

## CONSERVATION AND RATIONAL USE OF OCEANS AND TERRITORIES FOR SUSTAINABLE DEVELOPMENT: CONCEPTS OF THE ARCTIC POLICY

### *CONSERVAÇÃO E USO RACIONAL DOS OCEANOS E TERRITÓRIOS PARA O DESENVOLVIMENTO SUSTENTÁVEL: CONCEITOS DA POLÍTICA DO ÁRTICO*

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#### **Elaman Abdykakharov\***

\*Kyrgyz-Russian Slavic University, Bishkek, Kyrgyzstan

Orcid: <https://orcid.org/0000-0001-9448-9836>  
[e.abdykakharov@mymail.academy](mailto:e.abdykakharov@mymail.academy)

#### **Irina Vaslavskaya\*\***

\*\*Kazan (Volga Region) Federal University, Kazan, Russia

Orcid: <https://orcid.org/0000-0002-1363-3865>  
[i.y.vaslavskaya@mymail.academy](mailto:i.y.vaslavskaya@mymail.academy)

#### **Ida Goloborodko\***

\*Kyrgyz-Russian Slavic University, Bishkek, Kyrgyzstan

Orcid: <https://orcid.org/0009-0008-4663-5681>  
[i.goloborodko@mymail.academy](mailto:i.goloborodko@mymail.academy)

#### **Mikhail Leontev\*\*\***

\*\*\*Moscow State University of Civil Engineering (National Research University), Moscow, Russia

Orcid: <https://orcid.org/0000-0001-8192-6523>  
[leontev@mymail.academy](mailto:leontev@mymail.academy)

#### **Aleksei Khaliapin\*\*\*\***

\*\*\*\*Kuban State Agrarian University, Krasnodar, Russia

Orcid: <https://orcid.org/0000-0001-6110-9091>  
[a.khaliapin@mymail.academy](mailto:a.khaliapin@mymail.academy)

#### **Natalya Grigoreva\*\*\*\*\***

\*\*\*\*\*Financial University under the Government of the Russian Federation, Moscow, Russia

Orcid: <https://orcid.org/0000-0002-4813-7802>  
[n.grigoreva@mymail.academy](mailto:n.grigoreva@mymail.academy)

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#### **Abstract**

Technological advancements, economic prospects, and climate change have intensified discussions on governance solutions for aligning social and economic relations among governmental bodies at all levels, corporations, businesses, industries, and local populations, including indigenous Arctic communities. As a result, the Arctic governance system is evolving, influenced by repeated calls on the international stage to maintain the Arctic as a “zone of peace.” This governance is becoming more complex due to climate change and the responses of Arctic nations, each with strategic interests in the region. The article aims to identify the specific characteristics of sustainable development

#### **Resumo**

*Os avanços tecnológicos, as perspectivas econômicas e as mudanças climáticas intensificaram as discussões sobre soluções de governança para alinhar as relações sociais e econômicas entre órgãos governamentais em todos os níveis, corporações, empresas, indústrias e populações locais, incluindo comunidades indígenas do Ártico. Como resultado, o sistema de governança do Ártico está evoluindo, influenciado por repetidos apelos no cenário internacional para manter o Ártico como uma “zona de paz”. Essa governança está se tornando mais complexa devido às mudanças climáticas e às respostas das nações árticas, cada uma com interesses*



governance in the northern territories of Arctic nations in national and international contexts. The article considers cooperation among Arctic states in promoting the sustainable development of the Far North and the role of the Arctic Council in this process. Based on the case study “Concepts of the Arctic Policy among Arctic Nations for Sustainable Development”, the article concludes that the Arctic strategies of these nations should be grounded in multilateral cooperation on Arctic affairs. This approach would mitigate security issues in the region and reduce the risk of military conflicts by promoting transparency, predictability, stability, accountability, and pragmatic collaboration.

