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## Sustainable development of mountainous rural areas in Slovakia (with the case study of Poľana Biosphere Reserve)

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**Abstract:** *The paper looks first at the geographical conditions, specifically the economic, socio-cultural, demographic, and environmental, including local conditions as the vital factor underlying the course of transformation in mountainous rural areas.*

*Next, the paper considers the results of the case study from the Poľana Biosphere Reserve (BR) in Central Slovakia, which is an excellent model territory for studying man and nature relationships. Basic socio-demographic data on population of the BR are analysed and their relations to quality of life and sustainability are discussed. Selected aspects of sustainability and the life quality of population in the BR are studied in the analysis of recent situation using subjective estimates of local decision- and opinion-makers. The research (interview technique) is focused on the evaluation of perception of environmental and nature conservation problems, community's milieu, community development, and on the evaluation of the opinion about the community, regional sustainable development programmes and improvement of life quality. Finally, several conclusions important for future role of human factors in sustainable development of mountainous rural areas are presented as well as the list of the most important challenges for mountainous rural areas from the perspective of sustainable development.*

**Key words:** *mountainous rural areas, sustainable development, quality of life, the Poľana Biosphere Reserve (BR), human factor, management of rural areas*

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### Introduction

Mountain regions are of great importance within the European Union. About 20% of the utilised agricultural area is defined as mountain area and 27% of all farms are situated in the mountain areas. In Slovakia, mountain areas comprise about three fifth of the territory (Mazúr, Lukniš 1980). Mountain environments, occupying about one-fifth of the world's land surface area, are essential to the survival of the global ecosystem. They provide a direct life-support base for about one-tenth of humankind as well as goods and services to more than half the world's population. Mountain landscape is, however, heavily influenced by

local and global changes. The processes of globalisation, urbanisation and mass tourism are threatening mountain communities and the resources they depend on. Most mountain areas face increasing marginalization, economic decline and environmental degradation (Dax 2002). Integrated and sensible management of mountain resources and socio-economic development of the people deserves immediate action. Cultural landscapes in mountain regions develop and change over time as a result of the interaction of socio-economic, cultural and natural factors. Mountain regions constitute a fully integrated living and working space. Policies to safeguard environmental and cultural values should be implemented in sustainable rural development.

The changes of mountainous rural areas in Slovakia have accelerated in recent years. They are diversifying as a result of broader socio-economic factors, political transformation, and societal modernisation. Rural areas are no longer dominated by the agricultural sector. Agriculture is being restructured. Local socio-economic changes become part of the global processes of restructuring. New situation in mountainous rural areas, including marginalisation, has enabled these areas to be utilised in new sustainable ways (Ilbery 1998).

The essence and the principal meaning of the sustainability (or sustainable development) concept is the re-evaluation of the so far unilaterally and exclusively short-term oriented, therefore unsustainable, approaches to development, based on the idea of non-regulated production and consumption, or population growth. New approaches will have to be applied not only in the political, social, economic, legislative, environmental spheres, but also in the axiological and ethical spheres. They will have to be based on multidimensional, integrated, synthetic, holistic approaches. They will have to take into account the need for balance, co-existence, and complementarity among the environmental, economic and social dimensions of development. They will have to prefer *ex ante* prevention of the causes to the *ex post* removal of the consequences. Having said this, let us indicate that also some additional principles, on which the concept of sustainability is based, show an astonishing correlation to the basic attributes of the synthesizing, eventually integrative geographical, ecological (including human ecology and landscape ecology) approaches, as well as to approaches of other similar disciplines based on recognition that the nature and society represent in reality one system (Huba 2004).

As Miklós (1996) stated, the sustainable development concept implies the aspect of integrated approach to preserving the conditions and forms of life on the Earth. It is compatible with the opinion of Gould (1991) that the contemporary science needs a synthesis like never before.

Huba and Ira (1994) tried to summarise that the main characteristics of the sustainable development concept as a programme of building a harmony among the human beings as well as between mankind and nature, are, in particular: preference of prevention over therapy, preference of long-term (sustainable) approaches over short-term ones, search for and utilisation of naturally and anthro-

pologically stimulated auto-regulative and self-supporting mechanisms, preference of complexity over partial interests, not maximisation, but optimisation, efficiency growth in the energy and raw materials utilisation, as well as in the waste recycling, leading in general (together with other aims and requirements) to the continual transformation of developmental paradigm.

The aim of the paper is to analyse the mountainous rural space, creating new relationships and preconditions for future sustainable development in mountainous rural areas in Slovakia. The paper considers also the results of the case study from the mountainous rural area (Poľana Biosphere Reserve in Central Slovakia) analysing the role of human factor in sustainable development.

## Changing mountainous rural areas

### Natural landscape and environmental situation

It is possible to subdivide the mountainous landscape in Slovakia into two basic forms: the mountain ranges and/or plateaus on the one hand and intramontane basins, valleys and furrows on the other. The transition zone between the two mentioned basic types are the piedmont hilly-lands. These two types can be – from the geoecological point of view – further differentiated by climate, and according to the geological, hydrological, pedological, biological and other aspects (from warm basin landscape to very cool high mountains).

The most characteristic landscape type of the Slovak mountainous areas is the landscape with forests, eventually grassland-forest landscape, without permanent settlements or with scattered settlements, which represents about two thirds of all the territory of mountainous areas in Slovakia (Midriak 2005).

The second most frequent type of the mountainous landscape is agricultural, rural landscape, with moderate human impact upon the original natural environment (original forests mostly substituted by agro-ecosystems). This type of landscape represents about one fourth of mountainous areas in Slovakia. It is possible to subdivide it into subtypes with concentrated settlements, with dispersed settlements (both surrounded by arable land, grasslands and forests), and landscape outside the permanent settlements.

