



Analysis of the Causes of Conflict between the Miners and Naturalists

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<http://doi.org/10.29227/IM-2020-01-19>

Submission date: 06-11-2019 | Review date: 20-01-2020

Abstract

The primary goal of this paper is to suggest potential methods of post-mining areas management. Moreover, such methods must be compliant with the expectations of the residents of a given area. The assessment of natural and socio-economic factors affecting the choice of optimum reclamation and revitalization approaches was carried out using the following research methods: analysis of the available literature, case study, field research, photographic documentation. An analysis of the impact of deposit exploitation of mineral aggregates on protected species and their habitats located within the Natura 2000 sites was done. The scale of the problem is enormous. A proper approach needs to be developed among the economy, society and organization of managing the network. The Natura 2000 network covers huge areas simultaneously utilized for other purposes than nature conservation. The Natura 2000 network is in serious conflict with industry, especially with open-pit mining due to the location of mineral deposits. The results can be used to resolve conflict situations on Natura 2000 sites. An undertaking will only receive a go-ahead if it exerts no negative impact on a given area and if the public approves of it. Plans and undertakings having a negative impact on a given area are authorized but on the condition that mitigating measures are taken.

Keywords: mining, valuable natural areas, nature conservation, conflicts

Introduction

Before Poland's accession to the EU, various forms of nature conservation had existed on its territory. The most restrictive forms of nature conservation are still national parks and nature reserves where no forms of land development by people are permitted. The law of the European Natura 2000 network authorizes land development; however the condition to be met is a rational approach to the potential impact of undertakings or plans on endangered habitats as well as animal and plant species. For this requirement to be satisfied, one is obligated to perform a rigorous procedure of impact assessment on Natura 2000 areas. Such assessment takes into account social considerations [Badera 2013], along with economic and development-related issues, but the most important is protecting biodiversity and ensuring the required conservation status of habitats and species of importance for the entire Community [Poros, Sobczyk W. 2013].

Rapid economic development has led to intensified mining works in Poland and all over the world. Even a few dozen years ago, the profits generated through mining were a priority issue, while very little attention was given to the effects of that activity. Degraded areas were left for nature to heal them, which indeed happened – to various degrees. As the area of devastated patches of land expanded, the society began to perceive mining as a major threat to the environment. Currently, image improvement is possible through efficient land reclamation that meets the needs of local communities. Despite wide-ranging reclamation projects, the effects of past negligence can still be found.

Objective, materials and methodology

The primary goal of this paper is to suggest potential methods of post-mining areas management. Moreover, such methods must be compliant with the expectations of the residents of a given area. The assessment of natural and socio-economic factors affecting the choice of optimum reclamation and revitalization approaches was carried out using the following research methods: analysis of the available literature, case study, field research, photographic documentation. An analysis of the impact of deposit exploitation of mineral aggregates on protected species and their habitats located within the Natura 2000 sites was done.

Objectives of Natura 2000 programme

Dynamic development of our civilization has brought about numerous adverse effects all over the world. National leaders and decision-makers have become aware of the fact that excessive utilization of natural resources combined with continuous polluting of the environment may have catastrophic results. They understood that economic development is not the sole purpose of our existence. Moreover, the socio-economic benefits of possessing healthy natural areas were becoming increasingly evident. Environmental protection became one of key objectives of many countries, which facilitated the development of a relevant common legal framework.

The European Natura 2000 network is one of the tools used to ensure sustainable development because it creates growth opportunities for current and future generations. More important, however, this programme aims to be-



Fig. 1. Deposit of natural aggregates and a Natura 2000 area. Klaj, Poland (photo by A. Kowalska)

Fig. 1. Złóża kruszyw naturalnych i obszar Natura 2000. Klaj, Polska (fot. A. Kowalska)



Fig. 2. Construction of the motorway around Olkusz (Poland) Interference with the natural environment (deforestation) (Photo by M. Gomułka)

Fig. 2. Budowa autostrady wokół Olkusza (Polska). Ingerencja w środowisko naturalne (wylesianie) (fot. M. Gomułka)

queath the natural environment in good condition to our descendants.

Natura 2000 areas have been established to protect rare animal and plant species and unique natural habitats which are important for preserving natural values across Europe [Bulletin 2000]. The system of preserving valuable natural areas that jointly comprise a functionally coherent entity (mostly through ecological corridors) will facilitate more effective mitigation of adverse environmental changes than it would be the case with isolated, single ecosystems. There are no obligatory protection methods to be implemented in specific areas; however, monitoring of natural habitats as well as plant and animal species is required to evaluate the effectiveness of protective measures.

The Natura 2000 network was established to protect:

- endangered plant species,
- endangered animal species, in particular birds as they cover considerable distance and due to historical factors, they are treated as a separate category.
- endangered ecosystems – by conserving natural habitats [Kowalska, Sobczyk W. 2011].

