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MODELS OF ECOLOGICAL AND ECONOMIC FUNCTIONS AS TOOLS OF DECISION SUPPORTING IN MARKET ECONOMY

Summary

There have been analyzed the possibilities of using different classes of models to support decision-making in terms of certainty in the management of ecological and economic systems, including optimization and functional ecological and economic models, which are closely related and in some sense are equivalent models. Such models include those describing ecological and economic interaction by means of the problems of mathematical and linear programming. The specificity of these models is that their optimal values are functions of model parameters that reflect both economic and environmental characteristics of the studied processes, so this type of model is an implicit reflection of the set of allowable values of their parameters in the set of optimal values of objective functions. These reflections are numerical functions of the dependence of optimal values on model parameters, which in the case of models of linear optimization can be constructed in an explicit analytical form, and their properties are close to the so-called neoclassical functions used in the theory of consumption, production and so on. The paper proposes optimization of ecological and economic models for maximization of output and profit from it. The target functions of these models are the functions of output and profit respectively, and the admissible set of used production resources are formed by the restrictions on economic and environmental resources of the manufacturer. The vectors of the maximum possible volumes of these resources are used to build, on the basis of these models, ecological and economic functions of optimal output and profit, that are the functional models of decision-making in ecological economy. These functions, like other models in this class, are an effective tool to support decision-making in practice as they are a more convenient tool for those responsible for making decisions and implementing them. The algorithm for constructing such functions and their peculiarity for practical application is substantiated, which lies in the fact that they model strict control over the manufacturer's compliance with environmental standards, motivates the manufacturer to adhere to environmental production standards and relevant environmental legislation. As decision-making models, the proposed models of ecological and economic functions are of great practical importance for the development of environmental standards and technological policy of the country or its regions.

Keywords: model, decision making, linear optimization model, ecological and economic functions, ecological restrictions.

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