

Spatial planning in mountain regions – present trends, threats and opportunities (Sudety Mountains case study)

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Abstract: The Sudetes Mountains were subject to depopulation and disappearance of settlements from the end of the 19th century. This trend has been changed for the last two decades and fast development of new houses and tourist infrastructure can be observed. The aim of the study was to analyse these trends in the context of their environmental impact and potential threats and opportunities for the regional development and spatial planning.

The development of new buildings is often chaotic and do not respect the natural environmental conditions, reinforcing the erosion and disturbing the spatial order and landscape values of many picturesque places. However, some recent regional projects of further spatial development of the Sudetes focus on the environmental and landscape potential of the region and aim to promote the landscape tourism. If these projects are implemented, it can be expected, that the chaotic and devastating process of uncontrolled building development in the most precious environments can be limited.

The co-existence of diverse, often opposite trends of socio-economical-environmental processes, which can be nowadays observed in the Sudetes, makes the process of decision making, in order to provide the most suitable solutions for spatial planning, a highly complex and difficult task.

Key words: *spatial planning, depopulation, human impact, mountains, Sudetes*

Introduction

Mountain regions are easily subject to cascade of changes, due to high fragility of their environment with numerous natural thresholds. Therefore, on one hand, mountain environments and landscapes are able to reflect and 'store' different phases of human impact. On the other hand, the process of planning and decision making, considering the spatial development of mountain regions, should be carried out very carefully, in order not to disturb the fragile environment and not to trigger a chain of negative environmental and landscape changes, which may become irreversible sometimes. The Sudetes Mountains are a good example of diverse, complex interactions between socio-economical transformations of the region in the recent decades and their environmental consequences, which, in turn, have their further implications for the present spatial planning and economical development of the area.

In the Sudetes Mountains, in the post-World War II period, two main opposite trends of socio-economical development can be observed, both leading to environmental and landscape changes of

various extent and durability. These are depopulation, which locally started already in the end of the 19th century, and present (since c. 1989) increase of new houses and tourist infrastructure. Both these trends and their direct and indirect environmental and landscape consequences can be interpreted in the context of the threats and opportunities for the regional development and spatial planning. Therefore, the aim of the study was, on one hand, to analyze the socio-economical trends quantitatively and qualitatively in the context of their impact on the landscape and environmental system. On the other hand, the results should indicate the strong and weak points of contemporary socio-environmental interactions, in order to take the proper decisions on further development and spatial planning in the Sudetes Mountains.

The problem of proper management of mountain areas, including an adequate spatial planning, is at present an important, world-widely discussed issue, as many mountain areas are affected by the substantial socio-economical changes, followed by alternation of their environmental conditions. They include either depopulation, which is typical, for example, for most mid-mountains in Europe (i.e. Bork et al. 1998, Lipsky, 2001, Richter and Block 2001), or excessive human impact due to tourism (for example in Alps), infrastructure development or abusive exploitation of natural resources, which is especially the case of the mountains in SE Asia (i.e. Parish 2002). In that context, the Sudetes Mountains, where both these trends occurred in recent time, can be seen as a model area for tracing the existing and potential threats and opportunities for the regional socio-environmental development in the context of the spatial planning.

Materials and methods

The study was based on field mapping, analyses of cartographic materials from various time periods, historical records, as well as local and regional planning documents and statistics. The field mapping included: (1) extent of secondary vegetation succession on abandoned arable grounds, (2) geomorphologic mapping of anthropogenic landforms and their persistence/ state of degradation or disappearance from the landscape, (3) evaluation of the impact of new buildings and tourist infrastructure on landscape values. Cartographic analyses were based mainly on the comparison of the contemporary topographic maps with the topographic maps from the 19/20th century (1 : 25 000) in order to assess the changes of land use and distribution of settlements. Additionally, the analyses of population changes and recent development of new housing areas (on the basis of yearly amount of building permits) were based on archival data and statistical sources from the local and regional authorities.

Results

Socio-environmental trends in the post-World War II period

One of the most crucial processes in the Sudetes in the post-war period was the depopulation. The phase of outflow of inhabitants started already at the end of the 19th century and was mainly due to migration from the mountain rural areas to towns and cities with developing industries. This trend was intensified after the 2nd World War in relation to the total exchange of population and initial inflow of new settlers from lowlands with fertile soils. The lack of agricultural knowledge suitable for mountain areas, together with harsh natural conditions, changes of land ownership and collapse of many local industries led to substantial depopulation of most of the villages. Kłodzko region was the most severe depopulated area in

the Sudetes – table 1 shows the amount of villages which were subject to any phase of depopulation. For the entire region the decrease of population in the rural areas – as compared to the maximum amount of inhabitants at the end of the 19th century – could be observed in 82% rural settlements. As a result, many villages, especially smaller settlements and hamlets, stop existing. Around 46% of smaller depopulated settlements were included into the bigger ones, thus the entire settlement network in the Kłodzko region was substantially shrunken.

