ARTICLE

Regulatory Gap: Legal Uncertainty in the Context of the Population Status in Russia's Climate Change Adaptation

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Abstract. This study examines the population's legal status within the climate change adaptation frameworks in the Russian Federation. The research aims to identify and analyze the contradictions between the *de facto* central role of the population as the primary bearer of climate risks and its ambiguous, underrepresented position in the national regulatory system. Employing a qualitative analysis of Russian strategic documents and federal legislation, the study reveals a regulatory gap: the population is not officially recognized as the "climate-vulnerable object" (CVOs) of the national regulation. Consequently, the population is not guaranteed with

legal protection, though it is officially considered a beneficiary of climate protection measures. The current Russian model of climate adaptation can be described as technocratic and infrastructure-focused, ignoring specific social vulnerabilities, limiting direct resilience measures, and creating systemic legal uncertainty. The findings highlight a significant misalignment between Russia's current approach and internationally dominant, socially-oriented paradigms centered on human rights, vulnerability, and public participation. The article suggests key recommendations for legislative development, including the official recognition of the population's status, methodologies for assessing social vulnerability and non-economic losses, and the implementation of direct, targeted adaptation measures to foster a human-centric model of climate resilience.

Keywords: population; climate change adaptation; vulnerability; regulatory gap; human rights-based approach; Russia.

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Introduction

The scale of climate change in the 21st century positions it as one of the most significant threats to the socio-economic development of various world regions.[1] This

[1] Intergovernmental Panel on Climate Change. (2023). *Climate change 2022: Impacts, adaptation, and vulnerability* (contribution of Working Group II to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change). Cambridge University Press; Federal Service for Hydrometeorology and Environmental Monitoring. (2021). *Report on climate characteristics in the Russian Federation for 2020*. https://www.meteorf.gov.ru/upload/pdf_download/doklad_klimat2020.pdf. (In Russian).

is corroborated by existing quantitative assessments and forecasts of climate change impacts on long-term global GDP growth rates.[2] Profound economic transformations are accompanied by shifts in governance, presenting numerous challenges for global, national, regional, and local governance systems.[3] The role and status of the population is the main challenge in climate change agenda.

The conceptualization of the population as an object of management or a beneficiary is a central question in the global climate adaptation theory.[4] A review of trends in adaptation science[5] reveals that fundamental concepts such as "vulnerability" and "adaptive capacity" are intrinsically linked to the population. Consequently, the scholarly work examines the population through the lens of socio-economic vulnerability to hazardous climatic events, evaluating impacts on mental and physical health, well-being, and resilience. Researchers identify high-risk population groups and propose measures to mitigate risks from hazardous climatic phenomena and to foster population adaptation.[6] The heterogeneous impact of climate change on different population groups exacerbates questions of justice and equity in the distribution of climate risks and adaptation benefits.[7] Some authors emphasize how disaster vulnerability is shaped by historically entrenched social inequalities, political-economic structures, and cultural contexts.[8] Scholars also argue

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2 Kahn, M. E., Mohaddes, K., Ng, R. N., Pesaran, M. H., Raissi, M., & Yang, J. (2021). Long-term macroeconomic effects of climate change: A cross-country analysis. *Energy Economics*, *104*, 105624; Burke, M., Hsiang, S. M., & Miguel, E. (2015). Global non-linear effect of temperature on economic production. *Nature*, *527*(7577), 235–239.

3 Nand, M. M., Clissold, R., McNamara, K. E., & Yee, M. (2024). Guiding our responses to climate change by what people value: Insights from Fiji. *Geoforum*, *155*, 104080; Pill, M. (2021). Linking solidarity funds and philanthropic giving to finance loss and damage from climate change related slow-onset events. *Current Opinion in Environmental Sustainability*, *50*, 169–174; Barmina, A., Veselov, F., Alieva, A., & Verkeev, A. (2025). There are no natural disasters: Key approaches in social disaster studies. *Laboratorium: Russian Review of Social Research*, *17*(1), 176–215. (In Russian).

4 Turesson, K., Pettersson, A., de Goër de Herve, M., Gustavsson, J., Haas, J., Koivisto, J., Karagiorgos, K., & Nyberg, L. (2024). The human dimension of vulnerability: A scoping review of the Nordic literature on factors for social vulnerability to climate risks. *International Journal of Disaster Risk Reduction*, *100*, 104190; Jodoin, S., Savaresi, A., & Wewerinke-Singh, M. (2021). Rights-based approaches to climate decision-making. *Current Opinion in Environmental Sustainability*, *52*, 45–53.

