

From coal to tourism: a game-changer in the sustainable transition process

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Abstract

Purpose – This paper gives mining area managers guidance on how to begin this process and which scenario to choose. It aims not only to improve the quality of the environment but also to attend to the well-being of societies previously benefiting from the economic resources of raw materials. However, this task can be difficult to accomplish in countries of the poor South.

Design/methodology/approach – Building resilient infrastructure, promoting inclusive and sustainable industrialization and fostering innovation are among WHO's main goals. Ensuring the possibility of an equitable transition from traditional resource industries to sustainable resource management is a key task for global society.

Findings – The transformation of mines into tourist attractions has been studied by several authors. In many countries of the Global North, this transformation has been successful (to a greater or lesser extent). Unfortunately, much remains to be done in many countries of the South. These countries, often at the risk to miners' lives, engage in mining that is often economically unsustainable. The reason may not only be economic shortcomings but also a lack of conceptual solutions.

Practical implications – The current climate situation presents opportunities to receive funds from Northern countries that can be used for such a transformation.

Originality/value – Regions of the world with a history of transformation from raw material industries to services can provide know-how assistance and knowledge of good practices. Tourism in this aspect can become one of the game changers in the fight for a better future, including tourism itself.

Keywords Coal areas, Future, Mining, Pro-environmental transition, Tourism

Paper type Viewpoint

1. Introduction

Changes in global commodity markets are transforming the mining sector and have profound social consequences (Everingham *et al.*, 2022). Researchers emphasise the urgent need for targeted planning at the macro level as global markets see a decline in thermal coal production (Svobodova *et al.*, 2022). Overall, around 1,000 different mines worldwide are reported to close in the next 10 years (S&P Global, 2020). Generally, post-mining landscapes are often drastically different from pre-mining landscapes so there is an urgent need to redevelop them (Larondelle and Haase, 2012). Post-mining regions, as well as those still in use, have the capacity to meet the challenge of mine closure and transition to a different development model (Conlin and Jolliffe, 2010; Everingham *et al.*, 2022). Tourism may be one option for such a pro-environmental transition. This is an obvious way forward, as climate change will shape the future of tourism (Scott *et al.*, 2023). Moreover, the need for transformation is underlined by the Sustainable Development Goals, which include economic growth, decent work, no poverty and a sustainable society, among others (SDGs, 2024). However, it is important to note that, despite some clear positives, the Sustainable Development Goals do not fulfil their self-proclaimed goal of inspiring and leading coordinated efforts to eradicate poverty and injustice (Pogge and Sengupta, 2015). Here, tourism should act as a game-changer and should be sought to maximise its use. Unfortunately, although tourism

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generates benefits for countries North and South, the Global North receives a much larger share of the cake (Schänzel and Apollo, 2023). Thus, it may be difficult for poorer countries to implement those goals in post-industrial regions, so the South should draw knowledge and experience from countries that have already made or are making this transition. This direction is a concept from the present rather than the future, and this approach is known from many works whose authors have presented such possibilities with specific examples (Armis and Kanegae, 2020; Conlin and Jolliffe, 2010; Oktay Vehbi *et al.*, 2022; García-Sánchez *et al.*, 2021).

Moreover, industrial tourism is referred to as one of the opportunities to restore the high role of tourism in a post-pandemic reality (Garofano *et al.*, 2022). Moreover, industrial heritage has become increasingly popular as a tourist destination in recent years (Kua-Hsin and Gwo-Hshung, 2019). This provides an opportunity to develop disused mining sites for tourism purposes, especially in countries where the process of ending resource extraction is underway.

Some countries, especially those in the Global North, have already started the transformation, although much still needs to be done. The experience of countries that have already undergone the process of transforming post-mining areas can be helpful in shaping these areas in Global South countries where the process is yet to begin. Many countries such as India, or African countries are already paying attention to the need for sustainable reclamation of post-mining sites (Maiti and Ahirwal, 2019; Festin *et al.*, 2018). In order to ensure the best way to use and rehabilitate post-mining land, countries in the Global South should adopt a comprehensive path. Unfortunately, the experience of many countries shows that scenarios of short-term technical fixes are often chosen (Monosky and Keeling, 2021) instead of a comprehensive project with social, economic and environmental aspects (Bainton and Holcombe, 2018; Laurencont *et al.*, 2019). The experiences and examples of many reclamations in the countries of the Global North can be observed and can exist as a warnings to the countries of the Global South. Furthermore, in proposing solutions, it is important to note that the approach to tourism planning differs between the North and the South (Hall, 2007). This is related to different needs, economic resources and cultural and religious differences. Nevertheless, in both cases, reclamation towards tourism is a reasonable solution.

