



## THE ROLE OF PLANNING IN THE MOUNTAIN REGIONS AS EXEMPLIFIED BY MINING AREAS MANAGEMENT

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### Summary

It is clear from what we know about the various deposits of mineral resources in Poland that Polish mountain areas are rich in minerals. This applies especially to the Sudetes, the Świętokrzyskie Mountains, and some areas of the Carpathians. They were or still are the site of mining activity in many of its forms (underground, surface and hole mining). These activities have various effects, such as changing the specific spatial elements and interference with the natural and cultural landscape. This is particularly important in the mountain regions which are attractive to the tourist and fulfil recreational and spa functions. From the analysis of the Polish law a conclusion can be drawn that mining activity is generally excluded from the planning system, which has a significant impact on the mountain area and on a subsequent use of post-mining heritage.

### Keywords

mountain areas • mining • mining area • spatial planning • landscape • cultural heritage

### 1. Introduction

Compared to other areas, mountain regions are very specific. The peculiar characteristics of mountain lands include the lie of the land, hydrological and climatic conditions, as well as the vegetation and fauna. The uniqueness of the mountainous areas lies also in the significant role they play both in the economy and people's lives [Kopeć 2008]. Among the important features of these areas are the forestry and agriculture, as well as tourism, recreation, sports and health care resorts.

Mountain lands have a relatively complex geological structure and mineral deposits formed in the orogenic processes. In many mountains around the world various minerals deposits can be found, especially of hard and anthracite coal, metal ores (iron, copper, zinc, lead, nickel, uranium and other), precious metals and stones, chemical raw materials (barite, rock salt, potassium and magnesium salts), energy resources (natural gas, oil), a variety of rock materials (igneous, sedimentary and metamorphic), as well as water – both mineral and geothermal. Location maps of mineral deposits in

Poland [Bońda and Siekiera 2011]<sup>1</sup> show that the various minerals can be found in all Polish mountains and in areas at the junction of mountain areas. Sudeten Mountains especially stand out for their wealth of natural resources, such as anthracite, hard coal, uranium and gold ores, and chemical, rock and ceramic raw materials.

Natural resources included in the so-called resource balance [Leksykon... 1989], namely the minerals that have quantity, quality and structure useful for business purposes, are already subject to mining or can be extracted in the future. This also applies to mountain areas, where many mineral deposits, as a result of the uplift of the rock mass, lie relatively near the surface, making it easier and cheaper to exploit.

Mining activities oriented on extraction of raw material from the deposit can be carried out by three basic methods: underground, surface and hole mining, depending on the type of mineral and other factors. Regardless of the technique of extraction, exploitation always has a large impact on the landscape, natural and cultural environment, and may lead to multiple risks and conflicts. These are critical issues in the mountainous areas and their surroundings, where it is almost impossible to avoid obvious contradiction between the need to protect the regions' values and to stimulate economic development through such activities as mining. It seems that spatial planning can play a central role in the resolution of this conflict. Instruments of spatial planning should be able to include mining in a balanced development of mountain areas without harming their natural, cultural and landscape values.

## 2. Impact of mining activities on space

Mining, especially surface and underground mining, has a huge impact on the surroundings. Regardless of the risk of typical mining damages, mining activities have specific spatial effects, such as the formation of excavation pits (on the surface or underground), dumping ground (mine waste dump), and industrial installations and buildings (e.g. shaft extraction with towers, administrative, utility, technical, warehouse, craft buildings and buildings where the processing of exploited raw materials takes place). In addition to the construction of buildings, the operation of a mine generally means that engineering components must be introduced in an open space, such as roads, railway tracks, footbridges, paved squares, reservoirs and water courses, ramps, retaining walls, earth objects – levees and embankments, and many others.

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<sup>1</sup> The following distribution maps of mineral resources in Poland were analysed: Map of the distribution of metal ore deposits and chemical raw materials in Poland, Map of the distribution of copper ore deposits, Map of the distribution of ore deposits of zinc and lead, Map of distribution of native sulphur deposits, Map of the distribution of coal deposits of the Upper Silesian Coal Basin, Map of the distribution hard coal deposits (LZW), Map of the location of deposits of broken and block stones in south-eastern Poland, Map of the location of deposits of broken and block stones in south-western Poland, Map of the distribution of clastic mineral deposits in Poland, Map of the location of deposits of ceramic and refractory minerals in Poland, Map of the distribution of loamy mineral deposits in Poland, Map of the location of mineral deposits of compact rock in Poland, Map of the distribution of oil and natural gas in Poland.

