

# Study of sustainable development of protected areas in the National Park Poloniny

**Emphasis on socioeconomics relation with land use and protections of nature**

BASELINE STUDY



**PREPARED FOR  
DEVELOPMENT OF NATURE CONSERVATION AND OF PROTECTED AREAS IN  
THE SLOVAK CARPATHIANS**

**Slovak-Swiss Cooperation Programme**

prepared by  
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with the support of  
State Nature Conservancy of the Slovak Republic

2014

**Citation**

Jaroslav Solár<sup>1</sup>, Katarína Markuljaková<sup>1</sup> and Marián Janiga<sup>1</sup>. 2014. *STUDY OF SUSTAINABLE DEVELOPMENT OF PROTECTED AREAS IN THE NATIONAL PARK POLONINY – Emphasis on socioeconomic relations with land use and protection of nature.* Baseline Study. Prepared for development of nature conservation and of protected areas in the Slovak Carpathians. Slovak-Swiss Cooperation Programme. Prepared with the support of State Nature Conservancy of the Slovak Republic.

**Cover photo**

Bison *bonasus* grazing nearby NNR Pod Ruským, April 2013. Photo by Suchá.

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## List of abbreviations and acronyms

|                  |                                  |
|------------------|----------------------------------|
| <b>NP</b>        | National Park                    |
| <b>BZ, OP</b>    | Buffer Zone                      |
| <b>PKP</b>       | Nature and cultural heritage     |
| <b>PCA</b>       | Principal Component Analysis     |
| <b>PC</b>        | Principal Components             |
| <b>NPR - NNR</b> | National Nature Reserves         |
| <b>PR -</b>      | NR - Nature Reserves             |
| <b>EU -</b>      | European Union                   |
| <b>PA -</b>      | Protected Areas                  |
| <b>NGOs</b>      | Non - Governmental Organizations |
| <b>GIS</b>       | Geographic Information System    |
| <b>F</b>         | Female                           |
| <b>M</b>         | Male                             |
| <b>Econ.</b>     | Economic                         |
| <b>Pop.</b>      | Population                       |
| <b>Educ.</b>     | Education                        |

## Abstract

Preserved natural ecosystems such as beech forests and unique species - rich semi-natural grasslands and cultural heritage of Ruthenian and Ukrainian minority represent landscape potential for development of sustainable forms of tourism in NP Poloniny region. Social and political changes in the 20th century led to land abandonment, reforestation and emigration of young generations. We analyzed socio-economic data such as land use, demography and economical revenues in relation to nature protection data. Some socio-economic relationships clearly reflect global trends at the regional level (emigration to urban areas, wrong demographic indices, and dominant revenues from wood production, etc.). We revealed very weak socio-economic relationships to the system of nature protection of the local Poloniny National Park.

### **Key words**

NP Poloniny, land use, nature conservancy, demography, revenues, stakeholders

## Acknowledgments

This research was supported by the Project of Swiss Contribution and State Nature Conservancy of Slovakia [1551/2011] "Development of nature protection and protected areas in the Slovakian Carpathians". We thank local stakeholders and municipalities in NP Poloniny for useful information and cooperation.



# 1 Introduction



Peripheral position of ethnically mixed regions (Slovaks, Ruthenians, Ukrainians, Poles, Jews, and Gypsies), closed valley, displacement of population, gradual abandonment of farming, economic recession, changing lifestyles of young generations, the total marginalization and the backwardness (underdevelopment) of the region, have significant effects on the development of communities with a predominantly agro-forestry use of the surrounding landscape (Olah 2007).

Wallachian colonization by shepherds and peasants called Ruthenians (Russians) intensively influenced the development of settlements in the 15th and 16th century (Bural'ová 2002, Bural' 2009) and changed the landscape and greatly affected the forests. Contemporary studies have pointed out that the country

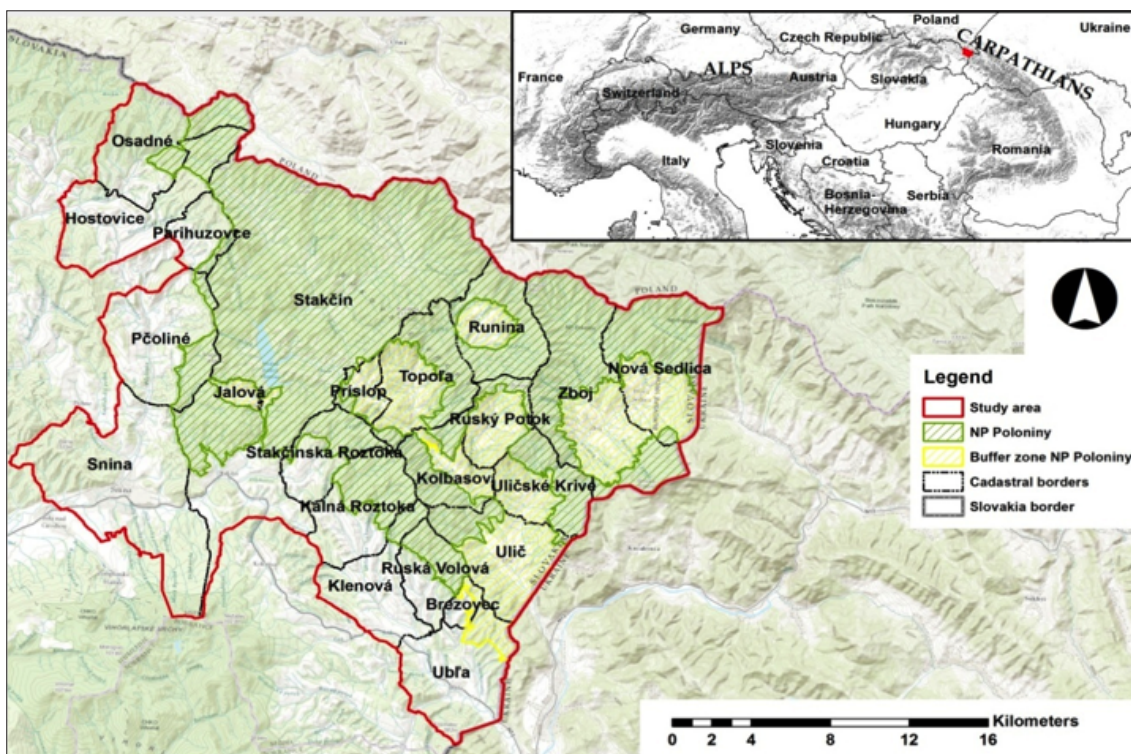


Figure 1: Study area (N 49° 02'7.90"; E 22°19'39.62").

was deforested by shepherds especially in localities with occurrence of relict spruce. The spruce area was eradicated and its habitats occupied by alder stands (Bural'ová 2002). Collaterally with the Wallachian colonization first mountain meadows "Poloniny" emerged in some areas. Word "polonina" of the Ruthenian-Ukrainian origin, is internationally accepted geographical term for grassland formations above the timber line in a large mountain range of the Eastern Carpathians (Bural'ová 2002). However, the Slovak "Poloniny" never reached to such an extent as those in the Polish and especially the Ukrainian Carpathians (Blažková and Brezina 2003). Due to its biodiversity this semi-natural grassland represents a valuable area. (Bezák et al 2007 Halada et al. 2010). However, to a considerable extent, there are also significant virgin beech forests occurring in the villages of Stužica, Havešová, Riabia skala, Rožok and Udava. (Jasík and Polák 2011). They are an unique example of the development of terrestrial ecosystems and communities in the Holocene. Carpathian beech forests represent a globally significant natural genetic bank of beech and accompanying species dependent on these habitats (Pichler et al. 2007). The richest beech forests are in Ukraine, including Subcarpathian Rus (Polák and Burkovský 2011). In spite of the continuous exploitation of different intensity since the 14th century, in some inaccessible areas of Carpathians the stands preserved their primeval character (Jaworki et al. 2002). The negative socio-economic development thus contributed to the preservation of the beech forest complexes. For example, due to the military reasons in the early years after World War II, the population from the Polish side of the Bukovské vrchy Mts. had to be displaced/resettled (Blažková and Brezina 2003). Due to this reason the cross-border virgin beech complexes were created. Obviously, modern social and political changes in the 20th century led to the state of gradual neglect which accelerated the process of ingrowths and reforestation of the country.

The very beginnings of regional (territorial) protection in Poloniny date back to the 17th century. First "protected oak grove" with no timber harvesting was already mentioned in the village Stakčín in 1660 (Bural' 2009). The initial protection of rare beech forests complex began in 1977, mainly due to protecting fragments of Eastern Carpathian virgin forests in Slovakia (Guziová and Bural' 1994). The area protection of Bukovské vrchy Mts. was declared because the Eastern Carpathians came to be the protected landscape area (Vološčuk 1988). In 1973 in Poland, on the other side of the border, Bieszczady National Park was established to protect the most valuable parts of the Polish Bieszczady Mts. with unique "Poloniny" and beech forests (Jaworki et al. 2002). Bieszczady National Park and Protected Landscape Area Eastern Carpathians were declared as bilateral International Eastern Carpathians Biosphere by UNESCO program

Man and Biosphere (MAB) in 1993 (Bural'ová and Némethová 2009). Under the UNESCO initiative in 1999 Uzanski National Park was established on the Ukrainian side of mountains. Its territorial protection dates back to 1906, when there were already protected valuable virgin forest ecosystems. The Slovak National Park Poloniny was established under the concept of environment protection (nature conservation) in 1997 (Kramárik 1998). Connecting Slovak, Polish and Ukrainian national parks, the first trilateral Biosphere Reserve (BR) in the world was established in 1999 (Halada et al. 2002). In the same year Poloniny National Park was awarded the prestigious European Council Diploma.

Current trends of landscape use have resulted in the secondary succession in the abandoned meadows of the Bukovské vrchy Mts. (Blažková and Březina 2003, Bezák et al. 2007, Gallay and Gallayová 2012). Present global trends resulting from the pervasive socio-economic driving forces lead to spontaneous reforestation of abandoned mountain landscapes in Europe (Mottet et al., 2006, Sitko and Troll 2008, Kozák 2009, Griffiths et al. 2013), which may cause a growing threat to biodiversity (Tasser and Tappeiner 2002, Dirnböck et al. 2003). Poor technical infrastructure, marginal location and the deficit of employment opportunities lead to the land abandonment and emigration (Petrovič and Bezák 2006) especially of the younger generation. Aging population gradually retreat from land-use management (farming), particular in the crest of the mountain.

Considering the temporal scale, there were three basic policy-induced milestones of the agricultural change in mountain regions following the World War II (Bezák et al. 2010, Izakovičová 2013): collectivisation, central planning change from central to market economy and Slovakia access to EU (Bezák and Mitchley 2013). Agriculture was a traditional way of life in the villages for centuries. Centuries of utilization of mountain meadows and pastures led to the development of unique, relatively species-rich mountain plant communities in the Bukovské vrchy Mts. until the World War II (Blažková and Březina 2003). At the time of the first Czechoslovak Republic (1918-1938) this territory belonged to the least developed areas. In the 20th century the region of Poloniny was a direct scene of the three war fights - the World War I, the Little War and the World War II. (Bural' 2009). This brought degradation of living conditions for the local people. During World War II, after the Hungarian-Slovak Small War in 1939, Poloniny region partially became part of Hungary, which led to significant deforestation of virgin areas. Virgin forest, mainly in Stužica, was saved from the complete harvesting by the termination of the World War II and the rearrangement of national borders, where Transcarpathian Ukraine fell to the Soviet Union (now territory of Ukraine). This made access and economic use of land from the Slovak side very difficult (Jasík and Polák 2011). Societal change and economic development in Slovakia from 1948 to 1989 had significant influence on agricultural trends in the Poloniny regions. Intensification has taken place especially in the lowlands and in mountain valleys and slopes around villages, where farm machinery had better access (Bezák and Mitchley 2013). The collectivization in Slovakia (1970–1989) led to the change of employment type from fulltime farmers to hobby farmers. Many farmers were forced to commute to work to nearby urban centers with expanding industries (Bezák and Mitchley 2013). The construction of the reservoir Starina has radical intervention in the lives of the region in addition to post-war reconstruction and socialist construction in a period of 80s in the 20th century. In connection with its construction seven municipalities with 3,500 inhabitants were evicted (Bural' 2009). These impacts significantly strengthen the position of beech stands in Poloniny. Currently, the Poloniny region belongs to most sparsely populated and least developed regions of Slovakia, because it lies outside the routes of Pan-European multimodal transport corridors (Michniak 2010). Rich cultural heritage of Ruthenian and Ukrainian minority (Bural' et al. 2013) and preserved natural ecosystems such as beech forests (Korpi 1989, Jasík and Polák 2011) and unique species-rich semi-natural grasslands (Bezák et al. 2007, Halada et al. 2010) represent country's potential for development of sustainable forms of tourism.