**Keywords:** Arctic, Sustainable Development, Arctic Council, Arctic Countries, Climate Change, Hydrocarbons.

*estratégicos na região. O artigo tem como objetivo identificar as características específicas da governança do desenvolvimento sustentável nos territórios setentrionais das nações árticas em contextos nacionais e internacionais. O artigo considera a cooperação entre os Estados árticos na promoção do desenvolvimento sustentável do Extremo Norte e o papel do Conselho do Ártico nesse processo. Com base no estudo de caso “Conceitos da Política Ártica entre as Nações Árticas para o Desenvolvimento Sustentável”, o artigo conclui que as estratégias árticas dessas nações devem se basear na cooperação multilateral em assuntos árticos. Essa abordagem mitigaria as questões de segurança na região e reduziria o risco de conflitos militares, promovendo transparência, previsibilidade, estabilidade, responsabilidade e colaboração pragmática.*

**Palavras-chave:** *Ártico, Desenvolvimento Sustentável, Conselho do Ártico, Países do Ártico, Mudanças Climáticas, Hidrocarbonetos.*

## 1 INTRODUCTION

Global warming is a source of environmental protection disputes and a potential driver of geopolitical changes (Parthasarathy *et al.*, 2024). In recent decades, the Arctic region has attracted interest from scientists and policymakers, with its strategic significance increasing considerably (Sotiroski, 2024). This has led to competition among Arctic-adjacent nations, primarily in the context of economic and border disputes. The main factors contributing to this rivalry are the discovery of natural resources in the Arctic and the emergence of new transportation routes due to the melting ice cover. The Arctic region possesses substantial economic and innovative potential, and its effective utilization requires the concentration of technical resources. This should stimulate economic activity and facilitate the production of goods and services competitive in the global market, ultimately driving the economic development of Arctic nations (Shikhverdieva *et al.*, 2022). On the contrary, cooperation in the exploration and utilization of Arctic resources could help reduce socioeconomic disparities among Arctic countries (Qanah *et al.*, 2024).

The unprecedented scale of changes occurring in the Arctic is also reshaping the region's role on a global scale. In the literature on international relations, the Arctic is defined as the territory located north of the boundary marked by the Arctic Circle. It encompasses parts of Russia, Canada, Norway, Sweden, Finland, Alaska (US), Greenland (an autonomous territory of Denmark), Iceland, and the Arctic Ocean. The Arctic center is the Arctic Ocean which remains largely covered by ice and is surrounded by treeless permafrost areas. From a climatic and ecological perspective, the Arctic is characterized as a region north of the natural tree line or an area where the average air temperature in July never exceeds 10°C (Potts & Schofield, 2009).

According to researchers, the Arctic region is unique for several reasons:

- It is highly susceptible to climate change and attracts nations interested in developing its resources, making the sustainable development of the Arctic a dynamic and ever-evolving issue (Mundi & L'Ecuyer, 2025);
- The Arctic boundaries are ambiguous, complicating the precise determination of territorial rights and resource ownership (Konyukhovskiy *et al.*, 2019);
- There is an ongoing debate over whether climate change and its consequences should be considered a global issue (part of humanity's "common heritage"), a national issue tied to geographical location and sovereign rights, or a local issue primarily affecting indigenous communities in northern territories (Ljovkina *et al.*, 2019; Thi Bich Nga, 2024; Tokmurzayev *et al.*, 2022). The indigenous peoples of the Arctic, including the Inuit, Sámi, Chukchi, and Nenets, have adapted to the region's harsh living conditions and developed unique cultures (Kolesnikov *et al.*, 2022). Given its sensitivity to climate change, the Arctic serves as an early warning system for climate scientists (Vlad & Sharovarov, 2023).

## 2 LITERATURE REVIEW

The current policies of Arctic nations are heavily focused on the intensive extraction of Arctic resources, including minerals, marine animal products, and fish. Natural deposits remain the primary economic driver in the region. According to data from the US Geological Survey, the Arctic holds an estimated 20-25% of the world's

untapped oil and gas resources, as well as significant deposits of rare earth elements and other strategically important minerals, including platinum, palladium, uranium, and cobalt. The Arctic seabed contains at least 90 billion barrels of oil and approximately 1.67 trillion m<sup>3</sup> of natural gas (Prado, 2021). The increasing accessibility of these resources due to climate change has intensified territorial disputes among Arctic states over their extraction and utilization rights.

