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GLOBAL PRACTICES OF PUBLIC ADMINISTRATION IN PROTECTING PUBLIC INTERESTS IN THE ENVIRONMENTAL SECTOR

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Abstract. The article presents the unification of global public administration practices regarding the protection of public interests in the environmental sector, with the aim of humanizing the further development of environmental legislation on a global scale.

It is shown that access to environmental information varies in different developed countries. Non-governmental organizations and researchers, who are not affiliated with government bodies, are also part of the system. They consider themselves defenders of public interests and act as independent observers in contrast to both government officials (who may advocate certain political interests) and the parties whose interests are directly affected. In this regard, the Human Development Index in countries around the world has been analyzed.

It is noted that contemporary environmental problems were essentially caused by the fourth technological paradigm, where the diverse use of hydrocarbon resources led to global warming, atmospheric pollution, and a decrease in oil, gas, and coal reserves. Throughout the era of the fifth paradigm, the environmental situation has only worsened. However, relying on the achievements of nanophysics, nanochemistry, and biology, new approaches to addressing global warming have been developed. Yet, solving one problem often gives rise to new, equally complex challenges. Along with the development of nanotechnology, the impact of

nanoparticles on the Earth's biosphere is also being studied. Accordingly, the global percentage distribution of products made using nanotechnology has been analyzed.

Keywords: public administration, environmental sphere, public interests, Human Development Index.

Introduction. The surge in environmental activism worldwide over the last 25 years has been marked by the reports of the Club of Rome, environmental forums, the development of regional and international programs for the preservation and restoration of natural resources, landscapes, territories, and aquatic areas, the advancement of environmental education and awareness, the emergence of numerous environmental materials in the media, and the rise of hundreds of "green" movements and organizations in all corners of the world.

The right of citizens to participate in decision-making processes during environmental governance is provided for by many international legal instruments. In order for the public to actively influence the development and implementation of environmental policies, it must be objectively informed about the nature of environmental problems. This underlines the relevance of the chosen research topic.

Literature review. The article (Kostrubiec, J., Karpiuk, M., & Tyrawa, D., 2024) covers the issue of environmental security in Poland for the purpose of international regulation, the goals of which are pursued at the level of the municipality, that is, the basic unit of local self-government. It is in local areas and at the source of any threat in which rapid response is often required to eliminate environmental pollution and its consequences. Accordingly, municipal authorities should be provided with a number of powers allowing them to take measures for environmental security. The study is characterized by an approach based on legal theory. The main method of research is the doctrinal method, as well as the method of legal analysis of the text. The study mainly relies on theoretical views presented in legal studies and those offered in case law practice.

The authors (Tsai C-C, Li X(D), Wu W-N., 2021) show that previous studies of public administration emphasize the importance of environmental protection and sustainability, but most studies focus on government actions and pro-environmental behavior of public servants. To fill this gap, the authors draw on linked literature and develop a conceptual model explaining how citizens' perceptions of social values, power and the environment affect public and private spheres. By analyzing data from the Taiwan Social Change Survey, the authors find that a willingness to conserve the environment demonstrates a significant mediating influence on the relationship

between citizens and most social values, government, and environmental determinants.

The results of the study (Karimi, K., Edrisi, A., & Rezaian, S. 2023) showed a significant connection between the virtual and non-virtual public sphere and responsible environmental behavior of citizens. Therefore, in order to improve the responsible environmental behavior of citizens, there must be a basis in the form of improving the public sphere.

It should be noted that in recent years, many scientists from various countries have been studying issues related to the development of the environmental sector. However, the protection of public interests in this context by government authorities, local self-government bodies, and non-governmental organizations is almost not considered. Given the above, the **aim of this work** is the unification of global public administration practices regarding the protection of public interests in the environmental sector, with the goal of humanizing the further development of environmental legislation on a global scale.

Research Methods. Using the hypothetico-deductive method, a research methodology was developed, which allowed for the formulation of the corresponding research hypothesis and the construction of heuristic models of state environmental safety management in countries around the world. The method of structural-functional analysis proved useful in systematizing the mechanisms of state environmental safety management in these countries, while the application of comparative methods enabled a comprehensive analysis of their status. The theoretical-conceptual method determined the direction of the study, embodied in the analysis of the functions, structure, and parameters of the object, and made it possible to propose strategic directions for improving the mechanisms of state environmental safety management in countries as a vital component of national security.

