



## Model of international scientific and technical cooperation in the context of globalization and development of territories

## Modelo de cooperación científica y técnica internacional en el contexto de la globalización y desarrollo de los territorios

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### ABSTRACT

Currently a great number of problems have accumulated regarding the Arctic agenda in international legal, military, socio-economic, environmental, and scientific spheres. The authors of the study believe that international collaboration in the scientific and technical sphere, built upon a legal basis, is the first direction of mutually beneficial interstate collaboration in the Arctic region. The development of international scientific and technical collaboration in the field of complex Arctic study presupposes a comprehensive approach with regard to economic, legal and political aspects, and analyzing static and dynamic indicators. Thus, it is necessary to develop a legal model of collaboration. The development of the legal model of international scientific and technical collaboration in the field of complex Arctic study involves a range of actions aimed at improving the regulatory and conceptual framework, changing the system of state management of scientific and technical collaboration in the Arctic zone in order to ensure a consistent policy and eliminate existing problems.

**Keywords:** Complex Arctic study, international collaboration, legal model, scientific and technical collaboration.

### RESUMEN

Actualmente se ha acumulado una gran cantidad de problemas en torno a la agenda del Ártico en los ámbitos internacional legal, militar, socioeconómico, ambiental y científico. Los autores del estudio creen que la colaboración internacional en la esfera científica y técnica, construida sobre una base legal, es la primera dirección de la colaboración interestatal mutuamente beneficiosa en la región del Ártico. El desarrollo de la colaboración científica y técnica internacional en el campo del complejo estudio del Ártico presupone un enfoque integral con respecto a los aspectos económicos, legales y políticos, y el análisis de indicadores estáticos y dinámicos. Por lo tanto, es necesario desarrollar un modelo legal de colaboración. El desarrollo del modelo legal de colaboración científica y técnica internacional en el campo del estudio ártico complejo implica una serie de acciones destinadas a mejorar el marco normativo y conceptual, cambiando el sistema de gestión estatal de la colaboración científica y técnica en la zona ártica para asegurar una política consistente y eliminar los problemas existentes.

**Palabras claves:** Estudio complejo del Ártico, colaboración internacional, modelo legal, colaboración científica y técnica.

## 1. INTRODUCTION

At present, there is no unified international legal framework for scientific and technical collaboration in the Arctic, although in May 2017 the Arctic Council signed an Agreement on Enhancing International Arctic Scientific Cooperation (2017), the purpose of which was to enhance collaboration in scientific activities in the Arctic and increase the effectiveness and efficiency of scientific research.

The life of a present-day society is to a great extent determined by the development of its scientific and technical potential. The high rate of new knowledge accumulation and the creation of innovative products are key factors that secure both the competitiveness of national economies and the efficiency of national security strategies. Global technologies, generated by scientific and technological progress have brought about a more intensive collaboration among states, and, as a result, the sphere of international legal regulation in the field of science, technology and engineering has significantly expanded. The exchange of scientific and technical achievements between states results in new forms of scientific and technical collaboration, new types of international agreements allowing partner states to maximize their benefit. Globalization and integration processes call for a special attention to the issue of developing a legal model that regulates international scientific and technical collaboration in the system of international law, which is especially relevant in the field of complex Arctic study, since in recent years the Arctic has become a region of high priority for countries interested in its development. At the same time, some issues on complex Arctic study are yet to be solved. This is mainly due to the complexity of the impact caused by geopolitical, economic, social, cultural, environmental and other factors. The primary aim of the current research is to investigate the nature of the legal model of international scientific and technical collaboration in the field of complex Arctic study by analyzing theoretical and philosophical approaches, categorical and terminological apparatus, where the legal model is the core term.

## 2. LITERATURE REVIEW

Over the recent years, the terms “model”, “legal model”, “model of legal regulation” have become increasingly common in scientific publications. In academic domain, there is no unified approach to the understanding of the term “model”, which indicates the ambiguity of this term both in scientific and legal spheres. A similar situation is observed with respect to the term “legal model”, which requires research in this direction. Modeling has come a long way from reproducing surface properties and relationships of objects to Galileo Galilei's models which penetrate the secrets of nature and the laws governing it. Scientific models were recognized by natural scientists in the 19th and 20th centuries, and science today could hardly be imagined without models. So, I. Newton (1989) in his work “Mathematical Principles of Natural Philosophy”, when describing the system of the world, proposed the rules of reasoning in philosophy, which have remained to be the basis for modeling until now. Modeling has become a rigorous method and a reliable assistant to science (Glinsky et al., 1965). It was not until the seventies and eighties of the 20th century that methodology of legal science became enriched thanks to the active application of the modeling method. The necessity to apply the modeling method was determined by the trend of integration and systematization of the accumulated scientific knowledge, the impetus for this was the development of a general theory of systems in philosophy. Since the 1980s, a number of relatively new for Russian legal science quantitative methods have been used in research: statistical analysis of legal norms, computer processing of legal information, economic analysis of law. A. Rosenblueth and N. Wiener (1945) consider “Models, formal or intellectual on the one hand, or material on the other, are thus a central necessity of scientific procedure. At the same time, mathematical tools became widely used for processing the results of legal research, the modeling process started to be considered from the viewpoint of law and mathematics. Over the recent years a number of fundamental studies have appeared devoted to the theory

