

UDC. 551.482+581.5:3(002.637)

ECOLOGICAL-ECONOMIC BALANCE AS A BASIS OF SUSTAINABLE DEVELOPMENT OF “WATERSHED – LAKE” SYSTEM

Hryshchankava N. D.

Laboratory of lakes research, Belarus State University, Minsk, Republic of Belarus

E-mail: nataba1@yandex.ru

This paper advances the argument that ecological-economic balance is a basis of integral and sustainable development of “watershed – lake” system. The article discusses the criteria of balance estimation. Recent concepts and approaches of research in subject are outlined.

Key words: ecological-economic balance, sustainable development, “watershed – lake” system.

It is generally accepted that lakes play the important role in a life of a society. Their separate components are the valuable natural resources used in the industry and an agriculture, transport and a recreation. Lakes also bear such vital functions for the person as maintenance with the foodstuffs, potable water and energy, protection against flooding. Being doubtless value, they require protection, rational use and the correct management, providing their sustainable development.

For realization of substantive provisions of the concept of sustainable development in Belarus in conditions of a developing economy essentially new approaches are required. One of such approaches is the concept of ecological-economic balance of the territory, offered by Kochurov B. I. [1]. This concept assumes creation of new spatial forms of nature-use – ecological-economic structures of sustainable development where technogenic formations are built in natural systems and form the steady and balanced symbiosis – geocosociosystem.

Now the methodology of studying and achievement of ecological-economic balance applicable to "watershed – lake" system is not developed. For this reason system treatment of criteria and parameters of balanced development, methods of studying of ecological-economic balance and planning of sustainable development of "watershed-lake" system is necessary. The choice of the criteria used for an estimation of balance is represented to be important. With that end in view degree of degradation of separate components of system is defined, and criteria are excess of norms and requirements. In the absence of the necessary information on natural components it is possible to take advantage of the data characterising character and depth of consequences of change of the nature: reaction of health of the population, an economic damage, etc.

There are some other approaches of research in subject. Watershed approach is among them. A watershed approach is a flexible framework for managing water resource quality and quantity within specified drainage areas, or watersheds [2]. This approach includes stakeholder involvement and management actions supported by sound science and appropriate technology. Using a watershed approach to restore impaired waterbodies is beneficial because it addresses the problems in a holistic manner and the stakeholders in the watershed are actively involved in selecting the management strategies that will be implemented to solve the problems.

Over the past 20 years, substantial reductions have been achieved in the discharge of pollutants into the air, lakes, rivers, wetlands and ground water. These successes have been achieved primarily by controlling point sources of pollution and, in the case of ground water, preventing contamination from hazardous waste sites. While such sources continue to be an environmental threat, it is clear that potential causes of impairment of a waterbody are as varied as human activity itself. For example, besides discharges from industrial or municipal sources, our waters may be threatened by urban, agricultural, or other forms of polluted runoff; landscape modification; depleted or contaminated ground water; changes in flow; overharvesting of fish and other organisms; introduction of exotic species; bioaccumulation of toxics; and deposition or recycling of pollutants between air, land and water. The laws that address these problems have tended to focus on particular sources, pollutants, or water uses and have not resulted in an integrated environmental management approach. Consequently, significant gaps exist in our efforts to protect watersheds from the cumulative impacts of a multitude of activities. Existing air, waste and pesticide management, water pollution prevention and control programs and other related natural resource programs are, however, excellent foundations on which to build a watershed approach.

As studies have shown, growth and development can have profound effects on our water resources. Storm sewer overflows and polluted runoff from non-point sources are a major reason that some water bodies do not meet clean water standards. One factor related to persistent water pollution problems is our development patterns, particularly patterns of highly dispersed development that have been common since the end of World War II. The more woodland, meadowland, and wetland areas disappear under impermeable cover, and the more miles and vehicles we drive and park on impermeable roads and highway surfaces, the more difficult protecting the quality and quantity of our water supplies becomes. In response to these current trends smart growth approaches, guided by a set of principles that help communities grow in ways that expand economic opportunity, protect public health and the environment, and enhance places that people care about, can help these communities accommodate development while protecting their traditional sense of place [3]. These principles provide a framework for making growth and development decisions that yield better economic, environmental, community, and public health results.

It is obvious that the human activities at the watershed of a lake are of utmost importance for the health of the lake and that a buffer zone between land and the lake reduce the vulnerability of the lake to the shore activities. The protection of the lake by a watershed can be compared with the membranes for the cells and the skin for human being. The overall conclusion is: lakes are open system and that are therefore dependent on all the activities in the entire drainage area. Lakes are ideal to illustrate how various environmental problems are linked and interacting also with social and economic problems – a holistic approach is urgently needed [4]. It is believed that ecological-economic balance as an example of such approach can be a basis of sustainable development of “watershed – lake” system.

List of literature

1. Кочуров Б. И. Геоэкология: экодиагностика и эколого-хозяйственный баланс территории / Б. И. Кочуров. – Смоленск : СГУ. – 1999. – 154 с.
2. Watersheds / US EPA. – <http://www.epa.gov/owow/watershed>. – 27.08.2010.
3. Smart Growth Online / US EPA. – <http://www.smartgrowth.org>. – 27.08.2010.
4. Jorgensen S. E. Papers from Bolsena Conference (2002). Residence time in lakes: Science, Management, Education. J. Limnol., 62 (Suppl.1), 2003, p.102 – 105.