

## Effects of Land Abandonment on Landscape Changes in SE Polish Carpathians

### Abstract

The study looks at the problems of land abandonment that occurred in the SE part of Poland as a result of the Second World War and succeeding events. The area of research covers 4250 km<sup>2</sup> of the Carpathian Mountains in the upper San River basin. Most of this land is protected as national or landscape parks of high aesthetical values. The northern, hilly part of this land was colonized very early, whilst the southern part with mountains as high as 1200 – 1350 m a.s.l. – a few centuries later.

Since the soils developed on Carpathians foothills were fertile, the area was used for agriculture, while the mountainous areas with poorer soils – as a pasture. Both parts were highly deforested in the beginning of the twentieth century. It was overpopulated and the local farmers were very poor. The landscape was characterized by a mosaic of narrow strips of fields, small patches of meadows, pastures and forests. It was very fragmented. During the wars, especially the World War II and following civil war between Poles and Ukrainians, majority of people living here were resettled. As a result, vast areas of arable land became abandoned. Thus, for over 60 years renaturalization of the local landscape has been in progress.

The process of landscape succession can be distinguished into 3 patterns. Insignificant changes of an land use lead to minor changes in landscape. This occurred only in small areas near the big towns. Significant changes occurred on most parts of foothills. Here, about 40-60% of land was abandoned, but those that remained cultivated is used in a similar way as before. Total change took place in the vast mountainous areas in the south where abandonment of arable land reached 80-100%. Change in intensity and type of land use was dramatic. Now, the leading use and also potentials of this landscape is related to tourism.

Population of villages in these areas is still decreasing and abandonment follows as a consequence. Due to the high aesthetical value of this territory, it is recommended to develop tourism infrastructure here with the aim of attracting more visitors. The potential of the landscape for tourism is considered to be very high. Since this land is not very valuable for agricultural, this potential for recreation and tourism will surface.

Keywords: Land abandonment, Renaturalization, Landscape changes.

### Introduction

The Carpathian Mountains stretches in the territory of Poland on southern peripheral strip. They are the youngest (alpine orogenesis) and highest mountains in the country. The south-eastern part of the Polish Carpathians is Bieszczady Mountains. Its foothills consist of Dynowskie Foothills on the north-west and Przemyskie Foothills on the north-east. The area of research covers 4250 km<sup>2</sup> of the Carpathian Mountains in the upper San River basin. The highest point is Tarnica Mount 1346 m a.s.l. Foothills are located 300 – 600 m a.s.l. Geology of these mountains is rather complicated. It is build up from flysch formations such as clay shale and sandstones, covered by various Pleistocene rocks, which have been compacted and warped. Wide and long ridges have a character of ridge-and-valleys mountains, which can be found only in this part of Poland.

### History of settlement

The first people came to this terrain as early as at the end of upper Palaeolith. Tradesmen travelled through this region during the Roman times. The first farmers took land into cultivation much later. Northern part of this region was one of the most densely populated places in Poland ever since the country's founding in the year 996 (Kunysz 1981). Higher parts on the south were taken into cultivation much later – between the 14th and 17th century. While the northern part is characterized by fertile brown and lessive soils and creates good conditions for farming, the southern part is used for stock breeding and extensive farming. Human impact on the environment grew along with the increase of population and was manifested mainly by land clearing. Deforestation was accompanied by soils erosion and accumulation of alluvia in the valleys on the north of the investigated area in the 11 – 12th centuries (Klimek, et al. 2003). It proves that agricultural activity was already a significant factor thousand years ago. General trend of population increase is noticeable up to the World War II, when dramatic changes took place.

The history of this land is dynamic and complicated since it was located close to the borders; land changed its owners several times. Formerly the Polish, from 981, was ruled by the Ukrainians. The Hungarians took this land over and ruled for most of the 10th century. From the year 1340, it came back to Poland, however there were short periods of foreign occupations. A long time of Austrian occupation started in the year 1772 and it lasted till the First World War. From the 1918, it came back to Poland again. This whole terrain was overpopulated at the end of XIX and beginning of XX century. This caused a miserable

