

# **Feasibility of Improving the Leading Regulatory and Technical Framework for the Digitalization in Modern Legal Reality**

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**Abstract** This paper focuses on the digitalization in modern legal reality with a stress on the feasibility of improving the leading regulatory and technical framework for the development of environmental management technologies. An urgent problem of modern law enforcement is the use of digital technology. Neither the legislator nor the law enforcer is often ready for their implementation in the practical jurisdictional process.

The aim of our paper is to consider the feasibility of introducing the existing digital technologies into the leading law enforcement practice in order to increase the legitimacy and fairness of the enforcement process. This problem is considered on the example of improving the legal, as well as technical and material basis for the development of environmental management technologies which is currently being implemented in the leading countries of the world.

Our results reveal the presence of several objective and subjective issues in the implementation of digital technologies. Moreover, we provide practical recommendations aimed at improving the current legislation to overcome the problems identified in this study.

**Keywords:** *leading regulations, technical framework, digitalization, modern legal reality*

## **1 Introduction**

The task of legislative and executive authorities in the modern world is to best take into account modern technologies in the process of law-making and law enforcement, since otherwise there will be a gap between the achieved level of technological progress and the level at which public administration technologies are located. The defining parameter for characterizing modern legal reality is the use of digital technologies, which permeates both the process of preparing bills and the process of direct law enforcement, in the framework of which information on relevant government regulations is communicated to managed entities. In addition, the use of digital technology in recent years has gained considerable interest in countering violations of the relevant regulations and in organizing a variety of monitoring activities.

The powers of state authorities include the definition, in particular, within their powers, priorities of socio-environmental policy, long-term goals and objectives of socio-environmental development, which should be consistent with the priorities and goals of socio-environmental development of the corresponding state as a whole. This activity includes the development and approval of strategic planning documents, monitoring and control over their implementation. Fixing in development programs certain parameters that the environmental protection sphere should reach in the coming years allows officials, entrepreneurs, and other interested parties to organize their activities in such a way that both state and public interests are taken into account in the future. At present, of particular interest are the new and promising approaches envisaged to improve the regulatory framework of environmental management and suggesting the possibility of introducing digital technologies into the regulatory process which can improve the quality and accuracy of decisions taken by authorities, as well as more effectively detect violations of existing regulations.

The problem that served as the basis for this study is the relatively low degree of digitalization of relations in the field of rational nature management, as well as their insufficient regulatory regulation. The aim of this particular study is to consider mechanisms for improving the efficiency of environmental protection through the use of digital technologies, for which tasks such as analysis of specialized literature, law enforcement practice and existing regulatory material are performed.

## 2. Literature review

A review of the existing literature on the environmental and economic planning of the introduction of digital technologies to improve the efficiency of the environmental management process shows that there are practically no serious monographic studies regarding the study of this problem. The monographs of Burkov et al. (2008) and Vishnyakov and Kiseleva (2016). More numerous scientific articles on environmental planning at the level of an individual subject of the Federation, as an example of such articles are the works of Dubovikova and Grigorjeva (2011), Ivashkina (2009), or Kuzmina and Korolkova (2004), as well as some others.

Bulgakova deals specifically with the use of modern digital technologies for building environmental management processes, this author focuses on the protection of forests (see Bulgakova 2009; Bulgakova 2018; or Gaponenko et al. 2019). The research of Bobretsov (2019) is also devoted to the use of digitalization in this area. Moreover, Lavrishcheva (2019) develops the use of information technology in ensuring the security of land resources.

The use of information technology for building environmental management processes in the use of individual environmental resources is addressed by Koryagin et al. (2018). The number of works analysing the problem of digitalization to various aspects of environmental protection is currently scarce. The most prominent works of this kind are the works of Arts et al. (2015) as well as Markovc et al. (2018). It should be noted, however, that most researchers are currently trying to develop common approaches to the use of digital technologies in environmental management processes, such studies as Kupryushin (2018), Kupryushin and Lugovskoy (2019) or Pushilina and Doroshchuk (2015). The provisions contained in economic development programs relating to the relationship between society and nature can be divided into three groups:

- concerning the rational use of natural resources (for example, reduction of emissions);
- concerning the elimination of the consequences of damage caused to nature (liquidation of objects of accumulated environmental damage, restoration of forests, construction of waste processing plants);
- concerning the development of modern eco biotechnologies that are not harmful to the environment.

