

## THE ROLE AND IMPORTANCE OF THE ARCTIC REGION FOR NON-ARCTIC STATES: THE CASE OF KAZAKHSTAN

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### ABSTRACT

The Arctic region has ascended to a position of paramount strategic and economic significance within the global order. As a consequence, it has become an increasingly attractive arena not only for Arctic states but also for external actors. While numerous non-Arctic countries have established their Arctic interests and formulated corresponding strategies, there are no studies in the scientific literature that address the prospects and opportunities of this region for Kazakhstan. This study identifies climate change, scientific capabilities, transit opportunities, and global initiatives as key factors shaping Kazakhstan's Arctic prospects. The research findings expand understanding of promising directions for Kazakhstan's foreign policy, specifically regarding opportunities that the Arctic region can offer non-Arctic countries.

**Key words:** Arctic, Kazakhstan, Foreign Policy, Climate Change, Science, Sea Route.

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### Арктикалық аймақтың арктикалық емес елдер үшін рөлі мен маңызы (Қазақстан Республикасы мысалы негізінде)

**Аңдатпа.** Арктикалық аймақ әлемдік тәртіпте стратегиялық және экономикалық маңызды орынға көтерілді. Нәтижесінде ол арктикалық мемлекеттер үшін ғана емес, сонымен қатар сыртқы акторлар үшін де тартымды аренаға айналды. Көптеген арктикалық емес елдер өздерінің арктикалық мүдделерін анықтап, соған сәйкес стратегияларын тұжырымдағанымен, ғылыми әдебиеттерде бұл аймақтың Қазақстан үшін болашағы мен мүмкіндіктерін сараптаған зерттеулер жоқ. Бұл зерттеу климаттың өзгеруін, ғылыми әлеуетті, транзиттік мүмкіндіктерді және жаһандық бастамаларды Қазақстанның арктикалық перспективаларын қалыптастыратын негізгі факторлар ретінде анықтайды. Зерттеу нәтижелері Қазақстанның сыртқы саясатының перспективалық бағыттарын түсінуді кеңейтеді, әсіресе Арктика аймағы арктикалық емес елдерге ұсына алатын мүмкіндіктерге қатысты.

**Түйін сөздер:** Арктика, Қазақстан, сыртқы саясат, климаттың өзгеруі, ғылым, теңіз жолы

### Роль и значимость арктического региона для неарктических стран (на примере Республики Казахстан)

**Аннотация.** Арктический регион поднялся до позиции первостепенной стратегической и экономической значимости в мировом порядке. Как следствие, он стал все более привлекательной ареной не только для арктических государств, но и для внешних акторов. В то время как многочисленные неарктические страны определили свои арктические интересы и сформулировали соответствующие стратегии, в научной литературе нет исследований, которые рассматривали бы перспективы и возможности этого региона для Казахстана. В этом исследовании изменение климата, научный потенциал, транзитные возможности и глобальные инициативы определяются как ключевые факторы, формирующие арктические перспективы для Казахстана. Результаты исследования расширяют понимание перспективных направлений внешней политики Казахстана, особенно в отношении возможностей, которые Арктический регион может предложить неарктическим странам.

**Ключевые слова:** Арктика, Казахстан, внешняя политика, изменение климата, наука, морской путь.

#### Introduction

The Arctic, with its extreme climate and unique environments, is increasingly drawing global attention. Its abundant natural resources, strategic importance, and pivotal role in Earth's climate system are fueling this interest. The region contains about a quarter of the world's undiscovered resource reserves: 44 billion barrels of gas condensate, 48 trillion cubic meters of natural gas and 90 billion cubic meters of barrels of oil [1]. While primarily the domain of Arctic nations, the Arctic's influence extends far beyond its borders. Given its landlocked location in Central Asia, Kazakhstan's focus on the Arctic might seem

unusual. However, the country has a history of polar research and has formally recognized the importance of the region by joining the Antarctic Treaty in 2014. This study examines Kazakhstan's potential involvement in Arctic affairs, a region as geographically distant as the South Pole.