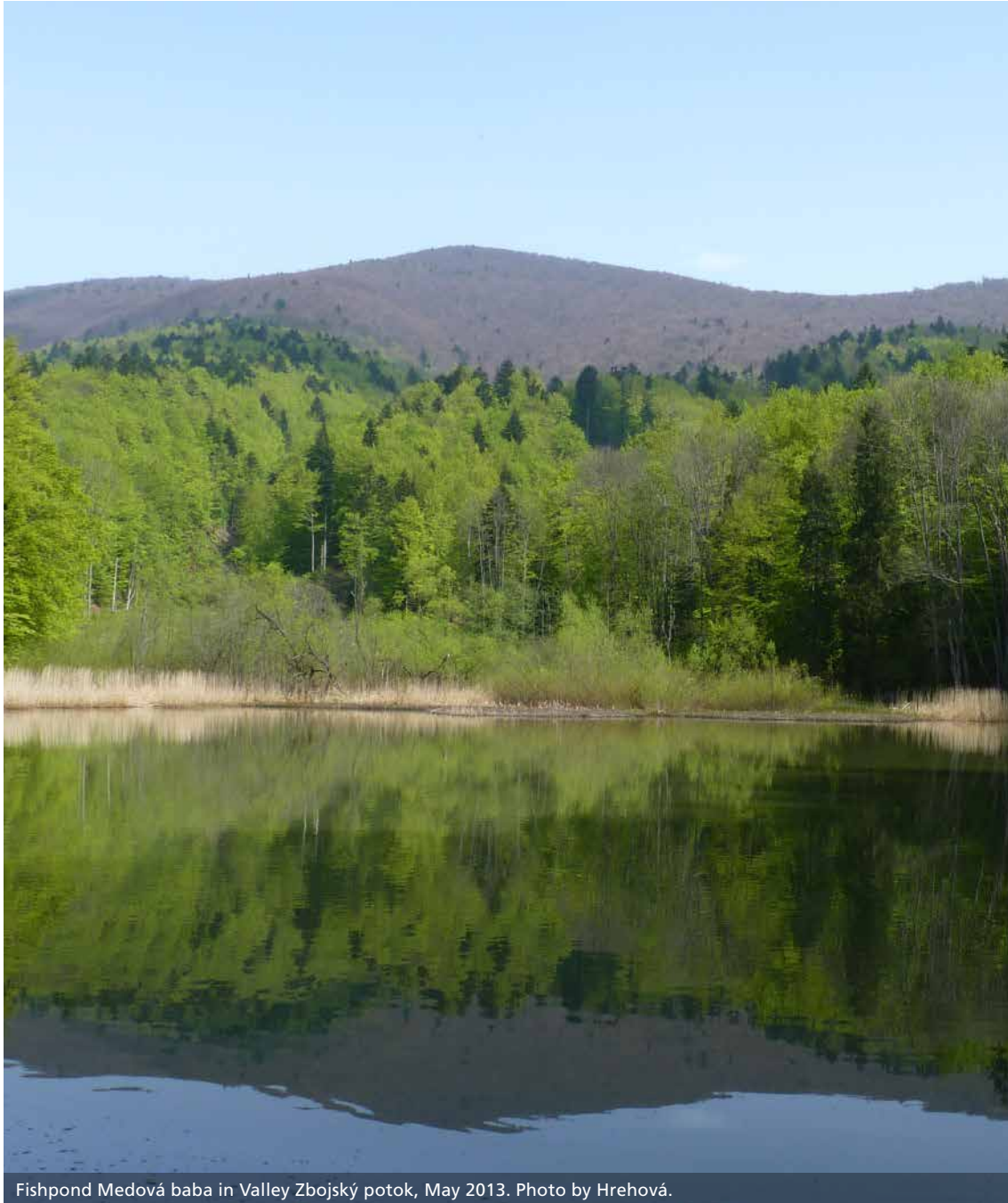
Recent socio-economic trend in the whole region of trilateral reservation led to increased forest fragmentation in all three countries (more in Slovakia and Ukraine than in Poland), mainly due to forest management (Jaworki et al. 2002). Differences in disturbance rates among countries appear to be most closely related to broad scale socioeconomic conditions, forest management practices, forest policies, and the strength of institutions (MacDonald et al. 2000, Kuemmerle et al. 2007). Poloniny showed a continuous population decrease since World War II up to the present time (Bezák and Mitchley 2013). Rural depopulation, land abandonment and further scrubbing over of the landscape were accelerated and consolidated in many mountain areas (Turnock 2002, Kozak 2003, Kozak et al. 2007, Kuemmerle et al. 2009). More broadly, land abandonment and rural depopulation (MacDonald et al. 2000, Kozak 2003) represent the socio-economic trend in Western Europe (Gellrich et al. 2007), whereas in Eastern Europe, abandonment landscape was

associated with the transition process (Renwick et al. 2013). Generally, three processes currently dominate in the region: forest expansion, urban sprawl (Kozak 2009) and rural depopulation. Rural depopulation and migration have been linked to land abandonment and forest regrowth in European mountain regions (Gellrich et al. 2007).

Recently, there are a lot of discussions about migration population and depopulation in mountain regions but rational numbers estimating these trends in relation to the nature protection are poorly known. The aim of this study is to determine trends in socio-economic relationships in relation with the natural environment and nature protection. Therefore, we proceed to a mutual assessment of socio-economic data such as land use, demography and economical revenues with nature protection data in this study.



## 2 Baseline data and knowledge for sustainable development in NP Poloniny



Streamlined management of natural, cultural and economic resources and human potential at local level is the key to ensuring sustainable development (UNCED 1992, Hrnčiarová 2000). We chose Cadastral area as basic spatial unit. Various statistical data (data from government and non-government organizations) was linked to cadastral areas, which represent units of human settlements. Study area includes the cadastral areas, which extend to the NP Poloniny and its buffer zone. Study area represented cadastral areas of: Osadné, Hostovice, Stakčín, Parihuzovce, Runina, Pčoliné, Zboj, Nová Sedlica, Topoľa, Príslop, Ruský Potok, Jalová, Snina, Stakčínka Rostoka, Kolbasov, Uličské Krivé, Kalná Rostoka, Ulič, Klenová, Ruská Volová, Brezovec, Ubl'a (see Figure 1).

We selected four groups of data in statistical analysis: regional political geography, regional demography, nature protection geography and local economy.

### Regional political geography

Regional political geography (see annex, Table 1) represents data of land use obtained from the Land Registry portal ([www.katasterportal.sk](http://www.katasterportal.sk) 2013). Land Registry records the total value of the urban and rural area. Also it records total value of agricultural land (area of arable land, permanent grassland, gardens, orchards), forest land, water sources, built-up areas, courtyards and other areas (see annex, Figure 13). Municipality Stakčín (16 774 ha) has the largest area of cadastre, which is almost six times higher than other cadastral area in the NP Poloniny (see Figure 2). The area of cadastre Stakčín arose, because joining with former village, which were displaced due to the construction of reservoir Starina. The smallest areas have municipalities as Jalová (279 ha), Brezovec (343 ha) and Príslop (618 ha).

Generally, we can consider the region for upland farming and forest landscape. The dominant element of land use structure is forest land in the study area. The largest share is in Runina (85,6%). In other municipalities, the proportion of forest land is more than half, excepting the villages Klenová (35,8%) and Jalová. Jalová has the lowest share of forest land (4,3%), mainly due to small size of the whole municipality. As can be seen in Figure 3, the second largest group of land use is agricultural land with the largest representation in municipality Jalová. The relative proportions of the various groups of land use shows an overall potential land use in individual municipalities. Most urbanized cadastral areas are Snina and Stakčín, which represent the major regional centres.

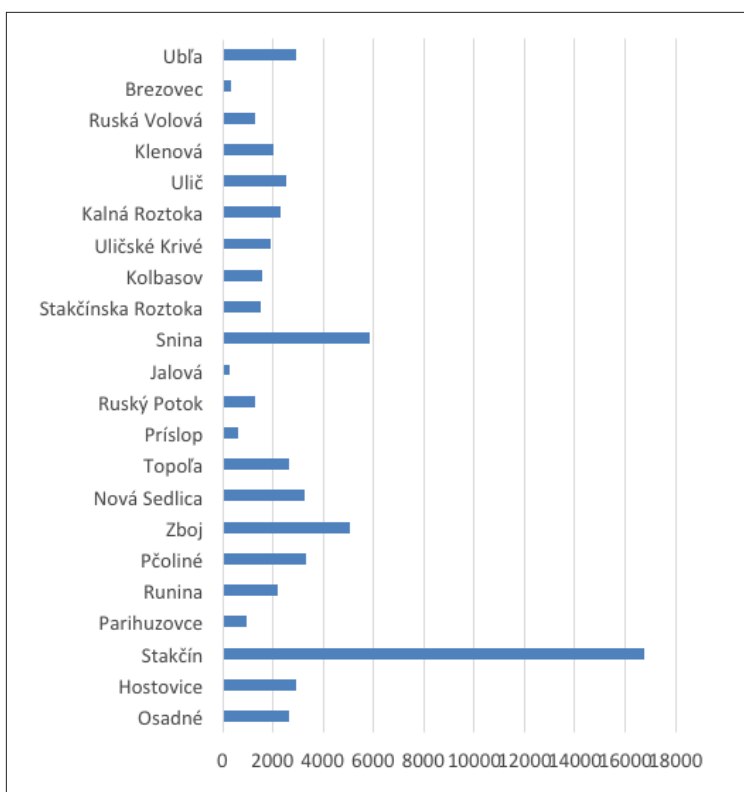
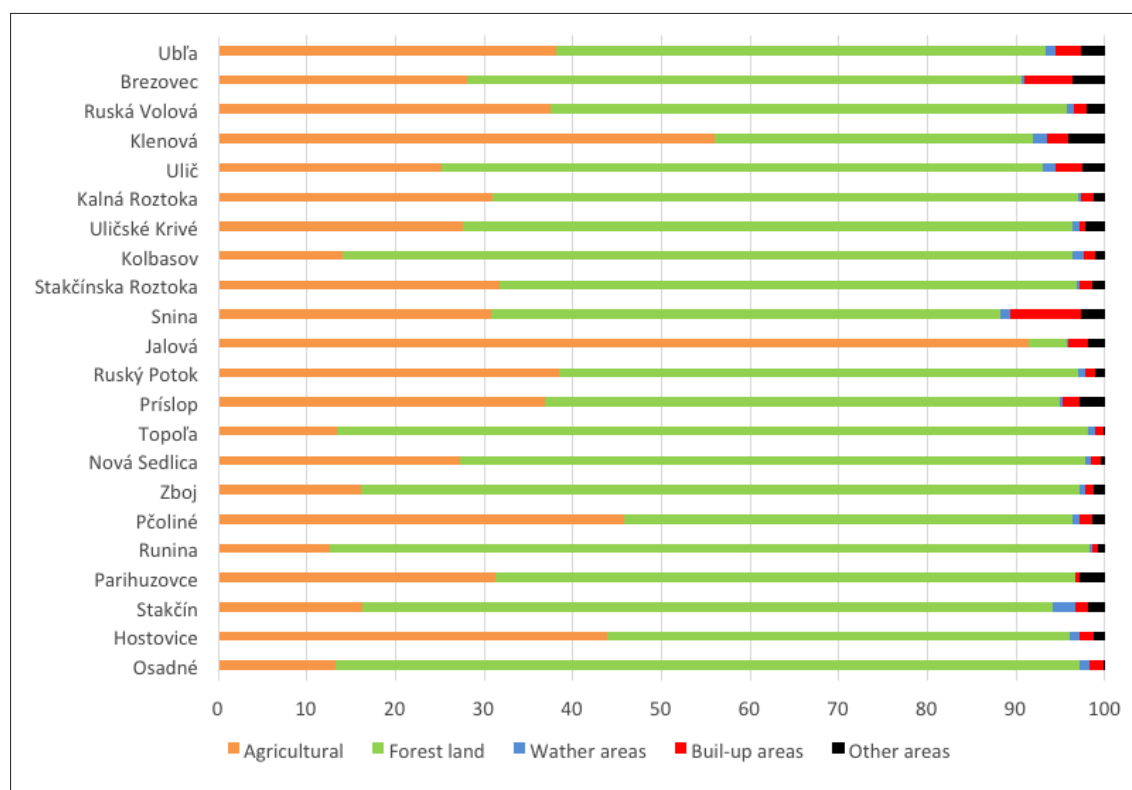


Figure 2: Cadastral areas in region NP Poloniny (in hectares).