Furthermore, the development of trans-Arctic shipping routes has gained momentum as melting ice makes new passages navigable (Song *et al.*, 2023). Distance calculations between major global ports highlight the high profitability of establishing and securing access to Arctic shipping lanes north of Eurasia and North America, with long-term prospects extending across the Arctic Ocean (Xu *et al.*, 2025). However, the reality is more complex as commercial shipping in the Arctic requires optimal route planning and reliable schedules and safety measures, which will be critical factors in the success of this concept (Li *et al.*, 2020).

Russia was the first to fully explore and navigate the Northern Sea Route (NSR) in the 1930s (Shchegoleva *et al.*, 2022). The importance of this transit corridor between Europe and Asia continues to grow due to climate change, technological advancements, and ongoing infrastructure investments in this strategic maritime route (Stepanov, 2024).

Another key passage is the Canadian Northwest Passage (NWP), a sea route from Europe to East Asia through the Arctic Archipelago. However, due to its complex geography and shallow waters, it remains less viable than the NSR. With the ongoing retreat of Arctic ice, this route could become more accessible. Canada has asserted sovereignty over the NWP, claiming that the Lomonosov Ridge is an extension of its continental shelf, supporting its argument that a significant portion of the Arctic falls under its exclusive economic zone (Isaac *et al.*, 2020).

The potential of new Arctic shipping lanes has become a point of geopolitical competition. Russia and Canada claim that their northern corridors are internal waters subject to their national sovereignty and regulation. The US and China argue that these routes should be considered international straits open to global shipping (Belyanina, 2022; Hong, 2012). The growing interest of non-Arctic nations in these transit routes driven by climate policies, environmental protection concerns, and efforts to regulate

resource exploitation is accelerating the internationalization of the Arctic governance (Munim *et al.*, 2022).

At the turn of the 20<sup>th</sup> and 21<sup>st</sup> centuries, international cooperation in the Arctic region primarily took the form of multilateral research projects under the auspices of the Arctic Council (Spence *et al.*, 2025). Being a forum for intergovernmental dialogue rather than a traditional international organization, its influence on regional developments has often been regarded as weak (Koivurova, 2010). These concerns have intensified in recent years due to new challenges arising from climate change, which is rapidly transforming the Arctic landscape (Barry *et al.*, 2020).

The only viable way to preserve the Arctic as a region of peaceful coexistence and cooperation is to establish a comprehensive international agreement defining its status, investment regulations, research policies, and resource exploitation rules (Kankaanpää & Young, 2012; Silchenkov, 2024).

This article aims to analyze the governance mechanisms for sustainable development in the northern territories of Arctic nations, considering national and international aspects.

### 3 METHODS

To achieve the research objective, we adopted a mixed approach, combining theoretical research methods (including analysis, abstraction, comparison, synthesis, and generalization) with the case study method (Polovchenko, 2022).

Analysis was used to examine literature, documents, and studies, breaking down the challenges of Arctic state cooperation for the sustainable development of the Far North into components and investigating each separately. Abstraction involved identifying key factors influencing changes in the region's sustainable development. Comparison and analogy allowed us to apply experiences and practices from states and international organizations, deepening the understanding of the significance of ongoing changes in Arctic sustainability. Synthesis facilitated the formulation of systemic conclusions, while generalization presented the Arctic as a crucial element of global sustainable development.

The primary research method was the case study which focused on exploring the complexities of a particular case. The resulting case study “Concepts of the Arctic Policy among Arctic Nations for Sustainable Development” included an analysis of the Arctic policies in Russia, the US, Canada, and Northern European countries.

## 4 RESULTS

### 4.1 Case study: “concepts of the arctic policy among arctic nations for sustainable development”

**Russia.** Among the eight Arctic nations, Russia has the largest presence in the region, covering approximately 40% of the Arctic’s landmass. More than half of the Arctic’s population holds Russian citizenship, and the largest Arctic cities (Murmansk, Norilsk) are located within the Russian territory. As a result, the Arctic is a key to Russia’s development strategy.

In 2007, the Russian “Arktika-2007” expedition conducted research claiming that the Lomonosov Ridge is an extension of Russia’s continental shelf. This would extend Russia’s exclusive economic zone to a large portion of the Arctic. Along the Russian coastline lies the Northeast Passage (a maritime route connecting Europe and the countries of the Far East), with the NSR forming a part of it. Russia, which has an extensive coastline in the north, is changing its strategic position and seeking an infrastructural connection between the Arctic border and central Russia.