Table 1. Characteristics of settlements in the Kłodzko region; all data refer to rural settlements within rural and urban-rural communes/ gminas (excluded towns and urban gminas)

Administrative unit (gmina)	Total number of settlements in historical time	Number of settlements which were subject to any phase of depopulation	Number of settlements which were included into bigger village or town	Number of settlements which disappeared completely	Settlements with present stabilization or increase of inhabitants	Number of settlements where new holiday houses have been recently built
Bystrzyca Kł.	63	61	31	7	20	32
Kłodzko	57	28	22	3	23	30
Lewin Kłodzki	23	21	10	4	1	10
Łądek Zdrój	17	17	7	3	4	9
Międzyzylesie	30	30	8	3	17	17
Radków	30	24	17	1	11	11
Stronie Śl.	18	17	5	3	8	13
Szczytna	31	23	24	2	8	10

Besides the depopulation, other problems were also mentioned as inhibiting the regional development. They included: decapitalization of properties, housing crisis, barriers in the development of industry, unfavourable directions in agriculture, improper forest-administration, conflicts in the development of tourism and health-resorts and degradation of natural environment (Ciok 1991, Łoboda 1993). In general, the entire region was classified as a problem area with low effectiveness of socio-economic and spatial structures, leading to stagnation or even regression of regional development (Ciok 1991, 1995).

The above mentioned socio-economical trends were followed by changes of the landscape structure and alternation of the environmental processes. Some of the settlements disappeared completely from the landscape as their houses were dismantled. In other places ruins of former buildings, traces of old roads and landscape features connected with previous agricultural land use (such as agricultural terraces, heaps of stones collected from arable grounds, fruit trees in the middle of forest etc.) can still be seen in the landscape (fig. 1, fig. 2). The term 'disappearing' or 'ghost' villages was often used in publication in relation to the Sudetes (eg. Chachaj 1978, Salwicka 1983, Miszewska 1989). The disappearance of field roads was especially important from the environmental point of view, as it limited the erosional processes. Previously, roads acted as the main sediment transfer routes from slopes to valley floors. Also the natural secondary vegetation succession on abandoned former arable fields – especially increase of forest stands (which was additionally reinforced by the artificial afforestation) – effectively limited the problem of soil erosion from slopes (Latocha 2009) (fig. 3). This phase could be described as renaturalisation of the environment, which was very positive from the ecological point of view, due to, among other, development



Fig. 1. The ruins of a farmstead in an abandoned village in the Stolowe Mts. (phot. by A. Latocha 2010)



Fig. 2. Old field road – an inactive gully (phot. by A. Latocha 2010)



Fig. 3. Spontaneous secondary vegetation succession and forest plantations on former arable grounds in the Stolowe Mts. (phot. by A. Latocha 2010)

of many various ecotones and increase of bio- and landscape diversity (Latocha, Migoń 2006). Additionally, the collapse of many ineffective and dilapidated industries resulted in general amelioration of the condition of the natural environment.

Recent changes of socio-environmental trends

From the end of the 1980's new trends in socio-economical development and spatial planning in the Sudetes region can be observed. The improvement of environment and landscape values, along with the socio-economical changes in Poland in recent decades, triggered a new trend, namely increase of housing development, especially holiday houses, which became substantial in the recent two decades (fig. 4). This process develops not only quantitatively but also spatially. It can be observed, that in recent years the places, where the new houses are located, spread to more and more new areas, even to very remote places or on steep slopes (fig. 5). As a result, many settlements, which were previously classified as abandoned or disappearing, are re-included in the settlement network and one can observe the renewed expansion of built-up areas once again (tab. 1). This process can be seen as a revival of rural areas in the remote mountain regions. However, most of the owners of the new houses are not connected with the local community and usually work in the cities. Moreover, the expansion of new housing in many places is very chaotic and due to the lack of environmental control over the building development, many picturesque places have lost their previous landscape values. The spatial order has been often disturbed, as

many of the new objects became new landscape dominants, affecting its previous natural composition as a harmonic cultural-rural landscape. Additionally, most of the new houses have little respect to the traditional local architectonic style, typical for the Sudetes, therefore they can be treated as strange elements in the landscape.