Transformation of the space used for mining is usually so far-reaching that it can be called a creation of a characteristic cultural landscape of mining regions, clearly distinguishable from other regions. Assessment of spatial impact of mining activities is rather ambiguous. Mining facilities, such as the excavation pits or shaft towers in underground mines, are often seen as a discord in the open area, or even as elements destroying its values. This is especially true in mountainous areas where traces of mining are visible very clearly and sometimes even dominate the natural, harmonious landscape (Figures 1 and 2).



Photo by Langer 2013

Fig. 1. Excavation of abandoned quarry in Żegocina, Beskid Wyspowy



Photo by Langer 2004

Fig. 2. Shaft tower of the salt mine "Salzdetfurth" (Germany, Lower Saxony) – space dominant in the mountain landscape

Another issue is the impact of mining activities on the function of the environment. In Europe there are many regions of intensive mining, often accompanied by other industrial sectors, usually smelting, processing and chemical industry. Such areas are located in the Upper Silesia in Poland, the Ruhr district in Germany and the vast area located at the borders between Belgium, France and Luxembourg. Due to the accumulation of large amounts of noxious industries mining regions are generally perceived as less attractive for the location of functions based on the use of natural and landscape values. This seems pretty obvious in the mountain regions where the operation

of mines, especially surface mines, is in conflict with other types of land management, such as tourism, leisure and health resorts.

From this perspective mining, though justified from an economic point of view, can be said to influence the area mainly in a negative way, causing many conflicts – both in the landscape and in the functional area. However, one of the effects of mining activities is the accumulation of a variety of elements that can be considered as a value. These include above all the excavation and mining facilities, including building complexes of significant architectural and compositional value. These elements are the essence of a specific cultural heritage of mining regions and the foundation of their identity.

A number of the European examples show that both surface and underground mining can successfully contribute to the attractiveness of regions traditionally associated with mining. After cessation of industrial activities mining facilities are adapted to new functions, such as tourist destinations, museums, centres of recreation, arts and culture, sports, entertainment, religious cults, science, education and others. Post-industrial reconstruction and development of disused mines should preserve the authenticity of mining heritage and link adapted elements with the environment. This goal can be achieved with tools of development planning, which should be essential in the coordination of activities undertaken in the areas defined by the mining function.

### 3. Spatial planning in mining areas

Mutual relations of spatial planning and mining activities are generally defined in two acts: the law on spatial planning and development [Ustawa... 2003] and in the geological and mining legislation [Ustawa... 2011]. Both these acts directly address the issues of mining in planning documents and take fairly consistent approach to the role of spatial planning in the areas of mining. The reference points in the analysis of this problem are two terms: “mining area” (*obszar górniczy*) and “mining terrain” (*teren górniczy*), which are defined in the geological and mining law. The first term means: “The space where a businessman is entitled to exploit the deposit (...) and carry out mining works necessary to fulfilling a license” [Ustawa... 2011, art. 6, § 1, p. 5]. The second one is: “space on which mining works can have harmful effects” [Ustawa... 2011, art. 6, § 1, p. 15].

According to the law on spatial planning and development, the study of conditions and directions of spatial development must take into account conditions resulting from the presence of proven reserves of minerals and of mining terrains [Ustawa... 2003, art. 10, § 1, p. 11–12]<sup>2</sup>. The act also imposes an obligation to determine the extent and ways of managing mining areas in the draft of local spatial development plan, if it covers the scope of the development of the mining area [Ustawa... 2003, art. 12, § 2, p. 7]<sup>3</sup>. At the

<sup>2</sup> This obligation is confirmed in the implementing act to the act, i.e. in the Regulation of the Minister of Infrastructure dated 28 April 2004 on the scope of the project study of conditions and directions of spatial management [Dz. U. z 2004 r., Nr 118, poz. 1233].

