



Constraints and Potential Spaces of China–India Cooperation in the Arctic: A Structural and Situational Analysis

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ABSTRACT

In recent years, Arctic climate change has not only affected the global environment but also enhanced the region's strategic and economic significance. Both China and India have shown growing interest in the Arctic. Following the Russia–Ukraine conflict, the region has witnessed an intensified trend of “re-securitization,” disrupting its governance system. Against this backdrop, examining the roles of China and India in Arctic affairs and assessing their cooperation potential hold substantial theoretical and practical relevance. Drawing on structural and neo-classical realist theories, this study constructs an analytical framework centered on structural and situational factors. It argues that the complex geopolitical and institutional landscape of the Arctic imposes significant constraints on China–India cooperation. Nevertheless, the two states retain notable potential for collaboration in areas such as climate change research, environmental protection, and sustainable development—fields characterized by low costs, high long-term returns, and positive cognitive resonance. In contrast, cooperation in Arctic shipping and the blue economy entails higher costs, greater perceptual divergence, and a narrower scope for joint action. As bilateral relations gradually stabilize, cooperation in the relatively low-sensitivity domain of Arctic affairs could further bridge differences, rebuild trust, and help address the region's most pressing challenges.

Introduction

China–India relations have experienced a turbulent evolution in recent years, shifting from a complex situation of both cooperation and competition to one increasingly dominated by confrontation.¹ The boundary dispute remains one of the core sources of conflict between the two nations,² while competition also exists in global trade, export markets, and energy acquisition.³ The United States and the Soviet Union, as well as its successor state, Russia, have long been engaged in structural contradictions and confrontational relations.

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However, prior to the outbreak of the Russia–Ukraine conflict in 2022, the United States and Russia maintained dialogue and cooperation in the Arctic. The Arctic has been one of the few areas where Russia and the West have continued to cooperate. This has led some scholars to introduce the concept of “Arctic Exceptionalism,”⁴ referring to the Arctic as a low-tension region, geographically distant from global centers of power, where a relatively independent governance agenda exists, and peaceful cooperation has traditionally been the mainstream approach to Arctic affairs.

Overall, China-India relations are marked by structural contradictions such as border disputes and regional competition, which make it difficult to eliminate confrontational factors in the short term. These elements contribute to the notable volatility in bilateral relations. However, the two populous nations, each with a population of over 1.4 billion, should not be positioned in opposition but rather seek opportunities for cooperation and joint development. On October 23, 2024, Indian Prime Minister Narendra Modi and Chinese President Xi Jinping held a bilateral meeting at the BRICS summit, where they reached a consensus to enhance communication and cooperation.⁵ On August 31, 2025, President Xi met with Prime Minister Modi in Tianjin during the Shanghai Cooperation Organization (SCO) Summit. Both leaders agreed that, following their meeting in Kazan, China–India relations had returned to the right track and continued to improve, emphasizing that bilateral cooperation would jointly advance the advent of an “Asian Century.”⁶ This thaw in China-India relations has also created positive factors for Arctic cooperation. The Arctic, as a unique region, may offer potential for advancing the broader normalization process between China and India. Both China and India are major emerging economies with keen interest in Arctic scientific research, resource development, and environmental protection. Furthermore, both states are signatories of the UNCLOS, the Spitsbergen Treaty, and observer states in the Arctic Council, providing a legal foundation and shared interests for Arctic cooperation. This paper does not assume that Arctic cooperation will eliminate the structural contradictions between China and India, but rather suggests that the Arctic could serve as a platform for dialogue and cooperation. It offers a balanced perspective to the competitive narratives between the two nations and injects positive elements into the sustainable development of the Arctic region.

