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Resilience of Arctic Communities: Concept, Methodology and Research Directions

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Abstract. This article is aimed at scientific review of theoretical and methodological approaches to the study of social (community) resilience and its empirical applicability in the context of territorial development of the Arctic. The relevance of this research is determined by the need to solve the problems of sustainable development of the Arctic region in the context of economic, social and natural challenges. Using the method of knowledge contextualization, the paper analyses various definitions of the concept of resilience, and describes factors and strategies for community resilience. It concludes that social resilience is the ability of communities to be flexible and able to adapt in response to external influences. Social resilience is difficult to measure and control; however, resilience factors are potentially observable using quantitative and qualitative methods, enabling the development of community resilience strategies. These strategies should be based on local realities, since they will take different forms depending on the community, and the idea of resilience itself will manifest in different ways. This justifies the need for empirical studies that would provide longitudinal data on social resilience in a particular area. Using the Arctic region as an example, the article presents foreign and Russian experience of research on social resilience in the context of global changes. It concludes that the development of resilience in Arctic communities requires a systematic approach, which should be based on knowledge of how local communities respond to global challenges.

Keywords: *resilience, social system, contextualization, theory, practice, methodology, sustainable development, Arctic, local community*

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Introduction

For a long time it was assumed that the main interest in the Arctic would be associated with the development of natural resources, but today one of the central topics of Russian and foreign scientific research is the global changes that are taking place in the region. Scientists are actively discussing the issues of Arctic development in the context of natural and socio-economic challenges. It is noted that against the background of global changes, the probability of various kinds of risks, which are characterized by unexpectedness and can endanger the livelihoods of local communities, is increasing. Under these conditions, the sustainable development of socio-

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economic systems of the Arctic becomes a fundamental problem. Attempts to solve this problem are being made in studies of the phenomenon of resilience as the ability of social systems to withstand external challenges and threats.

The term “resilience” came to social sciences at the beginning of the 21st century from natural science, where it literally translates as “elasticity” and reflects the ability (measured in quantitative values) of physical objects to recover shape after some impact without transitioning to another state. In the late 1960s and early 1970s, the term was used by analogy in the theory of ecological resilience with a focus on studying how ecosystems respond to various external influences [1, Folke C.]. From the late 1970s to the 1990s and in subsequent years, the resilience metaphor was tested on socio-ecological systems, initiating the consideration of a new concept as a “borderline” phenomenon between the natural and social sciences [2, Adger W.N.; 3, Norris F.N. et al.; 4, Wilson G.; 5, Davidson D.J.; 6, Barrett C.B. et al.]. Since the early 2000s, the concept of resilience began to gradually replace the concept of sustainability. Over the past two decades, there has been a revival of attention to society as a crucial arena for solving a range of problems. Scientists argue that it is important to understand how communities respond and adapt to various challenges and changes at the local level, and then move on to national and regional programs and plans for sustainable development [2, Adger W.N.; 5, Davidson D.J.]. For this aspect of the topic under consideration, foreign literature uses the concepts of social resilience or community resilience.

Thus, taking into account the novelty, relevance and prospects of the topic, the goal was to review foreign and Russian perceptions of the phenomenon of social resilience and to find out how this concept is represented in Arctic research.

Materials and methods

The main subject material of the study was scientific articles by foreign and Russian authors in the field of social and socio-economic sciences. Scientific articles were selected from the international scientific database Scopus, on the information platform ScienceDirect of Elsevier publishing house and in Russian scientific electronic libraries, mainly Elibrary.

The literature review was carried out on three aspects of the problem: concept, factors and strategies of social resilience. For this purpose, the method of contextualization of knowledge was used, the essence of which is to find contexts in the subject areas under consideration, which reveal the genesis, development and functioning of the concept of social resilience. This method allows us to identify gaps and problematic issues in the existing theoretical knowledge and to identify promising areas of research on the topic under consideration.

In order to analyze the resilience of the Arctic communities, we studied the Arctic Resilience Report [7, Carson M. et al.], prepared by experts of the Arctic Council, as well as scientific articles by foreign and Russian authors, which provide examples of empirical studies of the resilience of Arctic communities.