economic situation for the local people and was even reflected by the name "Galician poverty". The northern part was inhabited by the Poles and the Ukrainians and the southern, mostly by Łemko population, close to the Ukrainians. Numerous small towns of this land were inhabited by Jewish people exceeding often 50% of the total population. For ages all those nations lived here peacefully. However at the beginning of the 20th century, nationalistic consciousness began to arise among the Ukrainians. In 1939, two weeks after the beginning of war, the Germans came and, soon the Russians followed them. The border between these two occupants was established on the San River. The Germans started the extermination of Jews and also arresting and shooting other locals. Many farmers were forced to move to Germany and Austria where they became compulsory labour. In total, over 27 000 people from Przemyśl County, which comprised 12,5% of all people of the region, became compulsory labour in Germany. (Konieczny 1975, Kryciński 1997). The Ukrainians believed that establishing of free and independent Ukraine can be achieved with the help of Germany. Therefore, they often collaborated with the Germans, inciting deeper bad relations with the Poles. When the war between Germany and Russia has started, in the middle of 1941, the whole investigated area was quickly invaded by Wehrmacht. However 3 years later, in summer 1944, the Red Army liberated this land and then kept moving war front to the west. The new border between Poland and the USSR was set up at the eastern vicinity of this region. This way, eastern part of Poland was found in the USSR now, and migration of peoples started. Poles moved to the west, however, the Ukrainians did not want to abandon their land and move to the newly established the Ukrainian Soviet Republic. That started to complicate the already difficult ethnical situation. Soon local civil war between two nations broke out. As a result, many people were killed, numerous villages were burned to the ground. Eventually, Polish military forces were used to resettle the Ukrainians either to USSR or to northern and western Poland. The aim of this action called "Wisła", was also to liquidate troops of the Ukrainian Insurgent Army (UPA). Through violence, the ethnic tension was quelled. Ukrainians were resettled either to the USSR (about 100 000 people) or to the northern and western Poland (about 34 000). In SE Poland, where this action was executed, as much as 7000 Ukrainians and 2200 Poles lost their lives (Misiło 1996). Large parts of land were severely ruined, fields abandoned, and few industry destroyed. Density of population decreased by about 60% on the north, and by 80 – 90% on the south. Some Poles settled here in the late forties and fifties, but they could not compensate the decline in the Ukrainians. Ever since the 1950s, the rate of population growth has been very slow. Current trends of Polish demography do not point to any significant increases in the future. Nowadays, Bieszczady Mountains is inhabited only by about 60 000 people. While the population density in Poland is 114 people/km<sup>2</sup>, in some parishes of this region, population density could be as low as 3 people/km<sup>2</sup>.

#### Changes of landscape

The south-eastern part of the Polish Carpathian Mountains was formerly used for agriculture with intensity that varied from place to place. Foothills characterized by better soil conditions were inhabited earlier and used more intensively, mainly to produce crops. The southern region of mountains, where conditions for agricultural production are poor, was used most of all for breeding cattle and other animals. Crop production was less intensive here. In both cases, land clearing was progressing quickly. Natural landscapes build up by forests were giving way to cultural ones (agriculture). In the case of the foothills land cover used to be composed of picturesque mosaics of very narrow stripes of fields, small patches of forests, meadows etc. In the mountains, fields were located in the valleys, while big areas of pastures were stretching along the slopes, very often reaching the peaks. A distinctive feature of Bieszczady Mountains is "połoniny". Those natural treeless formations (meadows-like) are located on the top of local highest ridges, despite the fact, that it is below upper forest line. Połoniny are located above 1100 m. a.s.l., while in other mountains of Poland, forest grows as high as 1300-1500 meters (Kondracki 1989 after Lewandowski). Land clearing reached połoniny in the beginning of the 20th century. Forestation of this terrain dropped to 41,3%. Due to overpopulation, the land was highly partitioned and landscape fragmented. Each farmer wanted to give his sons the same quality and quantity of the land he owes, so each field was divided into as many strips as many sons. After years of this practice, fields in some regions became extremely narrow and disperse. In the 30s, in some villages of the region, unification of the land was executed with the aim of making farming more efficient, but it improved situation for short time only.

Abandonment of land, that happened as a result of the Second World War and the following military action "Wisła" changed this situation. As much as third part of arable land of some parishes on the north and close to 100% of arable land in the mountains were abandoned. Decline in the anthropogenic change factor resulted in the spontaneous return of landscape to its more natural state. The renaturalization of the local landscape has been taking place for over 60 years and is very advanced. Forestation exceeds 54% in the investigated area and is twice as high as the average for the country (forestation of Poland is 27%). Due to the high ecological values of the studied region, several protected areas were established after the war. The highest part of the Bieszczady Mountains is now protected as national park (currently 292,02 km<sup>2</sup>). It is the third largest national park in Poland and the biggest among mountainous national parks. Five landscape

parks (land that is protected in a less strict way), surround this area. They cover 1826,5 km<sup>2</sup> in total. It means that almost half (49,85%) of investigated area is protected. In addition, parks usually are surrounded by buffer zones. Many natural reserves, which are small but very strictly protected areas, have been founded as well. Three patterns of landscape development in the studied area can be distinguished:

1) Pattern with minor changes, taking place only in the surroundings of bigger towns (Przemyśl, Sanok, Dynów etc). Those areas were used for extensive farming and generally self consuming. The only significant changes are connected with the improvement of life standard (more roads of better quality, houses are now made of bricks, but their number is still almost the same as years ago). Nowadays some houses are built only for recreational purpose. They are owned not by farmers and therefore only minor land abandonment is noticeable in those areas. With these small changes, land use did not change significantly, neither in quantity and quality. Landscape as a whole has kept its main features and value. Borders of forest hardly change in these areas.

