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Editorial

The Managing and Restoring of Degraded Land in Post-Mining Areas

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Mining is an important branch of the economy, providing raw materials necessary for the economic and civilization development of the country. It is difficult to imagine how modern civilization would function without products obtained from raw materials extracted through mining methods—without energy produced from burning fossil fuels, without metal products obtained from ores, without roads or stone products made from rock materials. As a raw material, sand is one of the most frequently used materials on Earth, rich in mineral resources [1–3]. The extraction of energy, metallic, chemical, and rock materials is, therefore, an indispensable part of the modern world. At the same time, however, mining exploitation is associated with very strong interference in the natural environment, and through it, also in human life.

The exploitation of mineral resources related to human mining activities often leads to the entire or partial disintegration of ecological systems in all climatic zones. The most visible natural consequences of opencast mining in the environment are large-scale excavations remaining after the exploitation of sand, gravel, limestone, lignite, and hard coal, whereas coal-mine spoil heaps are elements mainly related to underground mining. This applies to both surface and underground mining [3]. As a result of mining exploitation, the destruction of soil cover and vegetation prevents the use of land for agriculture as well as for communal functions. Although post-industrial and post-mining areas are considered unsuitable from an agricultural point of view, they are valuable areas for selected economic and social functions, especially in highly urbanized regions [4].

Methods of limiting the negative impact of mining on the environment have been developed and improved for a long time now, at all stages of mining operations, from exploratory works to the decommissioning of a mining plant. One of the ways of limiting the negative impact of mining on the environment in the world is post-mining land reclamation, owing to which the areas transformed by mining activities are restored to their usable or natural values [5]. The development and restoration of ecological systems in degraded areas in various regions in post-mining areas depend on the ecological policies of local governments and their financial capabilities.

In the Special Issue "The Managing and Restoring of Degraded Land in Post-mining Areas", 12 articles were collected representing research in various natural environments, located on four continents, that are impacted by mining anthropopressure conditions. The most extensive representation is the reclamation of post-mining areas in the forest direction. Hu et al. [6] deal with the evaluation of soil quality and maize growth in reclaimed land with coal gangue filling. Gagnon et al. [7] attempt to rehabilitate large tailing storage facilities of ore combinations of planted woody species and organic amendments application in Quebec. *Robinia pseudoacacia* is the most popular tree species for land reclamation in mining areas within the Loess Plateau. Shi et al. use *Robinia pseudoacacia* in their research on the waste dump land of the Pingshuo mining area [8].

The successful establishment of a large botanical garden in the post-mining town of Radzionków (southern Poland) is an example of the transformation of brownfield sites to semi-natural areas [9]. The sandy landscape may be the result of industrial activities dating from medieval times, which created a center for mining and metallurgy. Under these stringent conditions, Rahmonov et al. [10] identify the changes in the phytomass in the initial stages of succession and their influence on the soil. Pratiwi/Narendra et al., a large team of scientists, provide a review article about managing and reforesting degraded post-mining landscape in Indonesia [11].

Polish researchers promote the activation of post-mining areas in tourism. Rurek et al. [12] popularize themed mining village attracts tourists in the area of the former underground brown coal mining in northern Poland. Rostański [13] describes the experimental development of a post-zinc industry spoil heap in Ruda Śląska (southern Poland), which was turned into a recreational area, as part of the LUMAT international project. Solarski and Krzysztofik [14] discussed the opportunities inherent in the naturalization of the townscape by analyzing an example of spatial development in the post-mining city of Bytom in southern Poland.

The article by K. Guo et al. [15] is part of the geoenvironmental research trend and concerns a causal analysis of ecological impairment in the land ecosystem using the example of the mining city of Daye (China). In turn, Y. Bai et al. [16] investigate morphodynamics phenomena—severe gully erosion on spoil dumps as significant threats to the land management of mining areas. S. Xulu et al. [17] note the need to enforce extracting companies to restore mined-out areas before pursuing closure permits. The restoration of mined-out areas is of great importance in South Africa, with a record of almost 6000 abandoned mines since the 1860s.

Inappropriate extraction of minerals may lead to the devastation of the landscape, destruction or degradation of soils, water and air pollution, loss or reduction in the diversity of living organisms, and contributes to the deterioration of the quality of life of local communities. The scientific articles presented in this Special Issue concern the methods and directions of management of post-mining areas and constitute important contributions to the issues of reclamation, revalorization, and revitalization of areas degraded by man as a result of his mining activities.

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