Review of foreign studies

Currently, there is no single definition of the concept of “social resilience” in Western science, as well as no uniformity in the linguistic expression of this phenomenon, for which the phrases “social resilience” or “community resilience” are used. According to the available theoretical approaches, resilience is understood as the ability of a system to respond to disturbing influences and to change, while maintaining its structure and functions [3, Norris F.N. et al.; 5, Davidson D.J.; 6, Barrett et al.; 8, Convertino M., Ververde Jr.]. In this approach, resilience is an element of adaptive potential, which is understood as the ability of communities to adjust to external changes and maintain their initial state.

The general methodological approach to the consideration of social resilience is based on the study of a specific territory in the totality of its geographical, natural, climatic, and economic characteristics, which form the context for studying the specifics of social organization and life activity of local communities. Within the framework of the concept of territorial development, social resilience is most often understood as the ability of local communities to successfully cope with various challenges and maintain viability under the influence of external threats [3, Norris F.N. et al.; 5, Davidson D.J.; 6, Barrett C.B. et al.; 8, Convertino M., Ververde Jr.].

A threat is considered to be the probability or actual occurrence of such phenomena or events that are anomalous, contain an element of surprise and carry a high risk of negative consequences for local communities. The authors emphasize that the more complex the social systems are, the more likely the occurrence of such events is; therefore, in such systems, unexpectedness is more common than predictability [3, Norris F.N. et al.; 6, Barrett C.B. et al.].

The analysis of the definitions of social resilience allows us to conclude that community resilience should be viewed not as a result, but as a process of development of key elements of resilience. Unlike the theory of stability adopted in natural science, a return to the initial state is not necessary. It is much more important that a social system is able to change and/or adapt in response to external influences [9, Holling C.S.].

Social resilience can be considered at the micro, meso and macro levels of social life. However, the resilience of individuals does not determine the resilience of social systems as a whole. Local communities are interpreted as heterogeneous systems, therefore, social resilience, unlike individual one, covers various connections and relations that cross all levels of social organization [3, Norris F.N. et al.; 4, Wilson G.; 8, Convertino M., Valverde Jr.; 6, Barrett C.B. et al.].

One of the debated issues is the question of what determines the resilience of communities. Based on the existing social theories, researchers argue that social capital is the most significant factor of community resilience in crisis situations [3, Norris F.N. et al.; 5, Davidson D.J.; 6, Barrett C.B. et al.]. The idea of social capital was originally proposed by P. Bourdieu and supplemented by R. Putnam; it is based on stable social ties, interaction, communication and trust between community members. This concept was then expanded to include “economic” and “natural” capital. Thus, social, economic and natural capital form the adaptive potential of communities, which

makes it possible to assess resilience both at the level of individuals and at the level of the community as a whole. According to scientists, communities that combine strong economic, social and natural capital are characterized by a high level of resilience. Communities where only two capitals are well developed can be characterized as moderately resilient or vulnerable, and communities that have only one well-developed capital (monofunctional communities) or do not have it at all, as a rule, are characterized by low resilience and high vulnerability [2, Adger W.N.; 4, Wilson G].

In practice, communities with a high level of resilience are extremely rare. In most cases, they have a certain set of indicators of vulnerability, such as high population migration or dependence on a particular economic sector. In this regard, Western researchers believe that the maximum possible viability probably cannot be achieved, so it should be considered as an ideal state [8, Convertino M.].

There is currently no consensus among Western scholars on the best ways to create resilient communities, due to the small number of empirical studies on this topic. Since most of the works focuses on just a few countries and selected examples of external impacts, the lack of generalizable evidence makes it impossible to objectively assess whether communities can build resilience and how.

According to available research, social resilience can be developed in two ways: either preventively, by developing risk-based territorial management strategies (formal development), or “bottom-up” through the development of social capital (informal development) [6, Barrett C.B.]. Informal resilience development can include providing support for local community activities that will help to involve local residents in various functions, develop their activity, sense of ownership and strengthen trust in authorities. It is also believed that the implementation of resilience strategies can find its most direct expression only at the level of an individual community, since political decisions have tangible results only at the local level [3, Norris F.N. et al.; 4, Wilson G.; 8, Convertino M., Ververde Jr.; 6, Barrett C.B. et al.]. In other words, any political decisions, such as the adoption of regional programs, are ultimately mediated and turned into actions with tangible consequences for local communities and its individual members. This is because local communities are embedded in more complex hierarchies of social organization at the regional, national and global levels. Accordingly, resilience strategies should be grounded in local realities, as they will take different forms depending on the community and available resources, and the idea of resilience will manifest itself in different ways.