2) Pattern with a significant changes taking place on the most parts of Przemyskie and Dynowskie Foothills. Land abandonment amounts to 40-60% and agricultural land is used in the similar way as earlier. Farming activity is limited to extensive crop production and insignificant breeding of animals, and its intensity has decreased. Abandoned land is a polygon of forest or meadows succession. Landscapes, closer to natural, are taking over cultural ones. This process is very advanced nowadays. In many areas natural succession and renaturalization are supported by foresters. It caused a decrease of fragmentation of the landscape and areas of ecotones decreased, as well. Forested areas increased in these areas by nearly 1/3.

3) Pattern with a total change taking place in vast areas of the central part of Bieszczady Mountains. Abandonment of a land reached 80-100% of agricultural land. Entire area were left without any kind of management for years before newcomers started to use it. Changes occurred not only in the intensity of land use but also in its type. People who settled down here in the fifties were foresters rather than farmers. The state founded several farms where sheep were bred from the beginning of the sixties. These farms were not too successful, and collapsed soon after founding. Due to the high aesthetical values of this land, tourism is systematically developing, in these areas. Several roads, hotels, hostels, campsites and restaurants were built. Solina reservoir, the biggest artificial lake in Poland, that was built in the sixties rises up a recreational value of this land. Forest is climbing up slopes and often reaches mountain. While grazing stopped, tourists cannot enjoy views from some peaks anymore. Nowadays, farming is just a marginal land use and the leading form are tourism-related activities.

Forest area [km <sup>2</sup> ]	1929	1997
Total	1753,46	2328,51
Number	200	187
Mean	8,77	12,45
Max	646,86	1162,95
Min	0,015	0,009
Forest perimeter [km]	1929	1997
Total	3011,75	3544,38
Number	200	187
Mean	15,06	18,95
Max	599,42	1205,41
Min	0,51	0,49

Table 1: Statistics of forests of the upper San River basin (based on topographic maps 1:300 000)

### Summary and perspectives

Population growth in Poland, especially in this area, is very low, practically equal to zero. Food production on fertile soils of other areas of Poland is enough sufficient, and therefore, the likelihood of further abandoning of those lands by farmers is high, as numerous examples from the Western Europe prove. Nowadays the economy of Bieszczady Mountains is related with tourism and this is probably the best way of using the potential of landscape. Villages of this area are constantly depopulating, youngsters are going to the cities to look for work and often settle there. Abandonment will follow as a consequence. Due to the high aesthetical values of this territory, it is recommended to develop a tourism infrastructure with the aim of attracting more visitors. Potentials of local landscape for tourism is considered to be very high. It creates an opportunity to perform numerous touristic, recreational and sporting activities, both in the summer or winter. Since this land is not very valuable for agriculture, these high potentials for recreation and tourism will surface. Local peoples already realised that, which is reflected in growing number of agrotourist accommodations, not only in the mountains but also in the foothills.

References:

- Klimek K., Łanczont M., Nogaj-Chachaj J., 2003: Aluwia małych dolin w obrębie przykarpackiej wysoczyzny lessowej jako wskaźnik zmian użytkowania ziemi w ostatnim 1000-leciu [w:] Człowiek w środowisku przyrodniczym. Pr. zb. pod red. J.M. Wagi i K. Kocel. PTG, Oddział Katowicki, Sosnowiec.
- Kondracki J., 1989: Karpaty. Biblioteczka Geograficzna. Wydawnictwa Szkolne i Pedagogiczne, Warszawa.
- Konieczny Z., 1975: Straty wojenne miasta i powiatu przemyskiego (1939 – 1945). Rocznik Przemyski, t. XV-XVI, Przemysł.
- Kryciński S., 1997: Przemysł i Pogórze Przemyskie. Przewodnik. Oficyna wydawnicza „Rewasz”, „Bosz” Sp. C., Pruszków – Olszanica.
- Kunysz A., 1981: Przemysł w pradziejach i wczesnym średniowieczu. Muzeum Okręgowe w Przemysłu, TPN. Przemysł.
- Misiło E., 1996: Repatriacja czy deportacja. Przesiedlenia Ukraińców z Polski do ZSRR 1944-1946. Tom 1. Dokumenty. Warszawa.

Maps:

- Topographic map 1:300 000, sheet 85, Nowy Sącz. Wojskowy Instytut geograficzny, Warszawa 1929.
- Topographic map 1:300 000, sheet 86, Lwów. Wojskowy Instytut geograficzny, Warszawa 1935.
- Touring map 1:300 000, sheet 8 - Małopolska Wschodnia, Karpaty Wschodnie. Mapa krajoznawcza, PPWK, Warszawa – Wrocław, 1997.

**Human Impact on Sensitive Geosystems. editors: W. Zglobicki, J. Rejman, UMCS, Lublin 2005.**