5 Nalau, J., & Verrall, B. (2021). Mapping the evolution and current trends in climate change adaptation science. *Climate Risk Management*, *32*, 100290.

6 Turesson et al., 2024; Boyakova, S. I., Filippova, V. V., & Vinokurova, L. I. (2023). Arctic uluses of Yakutia in the context of natural emergencies: Social challenges and experience of resistance. *Safety Issues*, *1*, 19–31. (In Russian).

7 Walker, S. E., Smith, E. A., Bennett, N., Bannister, E., Narayana, A., Nuckols, T., Pineda Velez, K., Wrigley, J., & Bailey, K. M. (2024). Defining and conceptualizing equity and justice in climate adaptation. *Global Environmental Change*, *87*, 102885; Kravchuk, N. V. (2019). Protection of rights and public good in the context of climate change: Trends and threats. *Social Sciences and Humanities. Social and Foreign Literature. Social Series 4: State and Law*, *4*, 106–114. (In Russian).

8 Barmina et al., 2025.

that the understanding of climate risks and their causes can create preconditions for inequality at both national and global scales.[9]

Another key global trend is to examine adaptation through a human rights prism. The rights-based approach implies that the population is not a passive object of impact but a bearer of rights that require protection. Jodoin et al. assert that rights-based approaches "emphasize the human dimensions of climate change" and stand for public participation in the decision-making process.[10] Insufficient participation of local populations can hinder the implementation of climate policy and potentially impede successful outcomes.[11] Significant attention is paid to the role of human rights in climate litigation and the importance of the Paris Agreement as an instrument integrating a human rights approach into the international climate agenda.[12]

Climate risks are complex, interconnected, and cascading in nature.[13] They are characterized by uncertainty, ambiguity, and transboundary effects. They are not merely discrete hazardous events but systemic crises affecting social, economic, and ecological systems. Therefore, adaptation to such systemic risks cannot be managed by an outdated, reductionist approach focused on individual objects rather than the entire social-ecological system, of which the population is a key element. The undefined status of the population as a core component of the social-ecological system is a direct consequence or cause of the inability to implement a systemic approach fully, leading to the neglect of specific population needs and vulnerabilities. Thus, the scientific literature increasingly acknowledges the central role of the population and the necessity of accounting for social vulnerability and justice, placing the population at the center of research from various perspectives: material, physical, mental, social, etc.

Climate change poses a range of risks to the population of the Russian Federation, including social risks.[14] Warming in various Russian regions may lead to increased mortality, the spread of pests and viruses, decreased living standards, and other

[9] O'Lear, S. (2024). The slow violence of climate security. *Geoforum*, *155*, 104078.

[10] Jodoin, Savaresi & Wewerinke-Singh, 2021.

[11] Howland, F., & Le Coq, J. F. (2022). Disaster risk management, or adaptation to climate change? The elaboration of climate policies related to agriculture in Colombia. *Geoforum*, *131*, 163–172.

[12] SoIntsev, A. M. (2020). Half-opening Pandora's box: Review of the Human Rights Committee's 2020 view on climate refugees. *International Justice*, *3*(35), 41–54.

[13] Parviainen, J., Hochrainer-Stigler, S., Cumiskey, L., Bharwani, S., Schweizer, P.-J., Hofbauer, B., & Cubie, D. (2025). The Risk-Tandem Framework: An iterative framework for combining risk governance and knowledge co-production toward integrated disaster risk management and climate change adaptation. *International Journal of Disaster Risk Reduction*, *116*, 105070.

[14] Lukianets, A. S., & Bragin, A. D. (2021). Assessment of the scale and prospects of the impact of climate risks on the socio-economic development of Russia. *Economic and Social Changes: Facts, Trends, Forecast*, *14*(6), 197–209. (In Russian); Pryazhnikova, O. N. (2024). Features of adaptation of social protection of the population to climate change. *Economic and Social Problems of Russia*, *1*(57), 145–157. (In Russian).

socio-economic problems, accompanied by significant damage to households and regional communities at large.[15] The risk of damage from hazardous climate events depends not only on their probability and intensity but also on societal susceptibility, coping capacity, and adaptation potential.[16] Social vulnerability to hazardous natural events determines whether a hazardous event turns into a disaster and whether substantial damage is incurred.[17]