## Regional demography

Regional demography (see annex, Table 3) includes key indicators of demography, such as the population (women and men, see annex, Figure 15) and population density, age structure at intervals of years 0-14, 15-54 women, 15-59 men, women over 55 and men over 60 (see annex, Figure 14), natality and mortality. Demography data was obtained directly from the local governments in the individual cadastral areas for the year 2012 (by record form, see annex, Figure 16). Some more demographic information such as economic activity of citizen and the number and proportion of unemployed, economically active and inactive population (see annex, Figure 8), but also information about education of population were obtained from the censuses of population and housing in the year 2011 by Statistical Office ([www.statistics.sk](http://www.statistics.sk) 2013).



**Figure 3:** Percentage proportion of land use in region NP Poloniny (in %).

The highest share of population is recorded in Snina (20 491), where is also the highest population density - 350 inhabitants per square km. Follows Stakčín (2 455), Ulič (913) and Ubl'a (839). More interesting shows up proportion of productive and post-productive population (see Figure 4). Municipalities Brezovec and Zboj have high proportion of dependent people. Generally, there is predominating a high proportion of post-productive population in the region. In some cases, cadastral areas with higher populations as Snina, Kalná Rostoka, but also Ubl'a, Klenová, Ulič and Stakčín appear, in terms of productivity, as a viable and still manage to keep young generation in the region. The highest proportion of the pre-productive population is currently in Kalná Rostoka and Klenová.

Unemployment is high in the whole region, from 22,4% to 48,6%. In Brezovec, Ubl'a, Klenová and Jalová, unemployment is more than 40%. Brezovec appear broadly as a municipality with a high proportion of old population, high unemployment, low education and are among the smallest cadastral areas in NP Poloniny.

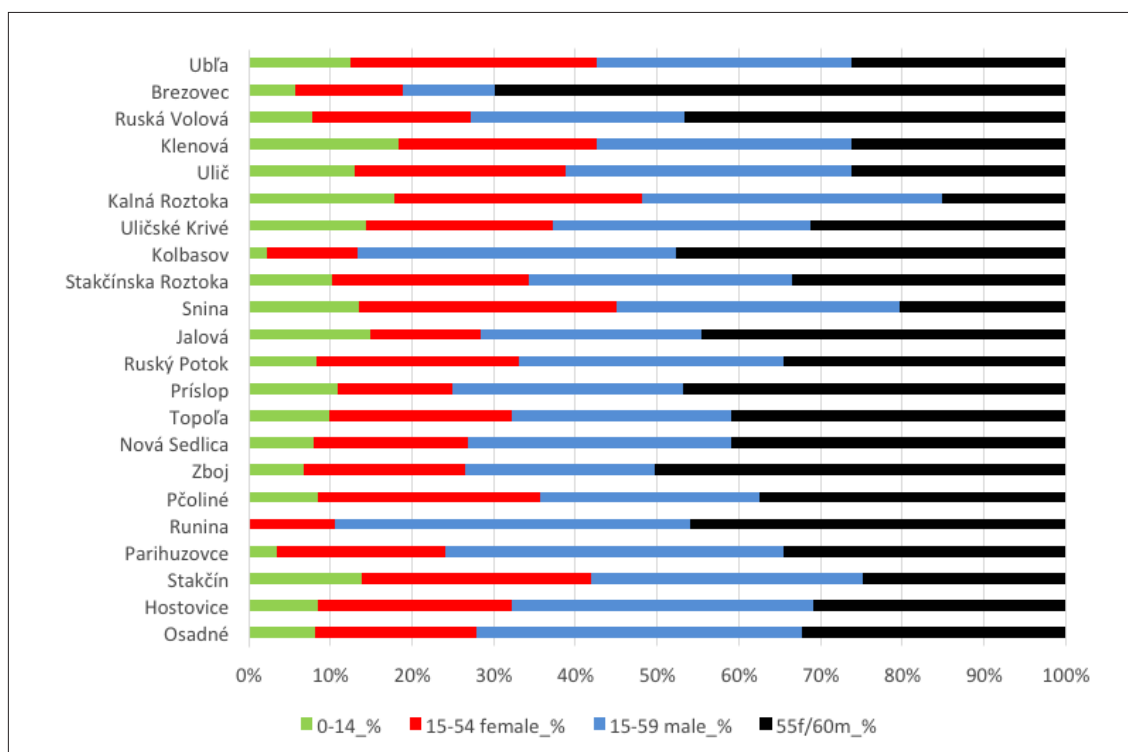


Figure 4: Percentage proportion of demography structure in region NP Poloniny (in %).

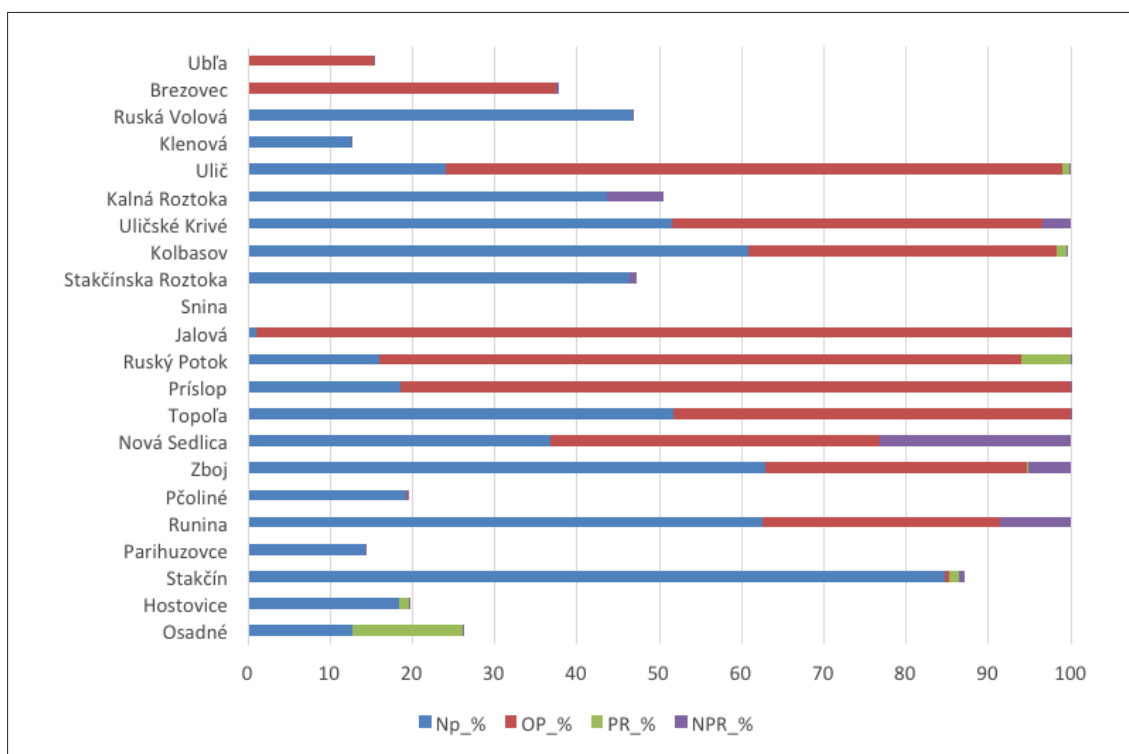
### Nature protection geography

The area of National park (NP) Poloniny is about 28 458ha wide and its buffer zone (BZ) has an area of 10 633ha. The area of 2 290ha belongs to natural reserves. The Nature protection geography (see annex, Table 2, Figure 9) consists from data of nature protection and count of existing natural (e.g. national reservation, NATURA 2000, Park of the dark sky, UNESCO) and cultural (especially wooden churches) sites (NKP). These data was obtained from the Slovak Heritage Office ([www.pamiatky.sk](http://www.pamiatky.sk) 2013) and the State List of specially protected natural environment of the Slovak Republic ([www.uzemia.enviroportal.sk](http://www.uzemia.enviroportal.sk) 2013).

In general, six cadastral areas (Uličské Krivé 51,5%, Kolbasov 60,8%, Topoľa 51,7%, Zboj 62,8%, Runina 62,6%, Stakčín 84,6%) have more than 50% of their area in territory of National park (see Figure 5). These municipalities, but also other as well as Ruská Volová, Nová Sedlica, Kalná and Stakčinská Roztoka represent key territorial administrative units, which have a high potential for development of the nature-based tourism, mainly due to the high proportion of their cadastral areas in NP Poloniny. In some cases, we register a significant share of natural as well as national nature reserves on the total area of the municipalities as in Nová Sedlica, Osadné, Runina, Zboj, Ruský Potok, Kalná Roztoka and Uličské Krivé, which provides added value to the development of the nature-based tourism.

### Local economy

For the local economy (see annex, Table 4, Figure 12) we selected those industries, revenues of which were possible to calculated according to the basic unit area - cadastre. Data represents revenues from forestry, hunting, water management, tourism and taxes. Revenues from agriculture could not be identified, because agricultural land is managed by local forestry companies whose powers go beyond the cadastral boundaries. For the calculation of revenues in forestry, we multiplied the data of timber harvesting (forest geographic informatics system LGIS 2013, see annex, Table 5, Figure 10) by an average price of timber, specified by the State Forests of the Slovak Republic. (The timber harvesting in the calamity area was multiplied by the price of firewood (see annex, Table 6). The economy of hunting revenues represent member fees, revenues from sales of meat from wild animals for members of the association and other associations,



**Figure 5:** Percentage proportion of protected sites in region NP Poloniny (in %).

hunting for fee and other revenues that are listed in the hunting database of the National Forestry Centre in year 2010 (see annex, Table 7, Figure 11) ([www.nlcsk.sk](http://www.nlcsk.sk) 2013). Revenues for tourism represent revenues from food services and accommodation. Revenues for the food services were calculated from the number of village visitors and minimal price 3€ per person, which they possibly paid for lunch. To calculate revenue for accommodation we used data showing the capacity, average prices of accommodation in individual communities (information available on the Internet) and %- usability coefficient of accommodation beds. Data on the capacity and visit rate were obtained directly from local representative bodies/municipalities in the individual cadastral areas (by record form, see annex Figure 16). Revenues from water management were calculated only for few villages such as Ubl'a, Ulič, Stakčín and Stakčínka Roztoka, where people are connected to the public water supply. Revenues represent invoiced amount of drinking water at a price of 1,57€ per cubic metre. Data on revenues from shared taxes (such as local taxes and local fees, tax for accommodation, for rent of buildings, for municipal waste and taxes on forest and agricultural land) were obtained directly from local representative bodies.

The highest total revenues (see Figure 6) are in Snina (2,8 million) and Stakčín (2,2 million). In Snina is that mainly due to higher tax revenues and water resources revenues. In Stakčín, total revenues are high because of forestry (Figure 7, see annex, Figure 12) and also the cadastre itself has a large surface area and a high proportion of forest stands. Lowest revenues were reached in Brezovec and Jalová.

From all collected data we created matrix to preliminary statistic analyse. We used the principal component analysis (PCA) and finally, from relation of the data, we evaluated several socio-economical conclusions in Poloniny region.

