Legal protection of atmospheric air in the context of sustainable development and public health: Russia and the world experience

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Abstract. The article deals with the legal regulation of air protection in the context of sustainable development and public health. The foreign methods of assessing the quality of atmospheric air are analyzed. The approaches to damage assessment used in Russia and other countries are compared. It also provides a brief overview of the gaps in legal regulation in Russia. The author considers it necessary to ensure the use of monetization of environmental losses of the state in mutual connection with other instruments of public administration. The environmental losses in monetary terms should ultimately serve as a basis for taking measures to reduce them. The concept of sustainable development is enshrined in many international legal instruments and national legislation. Its implementation is designed to pursue and achieve a balance between sustainable management of natural resources and economic development. Obviously the health of population should be considered as one of the main sustainable development indicators for countries with stable economic growth. The growth in industrial production leads to an increase in the emissions. The air is a transit environment, that is why the effects of its pollution have a negative impact on the quality of the neighbouring environmental components – water, soils, animals, flora. All these factors will have the inevitable and negative consequence for human health. It is due to the rising rates of morbidity and premature mortality the economically advanced countries include this factor into their state planning and monetize it.

1. Foreign methodology for assessing the harm caused by the air pollution
The problem of identification and quantification of the environmental pollution impact on human health is an extremely difficult scientific task for the world science. In particular, this is due to the difficulties in determining the scale of dependence of public health on indicators of environmental pollution. For example, the UK has developed approaches to monetize the cost of years of life lost due to the effects of air pollution, adjusted for quality of life [1].

The influence of air pollution on the economy, indirectly calculated through monetization of decrease in working capacity of the population (the methodology of an assessment of influence of air quality on efficiency of working capacity developed by David Ricardo) [2] is also subjected to monetary assessment. The study took into account the statistics of diseases such as coronary heart disease, strokes, lung cancer, asthma, chronic bronchitis, diabetes. Similar methods are used by the European Union and Ireland [3]. The model developed by Nicholas Muller and Robert Mendelsohn "Measuring air pollution damage in the United States of America" is used in the United States [4].
Most notably the experience of China - to reduce air pollution levels, the State Council of China in 2013 approved an action Plan for the prevention and control of air pollution [5]. On the basis of this Plan from 2013 to 2017 it has been analyzed national data on air quality monitoring and mortality to assess the impact on health of the population of 74 key cities of China, selected on the basis of their geographical distribution, level of pollution and population. As a result, a methodology was proposed to assess the economic losses from the impact of air pollution on premature mortality, as well as the occurrence of diseases such as chronic and acute bronchitis, emphysema, asthma, chronic lung disease, coronary heart disease, lung cancer and stroke.

Besides the human health losses, foreign methodologies mentioned quantify in monetary terms the loss of ecosystem services, biodiversity, agricultural production, and also damage to buildings and essential infrastructure. But special mention should be made, the human health losses constitute 94 per cent of overall number losses due to air pollution.

In all the countries mentioned above, if significant changes in air quality are expected, the methodologies for calculating damage are used by public authorities in relation to planned policies or by private initiators of large-scale projects. At the same time, if it is not possible to reduce the economic losses of the state, measures are taken to tighten air quality standards.

2. Russian legislation on the protection of atmospheric air

In Russia, article 42 of the Russian Constitution declares the right of everyone to a favourable environment. Federal laws "On environmental protection" and "On sanitary and epidemiological welfare of the population" define a favourable environment - it is an environment whose quality ensures the sustainable functioning of natural ecological systems, natural and natural-anthropogenic objects.

The Federal law "On the protection of atmospheric air" defines the quality of atmospheric air as a set of physical, chemical and biological properties of atmospheric air, reflecting the degree of its compliance with hygienic and environmental quality standards. This Law establishes also the requirement of state registration of pollutants and hazardous substances and the need for a special emission permit. It is prohibited to operate economic facilities that do not have a purifying system and system for monitoring of air quality.

In Russia, studies in the field of harm size have been carried out on an initiative basis in selected regions: for example, the 2002 study of 9 constituent entities of the Russian Federation. The German model of the "Ecosense", presented to Lomonosov Moscow State University by German partners (University of Stuttgart) was used in the calculation of damages [6]. Environmental damage from air pollution for Perm was calculated according to data for 2009-2011 by converting pollutant emissions from stationary and mobile sources to conventional tonnes in accordance with the relative environmental and economic hazards of each pollutant. The scientists have assessed various types of health risks from air pollution and drinking water in a large center of metallurgy and energy – the city of Novokuznetsk [7].