<sup>3</sup> The requirement of setting the extent and determining the ways of development of mining areas, which is a part of the local spatial development plan management, can also be found in the art. 7, § 4 in the Minister of Infrastructure regulation of 26<sup>th</sup> of August 2003 as to the scope of project of local spatial development plan [Dz. U. z 2003 r., Nr 164, poz. 1587].

same time the law does not explicitly say that local plans for mining areas have to be prepared, though it defines the areas as protected. However by virtue of the law both the study of the conditions and directions of the spatial development and a local spatial development plan must be agreed with the competent mining supervisory authority as to the ways of managing the mining terrains [Ustawa... 2003, art. 11, § 6f and art. 17, § 6b].

Paradoxically, the issues related to spatial planning are more clearly articulated in the geological and mining law. Already its first paragraphs permit mining activities only if they do not infringe the regulations of planning documents – study of conditions and directions of spatial development and local spatial development plan [Ustawa... 2011, art. 7, § 1–2]. In case of the infringement the license to extract minerals from the deposits can not be issued [Ustawa... 2011, art. 29, § 1]. However when preparing planning documents the factors important to mining have to be taken into consideration and then the agreement with the supervisory authority of the mining has to be obtained. It seems that ensuring the freedom of mining activities is another goal of these documents. Part VI, chapter 1 of geological and mining law is entirely dedicated to spatial planning. The most important provision in this part of the legislation is related to the preparation of local development plans for mining areas. It shows clearly that the development of such plans is not mandatory but only desirable when mining activities may have significant effects on the environment [Ustawa... 2011, art. 104, § 2]. This situation raises a fairly obvious dilemma between the need to protect the environment against the negative impact of mining activity and the stimulation of mines development – large workplaces and taxpayers making a considerable contribution to the budgets of mining communities.

Analysis of the Polish system of spatial planning at the local level suggests that the development of mining areas is not decided by the spatial aspects but rather by circumstances and needs relevant to the business of mines exploiting natural resources. In this perspective, the role of spatial planning amounted to minimizing the negative effects of mining, in particular its devastating effects on the environment and existing land use elements. Both the law on spatial planning and development, as well as geological and mining law completely ignore the cultural value of mining objects and their potential for adaptation and for multi-use when the exploitation is no longer carried out. This situation looks slightly better at the regional level. Regional spatial plans of land-use often show closed mines as an object of major tourist importance. However, this applies mostly to historical buildings that are already legally protected as historical monuments, but the contemporary mines are rarely considered as part of the cultural heritage of mining regions. This is confirmed in the current Spatial Development Plan of the Małopolska Region [Plan Zagospodarowania... 2003]. In this document medieval, ancient salt mines of Wieliczka and Bochnia are considered as objects shaping the cultural identity of the region, but the act does not mention here the twentieth-century mines in Siedlec and Moszczenica, even though they also belong to the historic mining region of “salt mines in Kraków”.

#### 4. Mining activities in mountain areas – the importance of spatial planning for the quality of the space

Development of the mine terrain, with the negligible support of spatial planning or the complete absence of such support, adversely affects the quality of the mountain areas. In the phase of exploitation of raw materials on an industrial scale, mining areas are transformed to meet the current needs of the mine with disregard for most of the existing landscape and natural values. As a result, the space used by the mining plant has a dominant sightseeing role with objects such as excavation pits, large complexes of building, tall engineering structures exposed in the mountain landscape. At the same time, the active area of the mine is usually isolated from the space and closed to the outsiders and therefore the positive aspects associated with mining activities can not be easily integrated into the system of tourist routes, theme trails or bicycle lanes.

Insufficient role of the spatial planning in mining areas is more evident after termination of exploitation works and closure of mines. In the absence of local spatial development plans, usually no one knows how to use interesting post-mining objects to adapt them to new functions. As a result, the most valuable components of mines are destroyed or stay unused for such a long time that they fall into complete decay. Untapped potential of inactive mines means a double loss to the quality of the mountain areas. On the one hand, unused and devastated post-mining objects with deteriorating technical conditions more and more interfere with the landscape and sightseeing panoramas. On the other hand, by not adapting the disused mines to new functions the overall usable attractiveness of the mountain areas is diminished, whereas the use of post-mining elements would be very interesting extension and completion of the tourist offer.



