1	1				3			
downhill skiing	4	3	3	1	9	9	9	9	36	27	27	9	36	26	26	6
cross-country skiing	4	3	2	1	4	4	4	4	16	12	4	8	18	9	8	1
climbing	2	1			1	1	1	1	2	1			4	2		
visiting caves and speleology	2	2			1	1	1	1	2	2			6	5		
stay in the countryside/country tourism	3	3	2	2	3	3	3	3	9	9	6	6	10	7	8	4
hunting	1	1	1	1	1	1	1	1	1	1	1	1	4	3	5	1
fishing	1	1	1	1	1	1	1	1	1	1	1	1	1	0	1	-2
getting to know cultural-historical monuments	4	4	4	2	10	10	10	10	40	40	20	40	46	43	46	21
overall evaluation of potential									242	190	184	143	269	174	195	112
medium-term potential																
stay/recreation by water	1	2		3	10	10	10	10	10	20		30	7	12		23
stay/recreation by thermal water	3				7	7	7	7	21				22			
water sports				2	3	3	3	3				6				0
hiking	4	4	3	1	10	10	10	10	40	40	30	10	38	32	26	4
downhill skiing/snowboarding	4	3	2	1	9	9	9	9	36	27	18	9	35	25	15	5
cross-country skiing	4	1	1		3	3	3	3	12	3	3		14	-1	2	
cyclotourism	4	3	1	1	6	6	6	6	24	18	6	6	22	12	2	0
stay/recreation in spa	4		4		7	7	7	7	28		28		31		30	
visiting caves and speleology	2	2			1	1	1	1	2	2			5	5		
getting to know cultural-historical monuments	4	4	4	2	10	10	10	10	40	40	40	20	45	42	44	19
visiting museums and galleries	3	2	3	3	6	6	6	6	18	12	18	18	21	13	22	20
getting to know local traditions	2	1	1	1	4	4	4	4	8	4	4	4	12	4	6	4
visiting events	2	2	2	2	5	5	5	5	10	10	10	10	13	9	11	10
attendance/visiting trade fairs/exhibitions					4	4	4	4								
attendance at congresses and conferences	3		1		4	4	4	4	12		4		15		6	
business tourism	2	2	2	1	4	4	4	4	8	8	8	4	12	10	11	5
other sports activities	2	1	2	1	5	5	5	5	10	5	10	5	10	-1	7	-1
overall evaluation of potential									279	189	179	122	302	162	182	89
potential of equipment																
temporary accommodation	4	2	2	2	10	10	10	10	40	20	20	20	42	18	20	18
tourist information offices	2	1	1		4	4	4	4	8	4	4		9	5	5	x
overall evaluation of potential									48	24	24	20	51	23	25	18

Source: modified according to the Regionalization of Tourism in the Slovak Republic study, Institute of Tourism, 2005

Tab.2: Potential of Presov County regions according to individual activities

activity	potention	medium-term horizont	long-term horizont
stay - recreation by water	good	UZ	UZ
	average		
	basic	T	T, Š
stay/recreation by thermal/mineral water	excelent		T, Š
	good	T	
water sports	good		UZ
	average	UZ	T
water tourism/watermanship	good		T
stay/recreation in spa	excelent	T, Š	
stay in forest/mountain environment	excelent		T
	good		Š, UZ, S
stay in the countryside/country tourism	good		T, S
	average		UZ, Š
hiking	excelent	T	T
	good	Š	UZ, S
	basic	UZ	
cyclotourism	excelent	T	T
	good	S	S, Š
	average		UZ
	basic	Š, UZ	
climbing	good		T
paragliding			T
visiting caves and speleology	good	T	T, S
downhill skiing/snowboarding	excelent	T	T
	good		S, Š
	average	Š	
	basic	UZ	UZ
cross-country skiing	excelent		T
	good		S
	average		Š
	basic		UZ
cross-country skiing	excelent	T	
	basic	S, Š	
getting to know cultural-historical monuments	excelent	S, Š, T	S, Š, T
	average	UZ	UZ
visiting museums and galleries	good	T, Š, UZ	
	average	S	
getting to know local traditions	good	T	
	basic	S, Š, UZ	
other sports activities	average	T, Š	
	basic	S, UZ	
visiting events (sport, culture...)	average	T, S, Š, UZ	
attendance/visiting trade fairs/exhibitions			
attendance at congresses and conferences	good	T	
	basic	Š	
business tourism	average	T, S, Š	
	basic	UZ	

Source: modified according to the Regionalization of Tourism in the Slovak Republic study, Institute of Tourism, 2005

The following survey shows brief characteristics of individual regions in terms of their contemporary state, development possibilities and some needs. The surveys are supplemented by the most significant tourism localities of the individual regions. This information is not a complete calculation, but presents the main elements that form the character of a region as a tourist target.

TATRA REGION

The Tatra Region, on the basis of the evaluation in the regionalization of tourism in the medium-term as well as long-term horizons, is of international importance, and is the most important of all the regions of tourism in Prešov County. It is defined by the Poprad, Kežmarok and Stará Ľubovňa Districts. In the medium-term horizon, the High Tatras should be connected with the Tatras of Poland, Pieniny (with another connection to Poland) and Vyšné Ružbachy Spa. In the long-term horizon, the adding of Zamagurie and the valley of the River Poprad is prospective. The Tatra Region basically has the potential to create centres of tourism with their environs, specifically Kežmarok, Červený Kláštor, Spišská Stará Ves, Vyšné Ružbachy and Stará Ľubovňa. A relatively broad region of tourism, offering a wide range of attractions, would be created in this way.

Main types of tourism:

- intensive domestic and foreign tourism
- long-term stay tourism
- short-term stay tourism
- one day visit rate

Forms of tourism

- summer stays in mountains
- winter stays in mountains – various forms of ski sports
- incentive tourism – congresses and conferences
- spa tourism with healing function
- cognitive tourism
- rural tourism

Activities with the highest long-term potential

- stays in forest or mountain environments
- hiking
- downhill skiing
- cross-country skiing
- getting to know the cultural heritage
- thermal water recreation stays

Significant localities

- urban type - Poprad, Kežmarok, Stará Ľubovňa
- localities with cultural heritage - Kežmarok, Poprad, Červený Kláštor, Spišská Belá – Strážky, Veľká Lomnica, Osturňa, Batizovce, Švábovce, Betlanovce, Ždiar, Podolínec, Stará Ľubovňa, Hniezdne
- spa localities – High Tatras climatic spa, Vyšné Ružbachy
- thermal swimming pools - Vrbov, Vyšné Ružbachy, Poprad, potentially Stará Lesná, Nová Ľubovňa
- recreational areas – the West Tatras, the High Tatras, Spišská Magura, Pieniny, the

ĽubovňaHills, the Kozie Chrbty range, the Levoča Hills
- tourism units - Podbanské, Tatranská Štrba, Štrbské Pleso (Štrba Tarn) including cross-country tracks, Smokovce, Tatranská Lomnica, Stará Lesná, alpine huts, Javorina, Ždiar (Strednica and Bachledova Valley), Jezersko, Červený Kláštor, Novoľubovnianske Spa, Lopušná Valley, Vernár, Liptovská Teplička