Existing research predominantly analyzes China-India relations in the Arctic from an adversarial perspective. For example, Nima Khorrami argues that India’s Arctic strategy focuses more on countering China than on engaging with the specific dynamics of the Arctic region.⁷ Anurag Bisen contends that China, as India’s primary competitor, presents a strategic challenge to India’s interests in the Arctic through its involvement in the region.⁸ Maria Lagutina and Yana Leksytina both assert that the likelihood of China-India Arctic cooperation is low, primarily due to the absence of a strong bilateral

cooperation framework between the two states in the Arctic. Instead, both nations are more inclined to engage separately with Arctic states. Additionally, the complex nature of China-India relations, particularly their rivalry in areas such as the Belt and Road Initiative (BRI) and the Indo-Pacific strategy, further diminishes the possibility of joint action in the Arctic.⁹ Zhang Yao notes that India's perception of China as a competitor in the Arctic presents a significant challenge to building mutual trust between the two nations.¹⁰ Zhang Xinyuan suggests that India's involvement in Arctic affairs is largely driven by its need to counterbalance China's growing influence in the region. India strengthens its cooperation with Russia and other Arctic states as a strategic means of balancing China's presence in the region.¹¹ Krasnozhenova, E. E., et al. highlight that China's activities in the Arctic have prompted India to enter the Arctic race. With the opening of Arctic shipping routes, China has reduced its reliance on traditional maritime routes passing through the Strait of Malacca. In this context, India is unlikely to allow China to become the only Asian participant in the Arctic region.¹²

Some studies have explored China-India Arctic cooperation within the framework of multilateral cooperation, although these works primarily focus on the collaboration between Russia and non-Arctic states (such as BRICS members), with China-India cooperation merely mentioned as an incidental point, without a systematic analysis. For example, Irina A. Strelnikova, Maksim G. Maiorov, and Dmitrii I. Popov analyzed the shared interests and potential for cooperation among BRICS countries and their new members in Arctic logistics. They noted that despite the existing contradictions between China and India, the two countries possess cooperation potential in Arctic affairs due to their shared economic goals and external pressures, and could play a key role in multilateral cooperation.¹³ Rasim Mammadli from Moscow State Institute of International Relations and Rabia Kalfaoglu from Moscow State University also argued that BRICS countries could engage in Arctic cooperation in areas such as the New Development Bank projects, marine affairs, fisheries, science, and environmental issues.¹⁴ This insight provides a useful starting point for exploring the potential of China-India cooperation in the Arctic.

Existing studies have provided valuable insights and inspiration for this paper; however, research on China-India Arctic cooperation remains somewhat limited. Most existing literature emphasizes the competitive or adversarial dimensions of China-India relations in the Arctic, overlooking their shared interests and potential areas of collaboration. Research from a multilateral perspective often centers on Arctic cooperation between Russia and BRICS countries, with China-India cooperation treated only as a secondary issue and lacking systematic, focused analysis. Consequently, the potential and constraints of China-India cooperation in the Arctic have yet to be fully explored. Building on existing scholarship, this study draws on the

analytical perspectives of structural realism and neoclassical realism to construct a research framework based on structural and situational factors. From the dual dimensions of structural constraints and situational interactions, it assesses the scope, boundaries, and drivers of China–India cooperation in the Arctic. This approach not only fills a theoretical gap in the existing literature but also provides a new analytical lens for understanding the logic of cooperation among non-Arctic states under the evolving geopolitical landscape.

The structure of this paper is organized as follows. First, it outlines the methodological approach adopted in the study and establishes an analytical framework based on structural and situational factors. Second, it examines the multiple legal frameworks governing the Arctic and analyzes their geopolitical and environmental implications. Third, it applies the proposed analytical framework to discuss the structural constraints and potential areas of cooperation between China and India in the Arctic, and further explores possible pathways for collaboration. Finally, the conclusion summarizes the key findings of the study.

Methodology and analytical framework

Methodology

This study examines the structural constraints and cooperative potential of China–India engagement in the Arctic under the new geopolitical environment that has emerged following the Russia–Ukraine conflict. It adopts a comprehensive research approach that combines systematic literature analysis with both descriptive and analytical methods. The primary sources include official policy documents such as the Arctic policies of China and India, government statements, legal treaties, and statistical data. These are supplemented by secondary sources such as academic papers, monographs, and research reports. By integrating diverse materials, the study seeks to uncover, from both structural and situational dimensions, the underlying logic and developmental trajectories shaping China–India cooperation in the Arctic.