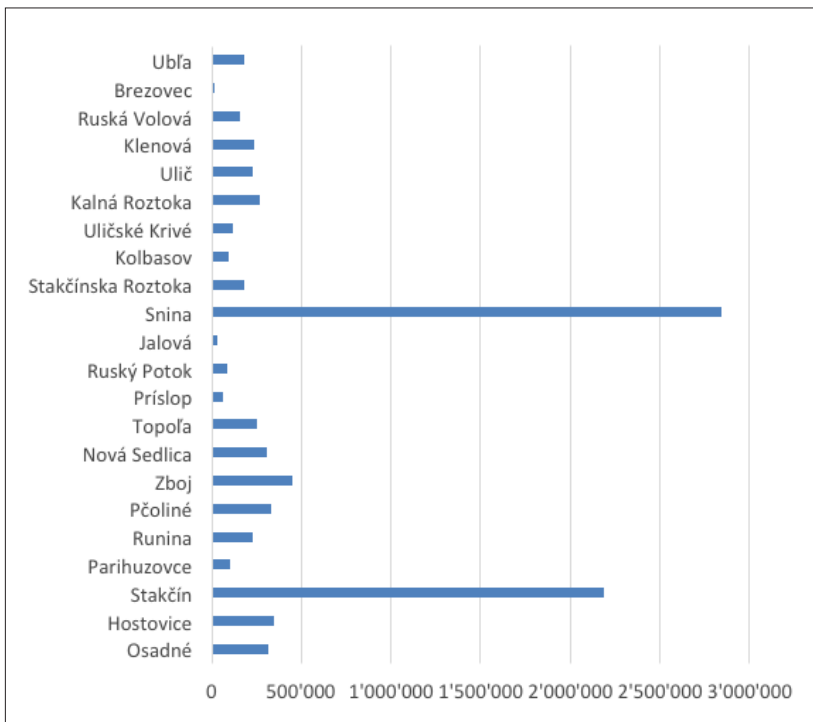


Figure 6: Total revenues in region NP Poloniny (in €).

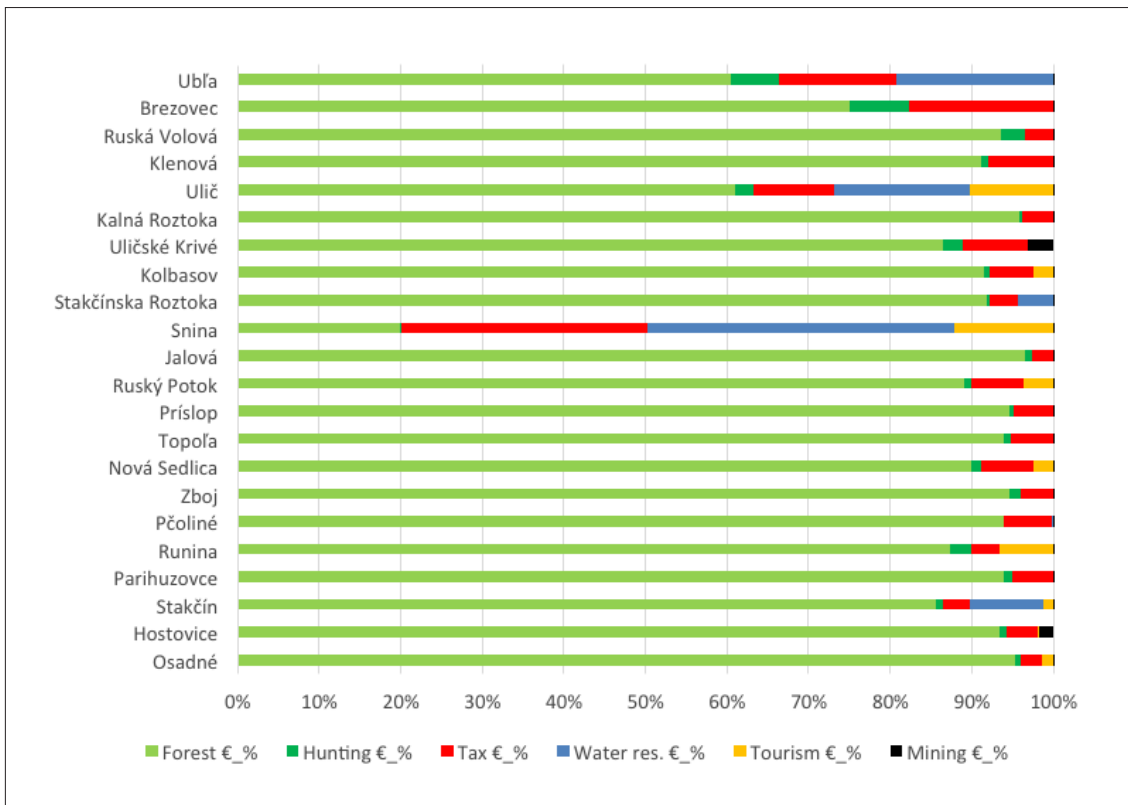


Figure 7: Percentage proportion of revenues in region NP Poloniny (in %).

### 3 Socioeconomics relation with land use and protections of nature



Beech forest above the Village Nová Sedlic, May 2012. Photo by Hrehová.

Data obtained from the region shows us, on demographic background, economic activity, land use and relationship with nature conservancy. The most visible fact in Poloniny region is concentration of population in cities and larger towns. Urban areas are represented by Snina and Stakčín with greater proportions of young people and higher population growth. Evidently higher pressure to land use change is within the boundaries of urban areas. Revenues in this region (urban areas) are from a wide range of economic activities. Stakčín, despite of low urban area compared to other municipalities (this is partly due to the cadastre size) and low proportion of taxes (most of the forest land is owned by the state) is the second most

populated municipality, for its location near Snina - the only city in the area. Settlements with a greater proportion of seniors and lower population growth are especially Parihuzovce, Runina, Príslop, Ruský Potok, Jalová, Kolbasov, Uličské Krivé, Ruská Volová, Brezovec. Revenues in these settlements are mainly from forest management. Higher revenues from taxes in municipalities Brezovec and Ubl'a are due to forest and agricultural land taxes of non-state entities. Proportion of protected area and the existence of the nature protection were not related to this fact, i.e. - State Nature Conservancy does not affect the demographic processes in the landscape, negative or positive.

Another fact in region is about activities in rural landscape. It is characterized by land use in the rural areas and forest management. Currently, all affected municipalities have over 90% of rural land (except Snina) in the form of forest land, as confirmed by the largest revenues from forestry, with 13 affected municipalities it represents over 90% of all revenues. There are lower revenues from taxes or tourism. This fact is independent on demography and proportion of economic active population. Study site and existence of national park is dependent on land in rural area, especially on the forest land. But on the other side, the size and location of areas of national nature reserves (NPR) or nature reserves (PR) are independent on size or locations of rural area. Generally, the overlap of protected land, forest and agricultural land in relation to land use change creates a risk of harm to protected areas.

Proportion of area of agricultural and forest land is characterized by the extent of agricultural versus forest land in cadastral areas. Cadastral areas, which have more agricultural land, have a larger proportion of natality and a greater proportion of children, but also a greater proportion of the unemployed people (mainly Jalová, Stakčín, and Klenová). Opposite situation is in Runina, Ulič, Ruský Potok or Osadné, where is a larger proportion of forest land. In the municipalities with greater proportion of forest land, we see the first signs of revenues from nature-based tourism, but total revenues in the region have no connection to this fact. Also, this fact is irrelevant to the protected areas.

Contrast of historical establishment of national nature reserves and nature reserves and fact of existence National Park in region is irrelevant to socio-economic and demography variables, apart from the fact, that the natality in settlements is lower than the mortality (mainly Jalová, Nová Sedlica). At the moment, this fact is unrelated to revenues in the region. In the region is undeveloped tourism, which represents "white plains" in planning development strategies. This provides a much more permanent long term solution in the form of nature-base tourism. In the cadastral areas, where is a greater proportion of protected areas, the revenues from tourism starts to rise. The first signs we can see in the villages Osadné, Ruský Potok and Ulič. This fact is independent on demography in region.

On the base of PCA analyze, the status of nature protection is irrelevant to demographic characteristics in the region and nature conservation has minimal effect on socio-economic relations of the population in the region of NP Poloniny. This is the mistaken perception in contemporary society. If the importance of nature protection will be increasingly marginalized in the future, this may lead to the enduring perception of nature protection as something unnecessary among the inhabitants.

### **Land abandonment and population migration**

The resulting facts clearly describe trends in Poloniny region. Some of these trends are also observed in EU or Carpathians region. Mainly, fact of concentration to cities and larger towns is global trend of 21. century. Local demographic trends since World War II showed a continuous population decrease (Bezák and Mitchley 2013). The significant depopulation is evidently since 1960s and 1970s due to collectivization. These observed trends led to land abandonment what is contentious issue within Europe (Renwick et al. 2013). From global view, observed emigration and spatial movement of populations is often determined by location - specific social, economic, political and environmental conditions (Baldock et al., 1996; MacDonald et al., 2000). Petrovič and Bezák (2006) notes, that emigration and land abandonment are related with poor technical infrastructure, marginal location and deficient of employment opportunities in Poloniny region. Land use abandonment affect spatial modification of landscapes - interruption of traditional farming practices. Stopping this fact we see in the involvement of local communities in the economic process (nature-based tourism in rural landscape, nature sites of spiritual significant, local sources, craftsmen, volunteers, traditional activity (honey), folklore, architecture, spiritual culture (churches – produce spiritual value – connect local people with their own identity) and cross border cooperation. Istvan Már (2013) from Szekeler fruit association began project Green social enterprises in Romania. There were in tradition way of

our ancestors safe guarding old varieties of fruit trees and producing high added value products. After three years 5 500 local people was benefiting from the initiative. They mixed environmental and cultural heritage as business asset for benefit for local communities with vision until 2020 generate 40 % of the annual budget of the owner NGOs. It means 1000 jobs, 500 local producers involving 1000 employees. Suitable development does not work without the involvement of local people. Also in Romania they changed understanding in forest management in PA – in 33 days 106 000 people signed the petition – all virgin forest are under protection (to stop fragmentation, illegal logging, invasive species etc.) In Gorgany nature reserve and NP Hutsulchyna in Ukraine (Slobodyan 2013), they created suitable tourist activities based on natural heritage and living traditions. From our results and also from results Kušová et al. (2008) which analyzed Czech biosphere reservation, there is no statistically significant difference between protected areas and their surroundings in terms of objectively measured parameters describing material wellbeing. Nor the inhabitants of protected areas feel themselves handicapped. For local stakeholders, support for agriculture is essential for such kind of landscape, favouring as farming activities with positive impacts on natural values and biodiversity, as local livelihood, possible forms of agro-tourism, attracting visitors to the region and total economic growth of the region (Petrovič et al. 2004, Petrovič and Bezák 2006).

### **Demographic and landscape structure**

Settlement structure in Poloniny is characterized by small residential settlements 50-500 inhabitants and central town Snina and municipality Stakčín. In Poloniny region, there predominate rural landscape under urban sites in all settlements, except Snina town, where is built-up area about eight %. Aging population trend is visible not only in Poloniny, but in general (Jeníček and Foltýn 2003), due to changes in health care, changes in values and lifestyle, especially due to the rural-urban migration of young people to cities for work opportunities, when benefiting major economic revenue from forestry and agriculture are insufficient under existing circumstances. More and more rural people are moving to urban centers in search of economic opportunities. The birth-death ratio is decreasing in region Poloniny in all of settlements. In villages Kolbasov and Príslop are more than 30% inhabitants older than 55 years. The male-female ratio is also decreasing and number of children under age of 14 absence in Kolbasov and Runina, in Zboj, Nová Sedlica, Hostovice, Topoľa and Osadné is this number less than ten percent of all population. This fact is closely related to unemployment and thus the economically active population. The share of the unemployed in Parihuzovce is very high, about 60% and lowest is in Stakčínská Roztoka, about 19% (Osadné – 22%, Snina – 23%), what is also high. Only in municipality Ulič is economically active population over 50% and in Parihuzovce less than 18%. Similarly to Janiga et al. (2012), based on the concept of ecosystem services (Westman 1977, Pagiola et al. 2004, Pagiola and Platanem 2007), showed that revenues from forestry represented 77% from whole revenues in area of NP Poloniny in the year 2010. Snina is centre of socio-economic development in region. Population migration to Snina creates positive perspectives for nature protection, but on other side creates pressure on rural areas. Social and environmental problems in cities generate migratory movements from “large” to “small” areas, Antrop (2004) this process characterized as the third stage of urban development.

