УДК 811:111:502.17:005.52

Starinovich A.,Ivaskevich K., Riabychina A.,Turcheniuk.M

Economic Assessment of Pollution Damage

Belarusian National Technical University
Minsk, Belarus

The term pollution can be explained as the flow of harmful substances or other objects into the environment exceeding the natural background. The result of the pollution is called damage. Damage from the pollution can be considered in several aspects: economic, social, environmental, moral.

In the flow of history, the assessment of economic damage has been widely studied. Despite the constant improvement in the methodical basis, the current methods have many shortcomings. It is connected with the fact that the concept of economic damage is a single measure of assessing the man-made impact on different areas of society but its calculation requires many raw data, that are hard to be recorded or simply defy formalization. Though part of the social, moral, aesthetic and other damages can theoretically be expressed by valuations this is still beyond the limits of the capabilities of the modern economic techniques. So as a result the estimated economic damage is always understated in relation to the real one.

In foreign economic literature being studied, the problem of assessing damage is connected with the concept of ‘external effects’. The impact of economic activity on the environment intensified the research in assessing these effects only in the late 1970s. Economists believed that the amount of damage was misused in economic calculations, considering it wrong to summarize the various amounts of damage to various recipients

or to calculate some local damages, for example the "cost" of human life calculation.

To solve existing problems an extensive list of regulatory documents approved at regional levels was established. It governs the assessment and reparation of the damage to the natural environment, public health, natural resources, and various entities in legal relations and various economic activities. There are currently about 70 regulations that establish and explain the variety of aspects in this area.

Despite a wide list of regulatory and methodical documents and the long practice of calculating the size of claims due to violation of environmental legislation, the concept of actual "environmental damage" and damage done to the public health is almost nowhere clearly disclosed.

It is evident that economic assessment of pollution damage is necessary for the formation of a mechanism for the cost of environmental management.

In the data being studied there are two methods of economic assessment of pollution damage: direct account method (recipient method), indirect assessment (enlarged method).

The recipient method of economic assessment is used to summarize the losses suffered by each recipient (pollution victims).

1. Losses in kind for each recipient are determined.

2. Losses are translated into value.

3. All losses are added up and the result is a sum of damage as well.

Unfortunately, the use of the recipient method is associated with many difficulties.

The first step is to collect and process a large amount of information that is heterogeneous, with a variety of recipients and losses.

The second phase requires an adequate monetary assessment of the losses. It is difficult to do because of the lack of uniform standards and the uniqueness of each situation. There is a high probability of receiving an under-estimated or inflated estimate of losses under the influence of subjective factors.

Thanks to the use of control areas, analytical dependency method and combined method the task of determining the size of losses in kind is helps simplified. The method of control areas is to compare the ecological, economic and social indicators of a contaminated area with the indicators of a conventionally clean (control) area. Ideally, the contaminated area itself is considered as a conditionally clean area before contamination. Losses are the difference in the performance of these areas. The analytical dependency method is the statistical processing of evidence to assess the impact of the pollution factor on the recipient's condition. The combined method is a combination of the control area method and the analytical dependency method.

An easier-to-use method of economic damage assessment and pollution is a larger method, or a method of indirect damage assessment. Using this method, pollution is differentiated by pollutants (e.g. air pollution, water, land). For each object, a larger valuation of damage is used, as measured in rubles per conditional ton of pollutant (for reservoirs and atmospheres) or in the cost of replacing a unit of the damaged object with another (for land).

According to the research conducted the economic assessment of the damage from pollution of the natural environment consists of the following costs:

– the additional costs due to changes in the natural environment;

– the cost of returning the environment to its previous state;

– the cost of reducing pollution is taken into account when assessing damage to the natural environment;

– the cost of environmental restoration;

– additional costs due to changes in environmental quality.

It is also evident that to assess the economic damage caused by pollution are to pay attention to such types of pollution as air pollution, pollution of reservoirs, pollution of land, pollution of nature by physical factors and the damage to bio resources. According to these knowledge scientists have developed several methods to determine all types of damage from pollution of the natural environment.

Summing up the analysis of existing methods of assessment, it can be concluded that modern economic techniques do not allow estimating accurately the extent of economic damage. «Absolutely objective» assessments are not possible in principle because of the complexity of the very notion of pollution damage. Though there have been already some studies in terms of risk theory, social choice, social well-being, simple and extended reproduction, market valuation methods, cost method, alternative cost, cost of risk, cost of livelihood and many others there is still a fundamental need to develop new approaches, theories and methods of informal analysis.