Furthermore, this study develops an analytical framework based on structural and situational factors to reveal how relatively stable constraints—such as geopolitical dynamics and regional institutional structures—interact with situational variables, including short-term policy adjustments and unexpected events. On this basis, the descriptive method is employed to systematically examine the legal and institutional landscape of the Arctic, its geopolitical context, and the policy orientations and practical participation of China and India in Arctic affairs. The analytical method, in turn, is used to identify the structural constraints affecting bilateral cooperation, the cost–benefit logic across different fields of collaboration, and divergences in perception and

identity, while assessing the overall feasibility and prospective direction of China–India Arctic cooperation.

Analytical framework

Building upon a comprehensive analysis of the relevant literature, this study constructs an analytical framework based on structural factors and situational factors to assess the spatial scope and constraints of China–India cooperation in the Arctic. In examining this issue, the study identifies multiple influences shaping bilateral cooperation and categorizes them into two main types, the first being structural factors. Kenneth Waltz, the founder of Structural Realism, argues that “Structure is the concept that makes it possible to say what the expected organizational effects are and how structures and units interact and affect each other.”¹⁵ Following Waltz’s conceptualization, structural factors in this study refer to the enduring and stable elements that consistently shape and constrain China–India Arctic cooperation—those fundamental realities that cannot be altered through bilateral efforts and that both states must inevitably confront. The structural factors examined in this research primarily include the global geopolitical and institutional environment, as well as the distinctive political and institutional context of the Arctic region. Within such structural settings, actors tend to develop specific cognitive pathways and behavioral inertia, resulting in homogeneous and repetitive decision-making patterns. Even when international circumstances change, states are likely to make similar choices in comparable situations, thereby maintaining existing structural outcomes. From the perspective of Structural Realism, the configuration of the international system is primarily defined by the state as its basic unit, and is shaped by the ordering principle, the characteristics of those units, and the distribution of capabilities.¹⁶ Among these, great power relations—particularly competition in relative material power—exert the most significant influence on the structure of the global order. Consequently, structural factors impose fundamental constraints on state behavior and largely determine the upper limits of cooperation between China and India in the Arctic.

In China–India Arctic relations, the influence of major powers—particularly the United States and Russia—is especially pronounced. The United States’ current great-power competition strategy, characterized by its dual containment of China and Russia and the promotion of the Indo-Pacific framework, has undoubtedly become a major constraining factor in China–India engagement in the Arctic. Russia, for its part, remains concerned about asymmetric interdependence with China in economic and trade relations and potential imbalances in political influence. As a result, Moscow has adopted a “dual reliance” balancing strategy between China and India, which has also become an important factor shaping the distance and depth of China–India Arctic

cooperation. Beyond the global geopolitical dimension, the unique geopolitical and institutional characteristics of the Arctic must also be considered. The region remains predominantly governed by the Arctic states and, unlike fragmented geopolitical zones, is relatively closed, stable, and marked by a clear hierarchy of identities. Since both the United States and Russia are Arctic states, the relational structure among Arctic states significantly influences the participation and cooperation of non-Arctic actors. The current configuration of competition and cooperation among Arctic states—such as the U.S.–Russia military rivalry in the region following the Russia–Ukraine conflict, the stagnation of existing governance mechanisms, and the involvement of emerging multilateral platforms such as the BRICS framework—profoundly shapes the future trajectory of China–India Arctic relations.

Second, drawing on the core ideas of Neoclassical Realism, this study argues that a state's relative material capabilities determine the basic parameters of its foreign policy. However, there is no immediate or perfect transmission mechanism between material power and foreign behavior. In other words, a state's external actions are shaped not only by systemic pressures but also by domestic political, economic, and cognitive factors.¹⁷ From this perspective, while foreign policy is rooted in systemic constraints, its specific manifestations must be “translated through intervening variables at the unit level.”¹⁸ Accordingly, this study conceptualizes such subjective responses and behavioral variations to external constraints as situational factors, in order to reveal the dynamic logic of state behavior within specific spatial and temporal contexts.