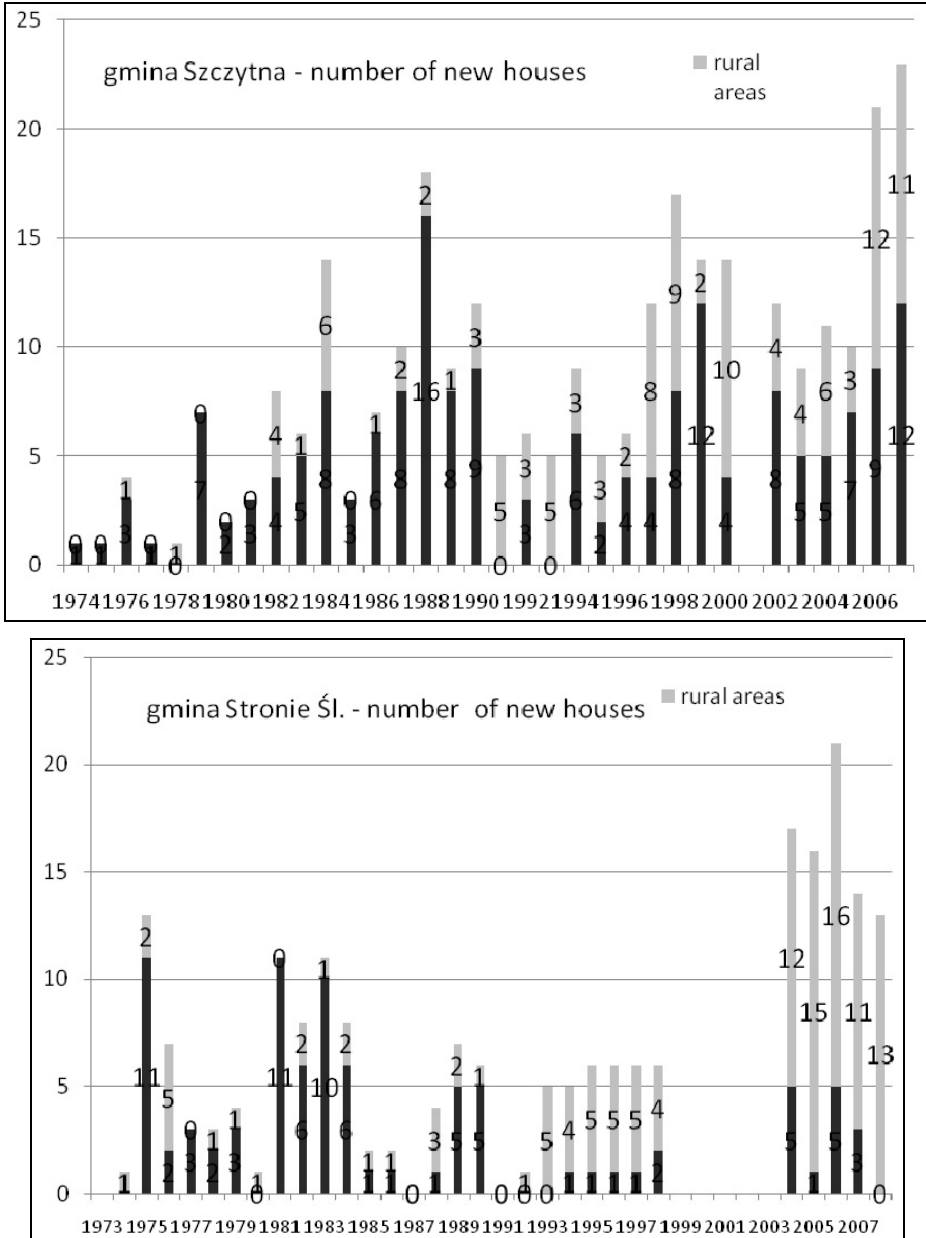


Fig. 4. Number of new single-family and holiday houses in two selected communes in Kłodzko region (on the basis of the yearly building permits)

The increase of recreation needs and their affordance among citizens in recent decades, resulted also in development of tourist infrastructure in the entire Sudetes region. At present, tourism is seen as a 'remedy' for the previous economic stagnation. In fact, the regional potential of tourism development, especially agrotourism, is very high (e.g. Wyrzykowski 2004, Potocki 2009). However, the natural values of the environment and landscape can be lost due to excess development of tourist infrastructure, such as new skiing areas, car parks, hotels and pensions, which can be observed already in some areas (e.g. Karpacz, Szklarska Poręba, Zieleniec, Czarna Góra).



