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Comparative Analysis of Domestic Approaches to Compensation for Damage Caused to Water Bioresources*



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Abstract. Issues related to renewable natural resources and compensation for damage to resources as a result of economic activities are in the focus of Russian and foreign scientists. The article presents domestic approaches to compensation for harm caused to water bioresources and their habitats. The purpose for the research is to conduct comparative analysis of two existing Russian approaches to compensation for harm caused to water bioresources: as a result of economic activities (construction of facilities, pipeline stringing., etc.) and illegal fishery of water biological resources (poaching). The authors conduct analysis of open data on water biological resources linkage, fishery yield and value characteristics of compensation through artificial reproduction of water bioresources as the main direction of natural resource recovery. The authors use data on the Arkhangelsk and Murmansk oblasts, Republic of Karelia, Komi Republic. They cover the issues of damage compensation from illegal extraction of water bioresources with use of the fixed charge approach. It has been established that business entities which compensate for the damage caused to natural resources resulting from the economic activities bear greater costs than those engaged in poaching in these regions. In this case, the same natural resource is affected. The authors have developed measures to improve state control in the sphere of compensation in the Russian Federation. It is appropriate to have a unified approach to ecosystem recovery regardless of the type of activities undertaken.

Key words: water bioresources, compensation, value, fixed charges, state control.

Introduction. Socio-economic development of the state and preservation of the environment must be integrated because environment, economy, human health, and social and environmental well-being are inseparably united. Our environment is constantly subject to negative anthropogenic impacts leading to changes in the components of natural environment, transformation of ecosystems, deterioration and depletion of natural resources, including water bioresources¹. In this regard, we currently observe increased damage to the natural components, which is becoming a very important area of national security in the sphere of environmental studies. The purpose for the study is to conduct comparative analysis of two existing domestic approaches

to compensation for damage caused to water bioresources: as a result of economic activities and illegal fishery of WBR. For this purposes, it is necessary to consider the legal grounds for damage compensation in Russia, review some tools of damage compensation applied in other countries; dismantle the schemes of damage compensation and conduct cost analysis of expenditures for this purpose; offer the ways of improving state management in this sphere.

Economic activity degrades or even destroys natural wildlife habitats, violates the course of natural processes in animal population including breeding, migration etc.; anthropogenic factors related to economic activities have a great indirect impact on fauna as a disturbance factor [20, p. 97]. It should also be noted that the issue of compensation for the past (accumulated) damage remains rather relevant. The issue is related to degradation of natural

¹ Water biological resources (hereinafter – water bioresources (WBR)) – fish, aquatic invertebrates, aquatic mammals, algae, other water animals and plants in the state of natural freedom.

environment, entire regions and investment attractiveness of the country, separate areas and industrial enterprises [7, p. 90]. According to expert estimates, losses in Russia's GDP due to deterioration of environment and related economic factors range from 4% to 6% each year. It should also be noted that in Russia, despite a significant number of documents regulating the assessment of damages, lack common methodological principles and standards for the assessment of environmental damage, recognized by the state. This leads to the fact that old and new documents contain incompatible methodological approaches [11, p. 141].

Compensation for damage to water biological resources. Economic entities when implementing their activities pollute and deplete natural resources, thus causing irreparable damage to the environment, as well as violating the citizens' constitutional rights [13, p. 298]. In Russia, the extent of unpreventable damage agreed upon by the Federal Agency for Fishery (hereinafter – the Agency) is an average of 9000 tons a year. For 2015, the Agency adopted 6128 decisions on coordination of economic activity after implementation of which the damage caused to water resources must be compensated for by breeding 2 564 million species of new water bio-resources. In this regard, the restoration of the natural environment and its components becomes an urgent objective and an important principle of public administration in Russia. In 2004, Federal law “On fishery and conservation of water biological resources” (hereinafter –

Law on fishery)². According to legal institutions, the development of this standard is expected to include, prior to economic activities, certain measures such as assessment of the impact of planned economic activities on biological resources and their habitats, development and implementation of measures on elimination of consequences of such negative impacts aimed at restoring their condition. Elimination of the consequences of negative impacts on bioresources and their habitats is implemented through artificial reproduction, acclimatization of bioresources or fishery reclamation of water bodies including creation of new, expansion or modernization of the existing production capacities, ensuring the fulfillment of such measures [28, p. 119].