In the Arctic's distinctive geopolitical setting, structural factors determine the upper limits of China–India cooperation, yet each state's responses to these structural constraints depend on its internal cognition and policy adjustment mechanisms. This perspective thus provides the theoretical foundation for the situational-factor analysis developed in this study. Compared with structural factors, situational factors focus not only on the distribution of material capabilities but also on the actors' subjective perceptions and cognitive reactions. Based on the assumption of bounded rationality, this category of factors defines national interest as the product of both rational choice and context-dependent psychological mechanisms. It acknowledges that actors, when confronted with sudden and atypical changes in their external environment, engage in rapid information processing and may exhibit affective judgments or other emotionally charged responses that influence decision-making. These factors are characterized by nonlinearity and context dependence, making them necessary objects of independent analysis.

Overall, this category of factors exhibits high variability and agency, often allowing for proactive modification through negotiation and consultation. They are characterized by a comparatively flexible nature. Unlike structural factors, which tend to produce homogeneity and convergence of outcomes

across different sectors, these elements emphasize the distinctiveness and diversity of resource composition and distribution in various domains. They thus represent a form of relational power, distinct from structural power, reflecting a dynamic understanding of power. Rooted in intangible resources, this type of power operates through attraction, identification, and interaction, with its essence lying in the generation of trust and mutual support among actors.¹⁹ From an analytical standpoint, the key to situational factors does not lie in assuming the elimination of structural contradictions but rather in recognizing that, despite structural constraints, states can still achieve limited cooperation in specific issue areas through negotiation and interaction.²⁰

In the context of China–India Arctic cooperation, examining the two countries’ perceptions, strategic objectives, interests, and specific policy approaches provides an important entry point for understanding their relationship. Accordingly, this study draws on the official Arctic policy documents of China and India, as well as public statements made by their governments in recent years concerning Arctic affairs, to analyze each country’s core interests and priority areas, thereby identifying potential points of convergence and opportunities for cooperation. In addition, the analysis incorporates recent representative international political events—such as the psychological stimulus India experienced in response to tariff sanctions imposed by the Trump administration and the subsequent countermeasures adopted by the Modi government—as key situational references for assessing China–India relations and their cooperative dynamics in the Arctic. Figure 1 presents the analytical framework constructed in this study.

This study argues that the Arctic’s political and institutional environment constitutes a structured system, whose core components include: (1) the

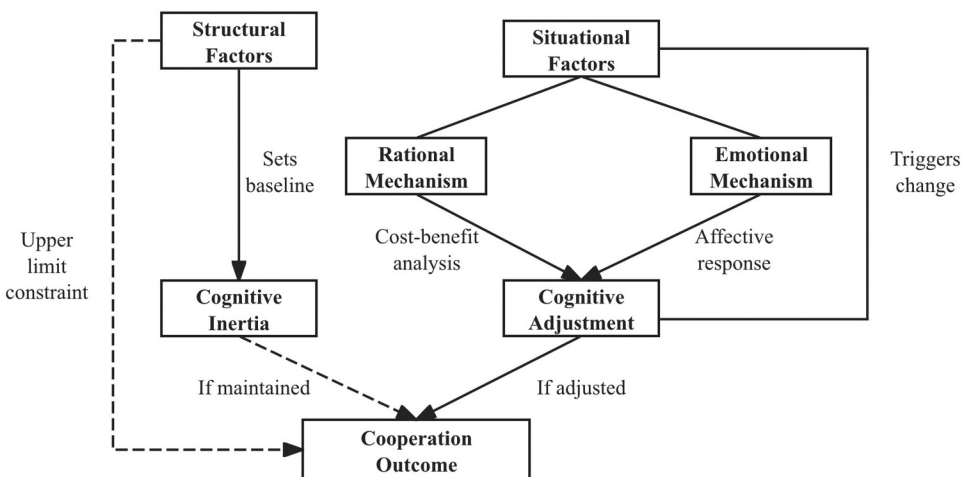


Figure 1. Structural–situational factors analytical framework for China–India arctic cooperation (Source: Author’s own elaboration).

configuration of power relations among major states within the international system, and (2) the governance mechanisms and institutional arrangements at the regional level. These structural elements constrain both the internal cognition and external behavior of actors embedded within them. Through long-term interaction, actors develop relatively stable cognitive patterns and behavioral routines for managing their relationships with others.