The third (the smallest) type of the mountainous landscape in Slovakia is slightly affected, unsettled or sporadically settled high mountain landscape of sub-alpine, alpine, glacial-alpine, glacial-klippen and/or glacial character (Mazúr and Krippel 1980).

From the environmental point of view, mountains belong to the more fragile landscape types, sensitive to different types of both natural and technical risks and hazards, as well as to the negative environmental impacts of different types.

Apart from the rural mountainous landscape located in the neighbourhood of industrial or mining areas, or along frequent communication routes, heavily

impacted by human activities and their negative side effects, the rural mountainous landscape suffers from soil destruction processes (mainly soil erosion), wind-storms and floods.

Characteristic feature of the changing mountainous rural area is a general extensification of the traditional economic activities, first of all related to agriculture, on the one hand, and the development of several new functions, first of all related to the tourism, on the other.

### Settlements and demographic situation

In the past, permanent settlement of the mountainous areas existed only in sites where minerals were mined or timber extracted and charcoal made. Only later, agriculture became the decisive breadwinning activity in these areas. The settlements situated in the most elevated positions slowly started to transform into recreation centres in the 19th century.

Mountainous and sub mountainous areas of Slovakia are generally characterized by a scarce settlement density while small settlements prevail (especially small towns). Distribution of settlements within mountain ranges also varies depending on relief. Generally, the settlements concentrate above all in large valleys or other depressions (basins or furrows).

A dispersed settlement consisting of hamlets or groups of houses is comparatively frequent in Slovakia. The genesis and functions of dispersed settlements, but also their location varies. Apart from the generally spread solitary settlements – hamlets and groups of houses (gamekeepers' lodges, mills, high-mountain cottages, etc.) there are areas with farming colonisation in farmyard form or solitary houses or their groups. Their origin dates to the Wallachian colonisation or they sprang by moving to remote parts of the villages, whose territories were overpopulated. They were farming communes where plant production or animal keeping were the principal activities. It also was the reason why they are located in lower mountains (Biele Karpaty, Javorníky, etc.).

Several basic trends have manifested in demographic characteristics of the mountain areas after 1990. Some of them are similar to those that have been observed in the country as a whole, and some are specific for the environment of the mountain or sub mountain rural area. Exhaustion of demographic sources, formation of marginal regions and change of the importance of rural functions manifest themselves in different ways in different regions of Slovakia.

Rural areas, both mountainous and sub mountainous, change and advance from the social homogeneity and uniformity to social heterogeneity and differentiation. Obvious trends of revival emerge, which prompt rural area toward another socio-economic level. These activities are associated not only with a varied possibilities to exploit the natural assets of the rural area but also with the return of certain individuals and also population groups to the rural area.



## Socio-economic situation

The process of modernisation in Slovakia (one of the modernisation alternatives of the 20<sup>th</sup> century) has marginalized the position of mountainous rural areas within the modern industrial state. These processes caused changes in the life of rural society, which are deep and irreversible, and continuous (Podoba 1999). Four decades of changes in agriculture (and also industrialisation impact) in Slovakia had their socio-cultural and economic consequences. The building up of new urban centres, new jobs and new housing attracted the rural population and caused migration from the traditional rural settlements. From the 1980s onward, the process of outward movement from cities to the countryside accelerated and corresponded with an increase of environmental pollution, efficient public transport, and a rising rate of private car ownership.

Agriculture has undergone substantial restructuring in the post-war period. Two major phases of change can be identified. First phase (from the 1950s to the late 1980s) was characterised by concentration, modernisation and industrialisation of agriculture. The above described processes were accompanied by negligence of natural conditions in the whole area of agricultural production that inevitably led to the deterioration of ecological stability, aesthetic properties and, eventually, to the deterioration of production potential of agricultural and forested land (Spišiak 1999). Continuous increase of energy inputs into the process of production exceeded the thresholds of the carrying capacity of ecosystems and caused unsatisfactory efficiency of these inputs as well as degradation of the environment. Second, the transitional phase of economy in mountainous rural areas was characterised by re-privatisation (restitution of ownership, including agricultural land), deconcentration (decentralisation and disintegration of co-operative farms), reducing farm output (decrease of agricultural production as a result of reduction of government subsidies, reduction in the use of fertilisers and heavy agricultural machinery, etc.), and integration of agriculture within broader rural economic, and environmental objectives (Ira, Huba 1999). The transformation process of rural mountainous regions since 1989 has been greatly influenced by the overall economic decline. The rural economy (including agricultural sector) faced a severe recession of the national economy since 1990, implying increases in employment (up to 20%–30%) and inflation rates, and declining consumer incomes as well as rising agricultural imports from Western countries. The mountainous rural economy is still depressed by low output prices, a weak position with respect to other regions, and with little access to credit.

Basic structures of agricultural land did not change significantly in the last decade. The decline of total area of arable land characterised the whole period of the 1990s. The most significant annual decline was observed in the late 1990s. On the one hand, the total area of permanent grasslands grew, on the other hand the decline of the total area of arable land was caused mostly by forestation, infrastructure and housing development, construction of waterworks, and other investments. Owing to the expected development of the tourist industry and

favourable environment for investments, it is possible to anticipate the pressure leading to the reduction of agricultural land in future.