Despite the undeniable central role of the population as the primary bearer of climate risks and the ultimate beneficiary of adaptation measures, a fundamental contradiction is evident in the current regulatory frameworks of the Russian Federation, where the population is officially excluded from the list of climate-vulnerable objects (CVOs). The legal status of the population is uncertain, as it is not recognized as a subject or an independent object of adaptation but merely indirectly acting as a beneficiary. This uncertainty represents a key legal gap and the central focus of this study. The research aims to analyze how this fundamental discrepancy between the *de facto* importance of the population and its ambiguous legal status is reflected in Russian strategic documents on climate change adaptation policy, and how global trends in adaptation governance are (or are not) incorporated into the Russian regulatory framework.

In this context, we analyzed the legal status of the population in Russian strategic documents on climate change adaptation policy and identified existing legal gaps. The study employed a qualitative analysis based on the interpretation and synthesis of information from the provided sources to explore the role of the population in the climate change adaptation system.

Following this introduction, the structure of the paper is organized as follows. Section 2 provides a brief overview of the Russian regulatory framework and methodological guidelines for climate change adaptation, outlining the key documents that form the basis of national policy. Section 3 presents the core results of the analysis, highlighting the formal exclusion of the population from the category of climate-vulnerable objects, its indirect recognition through related mechanisms, and the consequent legal uncertainties. Section 4 discusses these findings in the broader context of global adaptation governance trends, examining the implications of the identified legal gap and situating the Russian case within international scholarship.

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[15] Ledeneva, V. Yu. (2021). Climate migration: Trends and forecasts. *News of Southwestern State University. Series: Economics. Sociology. Management*, *11*(6), 233–242. (In Russian); Filippova, V. V., & Grigoriev, S. A. (2022). At the mercy of the elements: Rural communities of Yakutia in the conditions of destructive floods of the 20th century (on the example of the village of Khotochchu of the 1st Zhemkon nasleg of the Khangalassky ulus). *Arktika i Antarktika*, *4*, 20–42. (In Russian).

[16] Zakharova, O., Karagulian, E., Viktorova, N., Gamukin, V., & Yablochkina, V. (2025). Risk assessment of socio-economic vulnerability to climate change: Case study of Tuymen Region. *World*, *6*(1), 6.

[17] Aksenteeva, E. M., Galiuk, L. P., & Kobysheva, N. V. (2015). *Climate risks and adaptation to climate change and variability in the technical sphere*. Kirillitsa. (In Russian).

The final Section 5 concludes by summarizing the main arguments and proposing recommendations for harmonizing Russian practice with human-centric, rights-based approaches to adaptation.

1. Brief Overview of the Regulatory Framework and Methodological Guidelines for Climate Change Adaptation

The national climate change adaptation policy in the Russian Federation is developed within a multi-level system of regulatory and methodological documents. This system is structured hierarchically, from strategic planning at the national level to practical tools for governmental bodies and organizations. Its cornerstone is the ***National Action Plan for the Second Stage of Adaptation to Climate Change for the Period until 2025***, approved by Decree of the Government of the Russian Federation. This Plan sets the general goals and directions of work, for the implementation of which the Russian Ministry of Economic Development has developed a set of methodological recommendations. These recommendations ensure a consistent approach to risk and damage assessment, planning, and monitoring of adaptation measures across the country. Thus, the regulatory frameworks create a holistic, albeit evolving, framework for managing climate risks, the key elements of which are discussed in detail below.

The ***National Action Plan for the Second Stage of Adaptation to Climate Change for the Period until 2025***, approved by Decree of the Government of the Russian Federation No. 559-r of March 11, 2023 is a foundational document defining the second stage of climate change adaptation measures in the country until 2025. The methodological guidelines approved by Orders of the Russian Ministry of Economic Development No. 927 and No. 267 were developed to implement the provisions of this national plan.

Order of the Ministry of Economic Development of the Russian Federation No. 927 of December 28, 2023, approved two key documents:

1. ***Methodological Guidelines for Assessing Possible Damage from Climate Risks***, including recommendations for forming a list of climate-vulnerable objects in economic sectors and constituent entities of the Russian Federation. The Guidelines are intended for assessing potential damage from climate risks and for forming a list of objects most vulnerable to such impacts. They propose a consistent approach to assess damages at the level of Russian regions and economic sectors, considering both direct and indirect damages, as well as possible non-economic losses. The Guidelines also include forms for submitting assessment results and lists of climate-vulnerable objects. Adaptation entities (federal and regional authorities, organizations) must summarize the compiled lists within the framework of the National Plan and send them to the Russian Ministry of Economic Development. For damage assessment, it is recommended to use available information on capital

construction projects in zones of dangerous climate risks, as well as retrospective data and insurance cases.