The aforementioned goals constitute the basis for preserving natural balance in the environment and for correct functioning of natural processes. These processes are of key importance for the stability and sustainability of nature. Moreover, they play a very prominent role in terms of the ability to function of today's and future generations.

Implementation of contested projects and the good of the environment

To analyze in greater depth the issue of conflicts caused by the establishment of the Natura 2000 network, one should

be aware of several facts. The greater part of the society knew nothing about the new form of conservation, namely the Natura 2000 network, until the outbreak of conflict related to the planned construction of Augustów ring road through the Rospuda Valley. The resolution of that dispute only proves that with good will of both parties involved it is possible to reconcile assumptions of controversial projects with the interest of the environment.

The Natura 2000 areas currently constitute 17% of Europe's surface area, so the scale of the problem is enormous. A proper approach needs to be developed among the public and the organizations managing the network. The Natura 2000 network covers huge areas simultaneously utilized for other purposes than nature conservation. More than 30% of those areas are part of farmlands, the other part is used in forestry, fishing, recreation and more. Nature conservation being in opposition to other forms of managing the same area is the usual source of conflict. Efforts should be made to understand their mechanisms and causes to be able to resolve arising disputes.

In most cases, two types of conflict are likely to erupt [Radwanek-Bąk 2008]. The first type begins where the requirements concerning the preservation of protected habitats and species to be found in a given area need to be reconciled with particular forms of land use. Owners and users of land fear alternated or limited land use, unsatisfactory compensation or losing their freedom to decide. This type of conflict may be avoided or mitigated by offering sufficient compensation or other pecuniary incentives, by putting in place uncomplicated and effective administrative procedures, by gaining proper scientific knowledge and development of innovative practices [Kowalska 2013].



Fig. 3. Single-family housing located close to the boundary of a mineral deposit. The town of Trzciana in the Jasiołka Valley (Poland) (Photo A. Kowalska)
 Fig. 3. Budyunki jednorodzinne położone w pobliżu granicy złoża kopalini. Trzciana w dolinie Jasiołki (Polska) (Fot. A. Kowalska)

The second type of conflict is linked to organization of the planning process of Natura 2000 areas management. Land owners and users want to exert a greater influence on the way such areas are managed. To avoid such conflicts, the parties involved should be allowed to participate in decision making as regards areas management. Moreover, the public should be allowed to join, while effective communication and information channels should be put in place. Finally, one of the priorities should be making Natura 2000 areas an integral part of spatial planning and land use planning strategies. Important factors are knowledge, competence and training of the staff of nature conservation authorities and of the individuals managing the areas with respect to effective communication and negotiation skills.

The Natura 2000 network is in serious conflict with the industry – especially open-pit mining, due to the type of mineral deposits. Many protected areas have been established in the vicinity or even within managed or unmanaged sand and gravel deposits, thus creating a potential threat of being forced to cease mining (Fig 1).

Increased demand for mineral aggregates is a result of the massive motorway construction programme being implemented in Poland (Fig. 2). Since minerals can only be excavated where their deposits are located, this poses a serious problem – especially where deposit sites overlap with Natura 2000 areas.

An undertaking will only receive a go-ahead if it exerts no negative impact on a given area and if the public approves of it. Plans and undertakings having a negative impact on a given area are authorized but on the condition that mitigating measures are taken. A prerequisite in such case is lack of alternative solutions or a need to implement a given undertaking for crucial reasons resulting from the overriding public interest, e.g. social or economic interest [Engel 2009, Pietrzyk-Sokulska 2009, Sobczyk E.J. et al. 2017]. Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora sets out relations between land protection, development and management so that it is possible to ensure sustainable development of the areas where Natura 2000 network is located. The Directive goes beyond protecting species and habitats; it also takes into account the public interest permitting deviations from certain regulations [Bulletin 2000].

Mining of natural minerals may cause interferences with the natural environment. The extent of impact depends primarily on the mining stage and the condition of the envi-

ronment. The scale and scope of anthropogenic changes are caused by a combination of many intertwined factors that include, among others: land planning factors, terrain-related factors, but also technical, physiographic, economic, social factors as well as the duration of exposure to impact [Kowalska, Sobczyk W. 2011]. As mineral deposits are an environmental component, any land management plan should meet the requirements for deposits protection (with deposits being the source of raw materials for the economy) for the purpose of their future mining, as defined in official acts. Technical factors include geometric parameters of the pit, i.e. its size and depth. An important role is also played by methods of deposit treatment and mineral processing and the types of equipment used.

The terrain-related (situational) factors pertain to land management, location of the undertaking against existing infrastructure, distance from the source of demand and proximity of protected areas. The physiographic factors include natural conditions of a given area. They include: climate, land relief, water conditions, geological structure, as well as flora and fauna. The most important economic conditions include demand for and supply of aggregates in a given area, which affects the volume and rate of the mining activity.