Doctors working in the field of identifying the impact of environmental pollution on public health, assess the economic damage caused by the impact of air pollution on the health of the population within the boundaries of individual cities and municipalities (for example, in Moscow and Moscow region, Kemerovo region), using both domestic methods and software systems for the dispersion modelling, and foreign methods (in particular, the methodology for assessing the health risk of the World health organization) [8].

It is possible to note the similarity of approaches used by Russian and foreign scientists to the definition of both the objects of impact and the cost assessment of damage from air pollution. According to the analysis of data on total emissions for 2015 in Russia, the damage from air pollution from stationary sources alone will amount to 1.8% of gross domestic product. This figure is close to a similar estimate for the United States.

In general, there are three stages that are used in various (Russian and foreign) methodologies for assessing the harm from air pollution:
1. The dispersion modelling of emissions of pollutants to the understanding of changes in the concentration of pollutants in the borders of the various territories.

2. Assessment of the impact of changes in the concentrations of pollutants in the air on the health of citizens, the economy and the environment.

3. Assessment of the consequences of the identified impacts using a single monetary equivalent.

With regard to specific air pollutants that have a significant impact, foreign practices differ slightly from Russian ones. Simulations used in the EU, Canada, USA and others estimate concentrations for five major pollutants - particulate matter, nitrogen dioxide, volatile organic compounds, ammonia and sulfur dioxide.

The structure of the air emissions and the division of substances on the priority substances in the economically developed European countries and in the United States does not include most of the pollutants in respect of which Russia applies measures of state regulation (in Western studies stand out 5-6 groups of the main substances with more fractional classification of solid particles; in Russia the list of much more - regulated substances 254, of which 95 are substances regulated by the law on radiation safety) [9].

At the same time, analysis of foreign practices showed that the rates of specific indicators of economic damage in the calculation of environmental damage in different countries are quite close, given the differences in the value of currencies and the cost of living. This gives reason to apply them in our country after adjusting for the difference in economic development on the basis of such indicators as the purchasing power parity of different currencies, the ratio of the cost of the average human life.

3. Gaps in legal regulation on the protection of atmospheric air in Russian Federation
The Supreme Court of the Russian Federation stressed that as a result of economic activity, the environment can be caused irreparable harm. The manifestation of the consequences of harm to the environment, by its nature, cannot have clearly defined temporal or spatial boundaries. The conditional nature of the definition of harm to the environment used in the methods of calculating the amount of harm is based on the objective impossibility of its accurate assessment due to the uncertainty of the consequences of the causing impact [10].

According to the Russian Law "On environmental protection" damage caused to the environment is subject to compensation in full - taking into account the losses incurred, including lost profits. In addition, damage caused to health and property of citizens by the negative impact of the environment as a result of economic and other activities of legal entities and individuals shall be fully compensated. A similar rule on full compensation for damage caused to health and property by air pollution the Law "On protection of atmospheric air" contains.

However, in Russia, the methodology for assessing environmental damage due to air pollution has not yet been officially approved. Regulation of the quality of natural components is not correlated depending on the state-level indicators of the state of the environment. On the contrary, until now it is possible to individually establish temporarily agreed emission standards for individual economic entities.

It should be noted also that unlike the foreign list of pollutants most of the pollutants cannot be controlled automatically (as prescribed by the Law "On environmental protection").

Therefore, it seems appropriate within the framework of the state management system using the environmental-economic mechanisms, apply conditional monetized indicators (notional rates) harm as indicators of the effectiveness of state environmental policy, linking the results of their applications with other environmental policy instruments.

4. Conclusions
It is not an end in itself to introduce into the environmental quality management system at all levels of government a scientifically based methodology for preliminary monetary assessment of environmental
harm from the planned activity. It is important to ensure that this instrument is applied in a reciprocal way with other instruments of public administration.

The monetization of environmental losses of the state should ultimately serve as a basis for taking measures to reduce them such as:

- introduction of more stringent standards of air quality,
- ensuring the inevitability of liability for environmental offenses,
- expanding the range of measures of economic incentives for rational environmental management.

Only with this approach improving the efficiency of the state environmental policy will ensure a favorable environment for present and future generations within the framework of sustainable development of the country.

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