2. ***Methodological Guidelines for Monitoring and Evaluating the Effectiveness and Efficiency of Climate Change Adaptation Measures***. The Guidelines establish the procedure for annual monitoring of adaptation measures provided for in sectoral, regional, and corporate plans. Monitoring includes assessing the overall and current progress of implementing adaptation actions and achieving target indicators. The guidelines also define approaches to assessing efficiency (the cost of achieving SDG targets) and effectiveness (the number of target indicators of adaptation measures). If data on damage change before and after the implementation of a measure is available, economic efficiency can be calculated. The Guidelines contain forms for submitting monitoring and effectiveness evaluation results. The use of the Guidelines is not mandatory but is strongly recommended for obtaining a qualitative assessment of adaptation actions and comparable data.

Order of the Ministry of Economic Development of the Russian Federation No. 267 of May 13, 2021 ***"On the Approval of Methodological Guidelines and Indicators on Climate Change Adaptation Issues"*** was amended by Order of the Russian Ministry of Economic Development No. 928 of December 28, 2023, which approved the following documents:

1. ***Methodological Guidelines for Climate Risk Assessment***. The Guidelines define the object of impact (adaptation object) as an anthropogenic object or a component of a natural system the functioning of which depends on climatic factors. They contain approaches to retrospective assessment and forecasting of climate risks at various levels (federal district, constituent entity of the Russian Federation, municipality) using scientific information and climate models. The results of climate risk assessment are used for damage assessment and assessing consequences for the budget system, as well as in the preparation of adaptation plans. The guidelines also establish gradations of climate risk sources by intensity, prevalence, duration, and hazard level. Indicators of maximum possible damage and economic vulnerability can be used to analyze the protection of economic activities.

2. ***Methodological Guidelines for Ranking Adaptation Measures by Priority***. The Guidelines recommend considering the results of climate risk and possible damage assessment when determining adaptation measures. The ranking process involves identifying adaptation needs, selecting permanent (already implemented) and additional (adaptation) measures, and assigning ranks based on their contribution to achieving target indicators and associated costs. It is recommended to select no more than 2-3 measures for each identified adaptation need that have the maximum contribution to the target indicators. The ranking results are used in the preparation of adaptation plans.

3. ***Methodological Guidelines for the Development of Sectoral, Regional, and Corporate Climate Change Adaptation Plans***. The Guidelines are designed for

federal and regional authorities, as well as organizations developing adaptation plans. The plans can define operational and long-term measures aimed at reducing vulnerability and utilizing favorable opportunities associated with climate change. The tasks of the plans include implementing priority measures identified through the ranking process. Sectoral plans are developed by federal bodies, taking into account sector specifics and recommendations for regions and organizations. Regional plans are formed by the highest officials of the constituent entities of the Russian Federation, considering regional specifics, national and sectoral plans. Corporate plans are developed by stakeholders on a voluntary basis, taking into account sectoral and regional plans. The guidelines also define the structure and content of adaptation plans, including mandatory annexes with the results of risk assessments and measure rankings.

4. ***Indicators for Achieving Climate Change Adaptation Goals***. This list includes indicators used for ranking, assessing the effectiveness and efficiency of adaptation measures. Adaptation goals include reducing the exposure of objects to climate risks, enhancing adaptive capacity, utilizing favorable opportunities, and reducing climate risks for the economy and the budget system. The list contains specific indicators, such as changes in threshold values, maximum duration of reserve use and autonomous operation of facilities, as well as agricultural crop productivity.

Federal Law No. 414-FZ of December 21, 2021 "On the General Principles of Organization of Public Power in the Constituent Entities of the Russian Federation" grants the constituent entities of the Russian Federation the authority to participate in climate change adaptation measures. The system and structure of executive bodies of a constituent entity are determined by the highest official, which allows regions to form regional adaptation plans.

