

The influence of political and socio-economic factors on environmental changes in Polish Beskidy Mountains in the second part of XX century

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ABSTRACT: The second part of the 20th century was in Poland the period of dynamic political and economic changes, which significantly influenced the state of the natural environment. The present paper shows the changes in the land cover in two selected communes (*gminas*) of the Polish Beskidy Mts., having taken place under the impact of specific socio-economic factors (the resettlement action, the large-scale farming economy, the tourist development). The basis for the analysis was constituted by the aerial photography from three time periods (1952-56, 1969-74, and 1995), which served to elaborate the land cover maps and the land cover change maps, which, along with the maps of slope gradients, exposure, and the agricultural soil complexes, were used to develop the interpretation and evaluation of the transformations observed.

1 INTRODUCTION

The surrounding natural environment, which evolved as a result of combined action of abiotic, biotic, natural and anthropogenic factors (Kondracki & Richling 1983) is subject to incessant change. The study of these changes, as well as precise analysis of the factors bringing them about, constitutes one of the fundamental tasks of environmental protection. In the case of studies reaching back to the middle of the last century aerial photography is the perfect - and frequently the sole - record of the state of environment of the areas considered. The use of the remote sensing techniques and the GIS makes it possible to carry out the quantitative and qualitative analyses of the changes taking place, to identify the basic trends in the transformations, and to forecast the future state of the environment.

2 STUDY AREA

Two communes located in Polish Beskidy Mts. were selected for purposes of the study. The natural environment of both communes is similar, the primary differences resulting from the manner of conducting economic activities in the past half-century.

In the commune of Komańcza, located in south-eastern Poland, the starting point for the essential

transformations was constituted by the resettlement actions of the years 1946-47, whose effect was the removal of more than 3/4 of the population inhabiting this commune before the World War II. The land, left by the resettled population was taken over by the State Land Fund, and then transformed into the large-scale state farms. The political and economic transformations, having taken place at the turn of the 1990s, brought the collapse of the state farm system and the re-privatisation of the land previously used by the state farms (Blach 2000).

The second commune analysed - Zawoja - is located in southern Poland, in the western part of Beskidy Mts. The dominating factor in the transformations of the land cover in this commune was the development of tourism. Numerous vacation houses and hotels were established in this commune during the 1960s and 1970s, these facilities being owned by the manufacturing and mining enterprises from the neighbouring region, while the local population was abandoning the little profitable and laborious farming activities and moving to the tourist service sector. After the period of political transformations and the economic recession the majority of the recreational centres collapsed and the people employed in them either migrated to towns, returned to farming, or established the private hotel service businesses, treating the latter activity as the basic source of upkeep.