The Arctic also contains significant fossil fuel reserves. Around 80% of Russia’s natural gas comes from the region. The country extracts nickel, diamonds, and rare earth metals in the Arctic. To support these industries, Russia has been expanding its mining infrastructure, including key projects like the Yamal LNG terminal.

However, climate change poses a significant challenge for the Arctic, necessitating mitigation and adaptation measures (Gursoy, 2022; Ilyushin & Afanaseva, 2020). Thus, Russia has expressed interest in international partnerships focused on technological and innovative solutions for sustainable Arctic development (Egorov *et al.*, 2019). However, economic sanctions imposed on Russia have created obstacles, impacting the Russian economy and Arctic communities.

According to scientists, Russia maintains a comprehensive approach to Arctic development, which includes threat prevention and response to challenges through regional cooperation mechanisms (Sycheva *et al.*, 2023). Russia asserts that there are no issues in the Arctic requiring a military solution and expects that all nations committed to maintaining peace, stability, and constructive relations in the region will unconditionally uphold this obligation (Zadera, 2022).

For Russia, the Arctic serves as an additional source of energy exports, particularly considering Western economic sanctions (Safiullin *et al.*, 2024). As a result, Russia is pursuing ambitious energy projects in the Arctic while advancing new territorial claims in the Far North, affecting the interests of other Arctic nations (Canada, Denmark, and Norway). Russia has renewed its territorial claims over the continental shelf at the UN forum, taking steps to secure its interests in the NSR. Russia claims sovereignty over 1.2 million km<sup>2</sup> of the Arctic. Russia believes the conditions for realizing its interests are worsening as it is increasingly surrounded by North Atlantic Alliance countries after Finland and Sweden joined NATO.

Russia's growing interest in the North (President of the Russian Federation, 2022) is primarily driven by the desire to secure strategic raw materials and protect itself from potential military threats, including the possibility of invasion. Acknowledging the impact of climate change, Russia has recognized that seasonal maritime routes in the Arctic Ocean may soon become permanent and permafrost may begin to thaw, creating both opportunities and security risks for Russia's northern regions. The authors of Russia's Arctic doctrine have explicitly emphasized the need for investments in the northern region's industries to enhance its infrastructure efficiency and increase production capacity (Smirnova & Pravkin, 2022; Vaslavskiy, 2023).

In conclusion, Russia views the Arctic as a strategic continuum stretching from the North Atlantic to the northern Pacific Ocean. In this context, Russia's priorities include charging tolls for access to its part of the Arctic, securing the NSR, and modernizing regional infrastructure. Russia pursues a "dual use" approach, ensuring that the Arctic infrastructure serves civilian and military purposes.

**US and Canada.** North America holds the second-largest landmass in the Arctic. However, the Arctic contributes only a fraction to the GDP of both the US and Canada in contrast to Russia. As a result, Arctic issues have historically been a lower priority for

these countries. This attitude is shifting as Russia and other nations increase their presence and investments in the region. Canada has begun to increase its Arctic activities, including plans for new icebreakers and Arctic-capable ships. Yet, Canadian and US investments in the Arctic are still significantly lower than those of Russia.

The US is an Arctic nation due to Alaska, an exclave in northwestern North America. Alaska is the largest US state (over 1.7 million km<sup>2</sup>) and has a population of about 733,000 people. Despite its size and resources, US interest in Arctic affairs remains limited, largely due to Alaska's geographical isolation from the mainland 48 states. In addition, American policy often treats Alaska as a unique region with its own unwritten rules, cultural beliefs, and history, making it less sensitive to broader geopolitical concerns.

Despite environmental and legal challenges, oil drilling in Alaska continues. With the opening of new maritime routes and improved access to oil, gas, and other natural resources, the concept of the New Arctic is compelling the US to pay greater attention to the region.