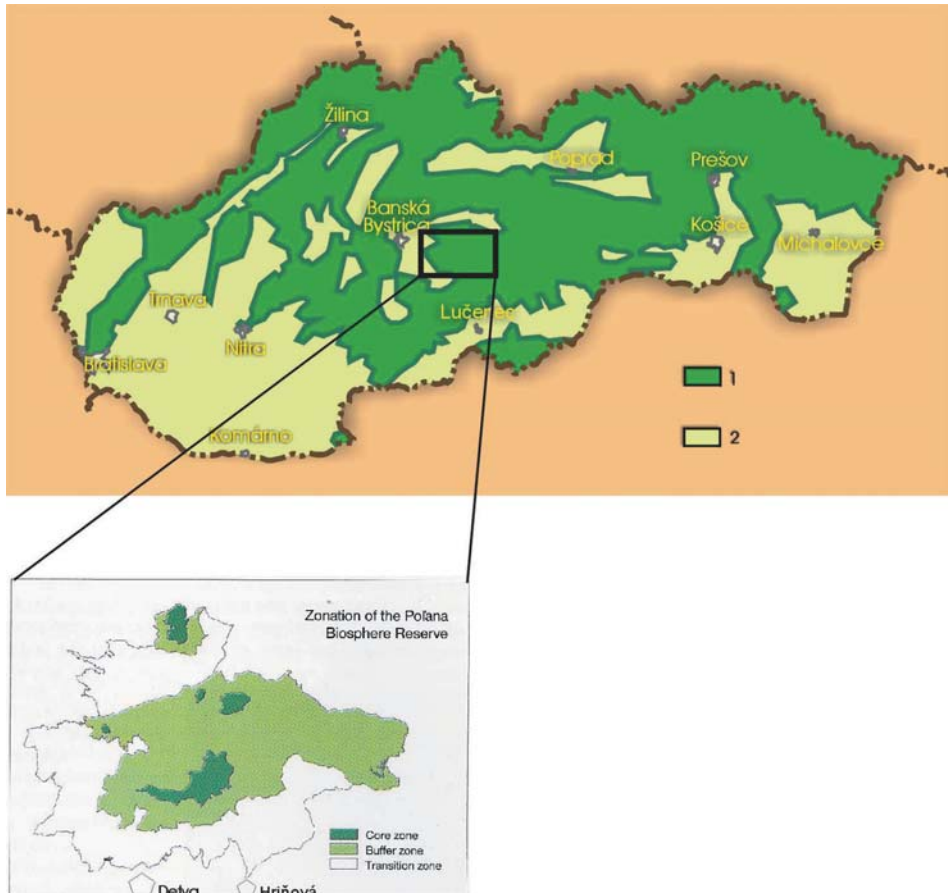
During the 1990s, significant changes have taken place in public transport. Gradually, the number of bus and railway lines (connections) has been reduced. As a consequence, the rural areas (especially in marginal regions) have been affected. In spite of the increasing role of individual transportation, the role of public transport in rural areas continues to be significant.

The marginalisation of mountainous rural regions has an impact on the economic, social, cultural aspects of life, as well as on the character of the environment (e.g. abandonment of settlements and agricultural land, degradation of soils, etc.). The restructuring of agriculture caused a decrease in employment in the agricultural sector. The marginalisation has created large compact areas within marginal territories in borderland regions in the northern, eastern, and southern regions of Slovakia. Some regions are located in central part of Slovakia. In these economically and socially marginal areas the problems emerged not only in social life, but also in the socio-technological structure, and in environmental modernisation (Falt'an et al. 1995). Part of marginal areas is inhabited by the Roma population living in unsuitable, substandard buildings in villages. The greatest problems of several Roma settlements is their inadequate infrastructure, including poor quality of drinking water, poor or non-existing roads, inadequate housing, no public lightning, sewers, gas, mains, sanitary installations, shops, post offices, schools, etc. (Radičová 2001, Vašečka 2002). In the marginal regions numerous economic, socio-pathological, civilisation, and infrastructural problems are concentrated in rural settlements. Surveys conducted in marginal rural areas (Falt'an et al. 1995; Huba, Ira 2000) showed that the most important problems connected with the implementation of economically, socially and environmentally balanced developmental programmes in rural communities are: lack of developmental programmes and activities, lack of subsidies from state funds, lack of capital investments, lack of advantageous credits, inadequate costs distribution, lack of public drainage and/or sewage disposal plants/waste water treatment, insufficiently developed technical infrastructure, lack of jobs, insufficient conditions for cultural and social life, lack of recreation/leisure facilities, insufficient provision of health and social services. This is amplified by unfavourable demographic structure of population, historical /cultural sites safeguarding, damaging forest management practices, waste disposal, water quality, inadequate agricultural land-use, and nature protection.

### **The Poľana Biosphere Reserve – case study of analysis of the role of human factor in sustainable development of protected area**

This part of the paper considers the results of the case study concerning the Poľana Biosphere Reserve (BR) in Central Slovakia, which is an excellent

model territory for studying man and nature relationships, where many of above mentioned processes and problems of mountainous rural areas in Slovakia are manifested in a very transparent way (Fig. 1).



**Figure 1.** Mountainous and sub-mountainous areas in Slovakia. 1 – Mountainous and sub-mountainous areas, 2 – Lowlands and lower parts of intramountain basins

### BR Poľana and its geographical characteristics

The area studied is represented by the territory encompassing the administrative confines of towns and villages that are fully or partially under the Poľana Biosphere Reserve (BR). It means that it is almost identical with the Poľana Biosphere Reserve, including not only the core and buffer zones, but also the transition zone.

The Poľana BR, situated in the Central Part of Slovakia, can serve as an example of mountainous rural area, where the role of human factor in sustainable development could be studied. The Poľana BR was established in 1990. Total area of BR is 20,079 ha (core area – 1,238 ha, buffer zone – 9,650 ha, and transi-



tion zone – 9,191 ha ). Since 1981 its National Conservation Status had been the Protected Landscape Area (PLA).

The Poľana BR is formed by the Upper Tertiary rocks: Veporids in the east, and volcanic rocks – resistant andesite rocks alternating with less solid tuffs and tuffaceous rocks – in the central and western parts. The volcanic activity (12 to 13 million years ago) mainly affected the centre of the Biosphere Reserve.

The part of Poľana below 800–700 m above sea level is within the moderately warm zone. Higher altitudes are in the cold climatic zone. The annual temperature moves between 2.5 and 8.0°C, and the annual precipitation is from 650 to 1,300 mm. More precipitation falls in spring and summer (April to September, with the maximum in June) than in autumn and winter (with the minimum in January).