However, actors are continuously exposed to the immediate stimuli of external environmental changes. When faced with differing interests across various issue areas, they may reassess and adjust their preexisting cognitive frameworks and behavioral habits. The direction and magnitude of such adjustments are primarily influenced by two sets of factors: one based on rational cost–benefit analysis, and the other derived from emotional dynamics rooted in perception and identity.

This study contends that, as rational actors, states are generally guided more by rational than emotional considerations in their decision-making. Emotional factors tend to play a secondary or corrective role in most situations. Consequently, when negative emotions are substantially weaker than positive ones, and when the cost of maintaining established behavioral patterns is significantly lower than the expected benefits, actors tend to preserve their existing behavioral inertia. Even when negative emotions slightly outweigh positive ones, actors are still likely to maintain existing behavioral patterns so long as the cost of doing so remains substantially lower than the anticipated benefits. Only when negative emotions greatly exceed positive ones and when the cost of sustaining existing relational patterns is considerably higher than the benefits will actors decisively alter their mode of interaction. In all other cases, behavior remains highly context-dependent and must be analyzed in light of specific situational conditions.

The Arctic region's multiple legal frameworks and its geopolitical and environmental significance

Multiple legal frameworks of the Arctic region

The Arctic Circle is comprised of eight countries: Canada, Denmark, Finland, Iceland, Norway, the Russian Federation, Sweden, and the United States. These countries are collectively referred to as the “Arctic States.” Some of the land and maritime areas within the Arctic region fall under the sovereign jurisdiction of these states, and these areas are governed by the domestic laws of the Arctic States. Outside the jurisdiction of the Arctic States, vast maritime areas are regulated by existing international legal frameworks, including international law and regional legal instruments. In addition, the indigenous groups of the Arctic, based on their traditional cultures and social structures, have developed unique governance mechanisms and normative systems,

which hold significant importance within the Arctic legal framework.²¹ Consequently, the legal structure of the Arctic region is diverse, encompassing international treaties, domestic laws, regional regulations, and more.

First, globally applicable international legal rules are applicable to the Arctic region. These include the United Nations Convention on the Law of the Sea (UNCLOS, 1982), the International Convention for the Regulation of Whaling (ICRW, 1946), the Polar Code (2014), the Convention on Biological Diversity (CBD, 1992), and the United Nations Framework Convention on Climate Change (UNFCCC, 1992). These rules hold global applicability and provide the legal foundation for Arctic governance, resource utilization, environmental protection, and other related issues.

Secondly, there are international legal frameworks specifically applicable to the Arctic region. These include the Svalbard Treaty (ST, 1920), the Agreement for the Prevention of Unregulated Fisheries in the Central Arctic Ocean (NEAFC Convention, 2021), and the Agreement on the Conservation of Polar Bears (1973), among others. Furthermore, regional treaties adopted by the Arctic Council, such as the Arctic Search and Rescue Agreement (2011), the Agreement on Cooperation on Marine Oil Pollution Preparedness and Response in the Arctic (2013), and the Agreement on Enhancing International Arctic Scientific Cooperation (2017), also grant certain rights to non-Arctic states, providing legal grounds for stakeholders outside the Arctic to participate in Arctic affairs.

Lastly, Arctic states have also introduced specific laws and policies pertaining to the Arctic. For example, Russia enacted the “Navigation Rules for the Northern Sea Route Waters” in 2013, and Canada established the “Arctic Waters Pollution Prevention Act.” Foreign vessels passing through waters controlled by Arctic coastal states must comply with the relevant national laws of these countries.

As such, the legal framework governing the Arctic region is not singular but rather comprises a complex interplay of multiple legal regimes. These frameworks include the domestic laws of Arctic states, international laws, and regulations issued by relevant international organizations or mechanisms. This intertwined legal structure reflects the complexity and uniqueness of the Arctic as a region where various stakeholders converge. Different legal rules and governance mechanisms intersect, collectively establishing a multi-layered, multi-stakeholder legal and governance model.