We analyzed the factors motivating Kazakhstan's interest in the Arctic by reviewing the strategic goals and policies of non-Arctic nations involved in the region. Arctic Council observer states, including Germany, France, the UK, Italy, Spain, Netherlands, Poland, Switzerland, China, India, Republic of Korea, Japan and Singapore prioritize environmental protection, research, and

transportation routes. By examining Kazakhstan's official documents and expert opinions, we identified key areas for potential contribution: climate change and environmental protection, scientific collaboration, and the potential benefits of the Northern Sea Route. These factors form the basis of our analysis.

### **Methodology**

This study employed qualitative content analysis and document analysis, established methodologies within the field of applied text information research. Initially, a comprehensive review of English and Russian language materials, encompassing articles, official documents, and other relevant publications, was conducted. The focus of this review was on the Arctic policies of non-Arctic states, climate change impacts on the Arctic, polar research, the development of new shipping routes in the Arctic, and Kazakhstan's foreign policy initiatives. The texts of Arctic strategic documents were taken from the official websites of government agencies of non-Arctic countries.

Furthermore, an analysis of Kazakhstan's domestic climate challenges, such as water scarcity and shifting weather patterns, underscored the necessity for a more in-depth examination of Arctic climate dynamics. Given Kazakhstan's geographical location and the potential for accessing the global ocean via the Ob-Irtysh river system, the Northern Sea Route emerged as a critical focal point for investigation.

The factor of global initiatives was determined through an examination of Kazakhstan's foreign policy, diplomatic endeavors, and multilateral engagement. This analysis encompassed the country's strategic documents, international agreements, and participation in global forums. Kazakhstan's adherence to multilateral principles and active role in international organizations provided a framework for identifying this factor. Central to this analysis were the nation's aspirations to assume a proactive stance in global governance and to uphold a rules-based international system. Involvement in Arctic affairs is considered a strategic avenue for enhancing Kazakhstan's diplomatic influence, contributing to global stability, and aligning with its broader foreign policy objectives.

### **Results and discussion**

*Climate change and environment.* The Arctic region serves as a critical component of the Earth's climate system. Its extensive ice and snow cover exhibits a high albedo, reflecting solar radiation and contributing to global temperature regulation. However, anthropogenic climate change has induced accelerated ice melt, disrupting this essential feedback mechanism. The reduction in ice cover triggers a feedback loop, characterized by the albedo effect, wherein decreased reflec-

tivity leads to increased heat absorption by the exposed ocean surface, further amplifying ice loss. This process is linked to the intensification of extreme weather events on a global scale, with far-reaching implications for regions distant from the Arctic. For Kazakhstan, potential consequences include alterations in precipitation patterns, temperature variability, and the frequency and severity of extreme climatic events, such as droughts and severe winters. As noted by the President of the Republic of Kazakhstan K.-J. Tokayev on May 21, 2024 at a meeting with foreign ministers of states SCO members that extreme weather conditions are emerging as one of the primary global challenges. In light of this, it is imperative to modernize the SCO's approach to natural disasters. Kazakhstan experienced the full force of climate change's negative impacts during the spring of 2024 [2].

The climate of the Republic is primarily shaped by the interaction of three air mass types: Arctic, temperate, and tropical. The absence of significant orographic barriers facilitates the unimpeded movement of these air masses in a north-south and west-east direction. Arctic air masses, originating over the Arctic Ocean and adjacent landmasses, frequently bring anticyclonic conditions upon incursion into Kazakhstan [3].

Climate change poses significant risks to agriculture, water resources, and ecological equilibrium. Shifts in precipitation and temperature patterns can adversely impact crop productivity, irrigation practices, and livestock well-being, thereby jeopardizing food security. Kazakhstan's varied ecosystems, ranging from steppes to mountains, are particularly vulnerable to climatic alterations. These changes can disrupt migratory patterns of avian and marine species, induce habitat loss, and ultimately diminish biodiversity.