The Poľana Biosphere Reserve is characterized by a blend of thermophilous and mountain plant species. Despite the common floristic paucity of volcanic bedrocks, Poľana's vegetation is quite rich. Remnants of beech-oak and oak-beech forests survive only in the south-western foothills. Beside oaks and beech trees, these forests also include hornbeam and lime trees. The most frequent forest communities in the area are beech and fir-beech woods. The summits are occupied by the primeval spruce stands, encircled by a narrow zone of spruce-beech-fir woods. The Poľana's indigenous spruce forests are the southernmost forests in the West Carpathians. Secondary meadows and pastures have developed on many large deforested sites in the southern foothills around the typically scattered settlements, farms and pastures.

The variety and specie-richness of the Poľana BR reflects its environmental diversity. There are many biogeographically outstanding and biosociologically significant animal species, whose rare populations are often endangered and thus strictly protected.

The area is sparsely inhabited. There are only three settlements (Iviny, Snohy and Vrchslatina), one recreation centre, several farmhouses, and gamekeeper's lodges. Most of the 360 permanent inhabitants are retired, and those in employment as a rule commute to industrial enterprises outside the region; only few of them work in forestry or agriculture.

Forestry takes place in mixed coniferous and broad-leaved forests with composition similar to the original, in spite of special logging. The composition consists of the following wood species: 62% of coniferous trees (Norway spruce 54%, silver fir 6%, European larch 1.5%, Scots pine 0.3%) and 38% of deciduous trees (beech 30%, sycamore 3.6%, ash 2%, oaks 1.3%, hornbeam 0.6%, elm 0.2%).

Mountain meadows and pastures are mown and used for cattle and sheep grazing. Although these activities have changed, the original floristic composition of these areas has been preserved to a certain extent, some retain their original



**Picture 1.** Overview of Poľana BR

plant and animal communities. At present, recreation and tourism do not endanger the ecosystems of the Biosphere Reserve. There is only one recreation centre, with accommodation for 150 people and three sites with a total of 50 cottages, as well as and 20 recreation chalets, with 450 beds. There are also 110 km of marked trails, used by 18,000 tourists a year. Mountain climbing is allowed at selected sites, in accordance with rules discussed with the nature conservation authorities.

Until the establishment of the Poľana PLA, individual scientists carried out research in the region at sites selected according to their interests and aims. Subsequently, the Administration of the PLA began to involve various scientific institutes in interdisciplinary research programmes. The existing knowledge is available in 700 publications produced since 1905. Many research projects (including interdisciplinary oriented ones) were realized there. The projects monitored the ecological status of the landscape structure, evaluated changes of the basic environmental components (relief, water, soil, air, forests) and assessed human impacts (forest management, building technology, industry, settlement, etc.) upon landscape. Some of them helped to propose various management approaches.

The biosphere reserves accomplish several activities under the Action Plan. The goals of the regional development of Poľana and Podpolanie regions are based on the „Strategy of Territorial Development of Slovakia“. The development pri-



**Picture 2.** Agriculture activities in Poľana BR

orities in the region are: to increase the socio-economic importance and prosperity of region and to protect natural and cultural heritage of region. The trends of regional development are not in discrepancy with the management of nature conservation. The possibilities of the Action Plan must be used as an effective management tool. The authorities of the BR secure and manage protection by legislative measures, exercise conservation principles „in situ“, coordinate the scientific activities and contribute to gathering of useful information for monitoring and regional planning. An emphasis is laid upon collaboration with local people. Here the main tool is disseminating information by means of newsletters, information bureaus and personal contacts with local inhabitants (Sláviková, Slávik 1998).

Several local and microregion initiatives, a relatively new phenomenon, have taken place in the Poľana region recently (e.g. Association for Region Podpolanie Development in Detva, Community Center – non-profit organisation in Čierny Balog, Vydra – Rural development organisation in Čierny Balog, Rural Microregion Čierny Hron, The Iron Road Association in Ľubietová and some others). Their targets are as follows: to support small and medium-size enterprises, to develop the information system, and to improve the environmental protection. The special aims are, *inter alia*, to revise the Regional Operating Plan and the Micro-region Action Plan, as well as to improve the mutual understanding, co-operation and public awareness with the aim of efficient utilisation

of the local natural and human potential, but also available structural funds and grants. An important role in this field is also played by the Information Centres in Detva and Čierny Balog, as well as by the Cycling Club of Poľana.

### Human factor – socio-demographic analysis

Socio-demographic characteristics were observed in the villages with territories under the Poľana BR. The region consists of 16 communes (in total 796.8 km<sup>2</sup>), with population of 43,010 by the end of 2003. Almost a third of population (15,024) lived in the biggest town of the region – Detva; 8,151 persons lived in the second to the biggest town – Hriňová. Given large administrative territories of several communes and a relatively low population number, the population density of the analysed territory is low, it does not even reach a half of the national average (54 compared to 110 inhabitants per km<sup>2</sup> in Slovakia). The settlement type is that of dispersed in the major part of the region – Podpolianska hamlet area with independent farming units that were rather distant from each other in the past. Construction of the engineering plants and new housing estates in Detva, Hriňová, and Valaská and concentration of all activities in the biggest communes of the region have changed the traditional pattern of the region. Only recently, after 1990, the long-lasting depopulation and concentration trends slowly start to change when the employment in the biggest firms in region has been reduced. Some dispersed farms have started to work. Consequences of the general socio-economic development also become manifest in the demographic characteristics of the region both as a whole and its individual parts.