It should be noted that the consequences of negative impacts on water resources (damage) are identified before their actual occurrence at the stage of planning and then are compensated for according to the established procedure based on the expected rather than actual consequences [15, p. 16]. The concept of “damage” is often viewed in the broadest sense. Damage in the narrow sense is damage caused to the environment and its components; in the broad sense – damage caused to human health as a result of exposure to adverse environmental factors (ecogenous damage) and damage to property (economic damage) [2, 14]. It must be said that Federal law “On fishery” simultaneously uses the terms “damage”

² Federal law no. 166-FZ “On fishery and conservation of water biological resources”, dated 20.12.2004. Available at: <http://garant.ru> (accessed: 27.01.2017 r.).

and “harm”. The terminological uncertainty persists in the bylaws. In the present study, the authors use the term “harm” and view it as a negative change in the state of natural populations of WBR and their habitats as a result of human impact. The types and factors of such impacts on WBR are determined by the prevailing regulatory legal framework.

The main focus of measures to compensate for damage caused to WBR in Russia is their artificial reproduction. Such measures are in almost all cases limited to reproducing new species by the existing enterprises of the Agency or commercial fishery enterprises. Even in cases where the cost of damage implies capital measures, economic entities prefer to limit them to reproduction of new species [6, p. 176]. It has to be mentioned that damage compensation focused entirely on the “compensation” of its quantitative parameters whereas qualitative characteristics differ substantially, which is reflected in the ratio of economic indicators of the value of lost and renewed resources, and has a negative impact on the state of water ecosystems. Current regulatory documents do not identify the indicators for assessing the efficiency of compensatory measures and monitoring mechanisms for their achievement.

Along with this, it has been established that people who have committed offences in the sphere of illegal fishery of WBR are liable under the laws of the Russian Federation. According to the State report “On the state and protection of environment of the Russian Federation in 2015”, in most water bodies the number of most valuable species still remains very

low – especially sturgeons and freshwater salmons. One of the main factors affecting fish population is their illegal fishing [4, p. 162]. In the coastal regions, where fishing is the main cause for a high level of illegal activity in fishing is a complex socio-economic situation in regions [1, p. 109].

The cost of damage from illegal fishing is determined by fixed charges. They represent conventional units of damage assessment established for each destroyed species or illegally extracted component of the natural environment; the amount of the fine is determined by the number of destroyed or damaged components of the environment according to the established charge [18, p. 127]. The charge approach to damage compensation is also used for calculating the amount of fine for damage caused to other natural resources [5, p. 250]. For the purposes of the study, the term “fixed charge” is defined as a conventional unit of assessing the damage caused to a single species of illegally harvested WBR.

Foreign instruments of redress. In the Republic of Belarus, the amount of compensation for damage caused to the environment (including illegal harvesting or extermination of wild animals including fish or other water animals) is determined according to the fixed charges, in their absence – by the actual cost of restoration of the environment taking into account the losses including loss of profits [3, p. 59].

In Western Europe and the United States, there is a developed institutional environment in the sphere of environmental protection and

compensation for damage to natural components. Directive 2004/35/CE of the European Parliament and of the Council on environmental liability with regard to the prevention and remedying of environmental damage establishes administrative liability for damage caused to protected species or natural habitats, for contamination of land and damage to surface, ground and coastal waters. According to the Directive, competent state agencies are obliged to take measures to prevent or eliminate damage without prior court decision [26, p. 24]. Compensation for environmental damage in most European countries is reviewed as a measure to restore or compensate for the damage caused to the environment, rather than a pecuniary fine from the responsible party. The purpose for this policy is not to punish the business entity which caused the damage, but to restore the environment [9, p. 75]. Thus, the EU Directive recommends using the rule when implementing business activities: the damaged areas of the environment must be restored to their original state. In addition, European countries have national regulatory documents on preservation of the environment. For example, in France there are a Convention on Biological Diversity and a Strategy for Biological Diversity adopted to monitor the situation and compensate for damage caused to natural resources [24, p. 40]. In the UK, there also exists the principle which states that “the polluter pays”. The polluter has to take measures to compensate or mitigate adverse impacts on natural components. The purpose for damage compensation is

the recovery of species composition, habitat structure, ecosystem functioning [22, p. 10]. In Germany, if damage is caused to the environment, the responsible person must take measures to limit the damage and restore the damaged environment according to the recovery plan approved by a competent authority [8, p. 24].

In the United States, principal legislation on environmental liability is the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1986, also known as the “Superfund Act”, and the Oil Pollution Act (1990). A business entity is responsible for cleanup activities for contaminated resources and compensation for losses caused by pollution of these resources, including environmental damage which is calculated on the basis of the cost of restoration works. Since the costs in these two categories may overlap legislative measures are taken to eliminate situations of double-counting [23, p. 126]. There are two ways of damage compensation: for unauthorized actions/accidents – “Evaluation of damage, rehabilitation and restoration” and for authorized actions, the “Agreement on the environmental impact”. The former implies measures on damage compensation, the latter requires to avoid, mitigate, and compensate for damage [25, p. 1202]. It is noteworthy that foreign scholars emphasize increased transparency and environmental responsibility of global companies, including Russian, in using natural resources. These companies carry disclose and give access to information about the impact of their activities on the environment [21, p. 96].

