On the concept and types of harm to the environment

E S Scheblyakov¹, E L Farafontova², S M Kurbatova¹, D V Rakhinsky³ and A A Kuzhleva¹

¹Krasnoyarsk State Agrarian University, 90, Mira Ave., Krasnoyarsk, 660049, Russia
²Reshetnev Siberian State University of Science and Technology, 31, Krasnoyarsky Rabochy Ave., Krasnoyarsk, 660037, Russia
³Krasnoyarsk State Medical University named after Professor V.F. Voino-Yasenetsky, 1, Partizana Zhelesnyaka str., Krasnoyarsk, 660022, Russia

E-mail: doess23@mail.ru.

Abstract. At present, the problem of compensation for damage caused to the environment by the negative impact of humans and economic entities is one of the most important for all countries of the world, including the Russian Federation. The result of human impact on the environment is climate change, as well as the condition of individual objects of the environment that are essential for human life. Depletion and pollution of the environment are enormous. Forms of human use of environmental objects are becoming more numerous and diverse. No less diverse are the sources of damage. This requires the development of effective legal mechanisms for compensation for damage in order to maintain the familiar state of the environment.

The current legal norms on environmental protection provide for the consequences of an environmental violation, while the legislation uses two basic concepts of “substantial or significant harm”, as well as “major damage” [1].

These concepts are expressed in the following features:

- Firstly, in the duality of the provisions of substantial harm as a consequence of an environmental crime. In some cases, significant harm is covered by the concept of “grave” consequences, in others it is characterized as an independent sign;
- Secondly, the occurrence of substantial harm in the above cases is not mandatory, that is, harm acts as an alternative sign of an environmental crime;
- Thirdly, it is characterized as an economic category;
- Fourthly, it is implemented using special methods for assessing the damage caused, established depending on the natural object and its features;
- Fifth, it is conditional, as it is determined on the basis of various factors of quality and quantity of a natural object;
- Sixth, depending on the specifics of a natural object, it can be expressed in the qualitative characteristics of this object [2].

In certain elements of environmental offenses, the concept of material harm is optional or clarifying.
For example, in the field of protection of water bodies and resources, significant harm is expressed in the characteristic indicators of the composition and properties of water, the level of water temperature, changing conditions for the normal functioning of aquatic organisms; these facts impair the ability of the reservoir to self-clean. There is a threat of causing substantial harm, as it carries the threat of harm to human health, agricultural production and fish stocks. Moreover, the possibility of harming human health means the danger of poisoning an undetermined number of people, etc. The interpretation of “substantial and significant harm” used in criminal law can be used to determine the degree of damage to an environmental object to determine environmental damage [3].

By the destruction of natural objects, the law means bringing it into complete unsuitability, that is, in a state where it ceases to exist as such, loses value and it is impossible to restore it. Determining the size of the harm caused depends on the following facts (conditions):

- the cost of destroyed or damaged elements of a natural object;
- economic, cultural, scientific, biological significance of the natural object as a whole;
- values of crops, breeds;
- the size of the damaged land;
- lost profits;
- the amount of damage, for example, the mass death of low-value fish species as a result of contamination of a reservoir, etc.
- carrying value of rehabilitation;
- qualitative characteristics of a natural object;
- loss of market value;
- expenditures for restoration and cleaning;
- the costs of crime prevention, for example, fire prevention [4].

Thus, it can be concluded that in legal norms there is no significant difference between the concepts of “substantial” and “significant” harm, by which legislation implies the inability of a natural object or ecosystem as a whole to self-regenerate; when establishing and assessing damage on a large scale, the value of the natural object is fundamental.

In the norms of civil legislation, the concept of major damage is not clearly defined and distinguished, which is essential for law enforcement practice. Based on the foregoing, it can be concluded that the main distinguishing feature of major damage, as an independent consequence and sign of an environmental offense, is its extent [5].

The courts, when considering cases, depending on the specifics of the damage to the natural object and the specific circumstances of the case, decide the degree of damage, the outcome of its nature.

Payment for environmental pollution does not exempt nature users from the implementation of measures aimed at protecting nature, as well as from compensation for harm to the environment, property and health of citizens caused by pollution.

Damage caused by environmental pollution, as a consequence of a committed offense, and compensated in accordance with the requirements of civil law, must be delimited from the mechanism of payments for emissions, discharges of pollutants, waste disposal within acceptable standards and limits and for excess pollution.

The resulting damage to the environment is a consequence of human production and economic activity [6]. Thus, harm to the natural environment means the deterioration of the environment caused by a violation of legal norms that establish environmental requirements and involve any deterioration of material and intangible benefits protected by law, which include: human life and health, property of individuals and legal entities.

Damage caused is expressed in two main forms: environmental and economic.
Environmental damage is usually defined as the harm caused to the environment, expressed in special natural units of measurement, such as the amount of pollutants that enter the environment; the amount of irrevocably used natural resources, etc.

Economic damage, as a rule, is characterized by several methodological approaches:

1. A probabilistic approach
In the study of the environment, an important place is the collection of information on the current state of the environment. From this point of view, five characteristic situations are distinguished, depending on the degree of awareness of the subject conducting the study about the actual state of the environmental situation. Such informational situations include deterministic, moderately deterministic, deterministic and stochastic, moderately stochastic and stochastic.

