

Summary of the doctoral dissertation written under the direction of
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“Succession of economic functions in post-mining areas
on the example of the Silesian Voivodeship”
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In recent decades, we can see the increased development of economic theory especially interested in the evolutionary approach to economic processes. The consequence of this is the emergence of an evolutionary economics allowing the possibility of explaining economic processes by analogy with the process of natural evolution. As part of this analogy, one can point to the possibility of using a special type of process that is succession, which is a targeted sequence of changes taking place in unstable conditions in order to continually strive for balance. Changes in the initial state of the phenomenon cause partial balance effects, in turn becoming the starting point for the next stages of the process, ultimately seeking a new system state that optimally uses the existing conditions. Evolutionary economics treats succession as one of the proposals to organize and justify transformations, postulating the need to adapt to gradual changes and introduce innovative solutions.

The work is an attempt to adapt the concept of succession, recognized in biology, to explain and point to recommendations in economic sciences. This activity requires the use of research experiments and theoretical findings at a high level of generalization. Among the many economic publications it is difficult to find works that use inspiration in the analysis of economic processes as a succession, which is a novelty. The argument confirming the validity of the research subject is a possibility to use the assumptions of succession theory in spatial management, especially for diagnosing changes in land functions. The dynamic nature of ecological processes and economic development encourage to undertake research into the conditions and direction of their course in an ever-changing environment, in conditions of uncertainty and risk, striving for a state or levels of space use balance. The search for inspiration in biological sciences is to be used to indicate the paths of reaching the desired structure of the function of use of a given area, which may be helpful in the work of local government practitioners and liquidators of economic activity involved in the transformation of problem areas management.

An important part of the work is examining the motivation of activities undertaken in post-industrial areas. Its main purpose is to highlight the most beneficial function of mining

area utilization based on the identified factors determining the nature of possible directions of change. The first detailed objective is to indicate the possibility of adapting evolutionary motives for the development of economic processes. This is worth noting because in today's times many economically ineffective decisions are made, as a result of which resources, including land, are wasted. The empirical aims focus on the recognition of a set of different factors, determining the direction of succession of new functions in the post-mining areas of the Silesian Voivodeship and attempts to assess their significance in changes in the structure of use in the years 1990-2018. In this region, there are many areas destroyed by long-term exploitation of hard coal, which necessarily require indication of a sequence of actions aimed at changing the features of their development.

In this dissertation the following main hypothesis has been put forward: with a given set of interacting factors, there is only one optimal function of using the post-mining area that maximizes, in accordance with the concept of succession, the results of the allocation of existing resources. It has been detailed in two assumptions:

- the evolution of economic processes should take into account the new use of the architectural heritage of the area,
- in the Silesian Voivodeship, economic succession in post-mining areas proceeds under the greater influence of social factors than zoological and architectural conditions.

This work is interdisciplinary, marked by a common sense of thought, which is expressed in its title. It consists of five chapters, in a compact form inscribing into contemporary economic thought, allowing mutual influence of economic and natural sciences.

The first chapter of the work describes the possibilities of inspiring economics with the achievements of biological sciences. The key topic is to use the assumptions of evolutionary economics as an approach defining the approach to economic development which is a series of permanent changes. They relate to managing development processes and predicting their effects, in which motivation reflects itself in specific activities and mechanisms related to decision making by business entities. The culmination of reflections on the evolutionary motives of development in economics is to show the elements of the relational space that interconnects the interactions between the economy, society and the natural environment.

The second chapter characterizes the course of the succession process, understood as a targeted sequence of changes, and points out to its mechanisms and models. Attention is paid to the processes of self-organization and system adaptation, which are a response to fluctuating changes that appear as a result of disruptions and disturbances. The learning

abilities of entities that decide about land transformations and their adaptation to unstable conditions are acquired under the influence of constant and dynamic dependencies and mutual interactions of ecological processes and economic development in order to achieve a balanced social, economic and environmental system. This chapter emphasizes the need to conduct long-term research on the development of a new structure of the land use system, striving to regain lost stability in the economic space.

The third chapter is devoted to the characteristics of mining operations, including the specific features of post-mining areas. It draws attention to the genesis of these areas and the effects of coal mining, depending on the mining technology used. In addition, the effects of mining impact on the rock mass and surrounding rocks, and on the surface area as well as water, air, soil and water pollution have been described. Differentiation in the conceptual scope of the area and the mining area was emphasized, being the basis for reference for the determination of the value of post-mining objects. The main result of the considerations contained in this chapter is a list of theoretical directions of succession, including activities aimed at the reclamation, development and adaptation of post-mining areas, developed due to the function performed.

The fourth chapter focuses on the description of types of factors influencing the transformation of post-mining objects and areas, distinguishing them from formal to legal, zoological and architectural as well as social and economic ones. The first are constraints for choosing the direction of reclamation and development, the second are components of the attractiveness of post-mining facilities and areas, while the third affect their competitiveness. This chapter distinguishes the main components of the factors determining the selection of the direction of adaptation of land transformed by mining activities, their measures and the effects of varying intensity of their occurrence. This part of the paper also proposes the main criteria affecting the basic conditions of admissibility and desirable preferences for the use of facilities and post-mining areas. Some actions were proposed and arranged to contribute to the achievement of exemplary development results arising from the course of purposely targeted succession in post-mining areas.

In the fifth chapter, the considerations concern the selection of methods of analysis and modeling of dynamic spatial phenomena. The results of their application are aimed at determining the functions of the areas, based on the recognition of various forms of past development of the post-mining areas of the Silesian cities. Four groups of changes were examined in different periods, from 1990-2018. On the basis of the determined patterns of the consequences of the function, the course of succession was determined on 135 studied areas

permanently excluded from operating activity on the basis of granted concession rights. They have been diagnosed with conversions of changes in coverage forms and use of areas that allow for proper arrangement of the proposed directions of succession. The set and intensity of the influence of conditions influencing the course of the succession process were also identified and assessed, which allowed to determine the direction of selecting the optimal development function of the studied post-mining areas of the Silesian Voivodeship.

The results presented in the work can be used as a collection of inspirations for activities that local governments and other practitioners are forced to undertake to transform and develop post-industrial areas. In the Silesian Voivodeship such activities have been undertaken for over 50 years mainly in centrally located areas. Many facilities located in peripheral areas also require adaptation measures, primarily appreciating their unique features. Post-mining areas can be valuable investment capital, especially in small towns, due to decreasing spatial resources.