Region as a whole displays the basic trends in population change and structure in accord with those that characterize the country (Jurčová, ed. 2003, 2004). Population of the region is ageing both relatively and absolutely. Slow overall population increase is typical for the region for long years now. This increase was secured above all by high natality values which could, in spite of high out-migration rate, secure for a moderate population increase long decades. Decrease of natality values and decrease of out-migration level after 1990 have caused that the overall increase is not so distinctly different in urban and rural areas as it was, for example in the 1970s and it is relatively balanced. In comparison with the total population of Slovakia the region represents still a positive image, especially from the point of view of natural reproduction values and development. On the other hand, as to the economic situation, the region suffers from production and employment reduction that has been observed in several major industrial enterprises in surrounding area during the 1990s, as well as from changes in agriculture. The influence of these factors is evident especially in changes of economic structure of population.

There are considerable differences between individual communes. The most marked population increase was observed in Detva; in the 1970s and 1980s. In the long term, the most distinct population decrease due to elevated out-migration manifested in Ľubietová, Hronec and in Lom nad Rimavicou. Many communes relatively stabilized after 1990 as the ratio between the individual com-



ponents of the overall increase has dramatically changed. Natural decrease of population manifests, due to the distinct decrease of natality values, in all communes of the region (with the exception of Detva, Čierny Balog and Valaská). What were traditionally high out-migration figures in the past, is manifested now only by the migration decrease only in the biggest settlements – Detva, Hriňová, Čierny Balog a Valaská and in Hronec, and in Osrblie and Strelníky as the only representatives of small communes. The remaining villages are characterized by migration balance and some of them even by migration increase. The values and the dynamics of these partial factors are responsible for a comparatively stabilized population development.

As far as the ethnic structure of the region Poľana is concerned, it is practically a homogeneous territory with the absolute prevalence of the Slovak ethnicity. German minority that lived here in the past (for instance in Ľubietová) does not exist any more. Percentage of population that adhered to the Slovak ethnicity amounted to 96.5% of total population in the region in 2001. Catholics prevail over Evangelicals (73.1% and 12.6% respectively). As regards religions, the region consists of two parts – north and west including communes Strelníky, Povrazník, Ľubietová, Hrochoť and Poníky where Evangelicals prevail and the rest of the region where the population adheres to the Roman Catholic religion with the exception of Očová where the ratio of these two religions is almost balanced.

As far as educational structure of population in region is concerned, a comparatively large share of population that acquired medium level of education, comes as a surprise. They mostly live in communes with an advanced industrial basis (Detva, Hriňová, Valaská). The highest percentage of university graduates is in Detva, Očová and Valaská while Lom nad Rimavicou and Drábsko are inhabited by the highest percentage of persons whose highest achieved education level is elementary.

Approximately a third of the total 22,000 economically active inhabitants of the region are employed in industry and construction. In agriculture, the dominant sector in the past, hardly 10% of economically active population group is employed. The majority of communes are remarkable for an extra high commuting rate – a possible proof of lack of jobs in region. Only Detva and Hriňová with numerous jobs in machine industry constitute an exception.

### Typology of communes by selected demographic quality of life characteristics

The values of some essential demographic domain of the life quality (life expectancy at birth, infant mortality, other specific mortalities split according to age groups, unemployment rate, etc.) are not available at the level of communes. Characteristics that are available at the level of communes, though, provide the possibility to compile a typology, which takes into account some very important demographic domain of the life quality. These indicators are synthesized as they



reflect several demographic and socio-economic processes with different manifestations at individual communes of the region. The overall population increase reflects processes of natural reproduction, natality, mortality, and demographic behaviour, and in certain way health condition of the population at a particular commune. Age index as expression of the population age composition expresses the ratio of post-productive and pre-productive population components. The number of out-commuters in a way reflects the economic status of the given commune because the smaller the number of the economically active persons that out-commute, the higher the economic level of the commune and its capacity to employ its own inhabitants. The values of quoted indicators represent then a quantitative expression of objectively measurable demographic and socio-economic characteristics demographic domain of the life quality. Based on them, four types of communes were identified in region Poľana (Figure 2):

TYP A – Moderate to distinct population decrease, prevalence of pre-productive component over post-productive population components, low share of out-commuters. Communes of this type, which can be most positively evaluated in the light of selected demographic domain of the life quality, concentrate in the southern or eastern parts of the region including both urban settlements Detva a Hriňová, another commune with bigger population number – Čierny Balog and eventually Sihla, which in spite of being small reaches similar values to those of the three above mentioned communes.