Localities within the region suitable for individual forms of tourism, on the basis of their level of potential:
- town and culture tourism
  - basic potential - Podolínec
  - average potential – Poprad – Spišská Sobota, Osturňa, Stará Ľubovňa, Jezersko
  - good potential – Kežmarok, Ždiar
  - excellent potential – the towns of Vysoké Tatry and Poprad
- spa and health tourism
  - basic potential – Gánovce, Stará Lesná, Veľký Slavkov, Plavnica, Nová Ľubovňa, Hromoš, Hniezdne
  - average potential – Malý Sulín, Červený Kláštor, Šarišský Štiavnik
  - good potential – Vrbov, Poprad
  - excellent potential – Vyšné Ružbachy (Nižné Ružbachy, Ružbašská Míľava)
- winter tourism and winter sports
  - average potential – Vyšné Ružbachy, Nová Ľubovňa, Litmanová
  - good potential – villages in Zamagurie (Jezersko)
  - excellent potential – the towns of Vysoké Tatry, Poprad, Ždiar
- summer tourism and waterside stays
  - basic potential – Veľký and Malý Sulín, Spišská Belá, Spišská Stará Ves
  - average potential – the area of Ľubovňa Uplands
  - good potential – villages in Zamagurie, the area of Pieniny (rafting on the River Dunajec, Červený Kláštor)
  - excellent potential – the towns of Vysoké Tatry, Poprad, Ždiar
- rural tourism and agrotourism
  - average potential – Liptovská Teplička
  - good potential – the area of Pieniny (Červený Kláštor), the area of Ľubovňa Uplands

SPIŠ REGION

The Spiš Region, on the basis of the evaluation in the regionalization of tourism in the medium-term horizon is of supraregional, and in the long-term horizon even of international importance. In the territory of the County, it is formed by the Levoča District. However, it is necessary to point out that only a small part of this region is situated in Prešov County, and the only touristically interesting area is between Levoča and Spišské Podhradie, although the area of LevočaHills, closed until recently, could become attractive over time.

Main types of tourism
- intensive domestic and foreign tourism
- short-term stay tourism
- one day visit rate

- temporary visit rate

Forms of tourism
- summer stays in forest – mountain environments
- cognitive tourism
- rural tourism

Activities with the highest long-term potential
- getting to know the cultural heritage
- stays in forest – mountain environments
- hiking
- cyclotourism
- stays in the countryside

Significant localities
- urban type – Levoča
- localities with cultural heritage – UNESCO monuments (Spišské Podhradie, Spišská Kapitula), Levoča, Bijacovce, Dravce
- recreational areas – the LevočaHills, Branisko, Spiš – Gemer Karst

Localities within the region suitable for individual forms of tourism, on the basis of their level of potential:
- town and culture tourism
  - excellent potential – Levoča, Spišské Podhradie
- spa and health tourism
  - basic potential – Baldovce
- winter tourism and winter sports
  - basic potential – Dravce, stredisko Závada,
- summer tourism and waterside stays
  - basic potential – Dravce,
- rural tourism and agrotourism
  - basic potential – oblasť Levočských vrchov (Vyšné a Nižné Repaše, Torysky, Oľšavica)

This is a region where the potential is relatively slightly utilized, and the infrastructure and supply of services are only slightly developed.

ŠARIŠ REGION

The Šariš Region, on the basis of the evaluation in the regionalization of tourism in the medium-term as well as long-term horizons, is of national importance. In the territory of the County it is formed by the Bardejov, Prešov, Sabinov and Svidník Districts. In the medium-term horizon, certain subregions should be developed in the region, specificlly the city of Prešov and its surroundings (e.g. Zlatá Baňa, Sigord, opal mines at Dubník), Bardejov together with Bardejov Spa (open-air museum with UNESCO monuments of international importance), winter ski resort Drienica-Lysá, the surroundings of Svidník towards Dukla together with the complex of wooden churches. A more compact region of tourism, offering a wide range of attractivities, would be created in this way.

Main types of tourism:
- strong domestic tourism
- significant proportion of foreign tourism

- long-term stay tourism
- short-term stay tourism
- intensive one day visit rate

Forms of tourism

- spa tourism with a healing function
- cognitive tourism
- summer stays in forest – mountain environments
- winter stays, ski stays
- shopping tourism

Activities with the highest long-term potential

- getting to know the cultural heritage
- spa stays
- stays in forest – mountain environments with hiking
- winter stays in mountains – skiing

Significant localities

- urban type – Prešov, Bardejov
- localities with cultural heritage – Bardejov (UNESCO monuments, open-air museum), the complex of wooden churches of the Eastern Christian rite, Dukla, Sabinov, Prešov, Kapušany Castles, Veľký Šariš, opal mines at Dubník
- spa localities – Bardejov
- recreational areas – the Lower Beskyds, the Ondava Uplands, the Šariš Uplands, the Slánske Mountains, the Čergov range
- tourism units – Lipovec – Šindliar, Dubovica – Žliabky, Renčišov – Búče, Drienica – Lysá, Regetovka, Sigord, Šarbov, Solivar

Localities within the region suitable for individual forms of tourism, on the basis of their level of potential:

- town and culture tourism
  - average potential – Svidník a okolie, dubnícke opálové bane
  - good potential – Bardejov
  - excellent potential – Prešov
- spa and health tourism
  - basic potential – Lipovce, Cigeľka, Šarišský Štiavnik
  - excellent potential – Bardejovské kúpele,
- winter tourism and winter sports
  - basic potential – Zlatá Baňa, Makovica – Nižná Polianka, Šarbov
  - average potential – Dubovica – Žliabky , Renčišov – Búče,
  - good potential – Drienica – Lysá, Bardejov, Regetovka – Stebnícka Huta,
- summer tourism and waterside stays
  - basic potential – oblasť Čergova, Zlatá Baňa
  - average potential – oblasť Slanských vrchov, oblasť Búsova
- rural tourism and agrotourism
  - basic potential – Lačnov, Olejníkov, Šindliar, Lipovce, oblasť Čergova (Stebnícka Huta, Regetovka, Nižná Polianka, Kríže, Cigeľka, Hertník, Osikov, Raslavice, Zlaté)
  - average potential – Renčišov, Lužany pri Topli, okolie Svidníka
  - good potential – oblasť Slanských vrchov

Nowadays this is a region with relatively slight, although above-average utilization of capacities, mainly due to Bardejov Spa. The area of the town of Lipany appears potentially to be a highly suitable territory where tourism should be developed on the basis of thermal ground water from a newly discovered borehole. With its capacity and other characteristics, this predestines the locality for intensive utilization in tourism. The remaining part of the region is beginning to use its potential for tourism only gradually. Historical monuments of international importance are slightly utilized in the region's tourism.

UPPER ZEMPLÍN REGION

The Upper Zemplín Region, on the basis of the evaluation in the regionalization of tourism in the medium-term horizon is of regional, and in the long-term horizon of supraregional importance. In the territory of the County, it is formed by Stropkov, Medzilaborce, Snina, Humenné and Vranov nad Topľou Districts. In the medium-term horizon, certain subregions should be developed in the region, in particular the recreational area of Domaša Reservoir (national importance), the area of Snina Fishpools and the adjacent parts of the Vihorlat range, and the area of the prepared theme park Bird Valley (Vtáčie údolie) near Humenné.