In January 2021, during the final days of Donald Trump's presidency, a strategic document titled "Blue Arctic: A Strategic Plan for the Arctic" was published. It emphasizes the necessity of strengthening the US presence in the region (Paul, 2023). A key objective outlined in the strategy is "building trust among nations." The strategy also advocates for reducing the risk of unintended conflicts by "expanding regional consultation mechanisms and joint planning efforts." The fundamental elements of preventing military escalation include "communication, restrictive measures, transparency, and verification" (Paul, 2023).

The US considers taking action in this area urgent due to the complex nature of Arctic challenges, ranging from ensuring unhindered access to maritime routes and raw materials to countering Russia's growing military capabilities. For this reason, greater emphasis is placed on controlling Arctic waters, accompanied by several measures, including strengthening military installations (e.g., Thule Air Base in Greenland), increasing US military presence at Ørland Main Air Station in Norway, and deploying the USS Harry S. Truman carrier strike group for NATO exercises. The US Arctic strategy prioritizes developing capabilities in key areas such as manned and unmanned

operational presence and patrolling; investments in infrastructure; critical research and projects enabling operations in the Arctic conditions.

However, weaknesses in the US Arctic strategy include failure to acknowledge the vast and diverse nature of the region in terms of development, infrastructure, and economic activity. Another unresolved dilemma lies in balancing the two main pillars of Arctic development: on the one hand, militarization and, on the other hand, establishing governance and cooperation networks (Menzhulina & Gunko, 2023). In practice, this includes initiatives such as the Arctic Security Forces Roundtable (ASFR), i.e., a cooperation format established in 2011 among twelve countries (Canada, Denmark, Finland, France, Germany, Iceland, the Netherlands, Norway, Russia, Sweden, the UK, and the US) to enhance communication and maritime awareness in the Arctic Circle. Since 2014, Russia has not participated in ASFR meetings.

**Northern European countries.** The Northern European countries in the Arctic region are members of the Nordic Council, which includes the three Scandinavian countries (Denmark, Norway, and Sweden), Iceland, and Finland. The Council also includes three autonomous territories: Greenland, the Åland Islands, and the Faroe Islands.

Norway, Finland, Iceland, and Sweden are relatively small players on the global stage. However, they also have significant interests in the Arctic, particularly in oil, gas, and mining industries, as well as in fisheries and tourism.

Norway is a global leader in Arctic oil extraction and a major exporter of oil and natural gas. Estimates suggest that half of the undiscovered hydrocarbon reserves are located in the Barents Sea. Norway is also the second-largest fish exporter in the world. Despite geopolitical tensions after 2014, Norway has maintained cooperation with Russia in areas such as fisheries, search and rescue operations, coast guard and border service collaboration, maritime incident response, and environmental protection. In 2008, Norway and Russia (along with the US, Canada, and Denmark) signed the Ilulissat Declaration, reaffirming the integrity of the international legal framework governing the Arctic Ocean. In 2010, Norway and Russia signed an agreement on their maritime boundary in the Barents Sea.

Nevertheless, Norway is considering a reassessment of the Svalbard Treat signed in Paris in 1920, which grants Norway sovereignty over the Svalbard Archipelago but

allows other signatory states to establish research stations and exploit natural resources there.

Until February 2022, the Arctic policies of Sweden and Finland largely aligned with those of other Arctic nations. However, their recent accession to NATO has increased the risk of disrupting the existing Arctic governance frameworks, potentially leading to the final breakdown of the Arctic Council. Sweden's and Finland's NATO membership has formally divided the Arctic region into two blocs: NATO countries and Russia (Sosnitskaia, 2023). Disruptions in scientific cooperation and maritime resource regulation may escalate, especially given the presence of non-Arctic states such as China, India, and Japan, which seek a greater role in Arctic governance and resource exploitation. These countries may attempt to deepen divisions among Arctic states, undermine existing governance models, and advocate for their internationalization, for example, following a model similar to that of the Antarctic governance.

Iceland is a small island nation (103,100 km<sup>2</sup>, population 368,000) with an economy based on innovation, knowledge, and flexible participation in global economic exchange. It is highly sensitive to changes in the Arctic region, which it perceives through the lens of its own shifting geostrategic importance, i.e., a crucial factor for small states. For this reason, Iceland builds its policy on multilateralism and the development of friendly relations with other international actors, actively engages in Arctic research, and seeks to enhance its competences as a reliable and capable partner in addressing regional challenges. Iceland is particularly interested in preserving the Arctic as a zone of international cooperation in environmental protection and natural resource management.