As mentioned earlier, climate change can have a detrimental effect on agriculture. Even though agriculture accounts for about 5% of Kazakhstan's GDP, it continues to be a major source of growth for long-term sustainable development, economic diversification and raising the living standards of the population in Kazakhstan. According to the study by «Halyk Finance», total agricultural area of Kazakhstan is about 217 million ha, of which arable land - 35 million ha (10th place in the world and 2nd by area of arable land per capita), mineral lands - 13 million ha. While Kazakhstan is amply endowed with land resources, it faces a severe water scarcity crisis, ranking among the most water-scarce nations in Eurasia. Only 2.8% of its territory is covered by water, with two-thirds classified as arid regions characterized by limited water access. The country is already experiencing a water shortage and, according to UN projections, could face a significant water deficit of 50% of its total need by 2040. The amount of rainfall, 250 mm per year, is comparable on a national scale to countries that are pastoral or where agriculture is totally dependent on irrigation [4].

Moreover, rainfall exhibits significant variability, posing substantial risks to rain-fed agricultural production. The continental climate, coupled with limited water availability, frequently renders moisture and weather conditions as primary determinants of agricultural output. Despite the relatively harsh climatic conditions, crop cultivation constitutes the predominant share of agricultural production within the country. Consequently, the principal impediments to enhancing crop yields in Kazakhstan are reliance on climatic conditions and low soil fertility. During periods of drought or excessive rainfall, such as in 2023, the yield of primary crops experiences a sharp decline. For instance, in 2022, gross wheat yield attained a decade-high of 16.4 million tons, corresponding to a yield of 12.4 centners per hectare, whereas preliminary data for 2023 indicate a gross wheat yield of only 11.5 million tons with yields of 8.5 centners per hectare [4].

Temperature increases and alterations in rainfall patterns can accelerate desertification, particularly in Kazakhstan's arid and semi-arid regions. This leads to soil degradation, reduced agricultural productivity, and heightened vulnerability to dust storms and land erosion. Modern desertification has been progressing in recent decades under the influence of global warming, characterized by rising annual average ground air temperatures, especially in arid, landlocked areas [3].

The fundamental problem is that even if global temperature increases are limited to 1.5 degrees Celsius by 2050, Central Asian countries will still experience a temperature rise of 2.5 degrees Celsius. This will result in water scarcity, extreme heat, desertification, and extreme hydrological events. Therefore, adaptation is both inevitable and necessary [5].

The Arctic region exerts a significant influence on global climate systems, thereby impacting the livelihoods of rural communities. Kazakhstan must closely monitor the Arctic to comprehend and mitigate the effects of global warming and climate change. In general, Kazakhstan is the most active Central Asian nation in the realm of climate issues. The country was the first in the region to ratify the Paris Agreement and adopt a Carbon Neutral Strategy by 2060. The rapid transformations occurring in the Arctic have far-reaching implications for weather patterns, water resources, agriculture, and ecosystems in Kazakhstan. By investigating Arctic climate change, Kazakhstan can enhance its ability to predict and prepare for future climatic shifts while safeguarding sustainable development and ecological equilibrium within its borders.

*Transit capacity and opportunities.* Arctic ice melt has opened new sea routes, notably the Northern Sea Route, which significantly reduces travel time between Asia and Europe. For Kazakhstan, aspiring to become a key Eurasian transit hub, the Northern Sea Route presents an opportunity to enhance communication and trade efficiency. By leveraging existing infrastructure and

developing new logistics centers, Kazakhstan can integrate into this burgeoning global shipping route.

In general, the water transport sector of the Republic of Kazakhstan possesses significant transit and transport potential since the country's major rivers traverse multiple states. Navigation in Kazakhstan is feasible on the Zhayyk, Syr-Darya, Ile, Esil, and Irtysh rivers [6]. For instance, the Irtysh River system connects the nation with the Arctic Ocean and the broader Arctic region. With sufficient development of river and maritime infrastructure, Kazakhstan could eliminate endogenous trade tariffs. This prospect would offer substantial opportunities for potential commercial, industrial, and broader economic growth within the Republic of Kazakhstan. Currently, utilizing the Irtysh River to access the Arctic route and the Northern Sea Route is strategically important for Kazakhstan, as it opens avenues for Central Asian states. In this regard, Russian scientist D. Mishina in her article entitled "Interdisciplinary Arctic of the Post-Soviet Countries" notes that the development of the Northern Sea Route and the infrastructure of the port of Sabetta gives Kazakhstan the opportunity to access not only the Arctic, but also the World Ocean, and thus the opportunity to cooperate with the world's leading maritime economies [7].