The work also applies the Human Development Index as a measure of human potential development, which provides an integrated assessment of human development.

The United Nations Human Development Index is one of the most widely used indicators of country development after GDP. It measures progress in terms of social outcomes, including life expectancy at birth, expected and mean years of schooling, and gross national income per capita.

Main Part. In different developed countries, public access to environmental information varies. It is most freely available in the United States due to the effective implementation of the Freedom of Information Act (1996). In contrast, in the United Kingdom, Germany, and to a lesser extent in France, access to information has

always been significantly restricted, and only recently, under the influence of EU directives, specifically the Directive on "Access to Environmental Information" (1990), certain changes have started to be observed. The technological stage currently characteristic of the US and many European countries involves active public participation in discussing and solving various issues related to ecology [5; 8].

German researchers have developed their own recommendations for involving the public in decision-making related to environmental risks. These recommendations include that the communication strategy must be well-structured and carefully prepared. The factual material, its interpretation, opinions, conclusions, and assessments of these conclusions should be considered and prepared separately, taking into account potential changes in the form of communication at each stage [7; 10]. The communication strategy should be focused on dialogue. The audience should have the opportunity not only to express their opinion on specific issues but also to participate in preparing the relevant program and have access to those responsible for environmental policy. In the process of comprehensive risk assessment and its subsequent management, the difficulties faced by decision-makers (administrators, lawyers, etc.) should be taken into account. This requires trust in government structures. In this regard, the Human Development Index plays a significant role, with data for 2022 provided in Figure 1 [3].

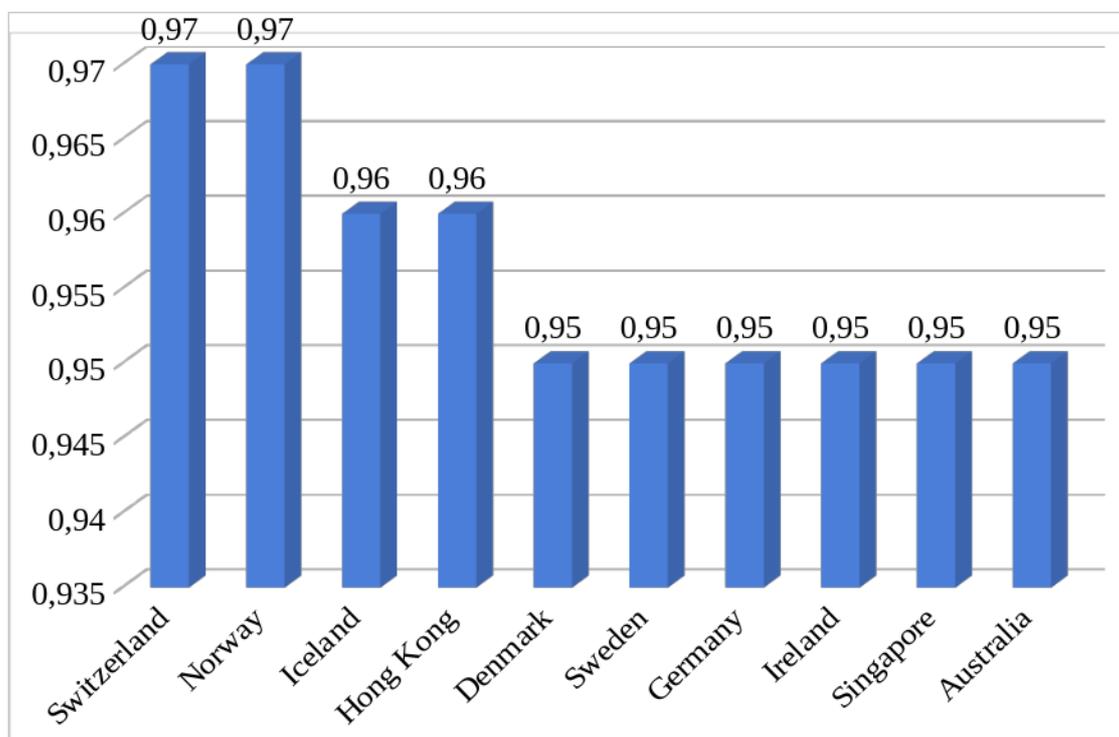


Figure 1. TOP 10 countries by Human Development Index as of 2022

It should be noted that non-governmental organizations and researchers, who are not affiliated with government authorities, are also components of the system. They consider themselves defenders of public interests and act as independent observers in contrast to both government officials (who may advocate for certain political interests) and those whose interests are directly affected. This decision-making practice is referred to as pluralistic.