Greenland is another example of a territory primarily defined by economic activity. This sparsely populated island, home to approximately 56,000 people, remains under Denmark's jurisdiction in key areas such as currency, defense, and foreign policy. However, local authorities in Greenland have decision-making power in other matters concerning the island. It cannot be ruled out that Greenlanders guided by their own pragmatically understood interests may vote for independence in the future (Zyablikov *et al.*, 2023).

Greenland's strategic location between North America, the Arctic, and Europe, along with the prospect of accessing vast, previously unreachable raw material resources, including rare earth elements essential for advanced technologies, has led to significant

international interest in the island. The combination of economic needs, pressure from major powers, and new opportunities emerging due to climate change is driving global competition for Greenland's resources. The island views its natural resources as a key to reducing financial dependence on Denmark, whose financial support accounts for half of Greenland's budget and a quarter of its GDP. Although a large portion of Greenland's population supports independence, the island's weak and undiversified economy primarily based on fishing and tourism remains a major obstacle. Currently, about 80% of Greenland is covered by ice. Over time, climate warming and technological advancements will provide companies engaged in resource exploration and mining with easier access to these deposits.

If Greenland gains independence from Denmark in the future, competition for access to its natural resources may intensify. China, the world's largest producer and consumer of rare earth elements, will likely seek to secure its supply by developing Greenland's deposits (Han & Liu, 2023). China's interest in Greenland is primarily focused on polar research and natural resources, while Greenland is interested in Chinese investments aimed at stimulating and developing its economy.

The US, the EU, the UK, and other countries will seek alternatives to Chinese investments (Serbina, 2023). These players are likely to increase economic assistance to Greenland to influence the future decisions of its government. Since 1950, the US has maintained an airbase on the island and even proposed purchasing Greenland in 2019. In September 2020, the EU published a plan to diversify energy resource supplies, including rare earth elements, with Greenland playing a key role in this strategy. In November 2020, London and Greenland signed a Memorandum of Understanding to strengthen cooperation in the fishing industry, a key sector in their bilateral trade relations.

## 5 DISCUSSION

The shifting perception of the Arctic has led to a surge in international interest, recognizing it as a region experiencing rapid climate change and a zone of emerging economic opportunities that could benefit the Arctic and the global community (Karshalova *et al.*, 2025).

Therefore, a primary objective for the sustainable development of the northern territories in Arctic nations should be establishing a network of international agreements and instruments (Tebenkova, 2023). These should unite organizations operating in the Arctic with the Arctic Council serving as the central coordinating body. In collaboration with relevant institutions, the Council could provide necessary support to other organizations while ensuring a direct understanding of agreements, identifying weaknesses, and proposing optimal solutions. Rather than competing with other organizations, the Arctic Council should focus on coordination and complementing their efforts. Its role in the region would be further strengthened if member states agreed to conclude legally binding agreements under its guidance. This would prevent the Arctic governance from being limited to isolated competences, such as the singular case of the Agreement on Cooperation on Aeronautical and Maritime Search and Rescue in the Arctic.

Thus, the Arctic strategies of Arctic nations should be based on multilateral cooperation, addressing regional security issues and balancing the risk of military conflict. This requires measures to ensure transparency, predictability, stability, accountability, and pragmatic collaboration. For this reason, the Arctic has the potential to become a model of sustainable development, where a justified combination of military deterrence, political dialogue, economic partnerships, and environmental cooperation can take shape within existing frameworks and through future cooperation.

## 6 CONCLUSIONS

Given its immense economic value and significance for global trade in terms of mineral resources and transportation routes, the Arctic is gradually becoming a region of strategic importance for nations worldwide in the pursuit of sustainable development. However, if competition in the Arctic remains unlimited and escalates beyond control, the primary threats will be to the environment and the security of Arctic inhabitants. To address these challenges, a new governance model for the Arctic must be developed, one that considers a much broader range of international actors than ever before.

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### Authors' Contribution

All authors contributed equally to the development of this article.

### Data availability

All datasets relevant to this study's findings are fully available within the article.

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