A pressing task is to harness the river's potential for river transport between Russia and Kazakhstan, as well as establishing a link to China. The Irtysh basin encompasses over 1,700 kilometers of waterways from the Chinese to the Russian border, including slightly more than 1,000 kilometers within East Kazakhstan and Abay regions, and approximately 600 kilometers within Pavlodar region. The Irtysh River itself extends for more than 4,000 kilometers, and its combined length with the Ob River reaches approximately 5,400 kilometers. Originating in China and Mongolia, the Irtysh flows into the Ob River near Khanty-Mansiysk, Russia. Its course traverses the People's Republic of China, East Kazakhstan, Abay, and Pavlodar regions (Republic of Kazakhstan), as well as Omsk, Tyumen, and Yugra regions (Russian Federation) [8].

The future of Irtysh River transit was also outlined in the state infrastructure development program "Nurly Zhol" for 2020-2025 [6]. The program emphasized the need to consider opportunities for developing the transit capacity of inland water transport, considering the development prospects of water transport in Russia and China. It further indicated the necessity of creating conditions for the further development of water transport on the Irtysh River, including increased transit and export cargo volumes. The signing of memoranda with Russian and Chinese parties on cargo transshipment along the Irtysh River could serve as a pivotal document. This document has the potential to contribute to the establishment of a tripartite joint venture through further refinement.

Interaction with Russia regarding the Northern Sea Route aligns with regional frameworks such as the Eurasian Economic Union (EAEU) and the Belt and Road Initiative (BRI). These initiatives foster economic integration, infrastructure development, and trade facilitation, providing additional support and resources for Kazakhstan's projects. The navigation agreement signed within the EAEU in 2019 enabled Kazakh carriers to expand river transport into the Ob-Irtysh basin [8].

Thus, the legal framework for implementing water policy through the utilization of transboundary river transit potential is already established. However, a comprehensive program to facilitate the Irtysh River's access to the Arctic is currently indispensable.

It is essential to note that the development of Russia's Yamalo-Nenets region is the final key to unlocking the Irtysh route to the Arctic. In particular, the development of the Port of Sabetta in the Gulf of Ob provides access to the Kara Sea and the Arctic Ocean. This transport corridor is expected to contribute significantly to the infrastructural and global market momentum required by Kazakhstan for seaborne Eurasian trade. The efficiency of the Sabetta seaport lies in its exclusive role as the entry point for Kazakh economy and trade into the open sea. The regional Russian authorities on the West Siberian Plain are already developing internal waterways from the Yamalo-Nenets Autonomous Okrug. Integrating with this continental river transport system enables our country to establish a viable and promising sea route.

Currently, river transport between Kazakhstan and Russia primarily operates along the Pavlodar-Omsk route. The river is utilized for exporting building sand, various gravel, and technical salt, while importing timber. Future development may encompass container transport routes, oil tanker operations, agricultural cargo transportation, and the establishment of passenger and tourist water routes.

The feasibility and benefits of the Irtysh corridor for Kazakhstan were demonstrated empirically in 2016 through two significant shipments from South Korea via the Northern Sea Route (NSR). This marked Kazakhstan's inaugural shipment via the NSR, originating from Ulsan, a major port situated on the Sea of Japan and a shipbuilding hub in South Korea. The total route length from Ulsan to Pavlodar was approximately 14,000 kilometers, including roughly 2,000 kilometers on the Ob and Irtysh rivers. The delivery of heavy equipment to the Pavlodar petrochemical complex involved a two-stage process: first, a barge transported the cargo from the Port of Sabetta to Omsk, followed by reloading and onward shipment to Pavlodar. The two hydrotreating reactors supplied to the Pavlodar Oil Chemistry Refinery weighed 527 and 550 tons, respectively.

A distinctive and appealing characteristic of this "river-ocean" transport route is its capacity to convey exceptionally large installations and fac-

tory equipment, as well as various machinery, in contrast to the carriage of goods in standard TEU containers [9].