Main types of tourism

- strong domestic tourism
- significant proportion of foreign tourism
- long-term stay tourism only during the summer season
- short-term stay tourism
- intensive one day visit rate

Forms of tourism

- summer waterside stays
- cognitive tourism
- summer stays in forest – mountain environments
- theme park visits
- shopping tourism
- Activities with the highest long-term potential
- water sports
- stays in forest – mountain environments with hiking
- cognitive stays, or tours
- cognitive tourism
- Significant localities
- urban type – Humenné, Medzilaborce (the Warhol Family Museum)
- localities with cultural heritage – Hanušovce nad Topľou, wooden churches
- recreational areas – the Lower Beskyds, the BukovskéHills, the Poloniny National Park, the Vihorlat range, Domaša Reservoir
- tourism units – Poľany, Holčíkovce, Kelča, Valkov, Dobrá, Danová, Snina Fish-pools, Ptičie, Chlmec

Localities within the region suitable for individual forms of tourism, on the basis of their level of potential:

- town and culture tourism
  - basic potential - Humenné, Medzilaborce, Ulič, Nová Sedlica

- average potential – Svidník,

- spa and health tourism
  - basic potential – Vranov nad Topľou, okolie Humenného,
- winter tourism and winter sports
  - basic potential – Driečna, Petrovce, Zamutov, Borov, Parihuzovce, Chlmec
  - average potential – zimné stredisko Biele kamene pri Sninských rybníkoch (katastre Snina, Zemplínske Hámre, Kolonica, Stakčín), Danová - Vydraň
- summer tourism and waterside stays
  - basic potential – Nižný Hrušov, Kamienka, Kamenica nad Cirochou, Slovenská Volová, Brestov
  - average potential – oblasť Vihorlatu (Chlmec–Porúbka, Zemlínske Hámre) a Bukovských vrchov,
  - good potential – obce v okolí vodnej nádrže Domaša, Sninské rybníky,
- rural tourism and agrotourism
  - basic potential – okolie Medzilaboriec (Miková, Borov, Oľka) a Stropkova (Šandal, Havaj), Vranov nad Topľou (Zamutov, Banské, Juskova Voľa, Hermanovce), Nižná Sitnica, Kamienka, Kamenica nad Cirochou
  - average potential – oblasť Vihorlatu a Bukovských vrchov, Holčíkovce

Nowadays, this region is only minimally used for tourism. The capacities are limited in extent and are also very lightly utilized. Domaša Reservoir needs intensive modernization of its amenities. The intention of the theme park (the biggest one in Central Europe) near Humenné (Ptičie, Chlmec) may be an incentive for the region. Furthermore, it is possible to utilize the intactness of the forest stands and quiet localities. Regarding climatic conditions, it is possible in suitable terrains to operate smaller and medium-sized ski areas, which can be attractive after arranging contacts with Poland. In this region, although it is the most distant from the crucial markets, it is possible to develop tourism attracting visitors from other parts of Slovakia and adjacent foreign countries. It is so far not possible to estimate the importance of the theme park, but it has the potential to become crucial in the region.

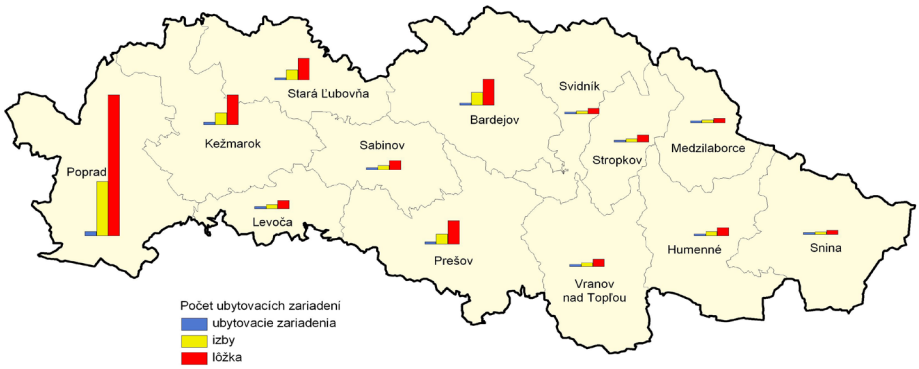
IMPLEMENTATION PRECONDITIONS FOR TOURISM

The group of implementation preconditions which basically indicate what each territory's facilities for tourism are like, and are the means by which tourism in the territory is carried out, is a large and very important group of preconditions. Communication factors (the texture and structure of the communication network, traffic availability) and the material and technical basis of tourism (accommodation, catering and amusements, traffic facilities, services) belong in this group. Accommodation facilities, which can keep a customer in the territory, are definitely the focal point of the material and technical basis.

In Prešov County, out of 464 accommodation facilities, there were 178 hotels, motels and guest-houses, 49 boarding houses, 8 chalet settlements, 110 other collective accommodation facilities (camping-sites and others) and 119 accommodation facilities in private houses towards the end of 2006. The visitors had 9,677 rooms available with 25,773 beds (including supplementary ones). This capacity serving for tourism represented 20.6% of the overall accommodation capacity of the Slovak Republic. The Poprad District has

dominant position, and is followed at a considerable distance by the Kežmarok, Bardejov, Prešov and Stará Ľubovňa Districts. The other districts have relatively small capacities of accommodation facilities.

Map 1: *Accommodation capacities in the Prešov County districts in 2006*



Source: Tourism in Prešov Region, the Statistical Office of the Slovak Republic, 2007

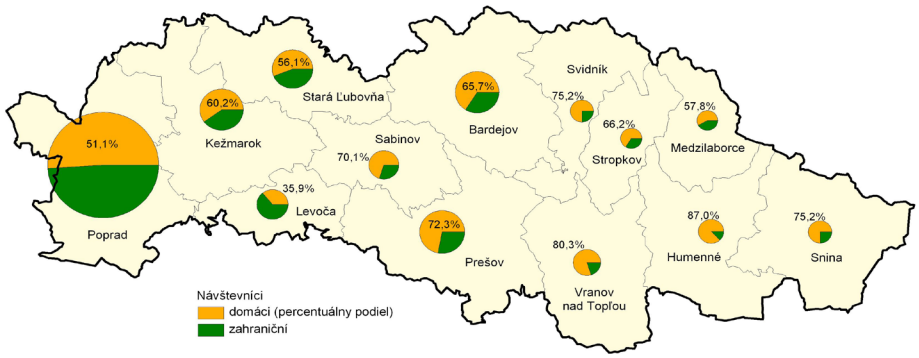
The visit rate is derived from the accommodation possibilities, the level of provided services and the individual regions' attractiveness. Prešov County, as the second biggest in Slovakia in terms of area, provided accommodation to 647 000 guests, which makes 18.1% of the overall number of users of accommodation facilities in the Slovak Republic.

According to the classification of visitors into domestic and foreign, the Slovaks participated in the visit rate of Prešov County accommodation facilities with 55.7% (361 000 visitors) and foreigners with 44.3%, which represents 286 000 visitors.

Thanks to the High Tatras Region, the most visitors came to the Poprad District, namely 64.4% out of the overall number of the County's visitors. This district is followed at a considerable distance by the Prešov District (7.7%), Bardejov District (7.1%) and Kežmarok District with a 6.9% proportion on the county visit rate.

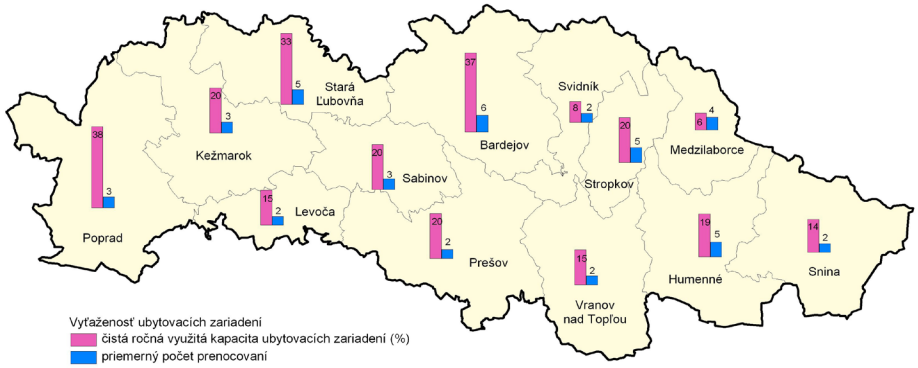
For spa tourism in Prešov County, the most visitors came to the Bardejov District (25 200), Poprad District (20 700) and Stará Ľubovňa District (14 700). The visitors stayed the longest in the Bardejov District, where the average length of stay was 9 days, which is connected with the particularities of healing spa stays, especially the procedure length.