It can be noted that it is the latter provisions that are most rarely found in the analysed programs, although the positive dynamics are obvious here. If the programs approved 5-10 years ago only mentioned the need to build environmental management in a rational way, which can be identified with a careful attitude to the resources surrounding the natural environment, less than ten years ago there were references to the need to use digital technologies, that is, to develop new types of industries based on the opportunities presented in this regard by progress in the development of information technology.

The process of changing the views of the developers of the respective development programs looks rather slow, not corresponding to the rate of degradation of natural communities, which is observed almost everywhere. The way out can be found in involving representatives of the scientific community in the development of development programs and in including requirements to build economic development on the basis of the achieved digitalization level ..

As an example of such programs, for example, the Forecast of the socio-economic development of the Russian Federation for 2018 and for the planning period of 2019 and 2020 involves the creation of an ecosystem of the "digital" economy of the Russian Federation through the effective development of markets and industries (fields of activity), in which big data will allow us to reach a new level of economic development. Modern plans for state development suggest the implementation of a set of measures aimed at creating conditions for the development of a "digital" ecosystem on a national scale.

## 3. Methods of assessment

In the process of considering the role of digitalization in modern legal reality, including in the field of development of environmental management technologies, mainly theoretical research methods were used, including such general scientific methods as deduction and induction, abstracting, structural-functional method and special methods (formal-legal , methods of legal construction and technical and legal analysis, systemic). The analysis of special literature and legal acts related to the problem was carried out.

Along with this, an empirical method such as observation was used, during the application of which the emerging practice of using digital technologies was considered on the example of the development of environmental management technologies.

## 4. Perspectives of digitalization

Currently, developed countries live a period of rapid development, due to the processes of informatization. An important indicator of the ongoing changes is the introduction of digital technologies not only in the life of a single

person, but also in the life of the entire urban economy. Modern digital and engineering solutions are used in urban and municipal infrastructure. The ambitious project of digitalization of urban economy can be indicated through the concept of “Smart City”. Similar projects coming from both central governments and local communities are aimed at developing the urban economy and creating its more attractive image, which, in modern conditions, in view of the general aging of the population, are of particular interest to settlements from among small municipalities, single-industry towns, since it helps to attract a larger population and young specialists to this convenient and modern environment. So, at present, the state-supported Smart City project has already absorbed hundreds of cities in such a vast country as the Russian Federation; similar projects are being implemented with more or less success in dozens of other countries of the modern world.

Unfortunately, urbanization processes occurring on all continents adversely affect the natural environment. The city line came close, for example, to various petrochemical plants, oil refineries, which constantly carry out emissions of industrial wastes into the air and the environment. Not only natural landscapes and the ecosystem suffer from this, but also the inhabitants of the settlements where such chemical production is concentrated.

Poisonous emissions make it impossible for residents of the city to breathe fresh air. Numerous appeals to supervisory and state bodies do not significantly change the situation. Citizens attached to their complaints data analysing the state of atmospheric air obtained by processing information from satellites and provided by mobile applications such as AirVisual. It is based on the Air Quality Index (AQI): in addition to a specific figure, the program uses colours - green, yellow, orange, or red, depending on the situation.

By comparing the data of the mobile (mobile) environmental laboratory and the information received from chemical manufacturers, law enforcement agencies together with concerned public representatives get the basis for checking a particular chemical enterprise, in their activities offenses are often detected, including including exceeding the maximum permissible concentrations of polluting substances tens and hundreds of times.

According to (Patarakin and Shustov 2013), modern media (based on digital devices and mobile technologies) are largely changing the nature of the environment - both as a science and as a field of education. This rather pragmatic approach reflects a new reality that arose in the information age and is the result of the rapid development, first, of the techno sphere of mankind.

It seems that only the increased attention of city residents, the use of digital technologies and mobile applications, the discussion of the environmental situation in social networks, allows the city authorities and law enforcement authorities to draw attention to the existing urgent problem. Anyone can find out the state of the air now by downloading the mobile application. The obtained environmental assessment data will satisfy his right to information, to a favourable environment, to compensation for damage caused to his health or property by an environmental offense.

The analysis allows us to say that an urgent need at present is to highlight in the science of ecology such a new concept as "digital ecology", which is based on mobile technologies and services, digital devices that allow you to influence, manage and apply environmental legislation.