Both China and India are signatories to international treaties such as the UNCLOS and the Svalbard Treaty, and are observer states in the Arctic Council, as well as members of the International Maritime Organization (IMO). These treaties and memberships provide a legal basis for their participation in Arctic affairs.

Furthermore, with global climate change, the area and thickness of Arctic sea ice have sharply decreased. This not only affects the temperature and

precipitation patterns in the Arctic region but also, through feedback mechanisms and interactions, influences the climate in the mid- and low-latitude regions of the Northern Hemisphere, and potentially impacts global climate systems.²² The climatic changes in the Arctic will have significant repercussions for the temperature and precipitation in both China and India, thereby affecting their agricultural production, food security, and economic development. Therefore, both China and India adhere to the principle of inclusive participation by multiple stakeholders in Arctic affairs.

Geopolitical and environmental significance of the Arctic

The Arctic has garnered significant attention due to its geopolitical and environmental importance. The Arctic's white ice cap, which releases more heat to space than it absorbs from the Sun, acts as a "heat sink" for the Earth, helping to maintain a stable global temperature. However, as a result of anthropogenic climate change, the Arctic ice is rapidly melting, with its warming rate nearly three times the global average. As global warming intensifies, the Arctic environment is undergoing profound transformations. During the summer months, the ice cover continues to shrink, and the region's temperature fluctuates between -60°C and $+30^{\circ}\text{C}$ (and sometimes even higher). Changes in the Arctic's climate and environment will have significant impacts on the climate and socio-economic development of the Northern Hemisphere, and potentially the entire globe. The melting of Arctic ice will contribute to rising global sea levels, while the reduction of sea ice will diminish the reflection of sunlight. Moreover, the melting of ice sheets will accelerate the release of greenhouse gases such as methane, further exacerbating global climate change. As a result, both Arctic and non-Arctic countries place high importance on monitoring and responding to the environmental changes in the region.

The ongoing melting of the Arctic ice sheet has made the region's abundant resources more accessible for exploration and extraction. The Arctic is estimated to contain approximately 90 billion barrels of oil (16% of the global total), 1,669 trillion cubic feet of natural gas (30% of the global total), and 44 billion barrels of natural gas liquids (38% of the global total).²³ Consequently, the Arctic has been dubbed the "new golden land" for extractable natural resources, attracting attention from both Arctic and non-Arctic states. While these resources hold significant economic potential, they have also intensified the competition between countries over control of these valuable assets.

As a major energy power, Russia's dominant position in the Arctic further complicates the region's geopolitical dynamics. In 2020, Russia earned up to \$167 billion from energy exports, while the outbreak of the Russia-Ukraine conflict in February 2022 exacerbated regional instability. Western sanctions

imposed on Russia severely impacted its energy exports and shook the geopolitical balance of the entire region. The West's push for an "anti-Russian" agenda in the Arctic, along with the suspension of international cooperation platforms such as the Arctic Council, has left Arctic governance in a state of turmoil. NATO's "northern expansion" has turned the Arctic waters into a frontline for Russian-European defense, shaping a confrontational relationship between Russia and the the seven other Arctic states, collectively known as the Arctic Seven(A7).²⁴ As military and security concerns have gradually replaced cooperation as the central focus of Arctic affairs, Arctic states have increasingly strengthened the region's strategic significance and security deployment. The United States, in its National Strategy for the Arctic Region (2022) and Arctic Strategy (2024), places Arctic security—particularly homeland and military security—at the top of its agenda. Russia, through the release and revision of key policy documents such as the Maritime Doctrine of the Russian Federation, has elevated the Arctic to a core area for national security and economic development, reinforcing its sovereign control over the Northern Sea Route(NSR). Similarly, the Nordic Arctic states have updated their Arctic strategy documents since around 2020, viewing the regional security environment as deteriorating and emphasizing the need to enhance defense cooperation and expand NATO's role in Arctic security.