It is worth noting that in the United States there are also legislative acts on fisheries and conservation of water biological resources. The Magnuson-Stevens Fishery Conservation and Management Act establishes fines for illegal fishing in marine waters. The Act specifies the gradation of fines (charges) depending on the offense and the extent of illegal fishing, as well as damage compensation equal to the market value of the harvest of water bioresources for sale. For example, one economic entity was fined 37 580 dollars for illegal fishing and sale of 430 pounds of scallops [26].

As we can see, the United States and the European Union adopt and implement uniform methodological approaches in the sphere of damage compensation. Russia, however, is the country with prevailing disjointed sets of separate guidelines segmented by specific industries or types of damage [10, p. 5]. However, we note a more fair approach of the U.S. government to the compensation for damage caused to WBR as a result of illegal fishing, which takes into account the market value of WBR harvest.

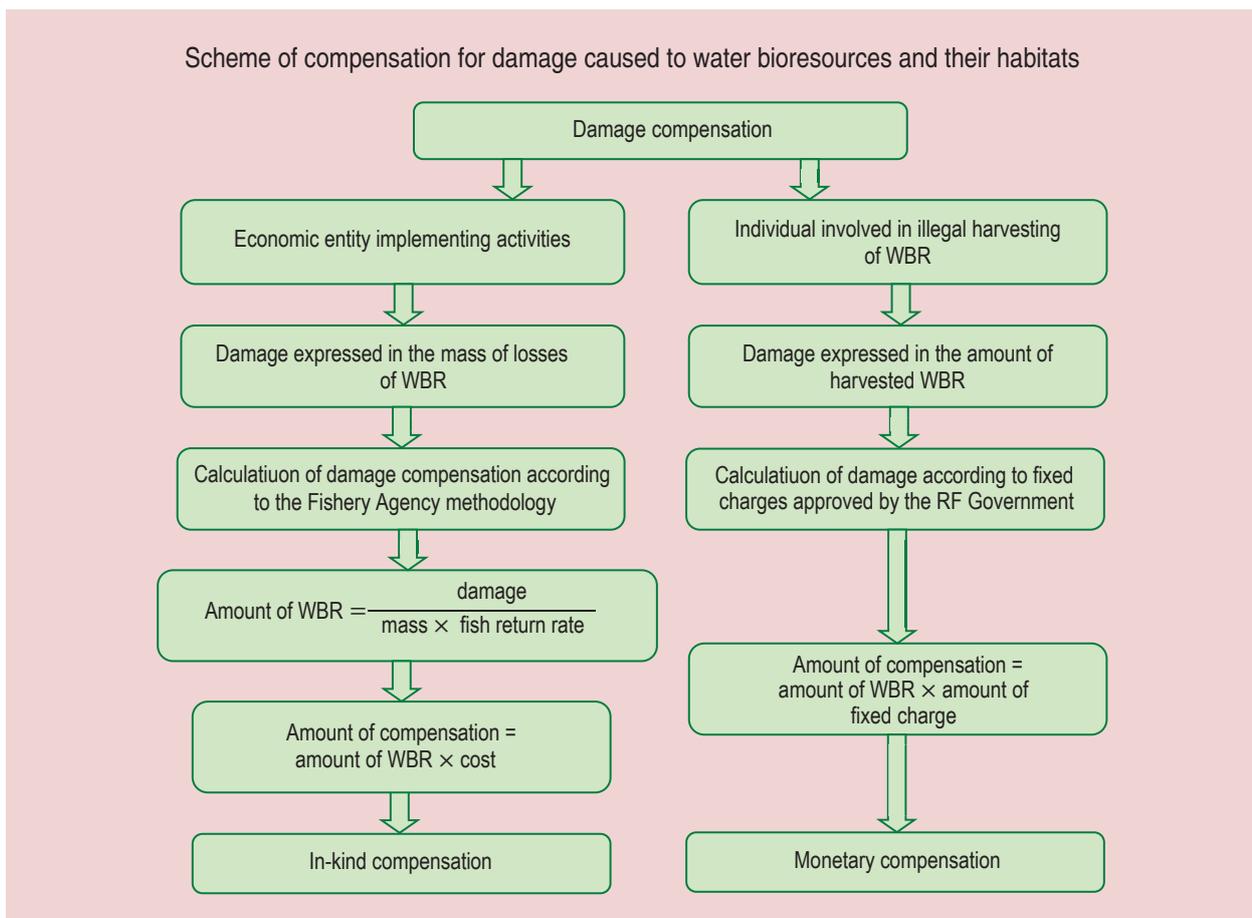
Moreover, foreign countries currently widely apply the concept of ecosystem services, i.e. benefits which people obtain from ecosystems [19]. For example, since 2008 Finland has widely practiced government compensation for private owners for abandoning their economic activity. In Portugal, the Coca-Cola company on the basis of an agreement pays forest owners fees for forest maintenance (abandonment of economic activity) to ensure the quality of water in the Tagua Tagua reservoir [17, p. 139].