In contrast, in countries where the ruling elite traditionally has a wide freedom of action in formulating policies, key policy directions are discussed by a relatively narrow group of stakeholders. They seek to reach a consensus among themselves, after which their decisions are simply communicated to the public. This practice, known as corporatism, exists in the United Kingdom, France, Germany, and Japan [6; 7].

Each of these two extreme approaches has its advantages and disadvantages, making it difficult to determine which one is more effective.

Sweden occupies an intermediate position between the mentioned countries, where efforts are made to combine the advantages of both approaches by developing new political decisions through the system of royal commissions with broad consultative functions. However, even here, a worrying trend has emerged of creating too many such commissions, which is a threat to the country's budget.

Modern environmental problems were essentially caused by the fourth technological paradigm, when the diverse use of hydrocarbon resources led to global warming, atmospheric pollution, and the depletion of oil, gas, and coal reserves. Throughout the era of the fifth paradigm, the environmental situation has only worsened. However, relying on the achievements of nanophysics, nanochemistry, and biology, new approaches to addressing global warming have been developed.

For example, at the Loker Hydrocarbon Research Institute in the US, a new solid material based on polyethyleneimine has been developed, which can be used to extract CO₂ from the air. This material is projected to be used in spacecraft, submarines, cars, and manufacturing processes. Its use in factory pipes or even outdoors will help normalize CO₂ levels in the environment and reduce the greenhouse effect. Another example: a group of researchers from the US and the UK has managed to invent and apply Krige intermediates (or biradicals), carbonyl oxides, which react with atmospheric pollutants and create aerosols that effectively reflect solar radiation from the Earth's atmosphere. The distinguishing feature of this type of reaction is its independence from light, meaning the protection process works around the clock [8; 10].

However, solving one problem often leads to new, equally complex ones. Along with the development of nanotechnology, the impact of nanoparticles on the Earth's biosphere is also being studied.

The general approach to the issue of nanomaterials follows this scheme: production of nanomaterials – production and use of goods using nanomaterials – waste and wastewater – waste recycling – landfills. Each of these links has its own approach to environmental safety. For example, when the concentration of nanoparticles exceeds 10 mg per liter, their aggregation and sedimentation begin. Further interaction of nanoparticles with the chemical environment and penetration into water leads to their absorption by plants or living organisms. This can subsequently result in penetration into cells. The study of the interaction of nanoparticles with living cells is one of the main goals of nanosecurity. In fact, the presence of nanoparticles in wastewater is beginning to be noted in developed European countries. However, nanoparticles are already being used on an industrial scale for the production of protective and light-absorbing coatings, sports equipment, transistors, light-emitting diodes, fuel cells, medicines and medical equipment, food packaging materials, cosmetics, and clothing [5; 8].

Looking at the dynamics of the growth in the use of nanoparticles, according to data from Nanotechroject experts, the number of products made using nanotechnology was only 212 types in all industries more than ten years ago, but five years ago, the number had increased to 1317 product types. This represents a 521% growth over five years.

Most of the products—738 items—are in the healthcare and cosmetics sectors. The general statistics by country show the leadership of the United States with 587 items, Europe with 367 items, East Asia with 261 items, and other countries with 73 items (Figure 2) [1].