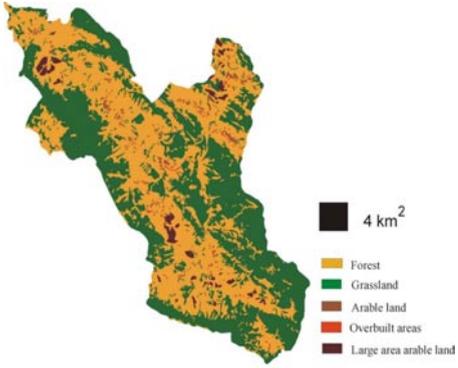


Fig.1.The map of land cover commune of Komancza for 1952

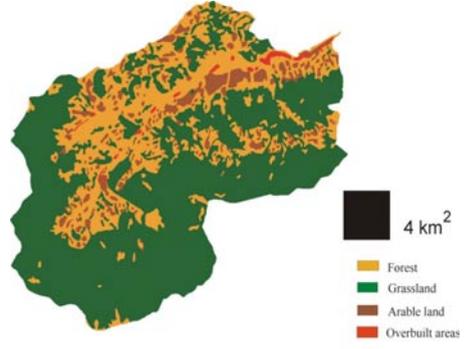


Fig.4. The map of land cover commune of Zawoja for 1956

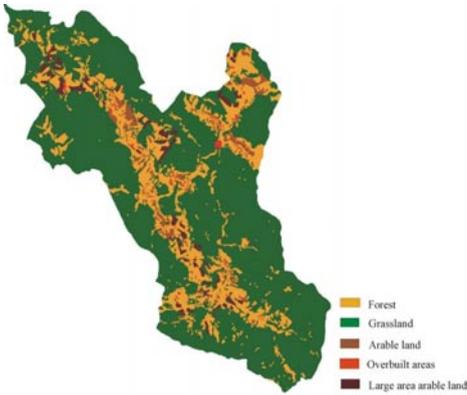


Fig.2. The map of land cover commune of Komancza for 1969

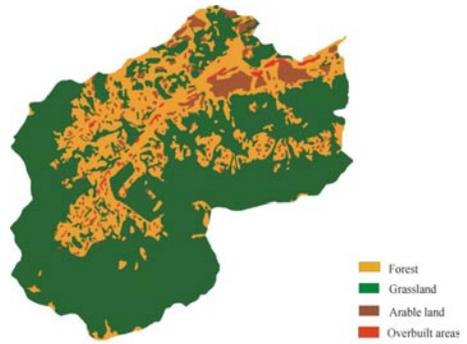


Fig.5. The map of land cover commune of Zawoja for 1974

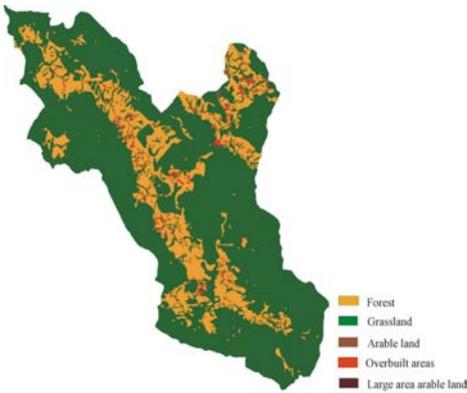


Fig.3.The map of land cover commune of Komancza for 1995

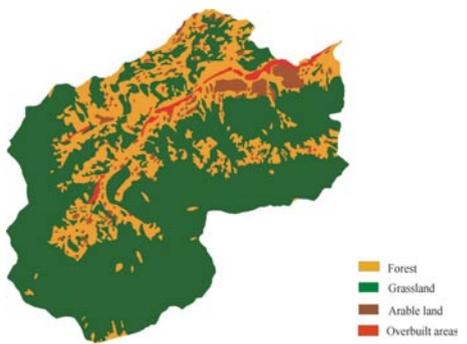


Fig.6. The map of land cover commune of Zawoja for 1995

3 METHODOLOGY

Panchromatic aerial photographs from years: 1952 in scale 1: 25 000, 1969 in scale 1:18 300 and 1995 in scale 1:30 000 for commune of Komańcza and from years: 1956 in scale 1: 25 000, 1974 in scale 1:31 000 and 1995 in scale 1:40 000 were used for purposes of the present report. On its basis the maps were elaborated of the land cover in the particular time periods (Fig1-6).

In view of the poor legibility of the photographs dating from the 1950s it was only possible to distinguish then the basic categories of land cover: arable land, permanent grasslands (meadows, pastures, and the grassy areas not regularly used), overbuilt areas, and forests. The minimum spatial unit distinguished was 1 hectare.

Table 1. Percentage commune of Komańcza occupied by particular classes

Land cover classes	Years:		
	1952	1969	1995
Forest	48,6	72,3	75,8
Grassland	47,5	21,3	21,3
Arable land	1,6	2,9	2,4
Large-area arable land	2,1	3	-
Overbuilt area	0,2	0,5	0,4

Table 2. Percentage commune of Zawoja occupied by particular classes

Land cover classes	Years:		
	1956	1974	1995
Forest	63,9	66,4	70,5
Grassland	28,3	26,7	24,1
Arable land	7,1	6	3,8
Large-area arable land	-	-	-
Overbuilt area	0,7	0,9	1,6

Then, on the basis of the land cover maps the maps of land cover changes were elaborated for the years 1952-1969 and 1969-1995 in the case of the commune of Komańcza, and for the years 1956-1974 and 1974-1995 in the case of Zawoja.

4 ANALYSIS OF DETECTED CHANGES

Thus, in the years 1952-1969 a significant increase of the forest areas was observed in the commune of Komańcza (26.5%), being the effect of the natural vegetation succession, developing abundantly on the formerly cultivated land (mild slopes of southern exposure), and of the planned forestation of the higher parts of slopes (those with more pronounced gradients, northern exposure and poor soils). Another perceivable tendency of change was the transformation of the permanent grasslands into

arable lands, being the result of inflow of population to the villages abandoned in the years 1946-47 (2.2% of the total surface of the commune), as well as of the development of the large-scale state farms (2.3%). This process is also associated with the increase of the overbuilt area (0.4%), encompassing both the new rural structures and the state farm settlements. Further, a change was observed in the arable land, belonging both to private farms and the state farms, transformed into the permanent grasslands (1%), this change taking place on the areas above 460 m a.s.l., and connected with the difficult access to such areas, or, in case of the state farms - a change of the production profile from plant cultivation to animal husbandry.