By leveraging the Ob-Irtysh river system and collaborating on infrastructure development, regulatory compliance, and scientific research, Kazakhstan can maximize the Arctic region's transit potential. This partnership enhances Kazakhstan's global trade position, strengthens regional influence, and promotes sustainable development, ensuring a prosperous future within the evolving Arctic landscape. Over time, the Ob-Irtysh river system could become a crucial link and bridge between the Arctic and the Central Asian Silk Road. To achieve this, the Belt and Road Initiative necessitates infrastructure development across Eurasia and the creation of a new Silk Road.

Cooperation with Russia provides Kazakhstan with strategic access to the Northern Sea Route (NSR), offering significant economic, logistical, geopolitical, environmental, and technological advantages. These include access to icebreakers, specialized vessels, and cold-climate infrastructure. The introduction and adaptation of such technologies can enhance Kazakhstan's capabilities in Arctic navigation and logistics.

It is essential to recognize that Kazakhstan's participation in the NSR necessitates substantial investments in infrastructure, including railways, highways, and ports. Strategic partnerships with Arctic countries and investments in advanced logistics technologies can assist Kazakhstan in maximizing the NSR's benefits, thereby fostering economic growth and regional integration.

*International scientific cooperation.* The Arctic constitutes a critical component of the global climate system. Research conducted in this region aids scientists in comprehending the intricate interactions among the atmosphere, ice, and oceans. For Kazakhstan, a country characterized by diverse climate zones and significant environmental challenges, participation in Arctic research offers numerous benefits. These include advancements in climatology, environmental monitoring, technological innovation, and international cooperation.

It is essential to acknowledge Kazakhstan's experience in polar expeditions and research. For instance, Kazakh scientists previously contributed to Soviet scientific expeditions to Antarctica. Notable participants included physicists M. Musabayev, F. Aitbayev, D. Bimenov, S. Madibekov, H. Bulibekov. The Kazakh physicist and journalist D. Beimanov twice visited Mirny Station in Antarctica as part of a Soviet research expedition. He is the author of numerous scientific publications on climate protection and environmental safety [10].

Regarding contemporary Kazakhstan, between 2011 and 2017, fifteen members of the Public Association "Kazakh Geographical Society" participated in three polar expeditions: the Arctic in 2015 and Antarctica in 2011 and 2016. The scientific research expedition "Pole of Independ-

ence" (2016), commemorating the 25th anniversary of the Republic of Kazakhstan's independence, included scientists from Al-Farabi KazNU's Biotechnology department, A. Baubekova and A. Yernazarova, as well as medical scientists from KazNMU named after S.D. Asfendiyarova. KazNU scientists conducting research in Antarctica pursued a dedicated program in ecology, biology, and human physiology. These researchers also examined the microflora of selected samples, microbial properties, and their adaptation mechanisms to extreme conditions [10].

Another Kazakh scientist and employee of «Kazhydromet», K. Bektursunov, participated in the 54th Russian Antarctic expedition in 2009. The mission involved collecting ice samples from Antarctic icebergs for comparison with Kazakh ice samples. This research could contribute to understanding the causes of global warming and predicting climate change in Kazakhstan [11].

Overall, participation in Arctic research aligns with global Sustainable Development Goals (SDGs), such as those addressing climate change, terrestrial ecosystems, and marine life. By contributing to Arctic research, Kazakhstan can demonstrate its commitment to these goals and solidify its position within the international community's efforts toward sustainable development. Consequently, the Arctic region's research potential offers significant benefits for Kazakhstan. Advancements in climate science, environmental monitoring, technological innovation, and international cooperation can enhance Kazakhstan's capacity to address its own environmental challenges and contribute to global scientific endeavors. Through active participation in Arctic research, Kazakhstan can increase its resilience to climate change, foster sustainable development, and expand its scientific and technological capabilities, ensuring a prosperous and sustainable future.