## **5. Improving public health**

The development of digital technology allows planning the future development of social services and healthcare facilities at a level that was not possible a few years ago. This is possible based on the analysis of information on the life conditions of each individual and the adoption by the state of appropriate decisions on its results. By analogy with the existing in practice concept of “objects of accumulated environmental damage”, we propose introducing the concept of subjects of similar (accumulated during their life) environmental damage, it will be necessary to include citizens of all modern states among such subjects, although the size of the environmental damage accumulated by them will be different and due to different reasons. Our proposal is to integrate the following data into one information system:

- Maps of the ecological status of territories, including all places of citizens' possible residence, as well as information on the actual places of residence of a citizen during his life;
- Information obtained in the process of conducting a special assessment of working conditions at workplaces and information on the types of work that a citizen carried out in the course of his labour activity;
- Data obtained by healthcare institutions in the process of medical assessment of a citizen's state of health during medical examination.

The idea may consist in the development of a special algorithm, which, based on the above data, would determine the degree of accumulated environmental damage in the body of each person, which will allow him to predict the development of certain diseases. Based on information on the concentration of such citizens in specific localities, in the future, the government may make decisions related to an increase or decrease in the number of

social and medical workers in a given territory. Also, these data can be considered when purchasing this or that equipment and medicines by relevant healthcare institutions.

The availability of information on the health status of a citizen at health care institutions will make it possible to make a qualitative revolution in the development of approaches to protecting the health of citizens. Instead of the current approach, in which, as a rule, measures of general disease prevention are used that are not aimed at counteracting the development of specific diseases and minimizing the negative changes occurring in the body of a particular person and caused by the whole history of his life, such a system will allow developing individual measures prevention, which, based on the existing prerequisites for the development of a disease, allows you to apply advanced measures of impact on health man. From the treatment of diseases that have already arisen, digital technologies will allow us to proceed to the development of methods for their individualized prevention (for example, by prescribing appropriate vitamins and procedures to the patient), which, in our opinion, can be assessed as a new stage in the development of healthcare systems in modern states. Hence, the digital economy and digital society should be socially oriented, aimed at meeting the needs and protection of everyone.

## **6. Digital technologies in the environmental management**

The effectiveness of the practical implementation of the concept of environmental management is currently directly dependent on the introduction of new digital technologies in this area, which, in this case, have five areas of their application: obtaining and accumulating data on the state of the environment; obtaining and accumulating data on subjects interacting with the natural environment; integration and analysis of the data; communication between entities involved in the organization of environmental management processes and state management of these processes.

The introduction of digital technologies in the organization of environmental management implies the involvement of not only technical specialists, programmers, but also biologists, ecologists, economists and lawyers in such activities. The studies themselves concerning the study of the problems of such a study should be of an interdisciplinary nature, since otherwise the necessary systematic nature of the organization of this process will not be achieved.

Currently created information and communication technologies are not only a tool for collecting information on processes occurring in the wild, but also a useful mechanism for monitoring and managing actions aimed at using the resources of the environment.

They allow you to build this activity in such a way as to minimize the load exerted by man on nature. In the event of violations in this area, they allow the law enforcement officer to make decisions based on the fullest possible completeness of data on actions committed by the offender.

Therefore, in order to provide continuous monitoring of the state of use of natural objects allows remote sensing from satellites, wireless data transmission networks, geographic information systems. The International Telecommunication Union (ITU) has concluded that ICTs, like data logging technologies and observing systems, greatly contribute to observing, monitoring and ultimately understanding the environment. However, the task of obtaining and analysing relevant data and the ability to draw appropriate conclusions for future actions require appropriate tools, which are digital technologies.

The process of using digital technologies in the field of environmental management should now be recognized as insufficient. For example, these technologies do not yet play the role that they could play in predicting possible future climate change. Such studies require the analysis of thousands of various parameters over the years, and therefore it is the digitalization processes in this area that allows humanity to give the correct answer to the nature of the changes that occur here.

The traditional work of nature researchers, consisting of visiting various places and collecting different types of data regarding the present state of natural objects, was very tiring for scientists and caused significant economic costs for the state. Modern devices based on digital technologies can help solve this problem: they are able to work for a long time without human intervention in real time transferring the parameters of their natural environment. In addition, many data of this kind can be directly obtained by digitally photographing the surface of the planet from outer space.

The use of artificial neural networks, which are a prototype of artificial intelligence and allow us to draw conclusions based on the analysis of a large amount of data that the physical capabilities of an ordinary person, has great prospects in organizing environmental management processes.

Recently, the need for wider use of decision support systems, a special class of computerized information systems that support the organization's decision-making activities, has been discussed. A well-designed DSS is an interactive software system designed to help policy makers gather useful information from raw data, documents, and personal knowledge, identify and solve problems, and make decisions. Similar systems are already being used to protect some especially valuable natural objects. For example, in Tanzania, the National Water Law focuses on "water models and decision support systems" as tools for implementing water policy and to achieve an integrated multisectoral approach (see Meena and Singh 2013).