Available funds are a decisive factor in selecting deposit extraction technology and equipment. Moreover, they are indispensable when mines are to be decommissioned, or when fees for the environment use (or potential fines for its degradation) have to be paid. Among social factors there are environmental ethics and awareness of both the people directly involved in mining and local residents. All these factors are reflected in taking care of the environment, which after all is a source of economic, health and recreation-related and aesthetic benefits.

Extracting deposits may pose a danger for groundwater, which may be subject to mechanical pollution, with increased turbidity being the obvious symptom. Their purging is a natural process occurring when water runs off into a river. The equipment used in mining may emit pollution in the form of oil-derivatives. To prevent that, only technically efficient equipment should be used that undergoes regular inspections. Changes in land relief and overgrowing vegetation, as well as soil degradation, are often only temporary when part of the pit is filled with ground once mining activity stops. Land reclamation aimed at restoring agricultural capacity may yet facilitate returning to the previous type of land management.

The impact on specific environmental components usually remains within the limits established for mining sites and mostly pertains to soils and land relief. Formation of dumping ground and access roads is also only temporary. Reclamation aimed at restoring water conditions makes it possible to adapt water bodies for agricultural purposes or recreation-related purposes.

And yet, when deposits are located in the vicinity of Natura 2000 areas, some negative impact on protected species and their habitats is at times exerted. Likewise – when residential buildings are within 20 meters from the deposit boundary, local inhabitants will experience adverse impact (Fig. 3). This is caused by dust and noise emission.

If we decide to follow the principle of sustainable development, we should use the environment in a way that will keep it in the best possible condition for future generations. One should bear in mind that the adverse consequences of the current activity will become a burden for our descendants. Because of that, all of us are obliged to utilize deposits rationally and to do everything we can to reduce the environmental impact exerted by mining to the greatest possible extent.

Conclusions

Many factors are crucial in determining whether the location of mineral extraction will affect the environment and adjacent areas, including protected ones. Some of these factors include: location of the mine, presence of mushrooms, plants and animals protected under EU and national law, technical conditions of mining activity, size of the mine, duration of deposit extraction, the range of impact on the ecosystem.

The range may be limited to the place of mineral extraction, which amounts to local impact on flora and fauna and existing water conditions. There is also a supra-local range of impact on fauna, flora and types of natural habitats as well as on objects of protection in protected areas, but also on migration corridors for animals, especially fish, amphibians and reptiles.

Mineral deposits, including aggregates, can often be found in valuable natural areas. Regardless of the volume of mining and mineral extraction method, this type of activity has an adverse impact on the environment. Aggregates extraction upsets the ecological balance of the area where it is performed as well as of the areas linked to it in ecological terms.

Examples of positive impact of mineral extraction justify perception of mining as a type of activity that creates new values. Mining can bring benefits to local communities by stimulating their activity and offering new jobs [Sobczyk W., Kowalska 2013].

Acknowledgement

The paper was written as part of statutory activity: Diagnostic methods and ways of environmental hazards waste reduction (Step V). Croup. 2. Redevelopment of brownfield sites in the opinion of the local community. Department of Environmental Engineering and Mineral Processing, Faculty of Mining, AGH University of Science & Technology, no. 11.11.100.482.

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Analiza przyczyn konfliktów między górnikiem i przyrodnikami

Głównym celem tego artykułu jest przeanalizowanie potencjalnych metod zagospodarowania terenów pogórnicznych. Takie metody muszą być zgodne z oczekiwaniami mieszkańców danego obszaru. Ocena naturalnych i społeczno-ekonomicznych czynników wpływających na wybór optymalnych metod rekultywacji i rewitalizacji została przeprowadzona przy użyciu następujących metod badawczych: analiza dostępnej literatury, case study, badania terenowe, dokumentacja fotograficzna. Przeprowadzono analizę wpływu eksploatacji złoża kruszyw mineralnych na chronione gatunki i ich siedliska zlokalizowane na obszarach Natura 2000. Skala problemu jest ogromna. Należy wypracować właściwe podejście do gospodarki, społeczeństwa i organizacji zarządzania obszarami Natura 2000. Sieć ta obejmuje ogromne obszary wykorzystywane jednocześnie do innych celów niż ochrona przyrody. Ponadto sieć znajduje się w poważnym konflikcie z przemysłem, w szczególności z górnictwem odkrywkowym ze względu na lokalizację złóż kopalni. Wyniki badań mogą być wykorzystane do rozwiązania konfliktów na obszarach Natura 2000. Przedsięwzięcie zostanie zatwierdzone przy akceptacji społeczeństwa oraz gdy nie będzie miało negatywnego wpływu na dany obszar. Plany i przedsięwzięcia mające negatywny wpływ na dany obszar są dozwolone, ale pod warunkiem podjęcia działań łagodzących.

Słowa kluczowe: górnictwo, tereny przyrodniczo cenne, ochrona środowiska, konflikt

