Environmental Pollution and Measures to Protect it in Russia

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Abstract: Nature is a natural condition of human life. The satisfaction of all the most important human needs is connected with nature. Every year the issue of environmental protection becomes more acute. Air pollution is one of the main environmental problems today. The key steps towards solving this issue are achieving carbon neutrality and decarbonization of the global economy. The article presents quantitative results of environmental pollution based on statistical observation data. It also lists environmental organizations that support activities to protect the environment, as well as measures to overcome global warming.

1 INTRODUCTION

The deployment of the digital revolution on a global scale is increasingly immersing us in a new reality (Bereznoy, 2018). The variety of technical and technological innovations that change our lives has increased many times in the last decade, and in the most diverse areas of human life (Sadovaya, 2018).

When it comes to digitalization, first we mean the infrastructure, hardware and software, the list of Internet platforms and offers (Beksultanova, Vatyukova, Yalmaeva, 2020).

Ignorant human intervention can disrupt the natural harmony of nature and can result in the loss of pristine forests, pollution of rivers, loss of soil fertility, irretrievable disappearance of valuable plant species.

Environmental protection was not a priority until the mid-twentieth century, although by that time anthropogenic activity had long had the most negative impact on nature. Only at the 27th session of the UN General Assembly was this issue seriously raised for the first time. At the same time, a new organization was created in the UN system — the United Nations Environment Programme (UNEP). In the same year, on the day of the start of the Stockholm Conference on the Environment, a special holiday was established — World Environment Day. It is celebrated every year on July 5 and is held under the auspices of UNEP.

The environment is one of the most fundamental categories of modern science and practice, which is on a par with such categories as peace, economy, society, democracy. The environment is an object of legal regulation of public relations concerning nature both at the national and international legislative level.

Environmental protection is recognized as a system of measures that are aimed at ensuring favorable and safe living conditions and human activity.

Environmental protection is commonly understood as a set of international, state and regional measures to protect the environment, enshrined in legal acts, instructions and standards and bringing the requirements to each specific pollutant.

2 MATERIALS AND METHODS

The work contains the results identified in the framework of published reports and analytical materials of international organizations, specialized

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analytical publications, data from foreign and Russian news agencies, as well as interviews and articles by leading analysts and experts. The purpose of this article is to identify the problem of low use of digital technology in agriculture.

Methods of the performed research:

- theoretical and empirical methods,
- descriptive methods,
- method of graphical illustration of data.

3 RESULTS

In Russia in 2021, 592 cases of extremely high and 1849 cases of high pollution of fresh water – streams, lakes, rivers, reservoirs, swamps, canals, etc. were recorded. This proves the fact that this indicator is 12% less than in the previous year, and this indicator has become the lowest since 2012, when the total amount of pollution was 1913. This is evidenced by the data of the analytical service Finexpertiza, which referred to the statistics of Roshydromet in its study.

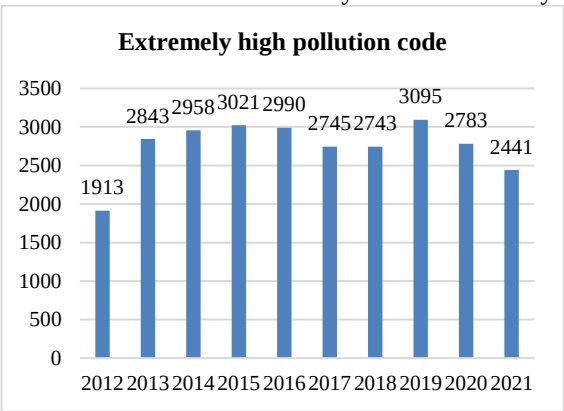

Figure 1: Number of cases of pollution of rivers and lakes.

Cases of surface water pollution were most often noted in the Murmansk (10% of the total), Moscow (9%) and Sverdlovsk (15%) regions. In addition, 4% of cases were detected in the Yamalo-Nenets Autonomous Okrug, Smolensk and Irkutsk Regions, as well as 3% in the Novosibirsk, Nizhny Novgorod, Tula Regions and Primorsky Krai.

Most of the pollution of reservoirs and rivers in 2021 was in the spring, which generally corresponds to the standard intra-annual distribution of incidents. At the same time, a greater number of cases of pollution were recorded in March - 298 cases of pollution, 109 of them extremely high. The Om River (Omsk and Novosibirsk Regions; 9 cases of EVZ), the Ob River (16 cases of EVZ were noted in the sections of its course in the Yamalo-Nenets and Khanty-Mansi Autonomous Okrugs), Lake Bolshoe Ostrovnoye (Altai Territory; 6 cases of EVZ), the Iset River (Sverdlovsk Region; 5 cases of EVZ) and the Mologa River (Tver Region; 5 cases of EVZ), the Tobol River (Tyumen and Kurgan region; 6 cases of EVZ), the Pravaya Hitta River (Yamalo-Nenets Autonomous Okrug; 7 cases of EVZ).