Map 2: *Proportion of domestic and foreign visitors in the Prešov County districts in 2006*



Source: Tourism in Prešov County, the Statistical Office of the Slovak Republic, 2007

Map 3: *Accommodation facilities utilization in the Prešov County districts in 2006*



Source: Tourism in Prešov County, the Statistical Office of the Slovak Republic, 2007

The accommodation facilities utilization in tourism is problematic. Prešov County with its 31.2% value of the annual accommodation capacity utilization ranks above the average level for the Slovak Republic. However, this position is only guaranteed by the Poprad, Bardejov and Stará Ľubovňa Districts. The other districts rank deeply below the average for Prešov County, but also for Slovakia as a whole. The utilization of accommodation capacities itself indicates that it is not necessarily vital to further increase accommodation capacities. The main thing will be mainly to increase the quality of services in the already existing facilities together with the offer of new activities that are attractive to visitors. Another important aspect is seasonality. It is necessary to place emphasis particularly on the yearly visit rate. Seasonal centres will have to develop new activities to attract visitors also in those parts of the year when they are markedly more weakly utilized.

Another evaluation criterion of the tourism development level are sales from accommodation. In 2006, their volume in the County reached 1 150 800 000Slovak

crowns, which represents 16.5% out of all-Slovakian sales. The proportion of the domestic visitors sales in the county represented 45.9%, which, at a nominal value, represents 528 700 000 Slovak crowns. Foreign visitors participated with 54.1%, which is 622 100 000 Slovak crowns. From the individual County districts, the Poprad District (809 200 000 Slovak crowns), Bardejov District (91 000 000 Slovak crowns) and Kežmarok District (72 700 000 Slovak crowns) reached the highest sales from accommodation.

The average price of accommodation in the County came to 508 Slovak crowns and was lower by 119 Slovak crowns than the all-Slovakian average. The highest average price of accommodation of 579 Slovak crowns was paid by visitors in the Poprad and Levoča Districts.

The composition of the County's visitors according to the country of permanent address points to the highest visit rate from the Czech Republic, Poland and Hungary, and of the non-European countries from South Korea, the USA and Canada. The longest stay in days on average was made by visitors from Belorussia, Liechtenstein and Turkey.

Tab.3: *Main characteristics of accommodation facilities in the Prešov County districts in 2006*

	number of accommodation facilities	number of rooms	number of beds	number of visitors altogether	domestic	foreign	net capacity utilization	average number of overnight stays altogether
Bardejov	29	1014	2266	45620	29961	15659	36,8	6,1
Humenné	9	233	592	5891	5127	764	19,1	4,7
Kežmarok	76	945	2659	44932	27050	17882	20,1	3,1
Levoča	19	219	597	15100	5416	9684	14,7	2,1
Medzilaborce	4	88	243	1442	833	609	6,1	3,5
Poprad	221	4959	13182	416589	212852	203737	37,9	3,4
Prešov	26	739	2039	49927	36085	13842	20,3	2,2
Sabinov	11	212	707	12989	9105	3884	19,5	3,3
Snina	6	79	235	3755	2824	931	14	2,4
Stará Ľubovňa	35	789	1894	36693	20574	16119	33	5,1
Stropkov	9	136	483	1876	1242	634	20,2	4,7
Svidník	4	88	356	3442	2589	853	7,7	2,3
Vranov nad Topľou	15	176	520	8812	7074	1738	15,1	2,3
Prešov County	464	9677	25773	647068	360732	286336	31,2	3,5
Slovak Republic	2490	48173	124323	3583879	1972071	1611808	28,8	3,1

Source: Tourism in Prešov County, the Statistical Office of the Slovak Republic, 2007

CONCLUSION

Tourism has become the strongest economic branch in the world and also belongs among the quickest growing branches. Tourism development is influenced by many factors, the most influential of which are income and standard of living, holiday leave and free time, the development of traffic and communication systems, increase in population and urbanization levels, and the state and development of the material and technical basis of tourism. Tourism development is to a considerable extent also influenced by the existence of recreational and cultural potential.

According to the documents Concept of Tourism Development in Slovakia and National Programme of Tourism Development in the Slovak Republic, the development of supply in tourism must be carried out at two levels – central and regional. The objective of the centre is to support those forms and products of tourism which are preferred in terms of the country's foreign visit rate support. However, the product of tourism has, in the first place, regional character. The objective of the regions will be to develop those products which they have the best conditions for supplying and selling.

The principal forms of tourism for which Slovakia together with Prešov County has the best preconditions and which, in the course of the coming years, need to be supported, developed and improved in preference, are (Uznesenie vlády, 2005a):

- urban and cultural tourism
- spa and health tourism
- winter tourism and winter sports
- summer tourism and waterside stays
- rural tourism and agrotourism

Subsequent to the National Programme of Tourism Development in the Slovak Republic, in the years 2002-2003, a new form of the Regionalization of Tourism in the Slovak Republic was compiled as an indicative and supporting document which reclassified the territory of Slovakia in terms of tourism potential into 21 areas, and which also suggests the most productive forms and types of tourism.

On the basis of the above-mentioned, the categorization of regions into four groups according to the territory's potential for tourism was compiled (P. Weiss et all, 2005):

1st category – regions of international importance

2nd category – regions of national importance

3rd category – regions of supraregional importance

4th category – regions of prevailing importance at regional level

Regarding the fact that the existing state in created conditions for tourism leaves space for possibilities of significant changes, especially in the long-term horizon, there were also formed two time horizons of evaluation – medium-term and long-term (P. Weiss et all, 2005).

Based upon this evaluation, Prešov County was divided into four regions, namely the Tatra Region, the Saris Region, the Upper Zemplin Region and Spis Region, although the latter is as yet, in the area of the County, represented only by the towns of Levoca and Spisske Podhradie with their immediate environs.

The Tatra Region, on the basis of the evaluation in the regionalization of tourism in the medium-term as well as long-term horizons, is of international importance, and is the most important from among all the regions of tourism in Prešov County. The Spiš Region, on the basis of this evaluation in the medium-term horizon is of supraregional, and in the long-term horizon even of international importance. However, it is necessary to recall that only a small part of this region is situated in Prešov County. The Šariš Region, on the basis of the evaluation in the regionalization of tourism in the medium-term as well as long-term horizons, is of national importance. The Upper Zemplín Region, on the basis of the above mentioned evaluation in the medium-term horizon is of regional, and in the long-term horizon of supraregional importance. All the four regions therefore have advantageous conditions in terms of the potential for tourism. The main factors which distinguish the

regions from each other are implementation preconditions for tourism represented by communication provisions and the presence of the necessary material and technical basis of tourism (especially the offered range and quality of services).

The Poprad District has the dominant position in the availability of accommodation facilities, followed at a considerble distance by the Kežmarok, Bardejov, Prešov and Stará Ľubovňa Districts. The other districts have relatively small capacities of accommodation facilities. The visit rate is derived from the accommodation possibilities, the standard of provided services and the individual regions' attractiveness. Prešov County, as the second biggest in Slovakia in terms of area, provided accommodation to 18.1% out of the overall number of visiting users of accommodation facilities in the Slovak Republic.