Comparative analysis of approaches to damage compensation. In Russia, there are 2 approaches to compensation for damage caused to water bioresources and their habitats:

- as a result of economic activity;
- as a result of illegal harvesting of water bioresources.

The *Figure* presents the scheme of damage compensation for economic entities which implement activities on water areas and shores, and for individuals involved in illegal harvesting of water bioresources.

In the Arkhangelsk, Murmansk oblasts, republics of Karelia and Komi, measures on damage compensation are, in the vast majority of cases, taken through artificial reproduction of Atlantic salmon, brown trout, and whitefish (Lavaret). Given that, despite the measures taken, the regions still experience the cases of illegal harvesting of Atlantic salmon, brown trout, and whitefish, the authors conducted comparative analysis of the cost characteristics of damage compensation for economic entities and damage as a result of eradication or illegal harvesting of water biological resources (poaching) with regard to the conditions in these regions. Considering the fact that up to now cost characteristics applied in two approaches to damage compensation have not been compared, the authors conducted comparative analysis. For these purposes, damage equal to 100 kg was used as the basis in both cases. It should be noted that, according to the current legislation, damage caused to water bioresources by any economic entity in the amount less than 10 kg is not compensated.



According to the Methodology for calculating the amount of damage caused to water bioresources, the calculation of the number of larva (new species) of water bioresources necessary for damage compensation through artificial reproduction is carried out using data on the extent of damage, the average weight of one reproduced species and fish return rate. The cost of reproduction of water bioresources was determined based on information from the trading platform and publications. The data are presented in *Table 1*.

It should be noted that large variations in the cost of damage is caused by the differences

in the weight of reproduced water bioresources and the cost of their cultivation.

The calculation of the cost of compensation for damage caused by eradication or illegal harvesting of water bioresources (poaching) is conducted with the use of data on the amount of damage, the average weight of one species of reproduced water bioresources, and the amount of fixed charges. Data are presented in *Table 2*.

Thus, the cost of damage compensation for economic entities which received the approval of the Agency (or its territorial administrations) and which are legally engaged in the activity, is several times higher than that the cost

Table 1. Data on the cost of damage compensation for economic entities

Indicator	Cost, rubles					
	Arkhangelsk Oblast			Murmansk Oblast	Republic of Karelia	Komi Republic
	Atlantic salmon	Brown trout	Whitefish	Atlantic salmon	Atlantic salmon	Whitefish
Damage, kg	100	100	100	100	100	100
Weight, kg	4.125	1.1	0.18	3.05	4.5	0.45
Number of species	485	1 818	15 432	656	444	79 365
Cost of artificial reproduction of 1 species, rubles	181.64	181.64	46.16	129.8	367	9.12
Amount of compensation for 100 kg, rubles	88 095	330 222	712 341	85 149	162 948	723 809
Sources: compiled from: On the approval of the Methodology for calculating the amount of harvest of water bioresources necessary for preserving water bioresources and ensuring the activities of fishery enterprises fishing for aquaculture purposes (fishery): Order of Ministry of Agriculture of the Russian federation no. 25, dated 30.01.2015. Available at: http://garant.ru (accessed: 27.01.2017); On the approval of the Methodology for calculating the amount of damage caused to water bioresources: Order of the Federal Agency For Fishery no. 1166, dated 25.11.2011. Available at: http://garant.ru (accessed: 01.02.2017); SBERBANK-AST. Available at: http://utp.sberbank-ast.ru (accessed: 27.01.2017).						