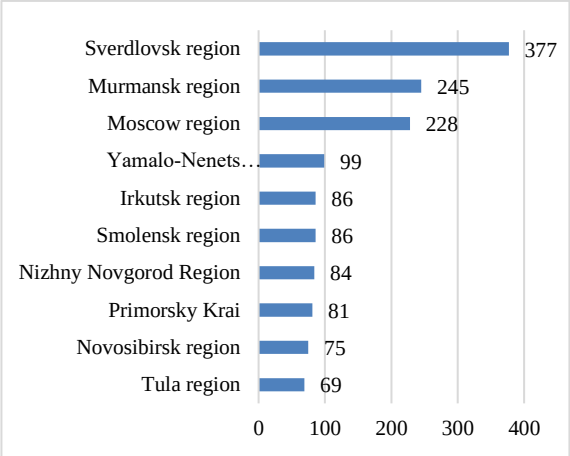

Figure 2 Number of detected pollution of rivers and lakes

In 2021, high and extremely high levels of pollution of surface fresh water were recorded for 35 pollutants. In addition to exceeding permissible concentrations, other qualitative characteristics of water acted as criteria for a negative impact on the environment.

The greatest danger is posed by substances found in Russian reservoirs, rivers, namely heavy metals, the most toxic of which are cadmium, lead, mercury, molybdenum, arsenic, chromium, zinc, nickel.

In Russia, according to the results of 2020, the minimum harmful emissions of enterprises over the past 20 years have been registered — 16.95 million tons, which shows 2% less when compared with 2019. Such data were obtained in mid-June 2021 by the international audit and consulting network FinExpertiza.

The TASS news agency of Russia, with reference to this study, reports that in terms of the volume of harmful and polluting substances that are released into the atmosphere by Russian enterprises in 2020, the Krasnoyarsk Territory occupies the first position (2.5 million tons). Significantly higher indicators were also recorded in the Khanty-Mansiysk and Yamalo-Nenets Autonomous Okrug, in the Kemerovo, Orenburg, Sverdlovsk, Irkutsk and Chelyabinsk regions, Krasnodar Krai, Bashkortostan.

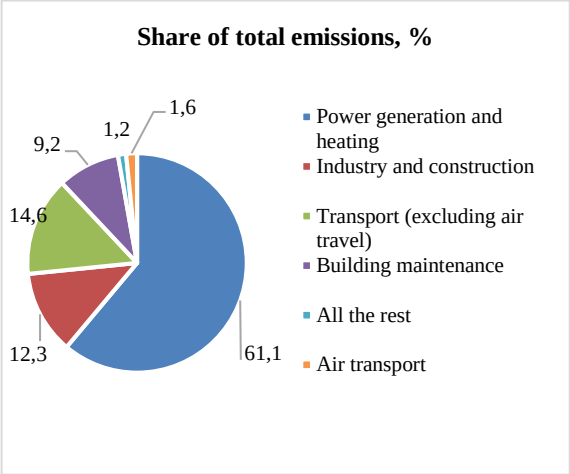

Figure 3: Sources of CO2 emissions in Russia for 2020.

Figure 3 shows the volume of greenhouse gas emissions by substances (carbon dioxide, nitrous oxide, methane, sulfur hexafluoride, etc.) and by sector (energy, industrial processes and product use, agriculture, waste, land use, land use change and forestry). As can be seen in the figure, the carbon dioxide content in the atmosphere has reached 1482.2 million tons. The bulk of the emissions are mainly due to emissions from the burning of fossil fuels and cement production. Global emissions have increased after lockdowns due to the COVID-19 pandemic in 2020. Of the total emissions from human activity in the period from 2011 to 2020, about 48% accumulated in the atmosphere, 26% — in the ocean and 29% — on land.

Along with achieving climate goals, the transition to low-carbon energy technologies will increase energy security and technological independence, as well as reduce negative effects on the health and quality of life of citizens.

4 DISCUSSION

In order to achieve this goal and limit warming, it is necessary to reduce greenhouse gas emissions by 45% by 2030. This is a fairly high indicator, and it is important for companies to start taking measures towards decarbonization right now. At the same time, they choose from two options.

It is possible to change production processes using other materials and chemical compounds, and thereby prevent the release of carbon dioxide into the atmosphere or minimize it. Reducing greenhouse gases associated with operating activities includes two categories of solutions: avoiding emissions and reuse or storage. The avoidance strategy involves increasing production efficiency, switching to more technological solutions and switching to new fuels and energy sources.