The main step in modern informatization of environmental management processes is the creation of a unified automated forestry industry information system. Its main goal is to unite on a digital platform information on forest resources contained and processed in various information systems of various departments. A digital platform should include a set of hardware, communication channels, management technologies, techniques and software products for the collection, use, integration, visualization, and analysis of data in the field of forest relations. Creating a unified industry information system will allow to solve the following tasks: optimize information flows; reduce time spent on receiving and exchanging information; increase control over the reliability and consistency of data from different sources; reduce paperwork and deadlines; to increase the validity and legitimacy of managerial decisions at the federal and regional levels; eliminate data duplication; increase the relevance of data on the natural fund; increase transparency of the natural resources market.

As Tkacheva (2019) indicates, the construction of three-dimensional maps of the environment and the integration of existing databases will ensure a high level of verification of information regarding the present state of nature objects and formulate new approaches to their quantitative and qualitative accounting. They will ensure the unity of the information received and guarantee a qualitatively new level of managerial decision-making.

## **7. Results and discussion**

The policy of modern states in the management, reproduction and use of natural resources is based on two fundamental principles: rational and efficient environmental management and environmental safety. The main goal of environmentally oriented socio-economic activities of society should be non-violation of ecosystem integrity, not exceeding the objectively existing limits of economic capacity. Overcoming the shortage of resources is one of the goals of the innovative development of any economic system. That innovation is an effective way to overcome the scarcity of resources, the implementation of innovation is one of the methods of rationalizing the use of resources. The goals of environmentally oriented socio-economic activities do not contradict, but are consistent with the goals of innovative development, and, therefore, are achievable precisely with the use of innovation.

Information technologies in the field of public administration in general, as well as in the sphere of managing the process of organizing rational environmental management, are the implementation of actions to provide timely and complete information to management entities at a given frequency. An analysis of established practice allows us to distinguish three varieties of such technologies:

- production, which provide the improvement of technological processes;
- information, which increase the efficiency of the processes of the information sphere of society;
- social, which are the rational organization of relationships between people.

The system of state environmental management is currently characterized by incomplete determination of the role and importance of digital technologies in organizing the process of rational environmental management, which prevents the development of a unified environmental policy in this regard.

The latest information systems, the use of satellite remote sensing data, electronic maps have already become important elements of modern environmental management. The current state of informatization of the natural economy allows the effective implementation of geoinformation technologies at all levels of forest management, as well as effective remote monitoring of the circulation of natural resources. Information technologies make it possible to increase the efficiency of environmental and economic functions due to the ability to quickly and without errors process large amounts of information, obtain statistics on the natural resources, process and design environmental measures in large areas in the shortest possible time.

It can be argued that the digitalization of various spheres and sectors of the world economy is developing at different rates; environmental management processes have also been affected by digitalization, but the experience of different states in this regard is very heterogeneous. Local digitalization processes allow you to create a model of individual technological operations, designed to improve the quality of use of natural resources. The high degree of penetration of digital technologies in the activities of environmental entities provokes global changes in the quality of this process.

## **8. Conclusions**

Currently, there is a contradiction in the world between the ongoing development of digital technologies for more efficient and careful environmental management and the slow introduction of these technologies directly into the field of environmental protection. In this case, it is necessary to determine and form the appropriate material base, as well as improve the regulatory material in the field of environmental management.

Abuses and mistakes in the process of organizing rational environmental management have profoundly serious consequences of a social nature. The destruction of natural ecosystems harms not only the plants and

animals living in these territories, but also directly affects human rights to ensure a favourable environment. This circumstance makes it possible to use all the resources of society to improve the organization of this process, in this area all the novelties of scientific and technical thought should find their application.

Extensive interdisciplinary research and cooperation between representatives of various fields of scientific knowledge will allow us to raise the use of digital technologies to a new level, which will open new opportunities and directions for their use in environmental protection. Digital technologies can also be considered as now a factor transforming the activities of both the legislator and the law enforcer, which forces both researchers and direct users of nature to reckon with themselves.

With regard to our findings, one has to note that it is important to hold the conferences and to organize the international cooperation in this field in order to mobilize and build the interaction of specialists in the field of digital environmental protection. The problem of nature conservation is global in nature, and modern states do not have the right to refuse to participate in their solution.

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