2. Results of the Regulatory Frameworks and Methodological Guidelines Analysis

The analysis of the regulatory frameworks and methodological guidelines for climate change adaptation highlighted the following key aspects:

1) Exclusion of the population from the list of climate-vulnerable objects (CVOs).

The analysis of the regulatory frameworks reveals a fundamental contradiction: the population, being the primary bearer of climate risks, is officially excluded from the structure of the adaptation process. According to the Methodological Guidelines (Order of the Russian Ministry of Economic Development No. 927), CVOs are defined exclusively as capital construction projects and housing stock under the jurisdiction of adaptation entities (governmental bodies and organizations). The population, as well as forests, arable lands, and orchards, is not classified as CVOs since it is not capital construction projects or housing stock. Adaptation measures aimed at the population are typically implemented through the protection or restoration of these

objects or through compensation for losses associated with their damage or loss. Thus, the focus of adaptation measures is narrowed to infrastructure protection, and the population is not recognized as an independent object of legal regulation in this sphere.

2) Indirect recognition of the population through related mechanisms.

Despite formal exclusion, regulatory acts contain a number of provisions that indirectly account for the population in two key aspects.

• Firstly, the population is recognized as an object of risk impact and vulnerability. This is manifested in accounting for non-economic losses. When assessing damage, it is recommended to consider damage to the health, life, and well-being of the population (clause 3.4 of Order No. 927). Furthermore, the damage assessment forms provide for indicating the number of affected and evacuated persons (Section 2 of Appendix 1 to Order No. 927). It is noteworthy that there are target indicators directly related to the population, such as "population size in the climate risk zone" and "number of people affected by emergencies" (Appendix No. 9 to Order No. 928). The concept of "exposure" used explicitly includes the "presence of people" (clause 2.6 of the Methodological Guidelines as amended by Order No. 928).

• Secondly, the population is considered as the ultimate beneficiary of adaptation measures. For instance, the protection of housing and communal services, social infrastructure, healthcare, education, and transport infrastructure directly ensures the safety and comfort of citizens. Measures aimed at increasing the resilience of these objects to climate risks, such as the construction of flood defenses or coastal protection structures, ultimately serve to ensure safety and reduce the vulnerability of the population in the face of climate threats. Even measures aimed at reducing economic damage, such as support for affected small and medium-sized enterprises, contribute to economic recovery and maintaining the population's standard of living after climate events. Furthermore, direct measures targeting the population are also legally established: relocation from dilapidated housing or public awareness campaigns.

3) Legal uncertainty and its consequences.

The analysis allows us to state the uncertainty of the population's legal status. It is neither a subject nor an independent object of adaptation, but acts in a derivative role as a beneficiary of measures taken concerning infrastructure. This approach creates the following systemic gaps:

• Indirect accounting of needs. The vulnerability of the population is considered indirectly, through the lens of object protection, which can negate the specific needs of particular groups;

• Priority of economic damage. The emphasis on assessing damage to CVOs can overshadow a comprehensive assessment of the social and non-economic consequences for the population.

• Lack of a strategy for direct measures. The unestablished status of the population limits the development and implementation of policy goals aimed directly at

enhancing the adaptive capacity of people themselves, not just the infrastructure surrounding them.

Thus, within the current legal system, the population remains in a "blind spot": its well-being is a declared goal, but its direct protection from climate risks is not formalized as an independent task of adaptation policy.

3. Discussion: The Population Blind Spot in Russia's Climate Adaptation Frameworks

The study has identified existing legal gaps in defining the legal status of the population within the national strategic documents that set climate change adaptation policy for the Russian Federation. The primary gap is the uncertainty of the population's legal status within adaptation processes. Within formalized climate change adaptation processes, such as the development of adaptation plans and damage assessment, the population is not formally distinguished as an independent subject or object with a clearly defined role distinct from that of a beneficiary of measures aimed at protecting CVOs and territories. However, the problem of an undefined population status is not unique. A gap exists in many countries between recognizing the population as the ultimate beneficiary and its formal role in adaptation governance. For instance, Marín-Puig et al. identify an "unattended gap" in local adaptation plans related to the quality of vulnerability knowledge.[18] They note that institutional mechanisms hinder community participation and that the role of the population is diminished in formalized processes. Russian researchers studying local communities also believe that an active population role could be helpful in cases of natural disasters.[19]

To date, the population is predominantly viewed as an object of risk impact and a beneficiary of measures undertaken by adaptation entities concerning CVOs and territories. In formal documents and processes, the population is primarily considered an object of climate risk impact (e.g., risk of damage to health, life, and well-being) and as a beneficiary of measures implemented by adaptation entities regarding CVOs and territories.[20] For example, when assessing possible damage, it is recommended to account for potential non-economic losses, including damage to the health, life, and well-being of the population.[21] However, this assessment is

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[18] Marín-Puig, A., Ariza, E., & Casellas, A. (2022). Unattended gap in local adaptation plans: The quality of vulnerability knowledge in climate risk management. *Climate Risk Management*, *38*, 100465.