### **Present questions and future in nature protection**

Protected areas are popularly imagined as “places without people” (West et al. 2006). In spite of our result that the National Park is irrelevant to socio-economic and demography variables and rural – urban migration, the higher population growth on Protected areas edges is evident across ecoregions, countries and continents (38 from 45 countries), what means that value of PA is very important for local residents (Wittemyer 2008). PA may increase economic prospects by increasing people financial access, providing benefits for rural residents. If they do so, it is positive for rural people. If local system is ineffective or do not exist, it has negative impact. Interaction between birth – death dynamics and the biotic factors influencing them and in turn, influence of PA on those factors is immense (Joppa 2012). For rural residents, which live in need, the existences of PA have negative effect for living. They are moving and searching economic resources, infrastructure and land tenure elsewhere – the massive rural – urban migration is happening around the world. According to Sholte and de Groot (2009) the samples of influences birth – death ratio are economies, ecosystem services and infrastructure and there exist three basic global models of inspiration to move to PA – attraction, frontier engulfment and incidental. PAs have a positive impact on employment in nature-base tourism and thus decreasing forest sector employment (of the pressure relief for the sector); it suggests the importance of alternative employment. Low population density with absence local services makes it hard to create viable employment opportunities (Lundmark et al. 2010). The market for nature-

base tourism is increasing faster than traditional tourism, at rate 10-30% per annum (Nevin et al. 2012). Our results support the assumption that the village situated near hiking trails, cultural and natural heritage (Nová Sedlica) report higher revenues in tourism as more remote villages. Tourism development is uneven regional development. In reverse relationship, when population structure is uneven and falling, is harder to promote economic restructuring and diversification (West et al. 2006). For protected areas, more challenging are the questions of balancing nature conservation with tourism, integrating community development in conservation, and, more importantly, assuring local people that conserving natural areas is beneficial not only for the State but also for local communities and institutions (Nepal 1997). The amount of shared taxes for accommodation and municipal waste also depends on the tourism situation in the municipality, the better tourism, the higher tax revenue for the municipality. Revenues from shared taxes for renting land and buildings depend on the acreage. Declaration or expanding the frontiers of nature reservation, which shared taxes do not pay, resulting in decreased revenues from shared taxes (Nová Sedlica). Such outages of taxes could be compensated exactly by developing of nature-based tourism.

Some socioeconomic and institutional recommendations for future management measures in the Poloniny NP provide Bezák and Halada (2010), such as implement measures of agro-environmental support. Involve local small- and medium-sized enterprises and farmers in agricultural/environmental support schemes. Establish closer cooperation between local stakeholders, farmers, non-government association and nature conservation institutions. Support cross-border cooperation and formation of local information centres. Inform local people via the local government about possible support for tourism. Stakeholder meetings can be a useful way to gain an understanding of stakeholder views and to initiate a debate about transition of European mountain areas from 'less-favoured' agricultural landscapes to 'highly-valued' environmental landscapes (Soliva et al. 2008). The institutional framework for sustainable mountain development has a very strong regional dimension, with numerous active institutions and organizations. The diversity of their structure, legal status, and set of stakeholders demonstrates that a wide array of models is already available. Such models can facilitate the building of new initiatives, in mountain areas and elsewhere (Kohler et al. 2012). "Sound environment" and "well-preserved nature" can be considered as two principal attributes of the territory (Kušová et al. 2008). Local communities must be able to empower themselves to face the challenges of rural development. Thus, self-reliance is the key to successful empowerment (Nepal 1997).

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## Annex



*Dryopteris filix-mas*, young curled leaf, May 2013. Photo by Hrehová.

**Table 1:** Political geography data in NP Poloniny.

| <b>Municipality</b>      | <b>Urban area %</b> | <b>Rural area %</b> | <b>Arable land %</b> | <b>Garden %</b> | <b>Fruit grove %</b> | <b>Grassland %</b> | <b>Agricultural land %</b> | <b>Forest land %</b> | <b>Water areas %</b> | <b>Built-up areas %</b> | <b>Other areas %</b> | <b>Total area in Ha</b> |
|--------------------------|---------------------|---------------------|----------------------|-----------------|----------------------|--------------------|----------------------------|----------------------|----------------------|-------------------------|----------------------|-------------------------|
| <b>Stakčín</b>           | 1,15                | 98,85               | 1,39                 | 0,31            | 0,01                 | 14,60              | 16,30                      | 77,79                | 2,53                 | 1,42                    | 1,96                 | 16774,73                |
| <b>Snina</b>             | 10,21               | 89,79               | 13,02                | 1,00            | 0,04                 | 16,78              | 30,83                      | 57,43                | 1,10                 | 7,89                    | 2,75                 | 5861,00                 |
| <b>Zboj</b>              | 1,66                | 98,34               | 2,16                 | 0,55            | 0,01                 | 13,47              | 16,19                      | 81,04                | 0,53                 | 1,05                    | 1,19                 | 5054,17                 |
| <b>Pčoliné</b>           | 2,58                | 97,42               | 6,47                 | 1,26            | 0,01                 | 38,11              | 45,84                      | 50,46                | 0,84                 | 1,41                    | 1,45                 | 3343,96                 |
| <b>Nová Sedlica</b>      | 1,71                | 98,29               | 1,59                 | 0,62            | 0,01                 | 24,99              | 27,20                      | 70,58                | 0,60                 | 1,23                    | 0,40                 | 3280,81                 |
| <b>Hostovice</b>         | 2,98                | 97,02               | 9,20                 | 2,14            | 0,01                 | 32,49              | 43,83                      | 52,25                | 1,10                 | 1,63                    | 1,19                 | 2904,29                 |
| <b>Ubľa</b>              | 4,32                | 95,68               | 7,33                 | 1,73            | 0,01                 | 29,13              | 38,19                      | 55,09                | 1,18                 | 2,91                    | 2,63                 | 2900,35                 |
| <b>Osadné</b>            | 2,38                | 97,62               | 0,80                 | 1,56            | 0,01                 | 10,91              | 13,26                      | 83,82                | 1,26                 | 1,53                    | 0,12                 | 2652,27                 |
| <b>Topoľa</b>            | 2,44                | 97,56               | 0,01                 | 1,33            | 0,01                 | 12,01              | 13,35                      | 84,78                | 0,74                 | 0,94                    | 0,19                 | 2638,41                 |
| <b>Ulič</b>              | 4,79                | 95,21               | 10,78                | 1,41            | 0,01                 | 12,94              | 25,13                      | 67,81                | 1,56                 | 2,90                    | 2,59                 | 2514,62                 |
| <b>Kalná Roztoka</b>     | 3,74                | 96,26               | 5,85                 | 1,13            | 0,01                 | 24,01              | 30,99                      | 65,92                | 0,39                 | 1,49                    | 1,21                 | 2278,51                 |
| <b>Runina</b>            | 1,18                | 98,82               | 1,16                 | 0,31            | 0,01                 | 11,16              | 12,63                      | 85,58                | 0,31                 | 0,71                    | 0,76                 | 2219,83                 |
| <b>Klenová</b>           | 3,29                | 96,71               | 24,29                | 0,63            | 0,01                 | 31,10              | 56,02                      | 35,83                | 1,70                 | 2,33                    | 4,12                 | 2001,00                 |
| <b>Uličské Krivé</b>     | 1,81                | 98,19               | 4,26                 | 0,33            | 0,01                 | 22,99              | 27,58                      | 68,75                | 0,76                 | 0,75                    | 2,15                 | 1909,30                 |
| <b>Kolbasov</b>          | 1,54                | 98,46               | 1,84                 | 0,74            | 0,01                 | 11,52              | 14,11                      | 82,22                | 1,36                 | 1,15                    | 1,16                 | 1596,54                 |
| <b>Stakčínka Roztoka</b> | 3,62                | 96,38               | 6,52                 | 0,65            | 0,01                 | 24,54              | 31,71                      | 65,14                | 0,25                 | 1,52                    | 1,38                 | 1515,35                 |
| <b>Ruská Volová</b>      | 2,23                | 97,77               | 7,48                 | 1,09            | 0,01                 | 28,93              | 37,51                      | 58,13                | 0,92                 | 1,34                    | 2,10                 | 1306,84                 |
| <b>Ruský Potok</b>       | 1,87                | 98,13               | 0,01                 | 0,94            | 0,01                 | 37,43              | 38,38                      | 58,66                | 0,75                 | 1,07                    | 1,14                 | 1288,48                 |
| <b>Parihuzovce</b>       | 2,25                | 97,75               | 0,17                 | 1,14            | 0,01                 | 30,02              | 31,34                      | 65,27                | 0,10                 | 0,51                    | 2,78                 | 952,00                  |
| <b>Príslop</b>           | 3,79                | 96,21               | 1,03                 | 0,98            | 0,01                 | 34,76              | 36,78                      | 58,16                | 0,21                 | 2,05                    | 2,80                 | 618,26                  |
| <b>Brezovec</b>          | 3,84                | 96,16               | 0,55                 | 1,40            | 0,01                 | 26,06              | 28,01                      | 62,67                | 0,27                 | 5,35                    | 3,69                 | 342,71                  |
| <b>Jalová</b>            | 5,88                | 94,12               | 0,47                 | 3,86            | 0,01                 | 87,06              | 91,40                      | 4,28                 | 0,26                 | 2,12                    | 1,94                 | 278,71                  |

**Table 2:** Nature protection geography data in NP Poloniny (NP-National Park, BZ-Buffer Zone, PR-Nature Reserves, NPR-National Nature Reserves, PKP-Nature and Cultural Heritage).

| <b>Municipality</b> | <b>NP %</b> | <b>BZ %</b> | <b>PR %</b> | <b>NPR %</b> | <b>PKP</b> |
|---------------------|-------------|-------------|-------------|--------------|------------|
| Stakčín             | 84,64       | 0,65        | 1,07        | 0,81         | 7          |
| Zboj                | 62,81       | 31,85       | 0,20        | 5,09         | 8          |
| Runina              | 62,57       | 28,76       | 0,01        | 8,64         | 6          |
| Kolbasov            | 60,76       | 37,57       | 1,17        | 0,04         | 9          |
| Topoľa              | 51,73       | 48,27       | 0,01        | 0,01         | 7          |
| Uličské Krivé       | 51,50       | 45,04       | 0,03        | 3,38         | 8          |
| Ruská Volová        | 46,68       | 0,10        | 0,01        | 0,01         | 4          |
| Stakčinská Roztoka  | 46,42       | 0,01        | 0,01        | 0,79         | 3          |
| Kalná Roztoka       | 43,62       | 0,01        | 0,01        | 6,83         | 8          |
| Nová Sedlica        | 36,83       | 39,90       | 0,01        | 23,20        | 6          |
| Ulič                | 24,14       | 74,88       | 0,84        | 0,11         | 5          |
| Pčoliné             | 19,32       | 0,01        | 0,01        | 0,01         | 4          |
| Príslop             | 18,57       | 81,43       | 0,01        | 0,01         | 2          |
| Hostovice           | 18,33       | 0,01        | 1,18        | 0,01         | 3          |
| Ruský Potok         | 15,94       | 77,99       | 6,07        | 0,01         | 9          |
| Parihuzovce         | 14,27       | 0,01        | 0,01        | 0,01         | 5          |
| Osadné              | 12,74       | 0,01        | 13,33       | 0,01         | 6          |
| Klenová             | 12,58       | 0,01        | 0,01        | 0,01         | 5          |
| Jalová              | 1,02        | 98,98       | 0,01        | 0,01         | 2          |
| Snina               | 0,02        | 0,01        | 0,01        | 0,01         | 7          |
| Brezovec            | 0,01        | 37,41       | 0,01        | 0,37         | 1          |
| Ubl'a               | 0,01        | 15,23       | 0,01        | 0,01         | 2          |