Table 2. Data on the amount of damage caused by eradication or illegal harvesting of water bioresources (poaching)

Indicator	Cost, rubles					
	Arkhangelsk Oblast			Murmansk Oblast	Republic of Karelia	Komi Republic
	Atlantic salmon	Brown trout	Whitefish	Atlantic salmon	Atlantic salmon	Whitefish
Damage, kg	100	100	100	100	100	100
Weight, kg	4.125	1.1	0.18	3.05	4.5	0.45
Number of species	25	91	556	33	22	222
Charge for 1 species regardless of size and weight, rubles	1250	580	250	1250	1250	250
Amount of compensation for 100 kg, rubles	31 250	52 780	139 000	41 250	27 500	55 500
Sources: compiled from: On the approval of the Methodology for calculating the amount of harvest of water bioresources necessary for preserving water bioresources and ensuring the activities of fishery enterprises fishing for aquaculture purposes (fishery): Order of Ministry of Agriculture of the Russian federation no. 25, dated 30.01.2015. Available at: http://garant.ru (accessed: 27.01.2017); On the approval of fixed charges for calculating the amount of compensation for damage caused by eradication or illegal harvesting water bioresources. Decision of the Government of the Russian federation no. 515, dated 25.05.1994. Available at: http://garant.ru (accessed: 27.01.2017).						

for individuals involved in the eradication or illegal harvesting of water bioresources (poaching):

- in the Arkhangelsk Oblast: 2.8 times higher for Atlantic salmon, 6.3 times – for brown trout, 5.1 times – for whitefish;
- in the Murmansk Oblast: 2 times higher for Atlantic salmon;
- in the Republic of Karelia: 5.9 times higher for Atlantic salmon;
- in the Republic of Komi: 13 times higher for whitefish.

Conclusion. This situation places as a disadvantage economic entities compensating for damage and individuals engaged in illegal harvesting of water bioresources. Of course, individuals engaged in illegal harvesting of water bioresources are liable to be fined. The amount of the fine, according to the article of the RF Code of Administrative Offences, may reach 200 thousand rubles. But in this case the authors consider the issue of compensation for damage caused to water bioresources.

However, the method of fixed charges of damage compensation based on using specific charges is considered as “a damage standard” – the model extent of damage compensation – questions the fact of full damage compensation. It should also be noted that the cost of one species of Atlantic salmon caught in the rivers of the Arkhangelsk Oblast is much higher in retail chains than the amount of a fixed charge. The average cost of an average weight salmon may be up to 5 thousand rubles. Thus, there is the actual mismatch of the amount of current market prices for water bioresources.

Compensation payments for illegal fishing are collected and usually distributed without direct correlation between the costs of environmental rehabilitation. The actual damage for illegal harvesting of water bioresources in allocated to the budget comes without any guarantees that the collected funds will be directed to environmental rehabilitation. Under existing conditions, when the restoration of illegal harvesting of fauna objects is almost impossible and is not carried out in practice, damage compensation becomes in fact an administrative penalty. In practice, civil liability, without fully fulfilling its function of damage compensation, turns into administrative which performs the punitive function – the claims are paid as penalties [12, p. 22]. The economic tools existing in the country are aimed at damage prevention and compensation is primarily fiscal in nature and does not encourage environment conservation and restoration activities.

In connection with the above, in order to use the uniform approach to damage compensation, the authors consider it appropriate to work in the following areas:

1. The Ministry of Agriculture of the Russian Federation the Federal Agency for Fishery in cooperation with scientific organizations should develop a unified standard for valuation of the size of fixed charges for eradication or illegal harvesting of water bioresources, which has not changed since 2000, and the cost of damage by economic entities. Practical implementation and application is to follow.

2. Objective determination of the amount of charges and cost of damage by economic entities on the basis of the economic situation and a reasonable combination of economic indicators of lost and renewed resources. It should be noted that the values of these indicators should be measurable. The guidelines for determining the amount of taxes can be the values of damage compensation by economic entities established on the market in recent years in order to compensate for the unpreventable damage. Of course, it is important that the amount of the charge results from other factors such as population's incomes.

3. The Ministry of Agriculture of the Russian federation should establish an institution for ecosystem services in the sphere of compensation for damage caused to water bioresources. One of such areas may be temporary abandonment of fishing enterprises of fishing on water facilities in exchange for compensation payments. This will help recover

part of population of water bioresources, which will compensate for the damage caused by the economic entity. However, the valuation of the compensation will be a very complicated task.

4. Measures for compensation for actual damage caused to water bioresources as a result of illegal fishing.

The authors also believe that public administration should have a uniform approach to compensation for damage caused by any activity – without separating legal business (e.g., bridge construction) and illegal economic activity (e.g., poaching). Since in both cases the target of damage is a human being engaged in activities related to the use of natural components. This will be a fair approach to human activities and more full compensation for damage caused to water bioresources and their habitats. According to the authors, these data can be used in the development of measures of state control in the sphere of preservation of water bioresources.

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