Photo by Langer 2008

**Fig. 3.** Alpine village of Hallstatt, a UNESCO World Heritage Site. An important element of the tourist appeal of Hallstatt is the Celtic salt mine



Photo by Langer 2008

**Fig. 4.** The historic building of the salt mine in the Bavarian town of Berchtesgaden, used today for tourism and as museum

In many European countries, and in Poland too, there are numerous examples of including post-mining facilities and areas in the system of various attractions that can initiate the development of broadly defined tourism. It is enough to mention the Alpine region of Salzkammergut, with its capital in Salzburg, often referred to as “the land of mountains and salt”. This area is a good example of combining tourist attractiveness of the mountains with specific mining heritage consisting of several historical salt mines located in the Austrian towns: Hallstatt, Hallein-Bad Dürnberg, Altaussee and Bad Ischl, as well as the well-known German tourist and recreation centre – Berchtesgaden in the Bavarian Alps (Figures 3 and 4). It should be noted that each of the mines mentioned above has its own character and style, and the mining towns of the region closely cooperate with each other and coordinate their mutual promotion in which two countries are involved – Austria and Germany.

In Poland there are some positive examples of functional adaptation and utilization of post-mining facilities that boost the attractiveness of mountain lands. The mines located in the Sudetes, including uranium mining tunnels in Kletno and Kowary, gold mine in Złoty Stok and a very interesting anthracite mine in Nowa Ruda are especially noteworthy here. Nevertheless, the current situation of the majority of inactive mines in the mountain areas and their immediate environment is not satisfactory. After completing the closure of mines the remnants of old mining facilities are generally not used. Buildings and engineering elements fall into decay, and the excavation pits, especially quarries, are subject to an intense process of ecological succession and quickly lose their original, authentic character. This applies to the aforementioned salt mines in Siedlec and Moszczenica (Figure 5), located in the vicinity of Kraków, on the edge of the Carpathian overthrust, and many Sudetes objects, such as a former coal mine in Ludwikowice Kłodzkie (Figure 6).



Photo by Langer 2010

**Fig. 5.** Decaying shaft headroom of the abandoned salt mine near Kraków Moszczenica of non existing extraction tower, demolished in 2013



Photo by Langer 2012

**Fig. 6.** Completely ruined buildings of the historic coal mine in Ludwikowice Kłodzkie, in the Owl Mountains

Sometimes the mines located in mountain areas are subject to adaptation after termination of mining, but the new function is in no way related with the attractiveness of mountain tourism. This is the case of Wałbrzych, located at the contact point of Central Sudetes and Western Sudetes Foothills, where the shaft headroom of the former coal mine “Thorez” was transformed into a local automotive centre, including a garage, second-hand car dealer’s and a car wash.



## 5. Conclusions

Article content and the presented examples clearly show that in the areas of mining the spatial planning is expected to perform a number of important tasks. It applies especially to mountain areas, where specific conditions promote the development of mining, and mining heritage is of particular importance for the landscape and practical use. Thus, with regard to the elements of mining and post-mining in the mountains and their surroundings the three basic functions of spatial planning can be emphasized:

- **preventive function**, aimed to reduce mining activity in the mountain areas of the highest value, including the areas covered by conservation programmes,
- **protective function**, with a primary goal to mitigate conflicts between mines carrying out the exploitation of raw materials on an industrial scale and their surroundings, and to minimize the adverse impact of mining activities on the various elements of the mountain environment and landscape,
- **adaptation function** involving the inclusion of spatial planning in the process of reconstruction and development of disused mines after termination of industrial activities, and in particular the adaptation of these objects to new functions that agree with the direction of use of mountain areas and raise their touristic attractiveness.

The tasks may be performed with basic planning instruments, i.e. local zoning plans and studies of conditions and directions of spatial development of mining communities – at the local level and the voivodeship spatial development plans at the regional level. Analysis of the current legal situation in Poland leads to the conclusion that Polish system of spatial planning fulfils only protective function. Significant improvement in the situation requires using the local spatial development plans for the areas of mining activities before licence for production of raw materials is granted. The local plan could determine the desired manner of managing the space by the mines, as well as the direction and scope of the use of the mine facilities after termination of industrial activities, while taking into account the exceptional landscape values and the specific function of mountain areas.

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