According to the classification of visitors into domestic and foreign, the Slovaks participated in the visit rate of Prešov County accommodation facilities with 55.7% (361 000 visitors) and foreigners with 44.3%, which represents 286 000 visitors.

Thanks to the High Tatras Region, the most visitors came to the Poprad District, namely 64.4% out of the overall number of the County's visitors. After this, at a considerable distance, followed the Prešov District (7.7%), Bardejov District (7.1%) and Kežmarok District with a 6.9% proportion of the County's visit rate.

For spa tourism in Prešov County, the most visitors came to the Bardejov District (25 200), Poprad District (20 700) and Stará Ľubovňa District (14 700). The visitors stayed the longest in the Bardejov District, where the average length of stay came to 9 days, which is connected with the particularities of healing spa stays (mainly the procedure length).

The utilization of accommodation facilities in tourism is problematic. Prešov County with its 31.2% value of the annual accommodation capacity utilization ranks above the average level of the Slovak Republic. However, this position is only guaranteed by the Poprad, Bardejov and Stará Ľubovňa Districts. The other districts rank far below the average for Prešov County, but also for Slovakia as a whole.

The composition of the County's visitors according to the country of permanent address points to the highest visit rate from the Czech Republic, Poland and Hungary, and of the non-European countries from South Korea, the USA and Canada. The longest stay in days on average was made by visitors from Belorussia, Liechtenstein and Turkey.

In conclusion we can state that Prešov County with its potential belongs among the leading regions of the Slovak Republic. The utilization of this potential is regionally strongly differentiated at the level of Prešov County. The best developed districts are Poprad, Stará Ľubovňa, Bardejov, partly Prešov, Kežmarok and Levoča. However, the eastern part of the county in the first place lags markedly behind the above-mentioned districts.

This report originated from research done on the scientific project VEGA No. 1/0210/08 "The specific position of the East Slovakian Region in the context of regional disparities in the Slovak Republic" at the Department of Geography and Regional Development of the Faculty of Humanities and Natural Sciences, University of Prešov.

References

ČUKA, P. (1992): Postavenie rekreačných stredísk Starohorskej doliny v závislosti na ponuke rekreačných možností. In: Zborník vedeckovýskumných prác. Séria prírodovedná . Odbor chémia, biológia, geografia č.1. Acta Universitatis Mathei Belii, Banská Bystrica, s. 124 - 149.

ČUKA, P. (2006): Priestorová dynamika infra a suprafraątruktúry cestovného ruchu. štúdia vybraných miest v Stredoslovenskom regióne.In.: Folia Geographica 10, Prešov, 90 - 98

ČUKA, P. (2008): Shaping of development trends of tourist traffic in Banská Bystrica and its recreational background out of geographic tourist tarfficand movement wiew, IN: ETHNE. MIĘDZYNARODOWE STUDIA SPOŁECZNO-HUMANISTYCZNE 1/2008, WARSZAWA , P.229-239, ISSN 1898-8431.

FOGAŠ, A. (2006): Horný Šariš, Krásy Slovenska, 3-4, roč.83, s. 10-21, MK SR 14/02 ISSN 0323-0643

FOGAŠ, A. (2008): Horný Zemplín, Krásy Slovenska, 3-4, roč. 85, s. 10-13, MK SR 14/02 ISSN 0323-0643

IVANIČKA, K., (1983): Základy teórie a metodológie socioekonomickej geografie, SPN, Bratislava

KACZMAREK,J., STASIAK, A., WLODARCZYK,A. (2005): Produkt turystyczny. PWE, Warszawa, 389 s

KOPŠO, E. A KOL., (1992): Geografia cestovného ruchu, 1. vyd., SPN, Bratislava

MARIOT, P. (1969): Príspevok k metóde výskumu potencie krajiny z hľadiska cestovného ruchu, Geografický časopis, Bratislava, ročník 21, č. 1, s. 57 - 73

MARIOT, P. (1971): Funkčné hodnotenie predpokladov cestovného ruchu ako podklad pre vytvorenie priestorového modelu cestovného ruchu, Geografický časopis, Bratislava, ročník 23, č. 3, s. 242 – 253

MARIOT, P. (1973): Metodické aspekty funkčno-chorologického hodnotenia lokalizačných predpokladov cestovného ruchu, Geografický časopis, Bratislava, ročník 25, č.1, s. 27 – 43

MARIOT, P. (1974): Metodické hľadiská hodnotenia realizačných predpokladov cestovného ruchu, Geografický časopis, Bratislava, ročník 26, č. 4, s. 313 - 333

MARIOT, P. (1983): Geografia cestovného ruchu, Veda, Bratislava

MIKA, M., FARACIK, R. (2008): Second homes as a factor of the transformation of rural areas in the Polish Carpathians. Folia Geographica 12, Prešov, 245-256, ISSN 1336-6157

OTRUBOVÁ, E. (1990): Socioekonomická geografia II., Vysokoškolské skriptá PF UK, Bratislava

ŠTATISTICKÝ MATERIÁL, Cestovný ruch v Prešovskom kraji, Štatistický úrad Slovenskej republiky, 2007

UZNESENIE VLÁDY, (2005a): Koncepcia rozvoja cestovného ruchu Slovenskej republiky schválená uznesením vlády SR č. 923 zo dňa 23.novembra 2005, Bratislava

UZNESENIE VLÁDY, (2005b): Stratégia rozvoja cestovného ruchu Slovenskej republiky do roku 2013 schválená uznesením vlády SR č. 632 zo dňa 24. augusta 2005, Bratislava, s. 41

WEISS, P., JANKOVIČOVÁ, M., KURČOVÁ, E., KOSTOVSKÝ, D., VANÍČEK, M., (2005): Regionalizácia cestovného ruchu v Slovenskej republike, vydalo Ministerstvo hospodárstva SR, odbor cestovného ruchu, Bratislava, s. 114
WINIARSKI, R. (2008): Turystyka w naukach humanistycznych. PWN Warszawa 175 s

Recenzovali: Prof. RNDr. Viliam Lauko, CSc.
Doc. RNDr. Peter Čuka, PhD.

WINTER WHEAT GROWING POTENTIAL IN SLOVAK RURAL LANDSCAPE

(Triticum aestivum L.)

***Jozef VILČEK*[1]**

Abstract: *By computing techniques development, particularly by application of Geographic Information Systems was today enabled that based on existing soil databases as well as innovated databases on soil characteristics it is possible to quantify and mark off categories of soil suitability important for crop growing. The aim of this paper was to show just such methods on winter wheat (Triticum aestivum L.) example.*

The work objective is to differentiate rural landscape of Slovakia with aspect to the possibility of effective winter wheat growing. The differentiation is based on pedo-climatic and production economic parameters. At soil categorization correlation relationships between the site properties (soil and climatic conditions) and these crop biological and agrotechnical requirement has been considered. Wheat requirement was elaborated in yield databases using the software filters so the given site property either excluded wheat growing or limited it; this was reflected in predicted production height. The prediction was subsequently interpolated into four suitability categories: soils not suitable for wheat growing, less suitable soils, suitable soils, and very suitable soils.

The database was formed subsequently and each of the Bonity Pedo-Ecological Unit (BPEU) was added in it as well as particular category of suitability for wheat growing. By mediation of the Geographic Information System on BPEU distribution in Slovakia the Map of Soil Suitability Categories Distribution for wheat growing was also generated. There is 29% of farmland very suitable for wheat growing, 25% suitable, 9% less suitable and 37% non suitable soils for wheat growing by our calculation in Slovakia. From potentially arable soils, proportion of the regions according to suitability of winter wheat growing is 42% very suitable, 37% suitable, 14% less suitable and 7% non suitable. These categories are in the paper characterized in details and specified from the view of geographic, soil, climatic, production, economic and energetic parameters, respectively.