[19] Filippova & Grigoriev, 2022.

[20] Porfirev, B. N., Aksenteeva, E. M., Eliseev, D. O., & Khlebnikova, E. I. (2024). Methodological approaches to assessing possible damage to economic systems from climate change. *Forecasting Problems*, *1*(202), 67–80. (In Russian).

[21] Noskov, S. N., Buzinov, R. V., Siurin, S. A., Eremin, G. B., Karelin, A. O., Gudkov, A. B., Popova, O. N., & Nikanov, A. N. (2023). Modern concepts of the influence of terrestrial and space weather on human health (review). *Journal of Biomedical Research*, *11*(2), 232–247. (In Russian).

a consequence of hazardous climate events, which are a set of factors impacting various objects and systems.[22] Such approach, where the population is primarily an object of impact and a beneficiary, aligns with a more technocratic rather than socially-oriented model of adaptation. Howland & Le Coq, using the example of Colombia, show how the dominance of state bodies and technical approaches can sideline a comprehensive understanding of adaptation and the participation of local populations.[23] This closely resembles the Russian situation with the dominance of adaptation entities (government bodies) and a focus on infrastructure; the emphasis on CVOs (infrastructure) and economic damage is a manifestation of a technocratic, reductionist approach incapable of adequately responding to the complex and cascading climate challenges affecting the population. In contrast, Nand et al., using the example of Fiji, show how responses to protect what people value must be based on population participation in decision-making and implementation. This model could present an alternative to the currently dominant approaches.[24]

The study demonstrated that Russian methodologies do account for non-economic losses (damage to health); for instance, the assessment of possible damage includes not only economic damage but also potential non-economic losses, including damage to the population's health, life, and well-being. However, the issue of non-economic losses is underdeveloped in regulatory acts, which fits perfectly into the global discussion on Non-Economic Loss and Damage (NELD). Thus, Schwerdtle et al. directly point to losses and risks in terms of health and humanitarian consequences.[25] Pill and van der Geest & van den Berg also discuss the problem of financing and managing non-economic losses from slow-onset events.[26] Thus, Russia, having begun to account for these losses,[27] is encountering the forefront of a global problem.

Existing adaptation measures directly targeting the population, such as social support for affected citizens and compensations, may face political or social obstacles, directly engaging issues of equality and justice.[28] For example, relocating people from dilapidated housing is considered an adaptation measure aimed at reducing

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22 Barmina et al., 2025.

23 Howland & Le Coq, 2022.

24 Nand et al., 2024.

25 Schwerdtle, P. N., Devine, C., Guevara, M., Cornish, S., Christou, C., Wyns, A., Jungmann, M., Sauerborn, R., & Voûte, C. (2023). What cannot be mitigated or adapted to, will be suffered. Loss and damage in health and humanitarian terms. *Journal of Climate Change and Health*, *13*, 100270.

26 Pill, 2021; van der Geest, K., & van den Berg, R. (2021). Slow-onset events: A review of the evidence from the IPCC Special Reports on Land, Oceans and Cryosphere. *Current Opinion in Environmental Sustainability*, *50*, 109–120.

27 Pryazhnikova, 2024.

28 Walker et al., 2024.

population vulnerability. However, it may encounter perceptions of what criteria for declaring housing dilapidated people will find fair[29] or their readiness to change their place of residence.[30] Implementing measures (ex., land-use changes) can affect the population, depriving them of traditional livelihoods. These are problematic issues, nevertheless, various measures are formally planned and implemented by adaptation entities.

Our research demonstrates that Russia, on the one hand, follows global trends by introducing assessments of damage to the population and non-economic losses. On the other hand, it reveals a persistent gap between the formal, technocratic approach to adaptation (focus on infrastructure) and the socially-oriented approaches dominant in contemporary international literature (focus on vulnerability, human rights, participation, and justice). Our recommendations are a step toward bridging this gap and harmonizing Russian practice with the best international scientific and management trends.