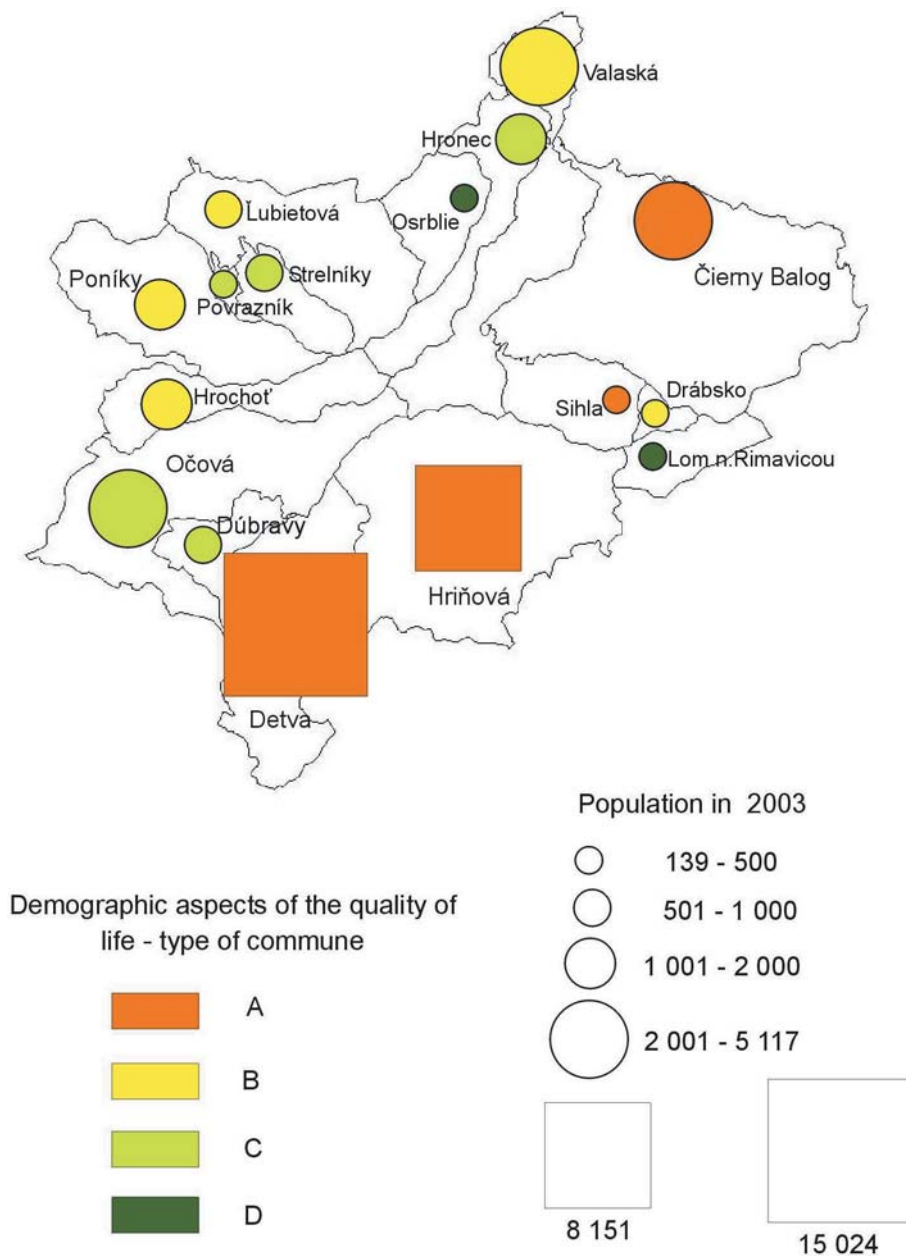
TYP B – Moderate population increase or decrease, prevalence of the post-productive over pre-productive population component, moderately high percentage of out-commuters. Communes of this type are situated in the western and partially also in the eastern part of the region including communes Valaská, Lúbietová, Poníky and Hrochoť, as well as Drábsko in the east of region.

TYP C – Moderate population increase or decrease, distinct prevalence of the post-productive over pre-productive population component, high percentage of out-commuters. Communes of this type are Očová, Dúbravy, Povrazník, Strelníky and Hronec.

TYP D – High population decrease, distinct prevalence of post-productive population over pre-productive, high percentage of out-commuters. This, from the point of view of demographic domain of the life quality negatively evaluated type concerns two communes – Lom nad Rimavicou and Osrblie.

#### Human factor – perception of developmental opportunities and quality of life (QoL)

Enquiry that applied a standardized structure of questions served as information source for the enlightenment of the human factor in the development of the rural mountain landscape on example of the BR Poľana. Questions, inspired by previous surveys (Rosová et al 1997; Huba, Ira 2000; Ira 2001; Sláviková 2004) were formulated and posed in equal manner to the whole set of respondents (20). Standardized interviews were carried out with the local and regional representa-



**Figure 2.** Typology of communes by selected demographic domain of the life quality

tives of the decision-making sphere and opinion-forming personalities in summer 2004 (Ira et al. 2005). Respondents were the representatives of the self-government (in the area studied), representatives of the state administration and local independent figures well informed about the local or regional issues.

The intent of the enquiry was to obtain information about the present and future of the Polana BR, and the individual communes in the contiguous territory in

relation to the possible quality of life improvement and application of the sustainable way of life concept. A half of respondents expected moderate development, a quarter of them expected stagnation and three of them even expected decay of the commune/region in the immediate future. Only one respondent expected a distinct advance. The prevailing attitude of inhabitants towards possible changes in life of the commune/region was considerably differentiated depending on local conditions (it varied from the conservative, over ambivalent to the favourable one). The participants of the enquiry saw the main and not exploited reserves above all in ecotourism/agrotourism (10), use of the local energy sources (9), in traditional trades (7), less in organic farming, small industrial environment-friendly plants (3), waste management (2) and in use of other local sources (2).

Respondents also answered the following question: *“What importance do you give to the following problems associated with securing an economically, socially, and environmentally balanced sustainable development of your commune/region?”* Problems related to sewage and wastewater treatment, lack of job opportunities, lack of governmental subsidies and lack of capital investments were perceived as the most important. Table 1 brings an overview of answers.

Answers to the question: *“What is your opinion of the activities that contributed to good quality of life and are in harmony with the idea of sustainable way of living in your commune/region?”* brought an interesting information. In the category of the realized and partially realized ones, separation of waste and recycling, measures focused on energy saving, use of traditional knowledge and skills of inhabitants, revival of popular usage/folklore, restoration of self-reliance and self-supply, improvement of basic services to population, improvement of commerce with food articles and other goods were indicated. Table 2 brings a more detailed overview.

## Conclusions

Mountainous rural areas in Slovakia experience continuous transformation. Dynamic nature of transformation of the 1990s brought the changes such as increasing marginalisation of many regions, increasing depopulation of marginal regions, declining significance of agriculture in terms of employment and relative importance of food production, changing organisation of agricultural production, exclusion and marginalisation of certain groups (the original old population, permanently unemployed, Roma population), afforestation of agricultural land, improving environmental quality, declining significance of public transport, changing values and perception of environment, and increasing environmental and sustainable development concerns (Ira 2003).