of games in law. Game theory allows researchers to model the behavior of participants in legal relations and determine the potential results of the interaction of subjects (predictive modeling). Among the fundamental studies in Russian legal science, the works by D.A. Degtyaryov (2011a; 2011b; 2014) and the monograph by E. Rasmusen (2007), devoted to the practical application of game theory in various branches of law, are worth mentioning. It is necessary to take into account the objective limits of mathematical and other quantitative methods applicability in studying state and legal phenomena. In this regard, there is a need to build a theoretical foundation for the application of the modeling method in all diversity of its variations, considering the specific features of legal knowledge and legal phenomena. Prominent legal scholars developed the theory of modeling in law (Rudashevskij, 1980; Levanskij, 1986; Gavrilov, 1980). In the early 90s, modeling became an independent tool of legal science. In support of the statement, the following case can be cited: B.B. Tsybikov (2006, p. 18) defines the legal model as “a set of constitutional principles of the Russian state. Legal dualism, that is, the gap between traditional customary law and new positive law, stands out as a universal fundamental feature for all modifications of the legal model in Russia”. Much attention to the terminological component is paid in the PhD thesis by G.V. Sincov (2009). According to the researcher, the term “constitutional and legal model of the institution of a referendum” includes two parts: structural and substantive. The model is considered as a structural-substantive form, including a set of theoretically possible situations of application of the institution of referendum provided by the legislation of the state (structural component), as well as constitutional and legal criteria, based on which individualizing features of each theoretically possible situation of application of the institution of referendum can be identified (substantive component). The author also uses the term “submodel of the institution of referendum” understood as a separate theoretically possible situation of holding a referendum provided by state legislation, which has a unique set of constitutional and legal features. The legal model of the financial services market is viewed as a “system of norms ...” (Semilyutina, 2005). The term “legal model”, among others, is used in studies devoted to problematic issues of patent law (Voroncova, 1996), trust property (Sokolova, 2011), local governance and self-government (Mihalyova, 2005).

A.S. Bezrukov (2008, p. 22) examines the category “legal model” in relation to those adjacent to it and gives the following definition: “it is a form of legal reality reflection created as a result of abstraction, idealization (for theoretical and metatheoretical models) or observation (for material models). It is in correspondence with the object under study and serves as a means of abstraction and expression of the internal structure of a complex legal phenomenon (or visualization in describing objects of the material world). This form of legal reality reflection carries information about the object or performs a special descriptive (demonstration) task”.

Thus, the analysis of the use of the terminological combination “legal model” has confirmed its situational nature, which causes terminological discord and leads to the erosion of its semantic content.

### 3. METHODS

We employed several scientific methods throughout our research. The philosophical and legal method allows analyzing the nature of the legal model in scientific and technical collaboration. The comparative method is a means of distinguishing the similar and different features of phenomena and processes within the framework of studying theoretical and regulatory basis. Applying systemic approach to researching the legal regulation of the scientific and technical activity enabled us to see the investigated phenomena and objects as a subsystem of a larger system of the international collaboration rather than as an independent system in separate scientific fields. The method of regional specificity made it possible to study the legal regulation taking into account a complex of regional problems of the Arctic and international trends in the development of law.

As it has been mentioned above, the terms “model” and “legal models” are polysemantic and require interdisciplinary consideration from the view point of the theory of state and law, philosophy of law. Some aspects of their meanings can only be clarified with the help of linguistics, social science, and political science.

We suggest specifying the features of the “legal model” term in relation to the research topic.

1. In the theory of state and law “model” is considered as an intellectual and volitional description of the process or phenomenon of state and legal life. In this research the international scientific and technical collaboration is an object of modeling.

Collaboration involves joint activities, contribution to the solution to the problem, interaction and mutual assistance. With regard to the field of international scientific and technical collaboration, we can talk about joint research, search for solutions to scientific and technical problems, sharing expertise, joint training of highly qualified personnel, creation of joint “mirror laboratories”.