Table 3. Area differences in percentage for the commune of Komańcza between 1952 and 1969

	Forest	Grassland	Arable land	Large area arable land	Overbuilt area
Forest	-	1	0,1	0,1	0
Grassland	26,5	-	2,2	2,3	0,4
Arable land	0,1	0,7	-	0,1	0
Large area arable land	0,3	1	0	-	0
Overbuilt area	0	0,1	0	0	-

In the years 1969-1995 a continued increase of the forest area was noticed (6.5%), mainly on the northern and steep slopes, resulting from the natural succession of vegetation. After the collapse of the state farms the large-scale arable land surfaces were transformed into grasslands and fallow lands (2.5%), while the arable land belonging to private owners, located far from the villages and in the higher parts of slopes were turned into permanent grasslands (1.8%). There was, on the other hand, an increase of the area of arable land located close to bigger settlements (1.2%), which was linked with the bi-occupational character of the population, working both in farming and in industry.

Table 4. Area differences in percentage for the commune of Komańcza between 1969 and 1995.

	Forest	Grassland	Arable land	Large area arable land	Overbuilt area
Forest	-	3,5	0,2	0	-
Grassland	6,5	-	1,2	0,2	6,5
Arable land	0,3	1,8	-	0	0,3
Large area arable land	0,4	2,5	0,2	-	0,4
Overbuilt area	0,1	0,2	0	-	0,1

In the commune of Zawoja the increase of forest area (5.7%) was observed in the years 1956-1974 on the high (parts of) steep and northern slopes. At the same time, transformation of the arable land into permanent grasslands (4.2%) was observed in the

higher parts of the steep slopes, as well as the transformation of the grasslands into arable land on the mild slopes, neighbouring with the larger population clusters (3.3%). Attention should be paid to the increase of the overbuilt areas in the river valleys, resulting from the expansion of the existing settlements, and the decrease of the areas occupied by structures on the higher parts of slopes (0.4%). A further increase of the forest area (7.1%) was observed in the years 1974-1995, associated with the natural succession of vegetation on the areas with difficult access, and with the planned forestation of the land excluded from agricultural use. Transformation of the grasslands into the arable land (1.9%) was also observed in the lower parts of the mild slopes, as well as the decrease of area of the arable land and its transformation into grasslands (3.6%) over the less easily accessible locations with low agricultural quality indicators.

Table 5. Area differences in percentage for the commune of Zawoja between 1956 and 1974

	Forest	Grassland	Arable land	Overbuilt area
Forest	-	3,4	0,3	0
Grassland	5,7	-	3,3	0,3
Arable land	0,5	4,2	-	0,1
Overbuilt area	0	0,4	0	-

This phenomenon is connected with the drop in profitability of agricultural production and the associated giving up of the laborious cultivation activities, as well as with the dynamic development of tourism and the change of the economic profile of the commune from agricultural to tourism-related. The development of the recreational and tourist facilities is also evidenced by the increase of the overbuilt area (1.1%), mostly due to the construction of hotels and pensions, as well as guestrooms, meant for tourists and holidaymakers (Blach.2002).

Table 6. Area differences in percentage for the commune of Zawoja between 1974 and 1995

	Forest	Grassland	Arable land	Overbuilt area
Forest	-	3,5	0,2	0,1
Grassland	7,1	-	1,9	1
Arable land	0,6	3,6	-	0
Overbuilt area	0	0,2	0	-

5 CONCLUSION

The account given above shows the differentiation in the changes of land cover in two communes of the Polish Beskidy Mts., at the same time confirming the proposition of a different socio-economic

conditioning behind these changes. Thus, in case of the commune of Komańcza we see the impact of the resettlement actions and the socialist rural economy, changing the landscape of small mountain villages, surrounded by the plots of fields of private farmers, typical for this part of Poland, into the large-scale farms, not encountered on these areas before. In the commune of Zawoja we observe a gradual abandonment of agriculture to the advantage of the dynamically developing tourist infrastructure, which in the final phase observed plays already the dominating role in the commune's economy.

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