The situation in rural areas, the new social and economic conditions force decision-makers to make a great effort in the area of environmental protection and

**Tab. 1** Importance attributed to individual problems related to the achievement of a better quality of life and sustainable development in the commune/region (VI – very important, IM – important, LI – little important, CE – I cannot estimate)

PROBLEMS	VI	IM	LI	CE
Air quality	0	2	18	0
Water quality	3	2	15	0
Appropriate use of farmland	1	7	11	1
Industrial, farming and other waste deposition	0	2	15	3
Transport load	0	3	15	2
Sewage and waste water treatment	1	13	4	1
Forest economy	1	7	10	1
Conservation of natural assets	1	3	10	6
Conservation of historical assets	1	4	12	3
Mineral mining	0	0	20	0
Fuel and energy supply	1	3	12	4
Fuel and energy use	2	1	9	8
Production affecting environmental quality	0	0	12	8
Lack of job opportunities	13	4	2	1
Public transport	1	6	13	0
Lack of leisure facilities	0	9	9	2
Load of recreation activities	0	0	18	2
Food self-supply from local sources	0	1	16	3
Housing quality	0	3	15	2
Quality of basic services	0	3	16	1
Safety of population	1	8	10	1
Health condition of population	0	0	11	9
Inadequate social behaviour (e.g. inadaptable population groups)	0	6	9	5
Inadequate age structure	2	10	5	3
Low percentage of qualified labour	2	2	10	6
Low percentage of inhabitants with higher education level	1	2	11	6
Low capacity of inhabitants to continue in traditional productions and other activities	0	5	6	9
Lack of local patriotism	0	1	16	3
Lack of public consciousness	0	2	13	5
Overisolation (individualism)	1	4	11	4
Neighbour jealousy	2	5	10	3
Lack of state subsidy	2	13	2	3
Lack of advantageous credits	1	9	6	4
Inadequate distribution of tax revenue	2	8	2	8
Lack of capital investments	2	11	3	4
Lack of business activities focused on the development	1	9	4	6
Lack of competency (too much of centralism)	0	1	14	5
Unsettled property/legal relationships (land ownership, privatisation)	5	6	7	2

**Tab. 2** Activities that are in harmony with the idea of improving the quality and sustainability of life; RE – realized, PR – partially realized, PL – planned, NP – so far not planned, but prospective, NO – not prospective, CE – I cannot estimate

ACTIVITIES	RE	PR	PL	NP	NO	CE
Separation and recycling of waste	2	14	3	1	0	0
Reclamation of dumping sites	3	3	1	1	1	5
Energy-saving measures	0	13	2	3	0	2
Water management/construction of water main	6	5	2	2	0	5
Measures concerning renewable resource use	0	2	8	4	2	4
Waste water treatment /construction of sewage	2	8	7	1	0	2
Substitute of solid fuels by noble fuels (gas supply, beside other)	1	3	9	2	3	2
Exclusion of transit transport	0	1	1	0	18	0
Favouring of public transport compared with individual transport	1	10	1	0	5	3
Public greenery planting	1	10	0	0	7	0
Reconstruction of historic houses /structures of folk architecture	0	13	4	0	2	1
Improvement of housing quality/equipment of households	0	11	4	0	1	4
Reintroduction of natural greenery and small animals in farming landscape	3	8	0	1	5	3
Improved care of natural assets	1	10	1	2	0	6
Use of traditional knowledge and skills of population	2	10	1	2	2	3
Restoration of popular usage (folklore...)	7	7	0	0	2	4
Restoration of traditional activities (services, local markets, seasonal activ.)	3	8	0	2	3	4
Support to development of socially and environmentally oriented activities orientovaných (trvalo udržateľných) pracovných príležitostí	0	1	5	3	2	9
Restoration of associations and their activities	1	7	0	0	4	8
Restoration of self-reliance and self-supply	3	10	0	0	2	5
Help to dependent persons	3	9	2	1	0	5
Strengthening of social control	1	4	2	1	4	8
Improvement of the basic services to citizens	2	11	4	1	0	2
Improvement of the trade in basic food articles and other goods	3	10	2	1	0	4



sustainable development. The most important challenges for mountainous rural areas in Slovakia are as follows:

- achievement of sustainable development in the areas with important natural and cultural values,
- restructuring of the local (micro-regional) economy to provide a better quality of life for the inhabitants of rural areas,
- application of technological and scientific development to improve both quality of life and natural protection,
- more efficient and environmentally friendly use of social and technical infrastructures (especially transport),
- balance between the population situation and natural resources utilisation,
- changes in consumption patterns leading to improved health of the population,
- reduction of the threat of growing unemployment and poverty,
- more sensitive decision-making with long-term perspectives,
- more conscious incorporation of ethical considerations into the decision-making,
- improvement of regional policy to help reduce the gap between the rich and the poor (marginal) regions.

Demographic characteristics represent an important component of quality of life indicators and prerequisites of sustainable development in region as a whole and in its communes. Demographic development or its indicators in the territory of Poľana do not especially differ from development and structure of the population of Slovakia in general. Internal differentiation between the individual communes in region is quite distinct in terms of demographic indicators related to quality of life and there are communes with positive structure and development and communes that can be evaluated negatively. The polarized demographic development separately for urban and rural has now changed and acquired comparable parameters in many aspects of quality of life. One of the prerequisites of further development of rural communes is activation of local sources based on the bottom-up initiative (for instance regional associations), which can greatly contribute to demographic, social and eventually economic revival of the Poľana region.

The results of the case study within the territory of the Poľana BR indicate an important task for the human factor – the management of the territory – based on sustainability principles. They suggest the possibilities of a closer look at the concept of “our Biosphere Reserve” (Hadley ed. 2002), which offers qualified answers to questions concerning quality of life of the locals and improvement of care after the BR. All important actors (individuals, governmental and non-governmental organizations, businessmen) should participate in an extended discussion of the future of the commune and the region (Vološčuk 2001) or about “their Biosphere Reserve”. Local participation and relative independence is the condition for the successful management model and use of the Biosphere Reser-

ve. It is the BR that should generate the opportunity to change the view of local problems and the way of using the valuable protected mountain landscape.