**Table 3:** Regional demographic data in NP Poloniny.

| Municipality       | Population | Male % | Female % | 0-14 % | 15-54 female % | 15-59 male % | 55f/60m % | Nativity % | Mortality % | Unemployed % | Econ. inactive % | Econ. active pop. % | Higher educ. % |
|--------------------|------------|--------|----------|--------|----------------|--------------|-----------|------------|-------------|--------------|------------------|---------------------|----------------|
| Snina              | 20491      | 48,94  | 51,06    | 13,51  | 31,49          | 34,75        | 20,25     | 0,88       | 0,67        | 21,47        | 51,45            | 48,55               | 9,34           |
| Stakčín            | 2455       | 49,12  | 50,67    | 13,93  | 27,94          | 33,36        | 24,77     | 0,65       | 0,81        | 29,76        | 53,73            | 46,27               | 7,47           |
| Ulič               | 913        | 50,27  | 49,73    | 12,92  | 25,96          | 34,94        | 26,18     | 1,10       | 2,63        | 30,24        | 51,39            | 48,61               | 5,58           |
| Ubla               | 839        | 46,01  | 53,99    | 12,51  | 30,04          | 31,23        | 26,22     | 0,72       | 1,19        | 42,42        | 55,07            | 44,93               | 5,20           |
| Pčoliné            | 584        | 52,40  | 47,60    | 8,56   | 27,05          | 26,88        | 37,50     | 0,51       | 1,37        | 26,02        | 57,73            | 42,27               | 8,93           |
| Klenová            | 523        | 48,57  | 51,43    | 18,36  | 24,28          | 31,17        | 26,20     | 1,15       | 1,34        | 42,38        | 59,77            | 40,23               | 4,98           |
| Kalná Roztoka      | 500        | 53,80  | 58,20    | 17,80  | 30,40          | 36,60        | 15,20     | 1,00       | 1,00        | 30,36        | 60,14            | 39,86               | 3,56           |
| Zboj               | 358        | 43,85  | 49,44    | 6,70   | 19,83          | 23,18        | 50,28     | 0,00       | 1,40        | 18,57        | 63,82            | 36,18               | 3,88           |
| Stakčínská Roztoka | 332        | 51,81  | 48,19    | 10,24  | 24,10          | 32,23        | 33,43     | 0,30       | 0,90        | 19,31        | 56,85            | 43,15               | 3,87           |
| Hostovice          | 295        | 54,58  | 45,42    | 8,47   | 23,73          | 36,95        | 30,85     | 0,00       | 2,37        | 18,49        | 59,66            | 40,34               | 5,42           |
| Nová Sedlica       | 279        | 53,41  | 46,59    | 7,89   | 19,00          | 32,26        | 40,86     | 1,08       | 2,87        | 25,45        | 61,67            | 38,33               | 3,14           |
| Uličské Krivé      | 250        | 40,00  | 42,40    | 14,40  | 22,80          | 31,60        | 31,20     | 0,00       | 2,00        | 31,52        | 65,67            | 34,33               | 1,12           |
| Osadné             | 183        | 56,28  | 43,72    | 8,20   | 19,67          | 39,89        | 32,24     | 0,55       | 3,28        | 21,28        | 75,13            | 24,87               | 5,29           |
| Topoľa             | 161        | 45,96  | 54,04    | 9,94   | 22,36          | 26,71        | 40,99     | 0,62       | 1,86        | 22,03        | 63,35            | 36,65               | 4,35           |
| Ruský Potok        | 133        | 45,11  | 54,89    | 8,27   | 24,81          | 32,33        | 34,59     | 0,01       | 0,75        | 37,70        | 54,48            | 45,52               | 0,75           |
| Ruská Volová       | 103        | 47,57  | 52,43    | 7,77   | 19,42          | 26,21        | 46,60     | 0,01       | 0,97        | 25,00        | 60,36            | 39,64               | 2,70           |
| Kolbasov           | 90         | 48,89  | 51,11    | 2,22   | 11,11          | 38,89        | 47,78     | 0,01       | 3,33        | 31,58        | 57,78            | 42,22               | 3,33           |
| Runina             | 76         | 53,95  | 46,05    | 0,01   | 10,53          | 43,42        | 46,05     | 0,01       | 3,95        | 24,32        | 56,47            | 43,53               | 4,71           |
| Jalová             | 74         | 39,19  | 33,78    | 14,86  | 13,51          | 27,03        | 44,59     | 2,70       | 8,11        | 40,63        | 60,49            | 39,51               | 1,23           |
| Príslop            | 64         | 53,13  | 46,88    | 10,94  | 14,06          | 28,13        | 46,88     | 0,02       | 4,69        | 38,46        | 77,59            | 22,41               | 1,72           |
| Brezovec           | 53         | 33,96  | 66,04    | 5,66   | 13,21          | 11,32        | 69,81     | 0,02       | 0,02        | 46,67        | 69,39            | 30,61               | 0,00           |
| Parihuzovce        | 29         | 55,17  | 44,83    | 3,45   | 20,69          | 41,38        | 34,48     | 0,03       | 3,45        | 12,50        | 75,76            | 24,24               | 3,03           |

**Table 4:** Local economy data in NP Poloniny.

| <b>Municipality</b> | <b>Forest %</b> | <b>Hunting %</b> | <b>Tax %</b> | <b>Water res. %</b> | <b>Tourism %</b> | <b>Mining %</b> | <b>Sum €</b> |
|---------------------|-----------------|------------------|--------------|---------------------|------------------|-----------------|--------------|
| Jalová              | 96,53           | 0,81             | 2,66         | 0                   | 0                | 0               | 32 666       |
| Kalná Roztoka       | 95,77           | 0,35             | 3,88         | 0                   | 0                | 0               | 267 904      |
| Osadné              | 95,37           | 0,68             | 2,55         | 0                   | 1,40             | 0               | 317 940      |
| Zboj                | 94,62           | 1,34             | 4,05         | 0                   | 0                | 0               | 449 880      |
| Príslop             | 94,59           | 0,57             | 4,84         | 0                   | 0                | 0               | 60 069       |
| Topoľa              | 93,96           | 0,90             | 5,14         | 0                   | 0                | 0               | 250 169      |
| Parihuzovce         | 93,96           | 1,04             | 5,00         | 0                   | 0                | 0               | 102 050      |
| Pčoliné             | 93,86           | 0,15             | 5,91         | 0                   | 0,09             | 0               | 335 390      |
| Ruská Volová        | 93,63           | 2,84             | 3,53         | 0                   | 0                | 0               | 156 792      |
| Hostovice           | 93,43           | 0,80             | 3,82         | 0                   | 0,26             | 1,68            | 344 332      |
| Stakčínska Roztoka  | 91,85           | 0,37             | 3,50         | 4,28                | 0,00             | 0               | 183 379      |
| Kolbasov            | 91,58           | 0,69             | 5,31         | 0                   | 2,42             | 0               | 96 467       |
| Klenová             | 91,14           | 0,83             | 8,03         | 0                   | 0                | 0               | 239 559      |
| Nová Sedlica        | 89,91           | 1,28             | 6,35         | 0                   | 2,46             | 0               | 308 728      |
| Ruský Potok         | 89,08           | 0,93             | 6,41         | 0                   | 3,58             | 0               | 83 768       |
| Runina              | 87,33           | 2,59             | 3,45         | 0                   | 6,63             | 0               | 228 391      |
| Uličské Krivé       | 86,57           | 2,38             | 7,96         | 0                   | 0                | 3,09            | 121 376      |
| Stakčín             | 85,60           | 0,90             | 3,24         | 9,07                | 1,18             | 0               | 2 184 176    |
| Brezovec            | 75,06           | 7,25             | 17,69        | 0                   | 0                | 0               | 16 294       |
| Ulič                | 60,99           | 2,25             | 9,82         | 16,62               | 10,32            | 0               | 226 732      |
| Ubľa                | 60,55           | 5,90             | 14,34        | 19,21               | 0                | 0               | 179 804      |
| Snina               | 19,96           | 0,14             | 30,21        | 37,53               | 12,15            | 0               | 2 846 435    |

**Table 5:** Wood harvesting in m<sup>3</sup> and annual revenues in NP Poloniny.

| Forest areas in NP Poloniny | Conifer % | Deciduous % | Sum m <sup>3</sup> | Calamity conifer % | Calamity deciduous % | Sum of calamity m <sup>3</sup> | Sum €        |
|-----------------------------|-----------|-------------|--------------------|--------------------|----------------------|--------------------------------|--------------|
| Sobrance                    | 2,29      | 97,71       | 146 829            | 20,75              | 79,25                | 48                             | 6 162 403,00 |
| Starina                     | 3,99      | 96,01       | 66 939             | 72,53              | 27,47                | 91                             | 2 821 278    |
| Udavské                     | 2,84      | 97,16       | 46 355             | 3,32               | 96,68                | 193                            | 1 954 409    |
| Snina                       | 3,55      | 96,45       | 39 517             | 30,15              | 69,85                | 417                            | 1 676 038    |
| N. Jablonka                 | 8,73      | 91,27       | 26 197             | 39,01              | 60,99                | 36                             | 1 115 705    |
| Zboj                        | 12,02     | 87,98       | 16 296             |                    |                      | 0                              | 698 227      |
| Topoľa                      | 3,85      | 96,15       | 12 646             | 100,00             | 0,00                 | 3                              | 532 480      |
| Ulič                        | 4,23      | 95,77       | 9 644              |                    |                      | 0                              | 406 355      |

**Table 6:** Domestic prices of individual ground wood types in 2012.

| Domestic Prices          | Conifer € | Deciduous € | Firewood (conifer) € | Firewood (deciduous) € |
|--------------------------|-----------|-------------|----------------------|------------------------|
| Price per m <sup>3</sup> | 50,87     | 41,75       | 20,08                | 37,29                  |

**Table 7:** Revenues (in €) of hunting grounds in NP Poloniny.

| Name of hunting grounds | User name                      | Annual revenues € |
|-------------------------|--------------------------------|-------------------|
| Poloň                   | Súkromné lesy Kredba a Mudroch | 6 639             |
| Beskyd                  | LPM Ulič, š.p.                 | 5 955             |
| Strub                   | PZ Zubor                       | 5 371             |
| Javorník                | PZ Javorník, Ulič              | 4 440             |
| Jeseník                 | PZ Beskyd Zboj                 | 3 900             |
| Pol'ana                 | PZ Jeleň Veľká Pol'ana         | 2 823             |
| Kyčera                  | PZ Osoj, Osadné                | 2 787             |
| Ruské                   | PZ Plaša, Ruské                | 2 694             |
| Starina                 | PZ Medveď, Starina             | 2 660             |
| Veža                    | PS Polonina, Snina             | 2 460             |
| Molyšov                 | PZ Laz, Hostovice              | 2 310             |
| Bukovec                 | PS Bukovec, Ulič               | 2 289             |
| Romanovo                | PZ Jastrab, Parihuzovce        | 2 072             |
| Nastaz                  | LPM Ulič, š.p.                 | 1 296             |
| Pčoliné                 | PS Pavlovec                    | 597               |
| Kolodník                | Polonina s.r.o.                | 525               |

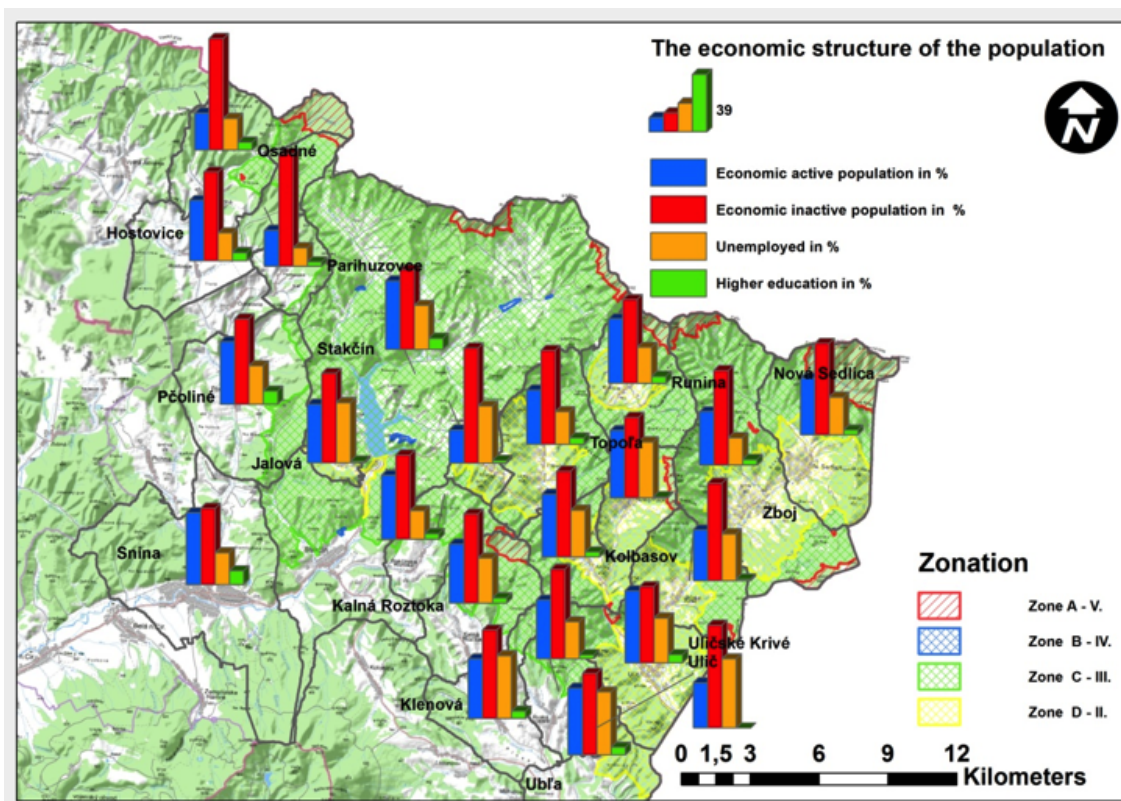


Figure 8: Economic structure of the population in NP Poloniny.

