

THE FORMATION OF IMPACT TERRITORIES THE BASINS OF TRANSBOUNDARY RIVER SELENGA

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ABSTRACT

We consider the impact territories of a regional system of nature management, which are centers of environmental stress in the Selenga River basin. Their studies involve assessing the pollution of natural environments and aims to develop measures to minimize their impact on the environment that will promote a regional system of ecological optimization of nature (RSPP), in general.

KEY WORDS: Formation, impact territory, Selenge river basin

INTRODUCTION

We consider the impact territories of a regional system of nature management, which are centers of environmental stress in the Selenga River basin. Their studies involve assessing the pollution of natural environments and aims to develop measures to minimize their impact on the environment that will promote a regional system of ecological optimization of nature (RSPP), in general.

METHODS AND MATERIAL

Analysis of the national experience of nature management study (NM) shows that the study of the functioning of the subsystems of the RSNM [3] indicating the nature management conflict, as well as complex of ecological problems will provide in the studied territory to distinguish impact territories (areas), which are characterized by a number of natural and ecological and socio-economic indicators for ecological optimization of the RSNM.

By Evseev A.V. and Krasovskaya T.M. [2] under the *impact territories (areas)* refers to areas within the

territorial-industrial complex, which as a result of negative anthropogenous impact have occurred negative changes in the environment that led to the emergence and development of critical ecological situations. For the first time there were allocated to the North of Russia. Impacted areas in the RSNM are sources of ecological stress, and their emergence and expansion is one of the most important contemporary problems of regional nature management (figure 1).

RESULTS

If, before the beginning of the XX century, nature management of the BNT, representing mainly the combination of the background types of nature management: agricultural, forestry and utilitarian

(gathering, hunting), there has been extensive in nature and did not cause significant adverse natural changes, but in the period of industrialization of the country, from the 30th years of the XX century, here,

as well as throughout Russia, began to form an industrial (industrial) type of nature management associated with mineral extraction and development of industrial centers. Industrial type of NM "quickly entered into conflict with the adaptive potential of the natural environment development," causing adverse alteration and destruction of components of natural landscapes, and thus began the formation of impact focus [2]. Characteristically, the occurrence of impact area is also associated with the development of other types of nature management, such as agriculture. With the development of productive forces, from the 50th of the last century intensive study of virgin and fallow lands has caused the most significant transformation of natural landscapes, including those associated with the emergence of huge amounts of

fluttering (mobile) sands of barkhan form, which is a testament of reducing natural resource potential of the territory. These territories are characterized by the development of a strong (maximum) degree of erosion on the most fertile areas of the region.

On the transformation of the landscape shows the results of geobotanical survey: plant communities in key plots are characterized by sparse and heterogeneity of vegetation, reduction of a projective surface and a pronounced digression appearance. These centers of desertification, in our opinion, are a typical example of the development of impact territories caused by the development of the agrarian nature management. They are characterized primarily for the Selenga River valley, where historically are the main agricultural areas (figure 2, 3).

DISCUSSION

A current analysis of the ecological situation in the Baikal region shows that the continuing degradation of the natural component due to increasing anthropogenic pressures and ineffective operation of nature management.

In general, in the RSNM the development of certain types of NM: agricultural, especially subsoil management and others led to the formation of large areas of space, which is not suitable for further use or taken out of economic circulation, but have a negative impact on the environment, this impact territories. They are characterized by varying degrees of transformation of natural complexes, indicating the presence of critical ecological situations.

These include problem areals in the studied territory:
- Khilok-Chikoyskaya sink, Tugnui-Sukharinskaya sink, lower reaches of the Dzhida River, concerning to the basin of the Selenga River, which are centers of desertification;

- large areas of lands occupied by technogenic sand tailings, mine and quarry waters of mines of the Dzhida Mining - Zakamensk impacted area;

- estuary of the Selenga River - Nizhneselenginskaya impact territory associated with the development of Nizhneselenginsk industrial center. Ecological condition of the given territory is defined by emissions from various types of industrial facilities. The main air pollutants are the Selenga Pulp and Paper Mill, Timlyuisky cement factory, automobile and railway transport. There is danger of contamination of soil for a number of chemical elements throughout: the concentration of lead, zinc, copper, chromium above the MPC in 2-5 times, higher than background for mercury in 2 orders and other areas characterized by varying degrees of transformation of natural complexes, indicating the presence of acute ecological situations [1].

CONCLUSIONS

Designation (selection) of impact territories are dictated by the desire to *arrange* the RSNM research from the view of ecological tension centers arising from the different types of nature management. Because a perspective development, improvement of the RSNM is inevitably linked to its ecological optimization, it is necessary to know the presence of ecological tension centers, which are designated by us as impact territory, in order to minimize negative impacts on the environment.

Impacted territories are characterized by the following main features: the beginning of the formation, the causes, the criteria for designation

(selection), including the natural-ecological and socio-economic indicators.