   - Deterministic information is a situation in which the subject has complete information about the state of the environment. At the same time, the management entity has the ability to accurately establish the circumstances of the development of the environmental situation and effectively implement the necessary measures to prevent harm;
   - a moderately deterministic situation arises in circumstances where the control entity does not have information about the individual elements of the state of the environment necessary for the study;
   - deterministic and stochastic is a situation in which the subject of control has half the information necessary for the study;
   - moderately stochastic situation is a situation characterized by the fact that the control subject has a small part of the necessary information for the study. As a rule, in such a situation, the amount of information does not exceed fifty percent of information about the state of the environment;
   - stochastic information situation is a situation in which the subject of research does not have the necessary information about the state of the environment and the prospects for its development.

Thus, the probabilistic approach is expressed in the fact that the extent of environmental damage is established on the basis of data that do not provide an opportunity to accurately determine the size of the damage caused and the reasons for its occurrence due to the incompleteness of the information necessary to give accurate conclusions.

2. A medium-by-medium approach
With this approach, the assessment of the damage caused to the environment is carried out according to the individual elements of the environment, while the norms that determine the methodology for calculating the damage are provided for by independent normative and methodological acts.

3. A resource approach
This approach is expressed in the fact that the assessment of the damage caused to the environment is carried out according to the elements of the environment used in human production and economic activities, taking into account the amount of human exposure from such activities.

4. An integrated approach.
This approach involves the assessment of the damage caused to the environment within a certain pollution zone by adding up the size of the damage caused by individual elements of the environment, i.e. is complex [7].

Based on the analysis of these approaches, it can be determined that the assessment of damage to the environment is carried out using the following methods:

   - a method of expert assessment, applied in case of insufficiency of legal regulation and ensuring a procedure for assessing damage to the environment;
   - a method of direct calculation, the essence of which is that the amount of damage is established for a particular studied object of the natural environment, taking into account the various
components of damage expressed in value form. A subtype of this method is the damage assessment method of control areas:

- a method of indirect assessment involves the use of mathematical dependencies in determining the dependence of the amount of pollution and the amount of damage to the environment. The following varieties of this method are distinguished: the method of analytical dependencies and the normative method;
- a market valuation method involves the use of two methods: the income method and the method of comparing sales;
- a method of energy assessment is to assess the damage to the biotic components of the environment, expressed in energy value.

Thus, these methods can be used to assess the damage caused to the environment.

To ensure legal regulation of relations arising between citizens and the state on the issue of compensation for damage caused to the environment, the creation of a well-developed legal framework and mechanisms for compensation for damage is required. It is necessary to establish special rules under which the responsibility of the state for damage to the environment will be clearly defined [8].

For the above rules to work effectively, a clear regulation of the limits of responsibility of the state, its responsibilities and a specific mechanism for determining the extent of damage to the environment is required, since the state acts as a regulator of these relations.

Current legislation requires the determination of the conditions and procedure for civil liability in case of damage to the environment. These conditions should provide for the possibility of limiting the civil liability of an economic entity, as well as the possibility of bringing the state to subsidiary liability. At the same time, these conditions imply the use of only certain types of environmentally hazardous activities such as: the operation of hydraulic structures, nuclear facilities, the transportation of oil and other hazardous substances.

Inadequate legal regulation and the absence of conditions for the differentiation of damage to be compensated in the manner prescribed by law (for example, administrative and civil law), entails inadequate calculation of payments used by the parties to assess the damage to be compensated in civil liability.

Thus, summing up, following conclusions can be drawn:

The system of compensation for damage to the natural environment, which consists in the fact that civil liability and administrative responsibility as a form of compensation for harm in the form of payments for environmental pollution, does not contain clear criteria for distinguishing legal grounds and their application, and therefore is not sufficiently effective.

It is also necessary to provide a clear mechanism for compensation for damage to the environment that arose as a result of the operation of a hydraulic structure, which is a prerequisite for the effective functioning of the mechanism for compensation for damage.

Environmental protection at the present time is one of the most important problems in Russia and around the world. The development of scientific and technological progress and an increase in the number of production and business entities increased the burden on the environment. This leads to the depletion of natural resources, pollution of the environment. The state of human health is deteriorating; the economic and political struggle for commodity markets and living space is escalating.

The problem of environmental pollution is the most important problem of the Russian Federation and the entire world community as a whole - environmental pollution is a factor in reducing the average human life expectancy.

References
[1] Brinchuk M M 1998 Environmental Law: Textbook (Moscow: Yurist)
[2] Vasilyeva M I 1990 The Right of Citizens of the USSR to a Healthy Environment
[3] Erofeev E V 2011 Environmental Law (Moscow: FORUM)
[4] Misnik G A 2008 Principles of Civil Liability for Environmental Damage (Moscow)
[5] Misnik G A 2011 *Legal Forms of Compensation for Environmental Damage* (Москва)
[6] Misnik G A 2001 *Environmental Law* (Rostov-on-Don: Phenix)
[7] Rokhlin V I and Serdyuk V M 1998 *Environmental Offenses* (St.Petersburg: Law Institute)
[8] Skamai L G and Mazurina T Yu 2007 *Insurance Business* (Moscow: Infra-M)