Review of Russian studies

The main directions of Russian research on resilience are related to solving the problems of sustainable development of territories (territorial resilience) in the context of economic, social, and natural factors affecting it. Russian scientific discourse often uses the calque “resistance” [10, Klimanov V. et al.; 11, Odintsova A.; 12, Korezin A.S., Murashov S.B.]. Howev-

er, in some works, there are such options as shock resistance [13, Zhikharevich B.S. et al.] and viability [14, Zamyatina N.Yu. et al.].

The territorial resilience of socio-economic systems is understood as the ability of the system to endure, to respond to sudden changes in external conditions, and also to quickly recover from them. In terms of content, this concept includes the following elements: the ability of the system to a) anticipate and prevent, b) resist and absorb, c) react, d) adapt, and e) recover [13, Zhikharevich B.S. et al.]. In turn, for each component of resilience, Russian scientists propose to develop a system of indicators, as well as methods for their quantitative and qualitative analysis for each element [11, Odintsova A.]. The assessment of each of the components makes it possible to identify the resilience potential, reflecting the degree of reliability of the system under disturbing influences. Such an expanded understanding of resilience makes it possible to use it as a methodological framework for researching and explaining various socio-economic phenomena and processes, studying ways to reduce the vulnerability of socio-economic systems in the context of global challenges, as well as developing specific measures to increase the resilience of societies and their adaptation to external influences [11, Odintsova A.; 12, Korezin A.S., Murashov S.B.].

Economic resilience, or shock resistance, of territories is considered on the example of cities, labor markets, infrastructure, logistics chains, etc. [15, Vazhenin S.G., Vazhenina I.S.; 11, Odintsova A.; 14, Zamyatina N.Yu.]. In the context of economic development of territories, various aspects of social resilience, or resilience of social systems, are studied [12, Korezin A.S., Murashov S.B.]. This direction analyses aspects of the applicability of the concept of social resilience to social systems, defines its essence, factors affecting the formation of resilience of individual social groups in crisis, instability or shock, develops tools for assessing the resilience of socio-economic systems.

A separate block of scientific works is devoted to the resilience (or sustainability) of socio-economic systems in the context of various environmental risks. The impact of global warming and an increase in extreme climatic phenomena in the Northern and Arctic regions of Russia on human living conditions is considered in the works of V.V. Vinogradova. The author and her colleagues believe that the assessment of climatic conditions in the Arctic and forecasting the future are very important for the life of the local population [16], it can be used to develop a system of indicators of natural and climatic factors that affect the living conditions of the population at the regional level and for the zoning of the territory, as well as the development of regulatory documents governing the life of the population in the Northern and Arctic regions [16].

Resilience of Arctic communities: research directions

Western science emphasizes that the intensification of economic activity, as well as the global nature of environmental changes, can have serious consequences for the inhabitants of

the Arctic. In this regard, the development of comprehensive strategies for the resilience of the Arctic communities is of particular relevance. The main research in this direction is conducted within the framework of the ecosystem approach and is related to the consideration of how various theoretical models of social resilience manifest themselves in the practice of resilience of Arctic communities to various natural risks caused by climate change [17, Desjardins S.P.A. et al.].

In 2016, the Arctic Council, in an attempt to understand climate risks for sustainable development, released a report on Arctic resilience [7, Carson M. et al.]. The main conclusion of the Arctic Council experts is that understanding and responding to the threats caused by climate change requires a systemic approach, which should be based on knowledge of how local communities react to these changes. In this context, resilience is seen as a way to respond to natural challenges. It is emphasized that social data are important for climate change modeling studies, which focus on ecological and climatic datasets, while the use of social data remains minimal [7, Carson M. et al.].

Distinctive features of the Arctic communities are that they are linked by natural-geographical, social and cultural ties, forming a single whole. However, the nature of this relationship is defined as weak. In practice, this is reflected in the fact that even within the boundaries of a single municipality, communities with different social organization and resources (natural, cultural, etc.) may be found. Therefore, the resilience of Arctic communities is largely dependent on the local context and is not related to the resilience of other communities.