*Kazakhstan global initiatives.* Kazakhstan's participation in Arctic affairs, despite its non-Arctic geographic location, can bring substantial benefits. Through international initiatives, Kazakhstan can influence global climate policy, expand its scientific and technological capacities, and enhance its geopolitical and economic standing. The nation possesses a history of successful global initiatives across various domains. For instance, Kazakhstan emerged as a primary initiator and advocate for establishing a nuclear-weapon-free zone. The relevant treaty was signed in Semipalatinsk in 2006. The country's role in non-proliferation was further solidified with the establishment of the Low-Enriched Uranium Bank (LEU) on Kazakh territory under IAEA auspices, designed to facilitate peaceful nuclear energy access while preventing countries from developing their own enrichment programs [12]. Kazakhstan's global endeavors also encompass peacemaking activities. Since 2000, Kazakhstan's peacekeeping contingent has participated in UN missions aimed at maintaining stability and security in Iraq, Cyprus, India, Pakistan, Lebanon,

Western Sahara, the Central African Republic, the Democratic Republic of the Congo, and Mali. During its 2017-2018 chairmanship of the UN Security Council, Kazakhstan prioritized peacemaking initiatives. The country has also become a significant actor in promoting peace negotiations, notably the Astana process for resolving the Syrian civil conflict initiated in 2017. The «Congress of Leaders of World and Traditional Religions» initiative has enabled Kazakhstan to significantly contribute to fostering tolerance and mutual understanding among diverse faiths, cultures, and civilizations [13]. The Conference on Interaction and Confidence Building Measures in Asia (CICA) platform, proposed by Kazakhstan at the 47th UN General Assembly in 1992, has evolved into a novel form of Asian security cooperation. In the face of emerging challenges and risks, CICA has provided an effective mechanism for preventive diplomacy and collective solutions to strengthen regional security. This proactive foreign policy demonstrates Kazakhstan's capacity to successfully generate and implement ideas and initiatives on a global scale, encompassing domains from interfaith dialogue to nuclear security.

If we turn to the issue of initiatives in the field of climate change, it can be noted that in 2009 Kazakhstan signed the Law «On the ratification of the Kyoto Protocol to the United Nations Framework Convention on Climate Change». Continuing this trajectory, in 2011 at a UN session, Kazakhstan proposed the "Green Bridge" partnership program aimed at strengthening green economic growth in the region. This program was approved in 2012 at the UN Conference on Sustainable Development "Rio+20" as an open-ended, cross-regional mechanism. The "Green Bridge" Partnership Program's integrated approach to addressing global environmental challenges involves active inter-country collaboration in implementing energy efficiency, resource conservation, alternative energy, and scientific research policies. The subsequent signing of the Paris Agreement on July 20, 2016, and its subsequent ratification by the Parliament of the Republic of Kazakhstan marked another significant step. The Paris Agreement outlined a roadmap for emissions reduction and climate change resilience enhancement measures.

On September 15, 2023, at the Meeting of the Council of Heads of States - Founders of the International Fund for Saving the Aral Sea (IFSA) in Dushanbe, President of Kazakhstan K.-J. Tokayev highlighted the creation of the Project Office for Central Asia on climate change and green energy as another crucial initiative. This step would facilitate the development of effective climate change adaptation and mitigation strategies. Additionally, addressing the General Debate of the 78th session of the UN General Assembly, K.-J. Tokayev emphasized the urgent need for immediate, effective, and transformative steps to prioritize environmental protection. He identified Central Asia as a frontline region, necessitating a focus



on positive climate change actions as defined by the UN, including investments in green jobs, elimination of fossil fuel subsidies, and ensuring women's equity, inclusiveness, and participation in all climate actions at various levels. However, he cautioned that without adequate funding, ambitious climate change plans would remain unrealized. In response, he proposed launching the Just Energy Transition Partnership (JETP) in Kazakhstan. Furthermore, K-J. Tokayev underscored that Kazakhstan's initiative to establish the Project Office for Central Asia on climate change and green energy in Almaty could contribute to addressing these challenges.

Consequently, Kazakhstan's participation in environmental and climate initiatives positions it as an active global climate negotiator. By contributing to Arctic climate discussions and agreements, Kazakhstan can advocate for policies addressing its domestic climate challenges, such as desertification and water scarcity, while simultaneously supporting global climate change mitigation efforts. Through Arctic-related initiatives, Kazakhstan can demonstrate leadership in combating climate change and ensuring sustainable development, enhancing its reputation as a responsible global actor committed to environmental stewardship and sustainable development. This leadership could inspire similar commitments from other countries, particularly in Central Asia. Collaborative efforts to monitor and mitigate these issues contribute to the improvement of the global and regional environment, benefiting both Arctic and non-Arctic regions.