The system of international scientific and technical collaboration includes international scientific relations, personnel training, international assistance in carrying out projects, the development of technological processes, ensuring the safe application of new scientific and technological products, and prevention of environmental damage. Scientific and technical collaboration is complex and includes scientific, technical, technological and material collaboration. The diversity of forms and types of collaboration must be reflected in the legal regulation of emerging social relations. Thus, the modeling of international scientific and technical collaboration is a means of understanding the process in the variety of its types and forms. The developed legal model can be classified as an ideal model, according to some criteria, for it acts as an abstraction of existing social relations in the field of scientific and technical collaboration. The system of legal norms regulating the processes of international scientific and technical collaboration may be considered as a model of the proper behavior of subjects in the area under consideration. However, the focus of the study is on the development of a real legal model. While developing the model, not only the system of legal norms is studied, but also the experience of their implementation both in the Russian Federation and other countries. The realistic nature of the model is determined by the fact that the scientific and technical collaboration modeling is carried out in relation to the specific practical area, which is a complex Arctic study. The emphasis is on establishing real ties, comparing normative regulation and state legal practice rather than construing an ideal image of legal reality, an abstract theoretical scheme of scientific and technical collaboration.

2. The legal model of international scientific and technical collaboration includes the characteristics of its constituent elements and their interrelations. Since we are dealing with modeling cooperation as a process, it is necessary to take into account the change in the legal model over time and the dynamics of this change.

3. The developed model of international scientific and technical collaboration in the field of complex Arctic study is interpretative and explanatory.

According to V.A. Shtoff (1966), the explanatory feature of the model helps reveal the mechanism of a complex phenomenon, its internal static and dynamic structure. The model serves as an interpretation, because it reproduces the structure or mechanism of the studied, but previously unknown phenomenon by analogy with the mechanism or structure of known phenomena. The interpretative nature of the developed model is justified by drawing on the accumulated scientific knowledge about international scientific and technical collaboration to study similar processes in the field of complex Arctic study.

4. In the course of this research, a model of international collaboration is being developed, which predetermines a higher degree of its flexibility and adaptability. The norms and procedures of the so-called “soft law” play a special role in the process of creating and implementing the provisions of international acts. Consequently, one of the features of the model is the nature of interaction between the subject states: conciliation procedures and the drawing up of joint plans and programs are becoming increasingly important. A.N. Chertkov reasonably underlines the need to take into account the political factor in the process of modeling international scientific and technical collaboration: the planetary scale of processes in the socio-economic sphere generates common interests. In accordance with the principle of the transition from quantity to quality, the collective efforts of states come into resonance, which increases the effect of partnership.

5. The legal model under development should, as far as possible, replicate the essential properties of the modeled process of international scientific and technical collaboration. It is this feature that proves the practical importance of developing the model, which is to become a means of understanding the real process of legal impact on the sphere of international scientific and technical collaboration. The process of developing a legal model also involves the identification of existing problems and ways to eliminate them. As noted in scientific researches, the creation of a predictive model of regulatory legal acts allows reducing the number of ineffective, socially irrelevant norms, and improving the quality of legislation (Salygin, 2013). The predictive capabilities of modeling are especially important in the context of the ongoing research, since we are talking about the study of dynamic processes. The significance of the predictive function is also evidenced by the normative consolidation of the term “prediction” in the Federal Law “On Strategic Planning in the Russian Federation” (Federal Law of the Russian Federation No. 172- FZ, 2014). Prediction is recognized as an integral element of the Russian model of strategic planning and is understood as “the activity of participants in strategic planning to develop scientifically grounded ideas about the potential risks of socio-economic development, about threats to the national security of the Russian Federation, about the directions, results and indicators of the socio-economic development of the Russian Federation, constituent entities of the Russian Federation and municipalities”.

It is necessary to underline that the significance of modeling is not limited to a predictive function. I.V. Fatyanov believes that the subject of modeling will deal with a sequence of stages:

- comprehension of the essence of a particular system;
- system management, that is, defining effective methods of influence;
- prediction, that is, the process of envisioning the prospects for the further development of the legal process.

The practical value of state legal modeling lies in the conclusions resulted from the analysis of the planned state legal decisions (Fatyanov, 2017). Firstly, we object to reducing management as a phenomenon to the process of searching for ways to influence, as the existing scientific and vocabulary definition of the term is broader and includes the corresponding power activity, system of agencies and a mechanism. Secondly, the objectives of modeling are wider, a model has not only predictive, but also methodological and epistemological significance.