Key words: *winter wheat; winter wheat growing soil suitability, agricultural landscape categorization*

INTRODUCTION

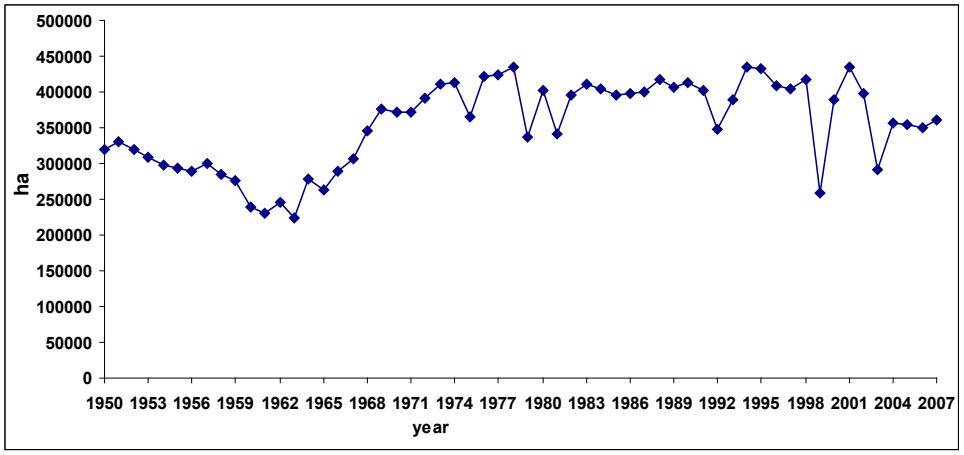
Wheat belongs among the oldest traditional agricultural crop-plants. According to the well-preserved records predecessor of present wheat was grown in the 8th to 10th millenium BC in Asia Minor and Southwest Asia. It has been grown since the 5th century AD in our region. Summer wheat, winter sort is the widest spread agricultural crop-plant in

1 **Prof. Ing. Jozef Vilček, PhD.,**
Soil Science and Conservation Research Institute, Raymanova 1, 080 01 Prešov, Slovak Republic, Department of Geography and Regional Development, University of Prešov, ul. 17. novembra 1, 081 16 Prešov, e-mail: j.vilcek@vupop.sk

Slovakia at present. It is grown at the acreage of 365 000 hectares in the average of the last years. It is grown practically in all regions from lowlands to mountain areas. The success of its growing depends, similarly to other crops, mainly on climatic and soil conditions of the countryside. These factors influence in the critical way productive and economic presumptions of this crop. It is sown at 30 thousand hectares in Levice and Nové Zámky district, at over 20 thosand hectares in Komárno and Dunajská Streda district, and over10 thousand hectares in Nitra, Trnava, Košice, Galanta, Trebišov, Michalovce and Rimavská Sobota districts. The smallest areas of this crop are in Kysucké Nové Mesto district (less than 100 hectares).

During last 55 years the biggest amount of wheat was grown in 1994 (435 thousand hectares) and the least amount in 1963 (224 thousand hectares).

Fig. 1 *Development of winter wheat area sown in Slovak Republic (1950-2007)*

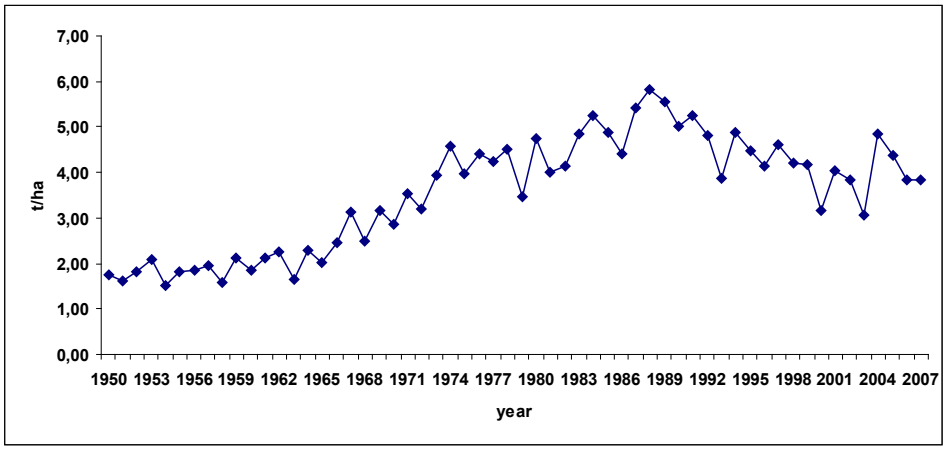


Source: Statistical Office of the Slovak Republic

Attained winter wheat yields are at the level of 4.03 tons per hectare in averages during the last ten years. The highest yields (over 5 tons per hectare) are in Piešťany, Topoľčany and Partizánske districts. Average over 4.5 tons per hectare is noticed in Nitra, Trnava, Bánovce nad Bebravou, Dunajská Streda and Šaľa districts. Long-termed low yields (in average under 2 tons per hectare) are in Medzilaborce and Svidník districts.

During last 55 years the highest winter wheat was in 1988 (5.81 tons per hectare) and the lowest in 1954 (1.51 tons per hectare).

Fig. 2 *Development of winter wheat hectare yields in Slovak Republic (1950-2007)*



Source: Statistical Office of the Slovak Republic

Recently, development of information technologies, especially Geographic Information Systems, enables processing of existing and innovated soil databases and more precise quantification and area division of soil suitability categories for crop growing,. The aim of this paper is to show such methods for winter wheat as an example.

MATERIALS AND METHODS

For outlining the regions of soil suitability for winter wheat growing, the bases for us were the crop exact and potential data. Because growing suitability is predominantly judged on the basis of really reached production, this factor played decisive role at the categories formation. Particular data of yields and winter wheat growing economics in Slovakia were obtained for period 1990 to 2000 directly from the farms. Data of 281 agricultural subjects were assessed. They have been farming in various natural conditions on total area exceeding 556 thousand hectares of farmland, which is approximately 23% of total acreage of farmland in Slovakia.

Both production and economic parameters of successful winter wheat growing are directly connected with pedo-climatic conditions. Data of Slovak climatic regions were analyzed and applied, as well as data of sloping, stoniness, soil depth, soil types and subtypes, soil point values and typological-production soil categories. These data were obtained from the Appraisal Information Database of the Soil science and Conservation Research Institute Bratislava, by mediation of the Bonited Pedo-Ecological Unit (BPEU) planar presentation.

The dependence of studied indicators on soil production potential in analyzed farms (expressed by average point value in 100-point scale) was tested by non-linear polynomial regression analysis. Subsequently, potentially possible yield of winter wheat, its share in cropping system as well as potential economical parameters (yields, costs, profit, or loss) were calculated using the regression equations for each of the BPEU and added to database. Soil rate of suitability for winter wheat growing was differentiated and qualified using the Geographic Information System ARC INFO, based on vector bonity maps (scale

1:5000) and area distribution of studied factors. All economic indices used in the work were calculated without government subsidy.

Used background:

- Soil Science and Conservation Research Institute database of Bonited Pedo-Ecological Unit (BPEU) data and their point evaluation in 100 point scale (Džatko, 2002),
- soil categorization by their allegiance to climatic region, sloping category, texture and stoniness (Linkeš et al., 1997),
- typological-production farmland categorization (Džatko, 2002) and database of production and economical parameters by the BPEU (Vilček, 1999),
- real winter wheat yields, their economic parameters (receipts, yields and costs) and real cropping system structure of arable land,
- energetic equivalents for winter wheat growing energy production, calculated by the methodology of authors Strašil (1987) and Preininger (1987).