Within a particular locality, the resilience of Arctic communities is determined both by internal resources (what the community has), and by external resources, which include local authorities that should assess possible threats and risks, plan and finance any resilience-related activities in the community. The internal resilience resources of the Arctic communities include the local culture, which consists not only of specific facilities, such as houses of culture or churches where local people meet, but also the values, formal and informal ties, mechanisms of relationships and social interaction between people that are characteristic of the area. This also includes the traditional culture of the indigenous peoples of the Arctic, for whom beliefs, customs, knowledge and practices are part of their daily life [18, Ford J.D. et al.]. For example, one of the articles by Canadian researchers shows how climate change has a serious impact on Canadian Inuit fishermen's traditional fishing activities [19, Galappaththi E. et al.]. These changes are manifested in changing weather conditions, redistribution of sea ice, habitats and number of fish. Drawing on the concept of resilience and qualitative interviews, the authors identify individual and collective ways of Inuit fishermen's responding to climate change. They believe that their adaptation is influenced by the indigenous worldview, social organization, traditional culture, and the Inuit knowledge system about the natural environment [19, Galappaththi E. et al.].

One cannot but agree with the opinion of scientists that local knowledge, culture and level of social organization, being an internal resource for the resilience of the inhabitants of the Arctic, determine adaptive strategies at the community level, but they do not compensate for the overall readiness for external influences. Resilience requires the development of strategies to respond to threats. Researchers believe that these strategies, more than anywhere else, require spatial planning for all aspects of socio-economic development.

Despite the available fruitful and promising Russian studies of the phenomenon of resilience, it is worth noting that there are few studies on the regional specifics of the resilience of socio-economic systems in the Russian Arctic. This is partly due to the fact that the practical viability of the Arctic territories is a little-studied issue, even though the number of works devoted to the Arctic is constantly growing. Today, systematic research based on qualitative methods of obtaining information, and their integration into the development of the theory and practice of socio-economic management of the northern territories, are still in demand. In the context of this direction, it is equally important to analyze and define numerous aspects of social resilience, including the identification, quantitative and qualitative characteristics of indicators of local resilience, as well as factors that negatively affect the ability of Arctic communities to cope with socio-economic and natural challenges. For example, I.V. Nikulkina and her colleagues explore the factors and methodology for assessing the resilience to economic shocks in the Arctic settlements of the Republic of Sakha (Yakutia). Scientists argue that the current way of life and traditional economic activities ensure the resilience of Arctic communities. The authors propose to use resilience as a methodological approach for implementing the policy of sustainable development of the Arctic both at the state and at the municipal level [20].

A team of scientists led by N.Yu. Zamyatina also considers the concept of resilience to be relevant, which, in their opinion, complements the theory of sustainable development. The researchers conducted a cluster analysis of 27 Arctic settlements of the Russian Federation according to six subsystems, including socio-cultural, and concluded that the sustainable development of Arctic cities is possible with the simultaneous fulfilment of the conditions of resilience in different subsystems of urban development [14].

Conclusion

- Global changes occurring in the Arctic have a significant impact on the livelihoods of local communities and necessitate the search for new approaches to the sustainable development of the region. One of them is related to the study of the phenomenon of resilience as the ability of local communities to withstand external challenges while maintaining their structure and function.
- Foreign and Russian researchers use a common methodological approach to the research of social resilience based on the study of a specific territory in the context of socio-economic and natural factors influencing it.

- The main components of community resilience are social, economic and natural capital, which determine the level of social resilience and the degree of vulnerability of communities to external influences. For each component of resilience, scientists propose to develop a system of indicators, as well as methods for their quantitative and qualitative analysis, which allow assessing the level and potential of community resilience.
- Assessing the level and potential of social resilience is important for developing ways to reduce vulnerability and increase the resilience of societies, as well as measures to adapt them to external influences.
- The socio-economic systems of the Arctic are very diverse, so the study of the resilience of the Arctic communities should be carried out taking into account the internal resources of local communities, as well as reflect the socio-economic characteristics of the Arctic territory.

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