Currently, the clearest example of impact area, existing in the valley of the transboundary Selenga River is the territory of the city of Zakamensk. This is a major center of ecological tension, which is characterized as a zone of ecological disaster (in the part of storage stale tailings of ore material) and as a zone of ecological emergency situation (the whole of the territory surrounding the city and its surroundings up to 2/3 area). The study of this impact territory is very relevant in the context of ecological issues and operation of NMPP in the BNT. Ecological and geographical approach to the designation of the given

impact area, located in the Selenga River basin, and reached its greatest development, based on available data on the transformation of the environment, using the stock, statistics, literature and empirical data.

The beginning of the formation of the given impact area, which we call "Zakamenskaya" associated with industrial type of NM (Zakamensk industrial center), namely the activities of the Dzhida tungsten-molybdenum complex (DTMC) that existed during the period from 1934 to 2001 in the Selenga River basin and which was the main enterprise of strategic purpose. Resource base of the DTMC is the largest proven reserves, but poor in content ores Inkurskoe tungsten deposit.

DTMC was located in the lower reaches of the Modonkul River. Modonkul - right tributary of the Dzhida River. The main sources of environmental pollution were concentrating complex DTMC, which included molybdenum factory "Pervomayskaya", tungsten Kholtosonskaya factory, tailings "Lezhalye peski" and "Gidrootval," pulp-lines, ditch runoff accidental discharges, etc., adjacent to the city of Zakamensk. Over a long period of Dzhida tungsten-molybdenum complex (Dzhida Mining) has been accumulated over 44, 5 million tons of waste in the area of 867 hectares, including 487 hectares in Zakamensk. They are concentrated in the vaults of stale food and sulfide tailings dump molybdenum and tungsten sulfide ores, which have not been preserved.

Causes of emergency of the Zakamensk impact territory are strong chemical pollution of the components of environment by technogenic emissions (air, soils, surface water and groundwater, vegetation) as well as a mechanical violation of the soil cover, which leads to its degradation, and soil. Thus, in the ores deposits there are elements related to a hazard 1 class: cadmium, lead, zinc, fluorine, fewer elements P hazard class - molybdenum, copper and 3 class - beryllium, tungsten, bismuth, rubidium, and cesium. Accumulated over many decades to drain waste processing plants in the drainage system and recorded for tens of kilometers downstream of the Dzhida River. Identified in sediments and revering vegetation of Dzhida technogenic geochemical stream can be traced to individual elements up to 200 km. For the most toxic elements of the length of the flow is from 2 to 20 km [4]. The intense air pollution was occurred during the extraction, transportation and processing of ore at preparation plants. The main sources of water pollution are the career field and possible breakthroughs of tailings. At low water contaminated water, sediments and revering vegetation. In high water, the length of the stream, the water level increases, in the case of simultaneous breakthrough tailing toxic elements submitted to

hundreds of kilometers in the dissolved and suspended condition. During this period there is a significant area of contamination of soil and vegetation of floodplain meadows and the formation of buried layers of fluvial deposits - a secondary source in the future [4]. The main scattering processes of technological materials are now the wind spacing, plane wash by time streams, anthropogenic scattering (dumping of roads, building dams, etc.).

It is obvious that the whole Zakamensk impact territory is characterized by the strongest transformation of the natural geochemical background, pollution, degradation of vegetation, soils, introduction of pollutants into the food chain, the prevalence of the population.

The criteria for designation (selection) of impact territory include a system of natural-ecological and socio-economic indicators. Distinguished two groups of criteria: chemical pollution of environmental components and mechanical breaking them (some of them). The number of direct indicators that directly reflect the ecological condition of impact territory, as well as indirect, corresponds to them. They are associated with a change of environment and degradation of natural ecosystems. Often with the destruction of natural ecosystems, due to a violation of the balance of nature, the degradation of flora and fauna. This is a disappearance of some species of plants and animals, disturbance and loss of the gene pool.

The group of socio-economic indicators reflects the changing environment and human health that is related to the social problems of population, caused by environmental pollution (health deterioration and the occurrence of diseases and deaths from them, and others).

Ecological and geographical approach to the designation of Zakamensk impact territory located in the Selenga River basin, and reached its greatest development, based on available data on the transformation of the environment, using the stock, statistics, literature and empirical data.

Thus, the analysis and study of existing national experience shows that a total of BNT selection (designation) of impact territories - geographical research objects - rightly, as it allows to *organize* large amounts of information: the age and the reasons for its occurrence, the degree of pollution and disturbance (transformation) of the given territory as a result of irrational economic activities; display by cartography. In this regard, needs an evaluation of the degree of contamination of natural environments at a rate of concentration of pollutants on various natural components (media) (coefficient of local accumulation of pollutant) on existing

methodological approaches, and its spatial map clearly showing the pollution of (transformation) of natural environments of the studied territory.

Ultimately, the knowledge of the existence and development of impact territories as centers of

environmental tension, development of measures to minimize their impact on the environment will contribute to ecological optimization of the RSNM.

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