The second category of measures includes recycling and re-production, as well as carbon capture with subsequent use or storage.

Another way to achieve carbon neutrality is to compensate for the negative impact on the environment by participating in environmental campaigns, such as landscaping projects and investments in waste–free production. Often, such measures are considered not as the main tool of "greening", but as an addition contributing to the achievement of the final goal.

First of all, companies are thinking about reducing their carbon footprint. Many of them are switching to renewable energy sources for this. This is not only the right step from the point of view of environmental friendliness, but also a cost-effective solution. For many companies, about a third of production costs are accounted for by energy payments. At the same time, there is a gradual decrease in the cost of renewable energy.

In addition, by reducing the carbon footprint, the company attracts attention to its initiatives and becomes more attractive to job seekers.

In Russia, the Committee on Ecology and the Committee on Nature Management and Raw Materials, which are part of the State Duma of the Russian Federation, as well as the Department of Nature Management and Environmental Protection, are engaged in the development of environmental legislation. The main executive bodies in this area are the Ministry of Natural Resources of the Russian Federation and Goskomekologiya. Coordination activities are the responsibility of the Government Commission on Environmental Management and Environmental Protection.

However, all these bodies do not act alone. Non-governmental environmental organizations also cooperate with them.

4.1 World Wildlife Fund (WWF)

It is the largest international environmental organization, uniting more than five million supporters around the world. WWF offices operate in more than 100 countries, including Russia. The Foundation carries out environmental monitoring, develops and supports environmental protection programs, works in close conjunction with the legislative and executive authorities. The main areas of activity are the protection of rare species (for

example, in Russia WWF conducts projects for the protection of bison, Near Asian leopards, snow leopards and other endangered animals), the expansion of nature reserves and sanctuaries, the introduction of the principles of rational nature management. WWF Russia implements marine, forest, climate and other programs.

4.2 Greenpeace

An independent international environmental organization that has become famous for notable public actions. Currently, Greenpeace's activities are mainly aimed at protecting biological diversity, reducing the emission of gases into the atmosphere and the production of toxic waste, as well as against the development and use of nuclear technologies. Protest actions, which are regularly organized by supporters of the organization, have created an ambiguous reputation for it. But this does not detract from the achievements of Greenpeace. For example, in Russia, the organization implements its forest campaign, in which volunteers conduct raids and extinguish fires in forests, plant young trees. A lot has been done to introduce eco-friendly methods of collecting, sorting and recycling garbage (Lublin, 2021).

4.3 UNEP

The already mentioned UN Program (UNEP) is the main UN body for environmental protection and one of the largest environmental organizations in the world. Its activities are mainly focused on environmental monitoring, the development of laws and regulations, as well as educational activities.

4.4 World Society for the Protection of Animals

This organization fights for the ethical treatment of animals — both wild and domestic. Over the years, the organization has protested against whaling, bullfighting, and keeping dolphins in captivity — in dolphinariums and zoos. And it has achieved significant success, for example, thanks to the activities of the WHO, bear baiting was banned in Pakistan. Now the WHO is developing a World Declaration of Animal Welfare, which will be presented to the UN. The main office of VOZH is located in London, and its branches are located in 13 countries, but the company's activities cover more than 150 countries of the world.

Of course, these are not all such organizations — there are hundreds of foundations and associations all over the planet whose main goal is to protect the environment. It is important that almost all of them exist on the funds of voluntary donations.

5 CONCLUSION

Russia has a huge potential to reduce greenhouse gas emissions and increase carbon uptake. The national goal of carbon neutrality no later than 2060 can be achieved in a cost-effective way, and most of the measures of decarbonization of the economy can be implemented by 2050. The key industries that can provide a deep reduction in carbon emissions are energy, oil and gas and coal industries, metallurgy, transport, chemical industry, and forestry, with the introduction of modern climate-oriented practices, can significantly increase the volume of carbon deposition by 2050.

Russia's climate policy should provide for the implementation of a set of measures to reduce greenhouse gas emissions in priority areas, including energy efficiency improvement, the development of carbon-free energy (renewable energy sources, the use of carbon capture and burial technologies), a radical reduction in methane emissions in the oil and gas and coal industries, the transition to carbon-free modes of transport (using biofuels, hydrogen, electricity, and also for environmentally friendly public transport), modernization and introduction of modern technologies in metallurgy, chemical, cement industry, improvement of methods of forestry and agriculture, introduction of climate-oriented technologies and practices in them, allowing to prevent carbon losses in forest biomass and soils, to provide additional carbon deposition by ecosystems.

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