#### **4. RESULT AND DISCUSSION**

We believe that the development of a legal model of international scientific and technical collaboration in the field of complex Arctic study involves:

1. Defining, studying, interpreting and correcting the system of the following interrelated elements:

A) Creation of a conceptual theoretical basis, research of the content and correlation of normatively fixed terminology in the field of study;

B) Analysis of law enforcement practices, regulatory legal acts and the dynamics of their change, regulating scientific and technical activities in the Russian Federation;

C) Determination of the priority directions of the state in scientific and technical activities and studying the legal and organizational measures taken to support them;

2. Study of the theoretical and regulatory framework for scientific and technical collaboration in the field of complex Arctic study in foreign countries;

3. Establishing relations between states in the field of scientific and technical collaboration and determining the normative, dynamic and quantitative parameters of the system of international scientific and technical collaboration in the field of complex Arctic study;

4. Analysis of legal risks, conflicts prediction within the framework of the constructed model, comparison of approaches to the legal regulation of scientific and technical collaboration in the field of complex Arctic study in the states included in the model, and a comparative assessment of their effectiveness;

5. Development of proposals for adjusting the legal model of scientific and technical collaboration in the field of complex Arctic study.

A dynamic legal model can be presented in the form of a cycle, rather than in the form of a scheme, for it is seen as a steady progress and not as a sequence of stages. The cycle includes:

I. Defining the theoretical and practical (legal and regulatory framework, law enforcement practices) base of the model.

II. Setting the parameters of the model (elements and their interconnection, qualitative and quantitative indicators);

III. Defining the ways of enhancing the performance of the model and its elements;

IV. Correcting the model with a subsequent returning to point I.

In our case we are dealing with the studying, interpretation and adjustment of the model which has already been formalized as regulatory legal acts of various types, law enforcement acts, statistical indicators, characterizing scientific and technical collaboration, so there is no need to separately single out the stage of formalization of the model.

The objective to develop a real legal model raises the question of its implementation. The term “implementation of a legal model” has appeared recently in the theory of law and has being used in scientific research devoted to the general problems of modeling as a method of legal research.

It seems that the content of the term “implementation of the legal model” should be clarified, considering the specific nature of this research. As the development of any legal model does not precede the processes of scientific and technical collaboration in the field of complex Arctic study, but on the contrary, the model is developed on the basis of knowledge of the already established system of relations, the implementation of the legal model will involve the proposal of formalized measures for its local correction

(the element of the legal model relating to the Russian Federation), the adoption of the relevant legal norms and their subsequent implementation in legal relations.

Summing up the results of the theoretical and philosophical study of the legal model of scientific and technical collaboration in the field of complex Arctic study, it is necessary to formulate key conclusions.

1. The term “legal model of international scientific and technical collaboration in the field of complex Arctic study” involves taking into consideration the dynamic aspects in the form of collaboration. The legal model cannot be developed without taking into account extra-legal factors, which act as social and political environment for the functioning of the legal model.

2. Modeling international scientific and technical collaboration is a means of understanding the process in the variety of its types and forms. Considering the features of the developed model, it can be classified as a real model, since in the process of its development, not only the system of legal norms is studied, but also the practice of their implementation in the Russian Federation and other countries.

3. The legal model of international scientific and technical collaboration includes both characteristics of constituent elements and their interaction with each other. The research focuses on a dynamically developing model which performs interpretative, explanatory and predictive functions. The developed model is to be flexible and adaptable to a significant degree, as it is a model of international collaboration.

4. The legal model of international scientific and technical collaboration in the field of complex Arctic study is a description of an intellectual and volitional character. It explains and interprets the process of international scientific and technical collaboration in the field of complex Arctic study in order to determine the optimal legal regulation and predict the results of its implementation.

5. The development of a legal model of international scientific and technical collaboration in the field of complex Arctic study involves defining, studying, interpreting and correcting the system of the following interrelated elements:

- creation of the conceptual theoretical basis;
- study of the content and correlation of the normatively fixed terminology;
- analysis of law enforcement practice, regulatory legal acts and the dynamics of their change;
- determination of priority directions in scientific and technical activities for the state, study of the legal and organizational measures taken to support them;
- investigation of the theoretical and regulatory framework for scientific and technical collaboration in the field of complex Arctic study in other countries;
- establishing ties between states in the field of scientific and technical collaboration and defining the parameters of collaboration in the field of complex Arctic study;
- analysis of legal risks and conflicts prediction;
- development of proposals for adjusting the legal model of scientific and technical collaboration in the field of complex Arctic study.

A dynamic legal model can be presented in the form of a cycle rather than a diagram, since it is assumed not in stages, but in the continuity of the process.

## 5. CONCLUSION

In the paper we have shared the findings gained through the research of the categorical apparatus and terminological field, the core of which is the legal model. We have also clarified the features of the legal model concept in relation to the subject of the research. As a result we present our definition of the nature of the legal model of international scientific and technical collaboration in the field of complex Arctic study. We view this model as the intellectual and volitional description, which explains and interprets the process of international scientific and technical collaboration in the field of complex Arctic study with the aim of determining the most optimal legal regulation and predicting the results of its implementation.

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