Based on the study's results, we propose the following recommendations for developing legislature and addressing the identified gaps:

1. To reconsider the legal status of the population in adaptation documents. This could introduce additional categories or clarifications in existing definitions to directly account for the population as a vulnerable element within the climate change adaptation system. A clear elaboration of the conceptual framework should be accompanied by defining conceptual approaches to the problem of the population's status in adaptation regulations, for example, by considering the population not only as an object of impact but also as an active subject of adaptation, a rights-holder, or by recognizing the priority of justice and equity principles in climate policy.[31]

2. To improve mechanisms for accounting for population vulnerability and assessing damage to health and well-being caused by climate change. Further development of methodologies for assessing non-economic losses is necessary, potentially using more detailed data beyond the databases of the Ministry of the Russian Federation for Civil Defence, Emergencies and Elimination of Consequences of Natural Disasters and accounting for the specific vulnerabilities of different population groups. Developing various formats for citizen participation in decision-making and enshrining these formats in legislation could be used for this purpose. Active citizen participation is a key element of the transition to a more effective, human-centric adaptation model.

3. To develop specific adaptation measures aimed directly at reducing population vulnerability. Most measures and management recommendations in the literature

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[29] Pasovets, Yu. M. (2023). Socio-economic vulnerability of regional communities: Experience of sociological interpretation and measurement. *Economic and Social Changes: Facts, Trends, Forecast*, *16*(4), 236–253. (In Russian).

[30] Ledeneva, 2021.

[31] Walker et al., 2024.

are too general (general principles rather than clearly defined actions, specific recommendations). Alongside infrastructure protection, measures focused directly on enhancing population resilience to climate risks should be considered and implemented, such as awareness and training programs, developing healthcare systems considering climate factors, and targeted support for the most vulnerable population groups. These measures are designed to address the problem that most actions are overly general.

Conclusion

This study demonstrates that the legal status of the population within the climate change adaptation system of the Russian Federation is characterized by significant uncertainty and internal contradiction. On the one hand, the well-being of the population is declared as the ultimate goal of adaptation policy. On the other hand, the regulatory framework, focused on protecting climate-vulnerable infrastructure objects (CVOs), formally excludes the population from the list of direct objects of legal regulation in this sphere.

The study employed a qualitative analysis based on the interpretation and synthesis of information from the provided sources to answer the question: What is the place and role of the population in the climate change adaptation system? The analysis of the regulatory framework and methodological guidelines for climate change adaptation revealed three key aspects of this contradiction:

1. The population is not recognized as an independent "climate-vulnerable object." This narrows the focus of adaptation measures to a technocratic paradigm of protecting material infrastructure, leaving behind specific social vulnerabilities and the adaptive capacity of people themselves.

2. The accounting of the population is carried out indirectly, mainly through the lens of protecting CVOs and assessing non-economic losses (health, life, well-being). Although this approach partially acknowledges risks to the population, it is derivative and reactive, being tied to infrastructure damage.

3. The existing legal frameworks limit the development and implementation of direct measures aimed at enhancing the resilience, adaptive capacities, and participation of citizens themselves, especially the most vulnerable groups.

Thus, within the Russian adaptation model, the population finds itself in a "blind spot": it is a declared beneficiary but it is not recognized as an independent subject with clearly defined rights, role, and mechanisms for its direct protection.

This normative gap separates the Russian approach from relevant international trends, where socially-oriented concepts based on human rights, principles of justice, and active community participation in decision-making processes (public participation) dominate. The initial steps to account for non-economic losses in Russian methodologies represent an important but insufficient step toward integrating advanced global experience.

To harmonize Russian practice with the best international standards and to overcome the identified gaps, the following steps are necessary:

• Clear normative consolidation of the status of the population as a key element vulnerable to climate risks within the conceptual framework of adaptation policy.

• Development of assessment methodologies for a more comprehensive accounting of social vulnerability and non-economic losses, involving disaggregated data and the participation of local communities.

• Development and implementation of direct adaptation measures aimed at increasing population resilience, including awareness programs, adaptation of healthcare systems, and targeted support for vulnerable groups.

The analysis underscores the necessity of evolving from a technocratic adaptation model, focused on objects, to a socially-oriented model centered on people, their rights, and active participation in building climate resilience.

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