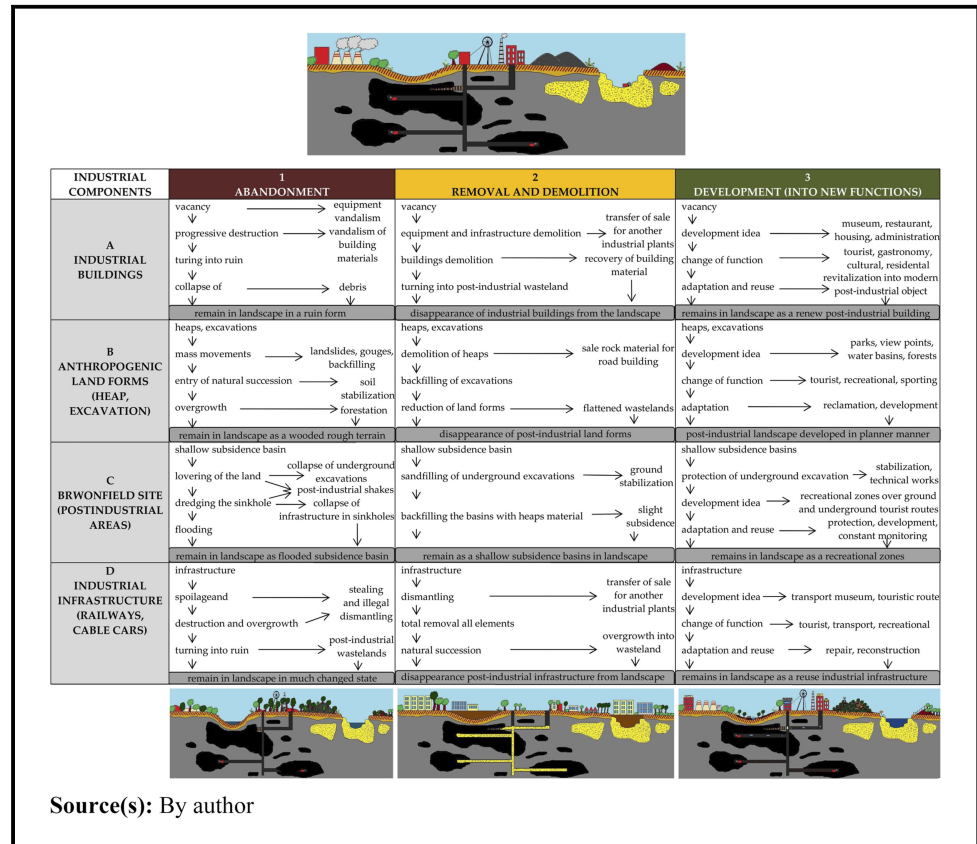
The development of post-mining areas into tourism, as presented here, is a proposal that could be a signpost for those managing such areas. It can provide a conceptual framework for the development of a detailed transformation policy or for the initiation of discussions on the topic of such changes in countries of the Global South.

2. Possible transformation scenarios

Post-mining areas can be a potential threat or opportunity; it all depends on how and to what extent they are skilfully converted. If post-mining areas are treated as a resource to be used, then their revitalisation brings the optimum benefits. The model for adapting post-mining areas for tourism purposes assumes three possible scenarios, which are arranged gradually, assuming different degrees of use of the space and infrastructure: from abandonment – the least expected scenario to full use of the area and infrastructure, which is the most favourable scenario. The model was developed with all elements of the post-mining landscape as reflected in the rows in the table (Figure 1). Simple scenarios or mixed scenarios within each post-mining element are possible.

The abandonment scenario presents the least expected future for post-mining areas and infrastructure. It implies the destruction and conversion to ruin or dismantling of mine infrastructure. It is associated with the complete loss of the mining tradition and the lack of adaptability for tourism. Over time, areas will be subjected to natural succession (Cui *et al.*, 2019) and uncontrolled ground movements associated with the collapse and flooding of underground workings (Dudek *et al.*, 2020). This is dangerous for society and the environment process due to uncontrolled land movements and erosion. Studies (Lowry *et al.*, 2019; Martín-Duque *et al.*, 2015) indicate that the post-mining landscape is subject to much stronger erosion processes than a landscape unaffected by mining. Hence, it becomes necessary to properly protect it, for example through plantings (Bolan *et al.*, 2011). The abandonment scenario is the least desirable because it leads to

Figure 1 A model of the possibilities for the use of post-mining areas



Source(s): By author

the loss of the mining from the landscape, despite its tradition. Furthermore, it leads to the creation of wastelands. Moreover, it does not offer a chance for the economic benefits of tourism and use their potential for local society.