## References

- Dax T., 2002, *Research on mountain development in Europe, Overview of issues and priorities*, The Innovative Structures for the Sustainable Development of Mountainous Areas (ISDEMA) conference. School of Agriculture, Aristotle University of Thessalonica, Greece.
- Falťan L., Gajdoš P., Pašiak J., 1995, *Sociálna marginalita území Slovenska*, S.P.A.C.E., Bratislava.
- Gould P., 1990, *Fire in the rain*, The Johns Hopkins University Press, Baltimore.
- Hadley M. (ed.), 2002, *Biosphere reserves. Special places for people and nature*, UNESCO, Paris.
- Huba M., 2004, *Sustainability concepts and environmentally oriented integrated sciences on landscape and society*, Ekológia (Bratislava), 23, Supplement 1/2004, 69–79.
- Huba M., Ira V., 1994, *Zamyslenie sa nad koncepciou trvalo udržateľného rozvoja*, Životné prostredie, 28, 6, 285–287.
- Huba M., Ira V., 2000, *Stratégia trvalo udržateľného rozvoja vo vybraných regiónoch*, STUŽ/SR, Bratislava.
- Ilbery B. (ed.), 1998, *The geography of rural change*, Longman.
- Ira V., Huba M., 1999, *Changes or Rural Space in Slovakia from Sustainability Perspective*, Geographica Slovenica, 31, 151–161.
- Ira V., 2001, *Social, Economic and Environmental Dimension of Sustainable Development in Protected Areas*, Ekológia, 20, Supplement 3, 305–316.
- Ira V., 2003, *Rural space in Slovakia: changes of spatial structures and spatial behavioural patterns*, Acta Universitatis Carolinae, Geographica, 38, 119–129.
- Ira V., Huba, M., Podolák P., 2005, *Udržateľný rozvoj BR Poľana s ohľadom na mienku vybraných hlavných aktérov v území*. In: Sláviková, D. ed. *Biosférická rezervácia Poľana po 15-tich rokoch*, Technická univerzita vo Zvolene, Zvolen, 219–227.
- Jurčová D. (ed.), 2003, *Populačný vývoj v regiónoch Slovenskej republiky 2001*, Infostat – Výskumné demografické centrum, Bratislava.
- Jurčová D. (ed.), 2004, *Demografická charakteristika obvodov Slovenskej republiky 1996–2003*, Infostat – Výskumné demografické centrum, Bratislava.
- Kusendová D., 2002, *Vývoj obyvateľstva*, In: *Atlas krajiny Slovenskej republiky*, MŽP SR Bratislava, SAŽP Banská Bystrica, ESPRIT Banská Štiavnica. Mapa, p. 151.
- Mazúr E., Krippel E., 1980, *Typy súčasnej krajiny*, In: *Atlas SSR*, SAV, SÚGK, Bratislava.
- Mazúr E., Lukniš M., 1980, *Geoekologické (prírodné krajinné) typy*. In: *Atlas SSR*, SAV, SÚGK, Bratislava.

- Midriak R., 2005, *Horské oblasti a ich trvalo udržateľný rozvoj (Krajinnoekologická štúdia s osobitným zreteľom na územie Slovenska)*, Technická univerzita vo Zvolene, Zvolen.
- Miklós L., 1996, *World directions in the protection of environment*, In Proceedings: *Sustainable Development of the 21<sup>st</sup> Century*. KEAKE Banská Štiavnica, Nadácia F.J. Tučeka. Banská Štiavnica, 5–15.
- Podolák P., 1999, *Demographic Aspects of Changes in Rural Areas*, *Geographica Slovenica*, 31, 162–169.
- Radičová I., 2001, *Hic Sunt Romales (There live Roma)*, S.P.A.C.E. Foundation and Fulbright Commission in the Slovak Republic, Bratislava.
- Retrospektivní lexikon obcí ČSSR 1985-1970 II/2*, 1978, FSÚ, Praha.
- Rosová V., Ďurkiovská K., Sláviková V., 1997, *Vstupné štúdie sociálnej dimenzie biosférických rezervácií na Slovensku: ľudia v biosférickej rezervácii CHKO BR Poľana a CHKO-BR Slovenský Kras*, In: Midriak, R., ed. *Biosférické rezervácie na Slovensku*, Technická Univerzita vo Zvolene, Zvolen, 77–81.
- Sčítanie ľudu, domov a bytov 2001*, 2003, Štatistický úrad Slovenskej republiky, Bratislava.
- Sláviková D., Slávik D., 1998, *Akčný plán Biosferickej rezervacie Poľana z hľadiska rozvoja regiónu*, *Životné prostredie*, 32, 1.
- Sláviková V., 2004, *Potenciálne a reálne predpoklady trvalo udržateľného využitia krajiny CHKO-BR Poľana (Rigorózna práca)*, Univerzita Mateja Bela, Banská Bystrica.
- Spišiak P., 1999, *Development of Rural Area in Slovakia (Applied to the Micro-region Podhorie)*, *Geographica Slovenica*, 31, 217–222.
- Stav a pohyb obyvateľstva SR v rokoch 2001–2003, 2003–2005*, Štatistický úrad Slovenskej republiky, Bratislava.
- Štatistický lexikón obcí Slovenskej republiky 2002*, 2003, Štatistický úrad Slovenskej republiky, Bratislava.
- Vašečka M., 2002, *Roma*, In: Mesežnikov G., Kollár M., and Nicholson T. (eds.), *Slovakia 2001. A Global Report on the State of Society*, Institute for Public Affairs, Bratislava, 149–165.
- Vološčuk I., 2000, *Trvalo udržateľný rozvoj v biosférickej rezervácii Tatry*, SNK MaB, Zvolen.