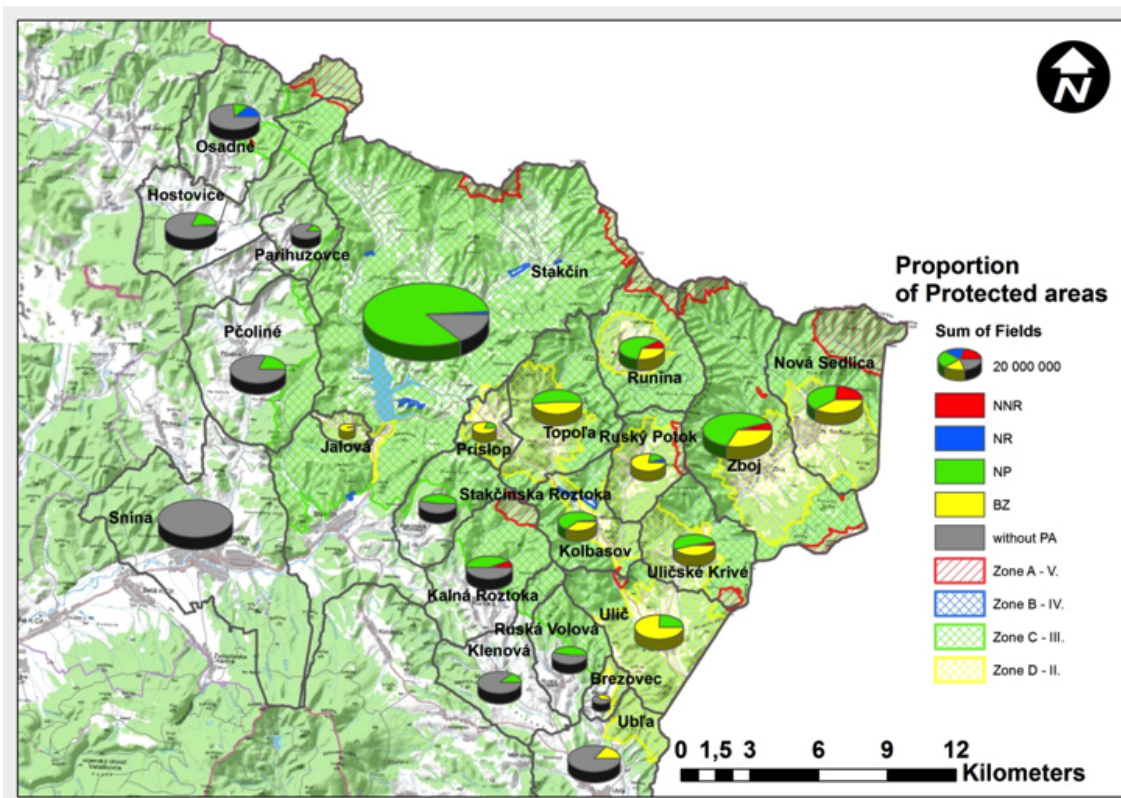


Figure 9: Protected areas in NP Poloniny.

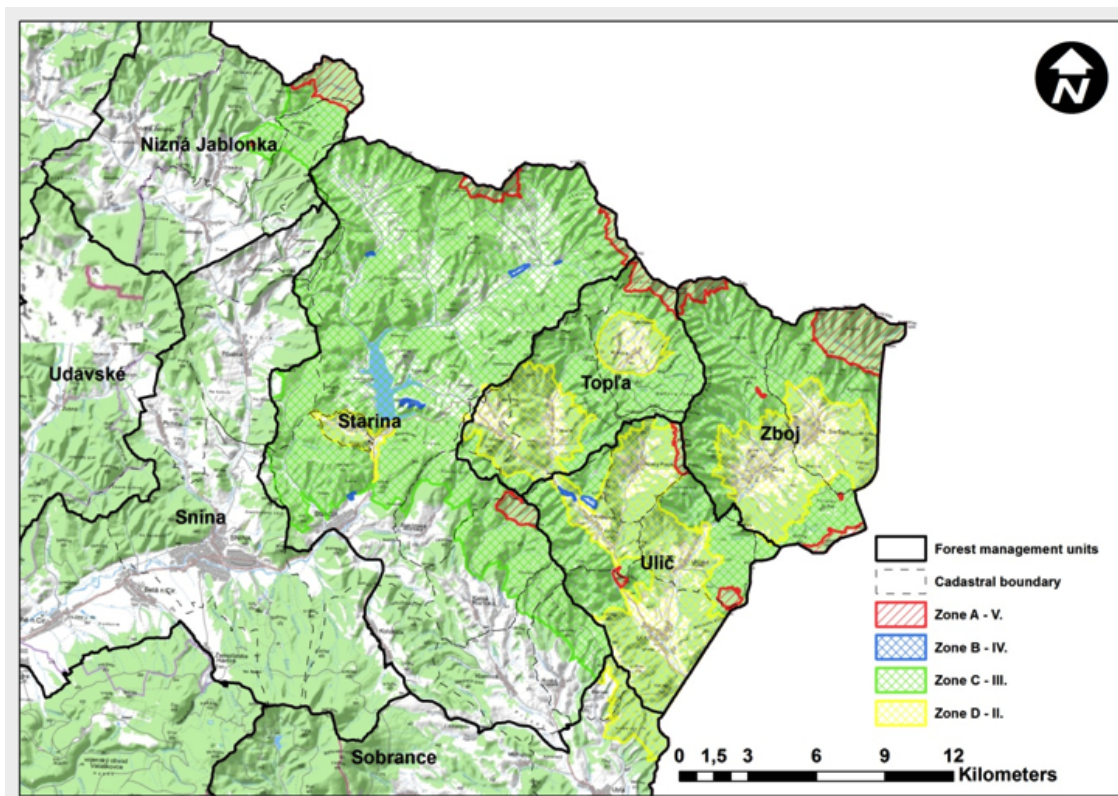


Figure 10: Forests management units in NP Poloniny.

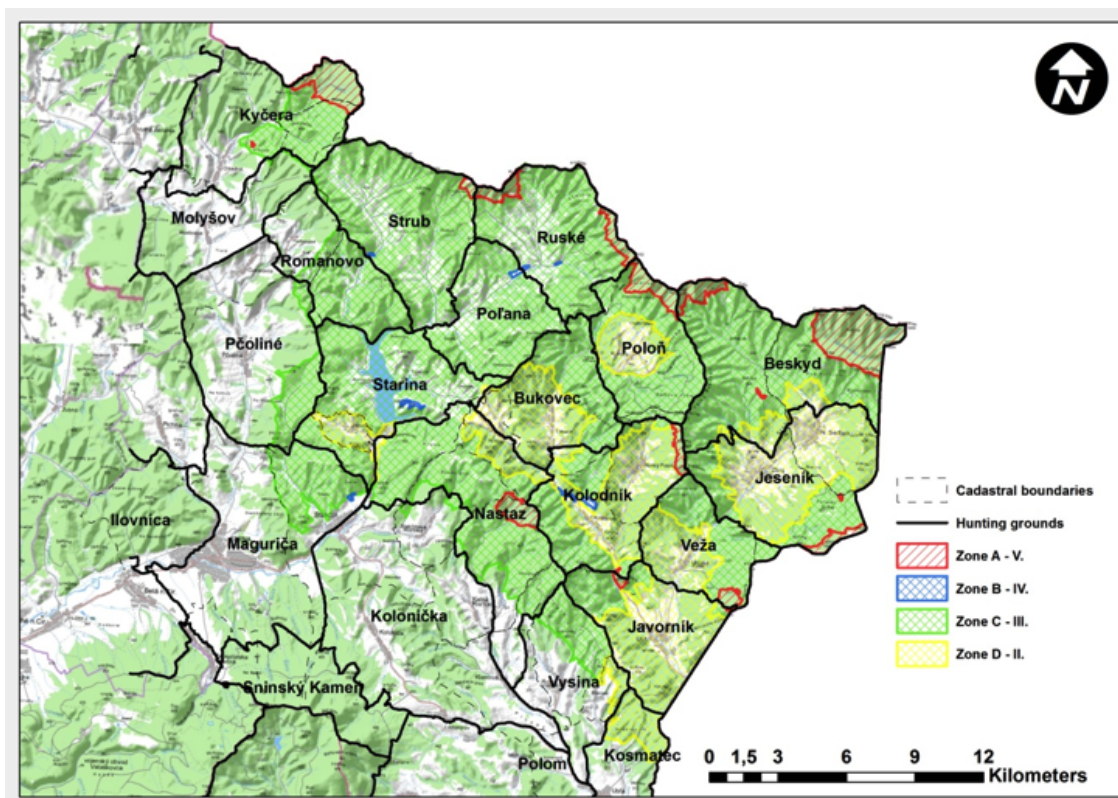


Figure 11: Hunting grounds in NP Poloniny.

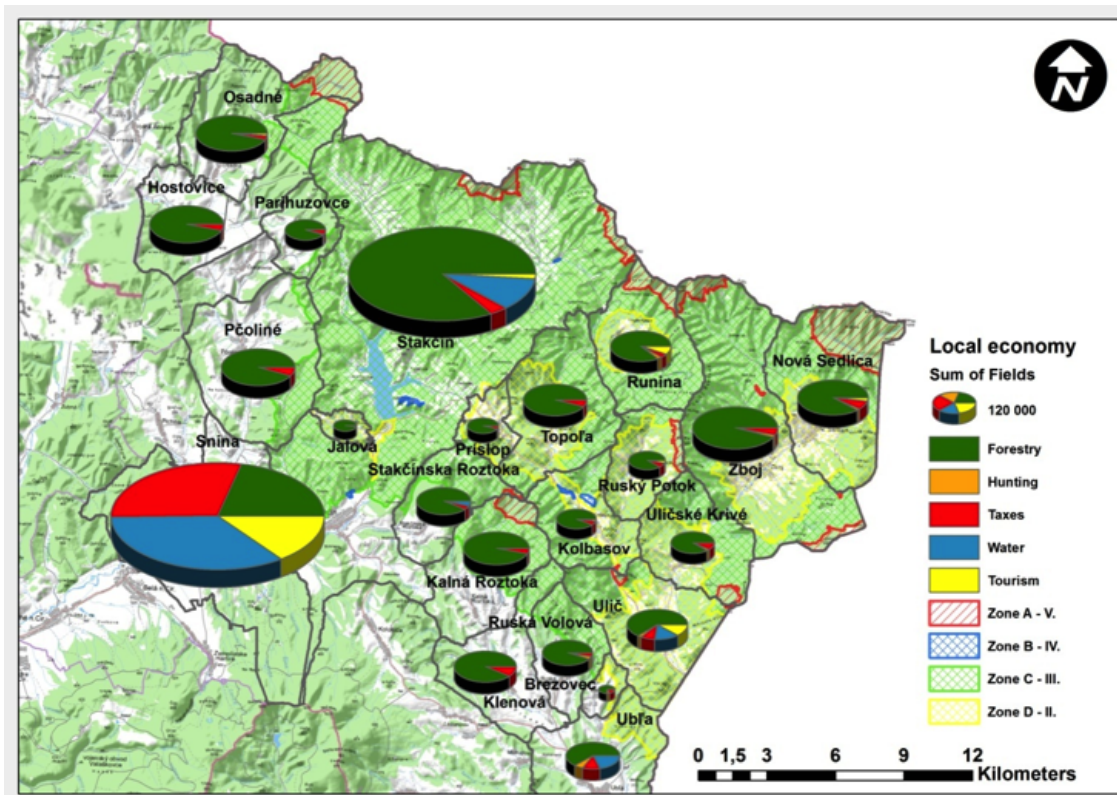


Figure 12: Local economy and spatial distribution of revenues.