The following codes for the evaluating parameters were chosen:

Soil-climatic regions: *00 - very warm, very dry, plainly, 01 - warm, very dry, plainly, 02 - sufficiently warm, dry, hilly, 03 - warm, very dry, plainly, continental, 04 - warm, very dry, basin-like, continental, 05 - relatively warm, dry, basin-like, continental, 06 - relatively warm, moderately dry, highland-like, continental, 07 - moderately warm, moderately moist, 08 - moderately cold, moderately moist, 09 - cold, moist, 10 - very cold, moist.*

Typological-productivity categories of soils*: O1 – the most productive arable soils, O2 - highly productive arable soils, O3 - very productive arable soils, O4 - productive arable soils, O5 - medium productive arable soils, O6 - less productive arable soils, O7 - low productive arable soils, OT1 - medium productive arable soils and very productive grassland, OT2 - medium productive arable soils and medium productive grassland, OT3 - low productive arable soils and less productive grassland.*

RESULTS AND DISCUSSION

Productive potential of our soils for winter wheat growing is used only at 75.6% nowadays. There are significant reserves in the correct placement of this crop according to the most suitable conditions for its growing. It is logical that winter wheat growing successfulness is influenced by many other factors, which varies in space and time. To detach suitable zones there is a problem to respect for e.g. recent soil reaction (pH). It is well known, that the optimal soil reaction for wheat is 6.6–7.2. It is not recommended to grow wheat withtout lime treatment when pH reaction is lower than 5.5. Genetically acid soils are intergrated among the less suitable categories for wheat growing.

The similar approach is used for typing light soils. Wheat demands concerning soil-climatic factors result from its superficial root system (most part of roots occurs in the depth to 0.25 m). Regarding to the moisture needs, light, easy dried soils are not suitable for its growing.

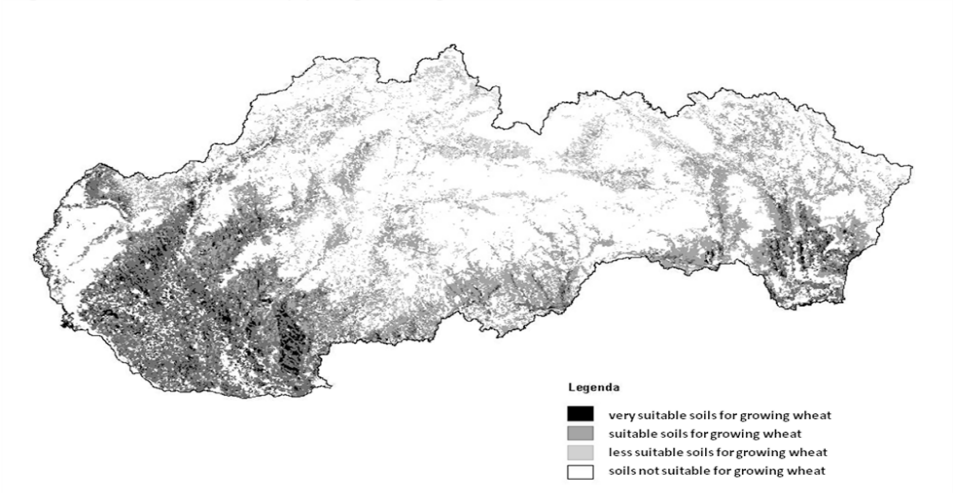
Analyzing the individual soil parameters in regard to wheat productive ability it can be followed that in mild slopes (to 7°) cropable potential is reduced in comparison to plain lands in 9.2% and in middle slopes even in 13.5%. There is an assumption that

middle eroded soils yields are decreased in 16.4%, strongly eroded soils in 20.4% and very strongly eroded soils even in 26.8%. There is a significant decrease of wheat production due to deteriorating climatic conditions. For example, in a very cold moist climatic region the wheat crop potential is lower in 32.0% in comparison to a very warm and very dry region. If the soil quality would be expressed using 100-point scale (100 points the most –productive Mollic Fluvisols), it can be stated that zero value of wheat growing profitability is at the soil value 18.53 points.

The economical effectivity analysis of wheat growing according to the soil representants shows at present that it is possible to produce 165 € profit from one hectare of this crop in Chernozems, in Mollic Fluvisols 145 €, in Fluvisol**s** and Calcic Luvisols it is 117 € , Albic Luvisols 78 €, Distric Planosols 55 €, Cambisols 48 €..

On the basis of available pedological facts and databasis four regions suitable for wheat growing were determinated by the inductive method. Spacial dislocation of this regions is presented in the following picture.

Fig. 3 *Farm suitability for growing winter wheat*



Source: author

RURAL COUNTRY CHARACTERISTICS WITH REGARDS TO WINTER WHEAT GROWING SUITABILITY

Region of very suitable soils

This region covers about 28.7% of all agricultural soils.It represents about 42% of potentially arable soils. There are soils in Podunajská lowland, Chvojnická highlands and Východoslovenská plain. According to the soil types there are chernozems, mollic fluvisols, brown earth, and fluvisols, which are medium heavy, deep and without soil skeleton. They can be found in warm to the very warm, dry to the very dry climatic region with continental type of weather.

Highly productive to productive arable soils were included into this region (soil point value 63-100 points),which winter wheat production potential is higher than 5.03 tons

per hectare and presumption of wheat seeding on the arable soil presents 21.7–32.3%. According to the typological-production soil categorization there are first four productive soils categories (O1–O4). It is possible to reach profit over 93 € per hectare and profitability rate higher than 25% by growing wheat. Bioenergy which is produced by photosynthesis and occurs in wheat grain reaches value equal to 80–96 GJ per hectare.

Region of suitable soils

This region covers about 25.4% of agricultural soils in Slovakia. It represents about 37% of potentially arable soils. Geografically it is presented by Chvojnická highlands, Myjavská highlands, north-eastern part of Podunajskej highlands, Juhoslovenská fold, Hornonitrianska fold, Košická fold, Východoslovenská highlands and Ondavská uplands. Dominant soil types there are fluvisols, brown earth, cambisols, pseudogleys and medium heavy regosols. Soil point value occurs in the range 33-62 points. There are mostly soils medium heavy to the heavy, without soil skeleton to the slightly skeletal, deep, situated in the plains to the slight slopes. This area is represented by the climatic regions 00 to the 07 (very warm and very dry to the mild warm and mild humid), the region 05 with quite warm and dry weather is the largest.

Winter wheat production potential presents 4.04–5.00 tons per hectare, and concerning the seeding structure in the arable soil it presents 10.6–31.6%. According to the Slovak typological-production soil categorization there are included very productive arable soils to the little productive fields (O3 to OT3). It is possible to reach profit 63-93 € per hectare and profitability rate 20- 25% by growing wheat. Bioenergy which is produced by photosynthesis and occurs in wheat grain reaches value equal to 65 - 80 GJ per hectare.

Region of less suitable soils

This region covers about 9.2% of agricultural soils and 14% of potentially arable soils in Slovakia.There are marginal parts of Turčianska fold, Ždiar fold, Žilina fold, Podbeskydská highlands, Oravská fold, Liptovská fold, Popradská fold, Hornádska fold and Spišsko-Šarišské intermontane. Cambisols predominate there as soil representant and mostly stagnicambisols. There is a significant occurence of pseudogleys and rendzina. Soil point value occurs in the range 18-32 points There are soils medium heavy to the heavy, mostly medium deep, medium in the less and more steep slopes. Absolutelly dominant are the climatic regions 07 up to 10 (mild warm and mild humid to very cold and humid), which take 87% of the category.