The removal and demolition scenario is an intermediate option. It assumes the removal of mining infrastructure and material deposited in heaps from the landscape. These elements are intended to be sold, and thus to be reused and generate an economic profit. Mining areas should be properly protected to avoid dangerous subsidence, sinkholes and another mining hazards over the pits (Milanez *et al.*, 2021; Wagner, 2021). In the case of open-pit mine sites, the workings should be protected against mass movements. Underground excavations are usually backfilled or filled with water and sand (Tomiyaama *et al.*, 2020). After reclamation and securing the land, the area can be used for other purposes, such as housing or services (Pavloudakis *et al.*, 2020). Despite the loss of the character of the post-industrial landscape, the land will be used by the local community. This is an acceptable scenario, but with the knowledge of the loss of the mining tradition and the lack of use as a tourist facility. In effect, selling the infrastructure and reusing the land bring about economic benefits. The post-mining area and pits are adequately protected and do not threaten the environment and humans. However, the landscape is completely altered physiognomically and has no tourism function.

The third scenario is the most desirable and means full reuse of post-mining land and infrastructure. This benefits both the space, which is reclaimed and has new functions, and society, which also benefits economically. Post-mining pits and quarries, properly secured, can be used for tourism purposes as underground tourist routes, as is the case with the mines in Zabrze in Poland, Pittston in Pennsylvania in the USA, or Bochum in Germany (Kuzior *et al.*, 2022; Farrenkopf and Siemer,

2020). Post-mining facilities are being transformed into museums, galleries, concert halls, etc. (Toderas *et al.*, 2019). Such examples can be found in the Ruhr region in Germany, the Silesian Metropolis GZM in Poland, and Ostrava Region in the Czech Republic (Lamparska, 2019; Pukowiec-Kurda, 2023). Opencast sand pits can be reclaimed for water and used as recreational reservoirs. Dumps and heaps mounded from waste rock can be used as lookout points or ski slopes. In the case of the Guido and Królowa Luiza mines in Zabrze (Poland), which were successful after being converted into mining museums, the fashion for industrial tourism and funds for revitalisation from external resources such as European Union programmes were driving factors. The existence of similar sites on the post-mining heritage trail in the Ruhr region of Germany, such as the Zolverrein Mine in Essen and the German Mining Museum in Bochum, on which they were modelled, was not insignificant. Thus, the transformation of coal mines into tourist sites in Central Europe, Poland and the Czech Republic benefited from German knowledge and experience. Moreover, it is worth emphasising that post-industrial regions have value not only from a technical and infrastructural point of view, but are places of preserved cultural heritage related to mining, metallurgy, railways, hydraulic engineering and others. This is repeatedly recognised by UNESCO, which inscribes such sites on its World Heritage List. Examples of such successes include the Tarnowskie Góry Silver Mine in Poland, the Blaenavon Cultural Landscape in the UK and the Zolverrein Mine in Germany.

The reclamation of post-mining areas should be carried out in a comprehensive manner, as it carries spatial, natural, social but also economic consequences (Worlanyo and Jiangfeng, 2021). All these elements should be rehabilitated equally. Despite that, the scenario called development into new functions is the best solution. It fully protects the post-mining area and uses it for tourism-related purposes. Researchers agree that successful reclamation of mines requires not only provides protection of its surface, drainage waters (Skousen and Zipper, 2014), but also engineering treatments and comprehensive design with the designation of new functions (Hendrychová *et al.*, 2020). The correct protection of the post-mining area means mining work, but also reclamation of soil and forestation with selected pioneer species (Pietrzykowski, 2019). The post-mining infrastructure is transformed into museums, galleries, restaurants, and hotels. And after adequate protection, the post-mining area is made available for tourism purposes as underground tours, recreation reservoirs and park areas. The scenario allows for the economic use of the area and the preservation of post-mining traditions.

3. Conclusion and future research

The model presented in this document offers mining site managers some guidance on how to begin the process of transforming post-mining sites. Of course, the model outlining possible action scenarios is very general and is intended as a basis for future research. Nevertheless, it can be the basis for determining development strategies for areas facing industrial closures. This is especially applicable to countries of the Global South, hence future research should focus on the experiences of southern countries with such transformations or with plans for such transformations. Developing research on the management of post-industrial landscapes is not only important from the point of view of the economy and its sustainable transformation, but above all from the perspective for society. On a well-organized, sustainable transformation from coal to tourism, local society should benefit the most.

It is well known that the current world is marked by rapid change and uncertainty, and to make it better game changers are needed. Tourism can become such a game-changer in extractive industry areas, becoming a driver of innovation and progress. Thus, the Sustainable Development Goals can actually be achieved.

The authors are currently working on editing a book that will analyse case studies from around the world, as well as the model presented here.

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