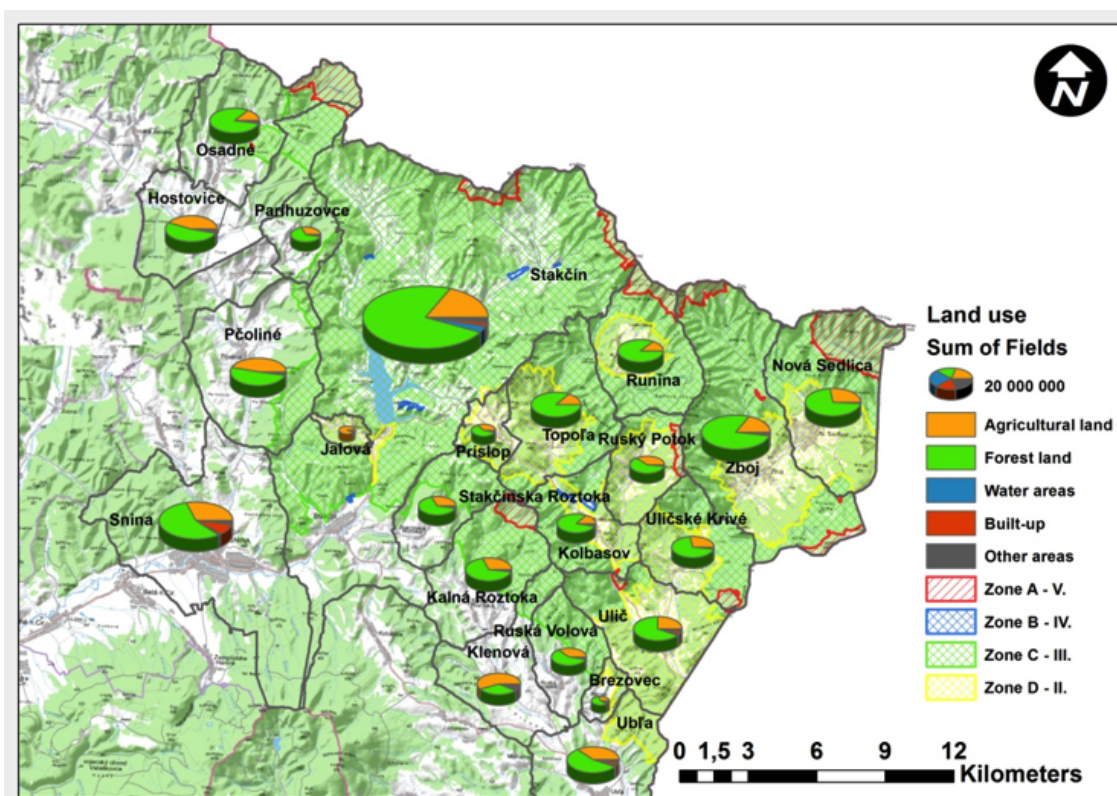


Figure 13: Spatial distribution of land use in m<sup>2</sup>.

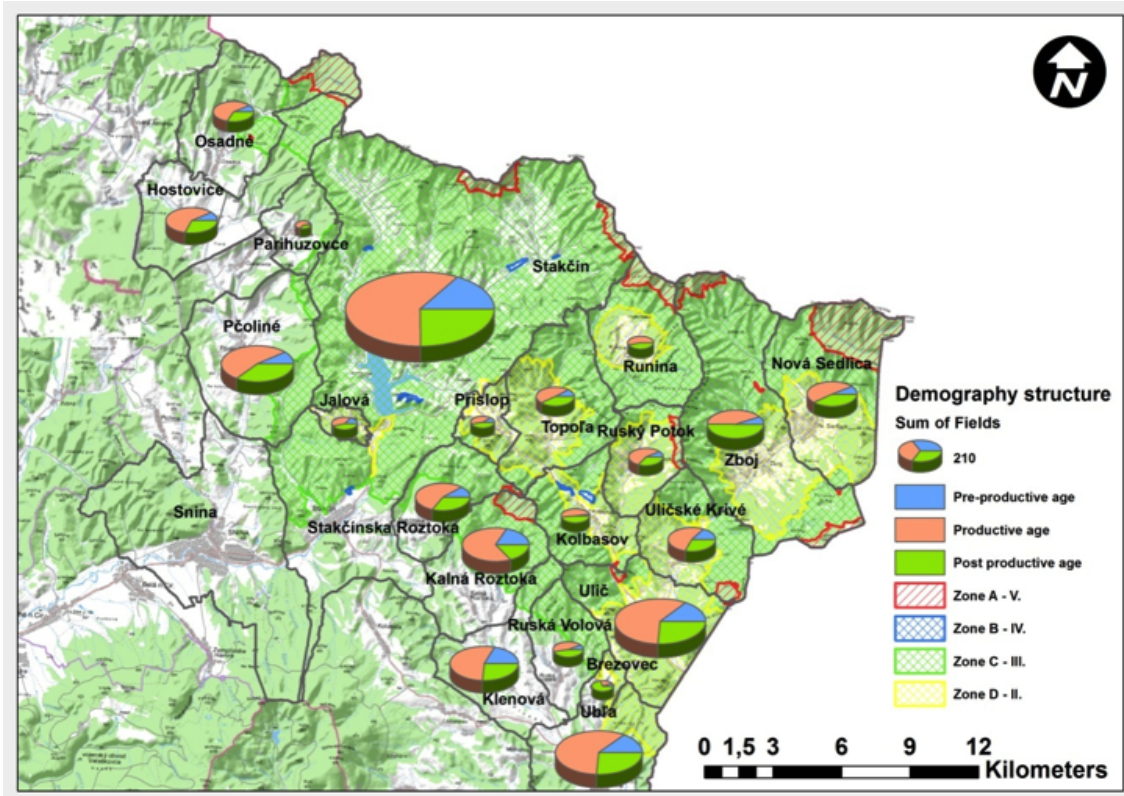


Figure 14: Spatial distribution of demography structure (Pre-productive age 0-14, productive age 15-54 female and 15-59 male, post productive age female over 55 and male over 60).

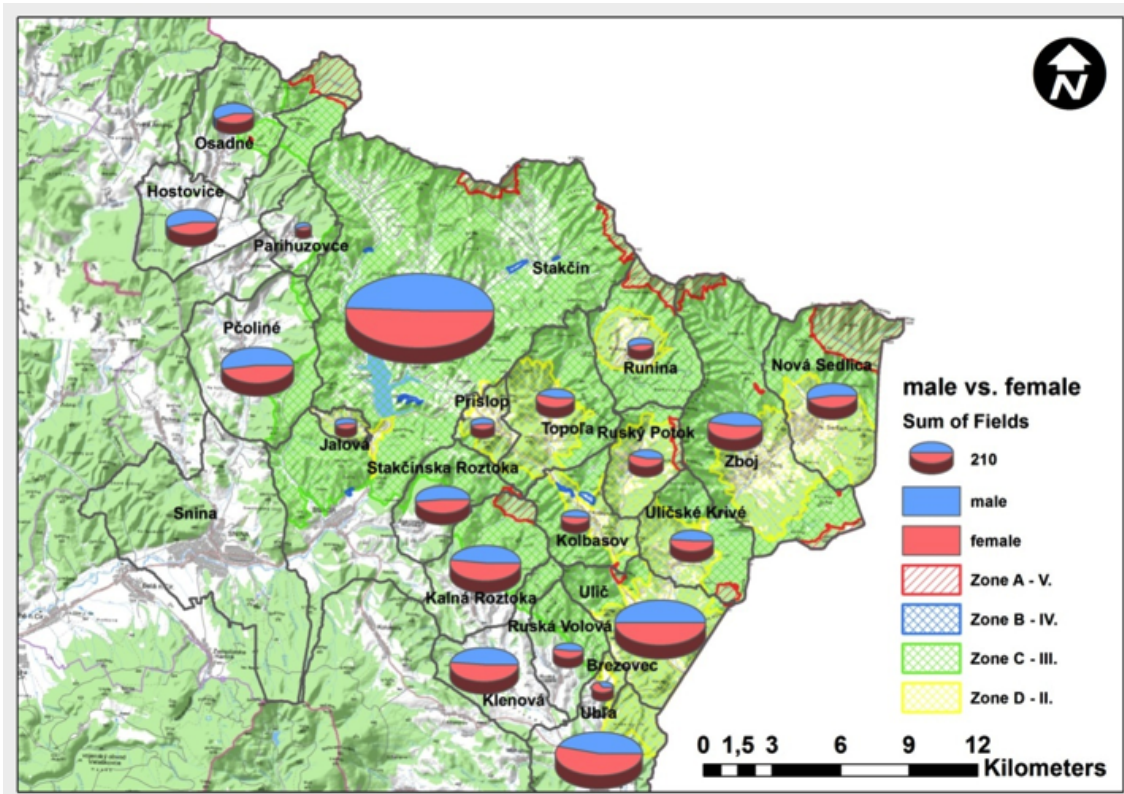



Figure 15: Spatial distribution of male and female.



Poloniny view of from the former Village Smolní, April 2013. Photo by Janiga.




Wooden church Saint Michael the Archangel. Greek Catholic church from 1718 in Uli ské Krivé, May 2013. Photo by Janiga.



VÝSKUMNÝ ÚSTAV VYSOKOHORSKEJ BIOLÓGIE  
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**Formulár pre koncepciu trvalo udržateľného rozvoja NP Poloniny**

|          |                    |  |
|----------|--------------------|--|
| Obec:    | OSADNE             | Zodpovedná osoba: Mgr. ROBERT DIKULIAŠKO |
| Adresa:  | OSADNE č. 100      | PSC: 067 34                              |
| Telefón: | 057/7798124        | Fax:                                     |
| E-mail:  | okc.osadne@azed.sk |  |

|   |          |
|---|----------|
| <b>Demografia</b>   |          |
| Počet obyvateľov  | 183      |
| Hustota obyvateľstva  |          |
| Muži  | 103      |
| Ženy  | 80       |
| 0 – 14  | 15       |
| 15 – 54 ženy  | 36       |
| 15 – 59 Muži  | 73       |
| 55 ženy / 60 muži   | 3/4      |
| Narodení  | 1        |
| Zomretí   | 6        |
| <b>Cestovný ruch</b>  |          |
| Návštevnosť v obci  | cca 1200 |
| Počet ubytovacích (UZ) /stravovacích zariadení              | 1/1      |
| Počet lôžok UZ, obsadenosť UZ                               | 1/8      |
| <b>Infraštruktúra</b>                                       |          |
| Obyvatelia napojení na verejný vodovod /kanalizáciu         | 0/0      |
| Obyvatelia s vlastnou studňou/iný zdroj pitnej vody         | 1/0      |
| Vyfakturované množstvo pitnej vody za obec v m <sup>3</sup> | 0        |
| <b>Dane</b>   |          |
| Dane za ubytovanie - výška/výnos v €                        | 0        |
| Dane za prenájom verejného priestranstva - výška/výnos v €  | 0        |
| Dane za stavby - výška/výnos v €                            | 795      |
| Dane za komunálny odpad - výška/výnos v €                   | 925      |
| Dane z lesných pozemkov                                     | 5 200    |
| Dane s poľnohospodárskej pôdy                               | 1 190    |

\*vypočítaná suma za všetky subjekty z príslušného zoznamu.

Figure 16: Example record form for concept of sustainable development NP Poloniny, municipality Osadné (scan copy).