Winter wheat yields per hectare reach 3.44–4.00 ton per hectare. According to the Slovak typological-production soil categorization there are included medium productive arable soils to little productive fields (O5 to OT3), where supposed profit is to 63 € per hectare and profitability rate is to 20% by growing wheat. Bioenergy which is produced by photosynthesis and occurs in wheat grain reaches value equal to 55 - 65 GJ per hectare.

Region of non suitable soils

Soils which are non suitable for winter wheat growing take about 36.7% of agricultural soils and 7% potentially arable soils in Slovakia. They occur mostly in the northern and middle part of Slovakia. Regarding pedological point of view there is a great variety of soil types, light, extremely heavy, acid, sloppy with unfavourable physical and chemical

characteristics. Cambizems, rendzina, fluvisols and gleys are predominant soil types here. In term of granularity, medium heavy, strongly skeletal, shallow soils occuring in steep and very steep hills are predominant. Similarly to the previous region, climatic regions 07 to 10 are absolutelly dominant.

Winter wheat yields per hectare does not reach 3.44 tons per hectare in the long term, so it should not occur in seeding structure. These soils are mostly suitablefor permanent grass overgrow (typological-production soil categorization OT and T). Point value of the soil usually does not reach 18 points. Regarding economic point of view winter wheat growing is lossy there.

CONCLUSIONS

In the paper presented soil categorization for winter wheat growing suitability brings more detailed analysis of the territory pedo-climatic conditions (based on BPEJ basic mapping unit) and it associates economical and energetic aspects of the crop growing. Substantial is that the system enables possible detailed area identification of given category for any region of Slovakia by GIS help. It is obvious that in territory identified by this method, further analysis is possible by using other supplementary parameters. Thus, the method is an open system that does not identify sharp borders of each category, but it creates them more or less mosaic-like based on particular conditions of the crop and site, respectively.

This work has been carried out within the project APVV 27-036602 "Information system about exploatation of agricultural landscape potential to support of region development" and the project VEGA 1/4366/07 "Pedogeographical aspects of multicultural use of agricultural landscapet.

References

HRAŠKO, J., BEDRNA, Z. (1988): Aplikované pôdoznalectvo. Bratislava, Príroda, 1988, 474 s. ISBN 064-170-88.

DŽATKO, M. (1980): Vypracovanie sústav členenia a hodnotenia agroekosystémov SSR (záver. správa). Bratislava : VÚPVR, 1980, 39 s.

DŽATKO, M. (2002): Hodnotenie produkčného potenciálu poľnohospodárskych pôd a pôdno-ekologických regiónov Slovenska. Bratislava, VÚPOP, 2002, 88 s. ISBN 80-85361-94-9.

KORBÍNI, J., FACUNA, J. (1978): Zóny vhodnosti pestovania hlavných poľnohospodárskych plodín v SSR. Bratislava, Príroda, 1978, 111 s. ISBN 64-223-78.

LINKEŠ, V., PESTÚN, V., DŽATKO, M. (1996): Príručka pre používanie máp bonitovaných pôdno-ekologických jednotiek. Bratislava, VÚPÚ, 1996, 43 s. ISBN 80-85361-19-1.

PREININGER, M. (1987): Energetické hodnocení výrobních procesů v rostlinné výrobě. In: Met. ÚVTIZ, vol. 87, 1987, v. 7, 29 s.

STRAŠIL, Z. (1987): Bilance energie a efektívnosti vkladů v zavlažovaných a nezavlažovaných ekosystémech půd (závěr. zpráva). Praha-Ruzyňe, VÚRV, 1987, 29s.

VILČEK, J., HALAS, J., SCHOLTZ, P., GUTTEKOVÁ, M. (2007): Poľnohospodárska pôda regiónov Slovenska v kocke; VÚPOP Bratislava, 386s., ISBN 978-80-89128-33-4.
VILČEK, J., BEDRNA, Z. (2007): Vhodnosť poľnohospodárskych pôd a krajiny Slovenska na pestovanie rastlín, VÚPOP, Bratislava 2007, 248 s., ISBN 978-80-89128-36-5.
VILČEK, J. (2001): Využívanie produkčného potenciálu našich pôd. In: Naše Pole, 2001, č. 5, s. 40-41.

POTENCIÁL AGRÁRNEJ KRAJINY SLOVENSKA NA PESTOVANIE PŠENICE LETNEJ FORMY OZIMNEJ

(Triticum aestivum L.*)*

Zhrnutie

Pri kategorizácii poľnohospodárskej krajiny podľa vhodnosti pre pestovanie pšenice letnej f. ozimnej sa zohľadňovali korelačné vzťahy medzi vlastnosťami stanovišťa (pôd, klímy) a biologickými i agrotechnickými požiadavkami tejto plodiny. Požiadavky pšenice boli zapracované pomocou softwarových filtrov tak, že daná vlastnosť stanovišťa buď pestovanie pšenice vylučovala, resp. ju obmedzovala, čo sa odrazilo na výške predpokladanej produkcie. Táto bola následne interpolovaná do štyroch oblasti vhodnosti pôdy pre pestovanie pšenice - pôdy nevhodné, málo vhodné, vhodné alebo veľmi vhodné. Následne bola vytvorená databáza, v ktorej každej bonitovanej pôdno-ekologickej jednotke (BPEJ) bola priradená konkrétna kategória vhodnosti pre pestovanie pšenice. Prostredníctvom geografického informačného systému o rozšírení BPEJ na Slovensku potom bolo možné vytvoriť aj mapu priestorového rozšírenia kategórii vhodnosti pôd pre pestovanie pšenice.

Z výsledkov vyplýva, že na Slovensku je 29 % poľnohospodárskych pôd pre pestovanie pšenice veľmi vhodných, 25 % vhodných, 9 % málo vhodných a 37 % nevhodných. Z potenciálne orateľných pôd zaberá oblasť pre pestovanie pšenice veľmi vhodná 42 %, vhodná 37 %, málo vhodná 14 % a nevhodná 7 %. Tieto oblasti sú v príspevku charakterizované z hľadiska pôdno-klimatických i produkčno-ekonomických parametrov.

Recenzovali: Prof. h. c. prof. Ing. Ondrej Hronec, CSc.
Prof. RNDr. Eva Michaeli, PhD.

ACTA FACULTATIS STUDIORUM HUMANITATIS ET NATURAE UNIVERSITATIS PREŠOVIENSIS, PRÍRODNÉ VEDY, XLIX.
FOLIA GEOGRAPHICA 14

SPECIAL ISSUE FOR THE 2TH EUGEO CONGRESS, BRATISLAVA 2009

FOLIA GEOGRAPHICA 14

Editor: RNDr. Radoslav Klamár, PhD.
Autor: kolektív
Za jazykovú stránku príspevkov zodpovedajú ich autori.
Náklad: 300 výtlačkov
Rozsah diela: 278 strán
AH: 17,81
Vydavateľ: Vydavateľstvo Prešovskej univerzity v Prešove
Vydanie: prvé, 2009
Formát: B5
Sadzba: Ing. Ladislav Nagy
Tlač: Grafotlač Prešov

ISSN 1336-6149 (Acta Facultatis Studiorum Humanitatis et Naturae Universitatis Prešoviensis, Prírodné vedy)
ISSN 1336-6157 (Folia Geographica)