CONSOLIDATION OF ECONOMIC AND ECOLOGICAL MONITORING AT THE IRON ORE MINING PROCESSING PLANTS

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Abstract. The author’s vision of the key role of the metallurgical complex in the economic system and significant systemic anthropogenic impact on the environment underlies the mining processing production monitoring and ecologization. The purpose of this paper is to develop the economic-ecological monitoring system as the information basis of analysis and decision-making of mining processing production in the context of environmental activities. The review of scientific sources for defining the essence of the ecological monitoring of iron ore mining production was considered. The structure of informational basis for the economic analysis of mining production economic efficiency of iron ore mining plants was given. The means for improving the information basis for analysis and evaluation of mining processing and production in the context economic-ecological monitoring is suggested. Keywords: efficiency of environmental activities, information basis, mining production, management, economic analysis.

Keywords: economic monitoring, ecological monitoring, iron ore mining, metallurgy, mining.

Introduction

The impact of human activities on nature is accompanied by the growth of industrial activity rates and introduced significant changes in the dynamics of processes occurring in nature. This interaction with the environment in production today is defined as one of the most pressing global challenges. The rapid development of science and technology has recently caused a significant increase in iron ore production. As a result, it has negative impacts on the environment. Thus, a contradiction between the needs for the production of iron ore and quality environment exists.

On the other hand nature protected activity is limited by resource support which determines the resizing costs of environmental measures, its competitiveness and its production profitability. Thus, the management decisions of environmental activities should be based not only on the effectiveness of environmental protection but also on economic activity, defining relations, such as economic activity (consumption, results) and environmental activities (costs, outcomes). One of the tools that can achieve a balance between the costs of environmental protection and profitability is the system that can be integrated into economic-ecological monitoring of influences of iron ore production activities on the environment. Such monitoring allows to identify environmental risks in time and take measures for their prevention and avoidance.

The complexity of this process, the lack of specific scientific and methodological support to conduct economic and ecological monitoring determine the relevance of the topic and importance for the development of the theory and practice of ecological and economic governance.

Method


However, the result of these studies did not form the effective methods of environmental impact monitoring of industrial activity and its influence on the environment. Some attempts at environmental monitoring system development were made in the works of Lizohub R.P. and Kozhemyakin T.V., which we will consider in detail in this article. However, in our opinion they are fragmented, incomplete, and do not give a clear idea about the methods of environmental monitoring.

The aim of our research is the analysis of economic and environmental monitoring as a way to study the interaction of iron ore mining and processing with the environment.
The issues of complex economic and ecological monitoring of iron ore production activities and their influence on the environment, its methodological support, implementation guidance and conduct have not been considered by scientists.

Environmental Law outlines the nature of environmental monitoring as a tool for environmental regulation that allows creation of an information base necessary to perform the tasks of environmental management and control. Therefore, the study of structure formation and the economic-ecological monitoring should start from the second component.

Ecological monitoring entails regular measurements, the evaluation of observations of air pollution on the borders of sanitary protection zones and industrial sites of enterprises. These are made by labs of business entities, and provide this information to the Designated Authority, and in some cases to the public.

Ecological monitoring should pursue the objectives of observation, assessment and prediction of changes in selected indicators of environmental performance of businesses. Thus, the system will collect information needed for setting and reviewing environmental objectives and tasks of enterprises, development and implementation of environmental programs (Venitsianov, 2003).

The approaches for improving the environmental performance of organizations are systematized at the international standards ISO 14000 "Environmental Management System". The three groups of indicators:

- the indicators of organization effectiveness;
- the indicators of management effectiveness;
- the indicators of conditions of the environment.

The system of environmental-economic monitoring for character of the interaction of industrial enterprise environment was presented in the works Kozhemyakina T.V., in particular the system of indicators for monitoring the interaction of industrial enterprise and the environment. Based on these developments we will form our own system of economic and environmental monitoring of industrial interactions with the environment. This should include the following two items: Indicators of industrial acquisitions and Indicators of performance.