Fig. 5. Spread of new houses on steep slopes contributes to changes of slope profiles (building escarpments) and enhances the erosional processes – ski centre in Czarna Góra (phot. by A. Latocha 2010)

The encroachment of both holiday houses and tourist infrastructure in upper parts of slopes has the potential to reinforce the slope processes again, as the building location do not often respect the natural environmental conditions and constraints, such as slope inclination. For example, the increase of soil erosion and linear erosion can be observed in places with disturbed vegetation cover and along newly built unpaved roads (fig. 5). The potential development of erosional processes might be also enhanced by the recent limitation of natural secondary vegetation succession. It is due to the expansion of built-up areas on one hand. On the other hand, the natural spread of shrub and forest stands on abandoned grounds has been limited after Poland has joined the European Union in 2004. The access to EU-environmental funds and implementation of agri-environmental schemes supporting sustainable land use have substantially influenced the landscape and environment in the Sudetes. Many places, where spontaneous processes of natural secondary vegetation succession developed for last several decades, forming diverse stages of succession encroachment with numerous ecotones, have been recently re-included into agricultural use and turned into, first of all, hay meadows.

Another threat connected with spatial planning development of the Sudetes and especially of their foreland is the recent 'boom' for building wind farms. At the moment only one wind mill has been constructed, but many other have been already included in the modified spatial development plans in several areas. The planned location of wind farms is often catastrophic from the environmental and landscape point of view, as it does not respect the existing natural beauty of relief, cultural heritage or routes of birds and bats migrations. This is a very hot regional issue at the moment, as many local communities protest against building the wind farms, as they are aware, that the tourism potential of the present cultural, harmonic landscape will be lost.

Projects on protection and promotion of landscape values

Fortunately, some recent regional projects on further spatial development of the Sudetes Mountains focus on the environmental and landscape potential of the region and aim at promotion of landscape tourism and sustainable development. If these projects are implemented, it can be expected, that chaotic and devastating process of uncontrolled building development or spread of wind farms in the most precious environments can be limited. These projects include, for example, the creation of landscape tourist trail in the Kłodzko region with network of viewing points (Latocha et al. 2008). This concept is a kind of revival of older regional tradition to build viewing towers, which were widely spread in the entire Sudetes in the 19/20th century (Przerwa 2005). Another example of implementation of ecological knowledge into practical use is the project 'Sustainable Mountain Development', which was coordinated by FAO. This project aims at reconstruction and maintenance of traditional Sudetic cultural landscape. It includes, among other, restoration of former breeding and planting species of domestic animals, grasslands and fruit trees, together with development of traditional agricultural practice, like sheep breeding and cheese production, which could become branded regional products (Cyron et al. 2007). Another positive example of cultural landscape restoration and protection is the establishment in 2008 the large Cultural Park of the Jelenia Góra Basin. It comprises the extent area of unique landscape-architectural complex of former residences, palaces, gardens and landscape parks, which were created in the 19th century and were severe dilapidated in the post-war period. The success of formal acknowledgement of the special value of the entire area can be attributed mainly to local communities and NGO's, which makes the success even more spectacular.

Socio-environmental processes and spatial development in the Sudetes – threats and opportunities

The various socio-economical processes, which occurred in the Sudetes Mountains in the last several decades, have been mirrored in the landscape and environmental changes. Moreover, the combined interlinkages between the socio-economic and environmental aspects of changes influenced the entire spatial order of the region, which became locally very diverse, evolving either towards increasing renaturalisation of the landscape in one places, or, in opposite, becoming exposed to increasing human impact in other areas. Tracing the chain of human-induced and natural changes shows it clearly, that the evaluation of changes may be often ambiguous. Processes, which are interpreted as negative from the socio-economical point of view and which lead to stagnation or regression of regional development (Ciok 1991, 1995, Łoboda 1993), may result in positive alternations as far as environmental and landscape values are concerned (fig. 6). In the Sudetes, substantial amelioration of general conditions of the natural environment, including the reduction of pollution and the increase of bio- and landscape diversity, was a side-effect of the socio-economical collapse due to depopulation, decapitalization of properties, housing crisis and barriers in the industry development after 1945. Paradoxically, the environmental results of that socio-economical crisis contributed to the recent re-evaluation of the region and became impulse to the contemporary development. The priorities have been substantially changed though – the present focus on the recreational and touristic needs (Wyrzykowski 2004, Potocki 2009) is based on the landscape and environmental potential of the region, which was improved due to former economical regression.