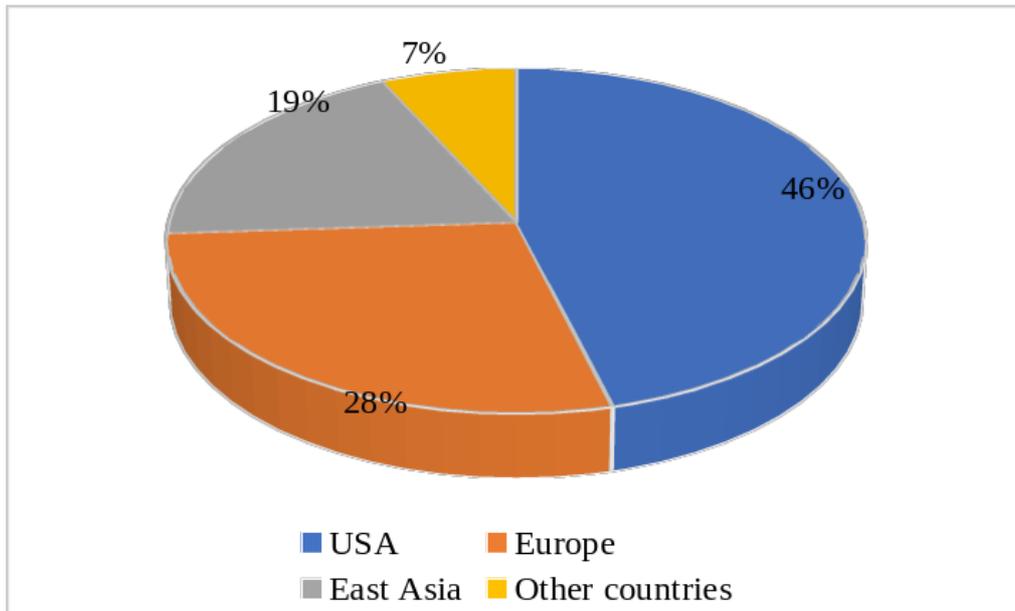


Figure 2. Global percentage distribution of goods manufactured using nanotechnology

When researching and designing industries using nanoparticles, caution is necessary. Due to the considerable uncertainty regarding the impact of nanoparticles on environmental safety, each specific case requires preliminary scientific research into the consequences of production and use of new technologies.

How has the innovation sector responded to the global economic crisis? In the United States, for example, the number of patented inventions decreased by 10%. In Germany, the number also decreased, but in Japan and South Korea, the number of patents increased, indicating that they are already patenting the next technological phase. However, the undisputed leaders in the pace of patent growth during the crisis were China, which increased the number of patents by 30%.

Thus, the theory of long-term technological paradigms points to the direction of a country's economic development and the necessity of changing the mentality. The mentality must change through the realization of the need to create conditions for synergy and the acquisition of competence by every participant in innovation processes and technology transfer.

In Europe, instead of gas, many industries and specific technologies have long been using biofuels. It is indispensable for heating homes with boilers. In recent years, the development of the solid-fuel boiler market has been gaining momentum in both the private sector and municipal utilities in the eurozone countries. Regarding the fuel for these boilers, experts believe Europe leans more towards biofuel. On a state level, consumers of energy-saving technologies are constantly encouraged. For

instance, in Germany, the government has announced a grant (depending on the capacity and type of boiler) available to homeowners who install biofuel boilers or stoves. If purchasing inexpensive equipment, this grant covers half the full cost of such a boiler. A preferential loan with a low interest rate can also be obtained upon request [5; 6].

Currently, Germany has about 17 million boilers and stoves, which can use all types of fuel and operate in both the private sector and municipal energy. According to expert data, around 600,000 biofuel boilers were operating in the country 10 years ago [1; 10].

Pellets as fuel are increasingly in demand. They are made from peat, wood waste, and agricultural byproducts. Italy ranks first in Europe in terms of the number of pellet boilers in the private sector.

Conclusions. Thus, the key functions of state environmental management include all forms of support for the process of achieving mutual understanding in society, uniting the efforts of various public support groups interested in environmental protection, ensuring the inclusion of environmental issues in important economic and political decisions, and systematically collecting, interpreting, and providing environmental information to the public. The result of this activity should be the achievement of the set environmental goals.

Discussion. It is important to note that in recent years, there has been an increasing need for the further development of the humanization of environmental legislation, focusing primarily on the protection of citizens' subjective right to a safe environment for life and health. It is necessary to study and fully consider the positive foreign experience in involving the public in decision-making related to state regulation of environmental safety, and to develop measures for adapting this experience at the global level, taking into account the mechanisms of ensuring environmental safety in countries that have achieved significant success in this area. Such countries include the USA, Germany, and Japan, each of which has certain priority areas for addressing specific issues with positive outcomes for the population and nature, which could also be borrowed for use in the state regulation of similar processes in our country.

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