We propose industrial takeover of such indicators as energy spending, taxation, the intensity of the soil, and aqua capacity of products, resource-intensiveness of the products, and the fuel capacity of the products. The performance indicators will include total volume of waste in natural and conditional natural units of measurement; the proportion of solid and gaseous impurities in the total amount of emissions of the company; the factor of trapping pollutants for solid and gaseous impurities separately; the number of conventional emissions per unit products and per one thousand UAH of manufactured products; emissions of pollutants per hour of all equipment and individual groups.

It should be noted that the two groups share a common indicator subsystem of feedback to adjust the monitoring system given the results of the latest research.

According to Kozhemyakina T.V. the usage of monitoring, consisting of two groups of indicators, allows the impact of the firm's production and the degree of its environmental impact. This will allow us to exercise more informed planning activities in terms of impact on the environment at the enterprise-level.

Company management, using economic and ecological monitoring, will perform a closer control over compliance with enterprises' requirements for environmental protection.

The system of economic and ecological monitoring for features of the interaction of industrial enterprise and environment should also include elements of feedback, because it will provide a mechanism to monitor, to control tasks during the output and to adjust the system after its implementation.

The basis for the environmental monitoring of iron ore production activities influence on the environment is to monitor the use of mineral resources, the state of the geological environment, mines, land, and water objects performed by users of mineral resources (Lizohub, 2010).

Environmental monitoring is carried out to reduce the harmful effects of mining operations on the environment, ensuring its safe keeping and the protection of natural resources. This is accomplished through information management in a rational and integrated use of mineral resources, environmental protection, and safe mining operations. Ecological and economic monitoring will include the impact made by assessment on the environment, but also a correlation between the environmental benefits and financial results.

The main tasks of environmental monitoring ore industrial plants are:

- environmental assessment and use of mineral resources in carrying out iron ore production;
- prediction of environmental conditions, including changes caused by technological accidents and disasters;
- the development of recommendations for prevention of industrial accidents and disasters, the prevention or reduction of harmful effects of mining operations on the environment, rational use of mineral resources and the protection of natural resources;
- the implementation of tracking accuracy for the movement of mineral resources and their losses during extraction and primary processing.

The challenge of environmental monitoring is achieved through the organization of remote and ground-based observations, providing quality and reliable information in the required amounts of information analysis and decision on the analysis of relevant decisions.

We can include such objects of environmental monitoring for iron ore production activities effects on the environment:
- industrial objects (mining, overburden dumps, tailings, sumps and storage of drainage water and other industrial, transport communications, etc.) formed during production, transportation and processing of mineral resources, the use of mineral resources for purposes not related to mining and reclamation;
- natural objects (geological environment, hydrosphere, atmosphere, biosphere) in the area of the harmful effects of iron ore production;
- deposits of underground water in the area of the harmful effects of economic activity;
- sources of pollution and disturbance of the environment using a subsurface;
- land surface of the mineral deposits, in part for its development;
- mineral resources, equipment which is put on record;
- environmental structures designed to prevent the harmful effects of mining operations on the environment.

Conducting a purely environmental monitoring cannot provide comparable observations and compatibilities with other systems monitoring. Therefore, we offer enterprises to conduct complex economic and ecological monitoring, the essence of which is parallel with the systematic observation of simultaneously manufacturing, financial and environmental activities of the company with regard to the analysis of interference between the performance of each of the segments and adjustment of the system because of the results.

Discussion. The development of complex economic and ecological monitoring of the structure of iron ore production influences the environment, which includes a list of indicators and the monitoring of facilities, was the result of this study. This developed structure allows of the implementation of an efficient and comprehensive monitoring system. As a result, it is possible to correct relevant environmental and economic activities reasonably and scientifically. Within this article the practical recommendations for economic and environmental monitoring were provided. The introduction and implementation of an integrated economic-ecological monitoring of iron ore production activities influence on the environment will allow the provision of creation of environmentally oriented management and control of enterprise.

References