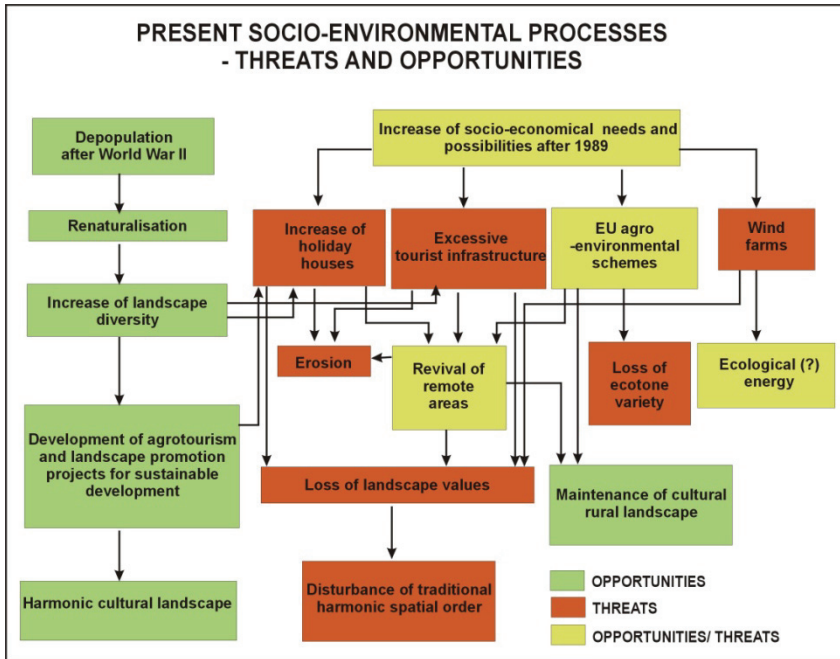


Fig. 6. The main present socio-environmental processes in the Sudetes Mountains – threats and opportunities

Nevertheless, the opportunities for the spatial development of the region for tourism and recreation, provided by landscape and environmental values, might easily become out-balanced by the excessive exploitation of the natural resources and space, as well as by the improper decisions considering the spatial planning in the most valuable areas. The natural opportunities, such as open and diverse landscape or renaturalised environment, may become threaten by further spatial development if it continues to progress in such chaotic and ‘aggressive’ manner, as it is already the case in some areas in the Sudetes. Also the role of the recent revival of previously abandoned and neglected areas or the implementation of the EU-environmental supporting funds and schemes may be ambiguous. They may contribute either to the maintenance of cultural, harmonic rural landscape on one hand, or to the loss of landscape and environmental values and variety on the other hand. It depends on the intensity and spatial extent of these processes, if they should be classified as opportunities for the regional development and maintenance of the spatial harmonic order, or rather as threats for maintenance of the balanced relationship between human impact and economy, and landscape and environmental values (Fig. 6).

It is worth stressing, that all the processes mentioned above can be observed in the region at the same time in different places – the areas with progressing depopulation are adjacent to the areas with intense expansion of new housing; the popular tourist resorts with excessive infrastructure and intensified erosional processes neighbour the abandoned places with proceeding secondary vegetation succession; the areas subject to chaotic development of new built-up territories are located closely to the areas, where values of the traditional cultural landscape are appreciated, promoted and formally protected. The co-existence of the opposite trends of socio-economical-environmental processes, which can be nowadays observed in the Sudetes, makes the process of decision making, in order to provide the most suitable and sustainable solutions for spatial planning, a highly complex and difficult task.

Conclusions

To sum up it can be stated, that present trends of spatial development in the Sudetes Mountains develop in various directions and are locally very diverse. This, in turn, can lead to different environmental effects with some areas losing their landscape values, and other – maintaining them and enhancing. The wide-spread renaturalisation and depopulation of the region, which were typical for post-World War II period, are not longer the dominating processes. The increased human impact affects once again even remote and previously abandoned areas. It can be stated, that nowadays it is a critical moment for the reasonable planning of further spatial development in order to coordinate it on a balanced level between the increasing socio-economical needs and the need to preserve and maintain the harmonic, cultural mountain landscape.

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