### Conclusion

As a result of the study, four primary drivers were identified and analyzed to explain Kazakhstan's potential interest in the Arctic region: climate change, the Arctic's transit potential, scientific opportunities in the Arctic, and Kazakhstan's global initiatives. Each driver offers strategic benefits for the country, ranging from increased climate change resilience to economic opportunities and scientific advancements.

The Arctic's critical role in regulating Earth's climate through ice and snow reflectivity is threatened by global warming, inducing rapid ice melt and triggering feedback mechanisms that exacerbate climate change. This phenomenon has global implications, including for Kazakhstan, where alterations in weather patterns, precipitation, and temperature can lead to more extreme weather events impacting agriculture, water resources, and biodiversity. As a nation heavily reliant on agriculture yet already experiencing water shortages and extreme climatic conditions, Kazakhstan faces considerable challenges. The country has demonstrated a proactive stance on climate issues, exemplified by ratifying the Paris Agreement and developing the Carbon Neutrality Strategy by 2060. By focusing on the Arctic's influence on global climate systems, Kazakh-

stan can better prepare for and mitigate climate change, ensuring sustainable development and environmental stability.

The melting Arctic ice also presents significant opportunities for Kazakhstan to solidify its role as a key Eurasian transit hub. The emergence of new sea routes, notably the Northern Sea Route, offers a shorter and more efficient trade route between Asia and Europe. By harnessing the potential of the Ob-Irtysh river system and developing essential infrastructure, Kazakhstan can integrate into this expanding global shipping network. Strategic utilization of river transport, particularly the Irtysh River, can facilitate Arctic access and enhance connectivity with major trading partners like Russia and China. To achieve this, it is necessary to accelerate investments in the modernization of the Irtysh River infrastructure and improve logistics links with the Russian Ob basin and the port of Sabetta, including through trilateral agreements with China and Russia.

Leveraging its experience in polar expeditions, Kazakhstan's scientific community can contribute to Arctic research, refining climate change forecasting models, improving agricultural planning, and aiding water management and disaster preparedness. Moreover, innovations developed for Arctic extreme conditions can be applied to Kazakhstan's regions with challenging climates. This engagement aligns with global sustainable development goals, especially those related to climate change and environmental protection. By actively participating in Arctic research, Kazakhstan can bolster its climate change resilience, support sustainable development, and expand its scientific and technological capacities. It should also be noted that scientific cooperation is a key tool of soft power. Kazakhstan has a history of polar expeditions and expertise in climate research that should be used and internationalized. Active participation in Arctic scientific networks will enhance Kazakhstan's credibility.

Building upon its rich experience in global initiatives such as establishing a nuclear-weapon-free zone and participating in peacekeeping missions, Kazakhstan can influence other domains, including global climate policy, to expand its scientific and technological capabilities and strengthen its geopolitical and economic positions. The country's commitment to environmental protection is evident through its participation in the Kyoto Protocol, the Green Bridge Partnership Program, and the Paris Agreement. President K-J. Tokayev's recent proposals, including the establishment of the Project Office for Central Asia on climate change and green energy and the Just Energy Transition Partnership (JETP) in Kazakhstan, underscore the country's proactive approach to addressing climate change. Through involvement in Arctic-related initiatives, Kazakhstan can advocate for policies addressing domestic environmental challenges like desertification and water scarcity while supporting global climate change mitigation efforts. This participa-

tion positions Kazakhstan as a responsible global actor, demonstrating leadership in sustainable development and inspiring similar commitments from other countries, particularly in Central Asia.

It should be noted that the Arctic is not currently an established vector of Kazakhstan's foreign policy. Limited access issues, high costs of infrastructure adaptation, and low immediate returns from Arctic engagement – especially given Kazakhstan's existing environmental crises – deprioritize Arctic policy in real terms. However, our country demonstrates emerging strategic potential – especially in the areas of scientific cooperation and environmental diplomacy – that could be exploited if embedded in national strategic planning and supported by investments in infrastructure, multilateral integration, and policy development.

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