Amid these developments, countries have intensified their military investments in the Arctic. Russia has modernized Soviet-era Arctic military facilities and strengthened the nuclear deterrence capability of its Northern Fleet,²⁵ while the other seven Arctic states have further increased defense expenditures, using the NATO framework to enhance their military presence and collective defense posture.²⁶ Against this backdrop, the Arctic is undergoing a structural transformation from "cooperation and security" to "confrontation and fragmentation." A dual security system, comprising NATO and Russia, is taking shape, weakening traditional cooperation mechanisms and resulting in an Arctic order characterized by "re-securitization" and the dualization of governance.

Russia holds the largest territorial share of the Arctic, with its abundant hydrocarbon reserves spread across several basins, including the Caspian-Volga, Yenisei-Khatanga, West Siberian, Pechora, and Anadyr-Sakhalin basins.²⁷ These resources are crucial to the European economy; for instance, 25% of Germany's oil imports depend on Russia, and its natural gas imports from Russia account for as much as 40%.

Russia exports its resources to Europe through pipeline networks established during the Soviet era, including the Yamal-Europe pipeline, which connects the European Union and Ukraine, passes through Poland and Belarus, and ultimately reaches Germany. Another key route is the Nord Stream 1 pipeline, which runs across the Baltic Sea. However, severe sanctions have forced European Union countries to seek alternative energy supply

sources. As part of the Southern Gas Corridor, the Trans-Anatolian Natural Gas Pipeline (TANAP) transports Azerbaijani natural gas across Turkey and connects with the Trans-Adriatic Pipeline (TAP) at the Turkish–Greek border. TAP then carries natural gas from Azerbaijan’s Shah Deniz field in the Caspian Sea through Greece, Albania, and the Adriatic Sea to European markets. As sanctions deepen, the European Union is expected to gradually reduce its reliance on Russian energy by 2030, with the East Asian economic zone emerging as the next major market for Russian energy exports.

Overall, the geopolitical landscape of the Arctic is undergoing profound transformation. Climate change has enhanced the accessibility of Arctic routes and resources, while the Russia–Ukraine conflict has triggered new configurations of power and intensified security competition. The long-standing notion of “Arctic exceptionalism” has been replaced by a logic of “re-securitization.” Confronted with ongoing tensions with the West, Russia has pursued a “pivot to the East” strategy, creating new opportunities for Asian countries to engage in Arctic affairs. Against this backdrop, the Arctic has emerged not only as a new frontier for global climate governance but also as a crucial arena for major power competition and interaction among emerging economies. For China and India, finding a balance between competition and cooperation has become a central issue.

Strategic interests of India and China in the Arctic

China’s Arctic interests and strategies

China’s strategic involvement in the Arctic encompasses multiple objectives, including economic, scientific, security, and environmental goals. As a key stakeholder in Arctic affairs, China has actively sought to participate in Arctic governance through initiatives like the “Polar Silk Road.” However, the practical challenges and effectiveness of this strategy require further exploration. In the context of the complex Arctic situation, China and Russia have strengthened their cooperation in the region, with China’s engagement in Arctic affairs becoming increasingly multifaceted. This section will analyze China’s strategic interests and policies in the Arctic, as well as the dynamics of China–Russia cooperation in the region amidst the growing fragmentation of Arctic governance.

China’s Polar Silk Road: strategic ambitions and current realities

In 2013, China introduced the BRI, and as global warming accelerates the melting of Arctic glaciers, the shipping potential of Arctic sea routes has gradually come to the forefront. This has created opportunities for the integration of the BRI with Arctic shipping lanes. In July 2017, during a meeting between the leaders of China and Russia, both sides proposed strengthening

cooperation on the NSR and jointly building the “Polar Silk Road.” In January 2018, the Chinese government released the white paper on China’s Arctic Policy, officially incorporating the “Polar Silk Road” into the BRI framework, marking a key channel for China’s participation in the development of Arctic shipping routes. Geographically, the “Polar Silk Road” refers to the maritime routes through the Arctic Circle that connect three major economic centers: North America, East Asia, and Western Europe.²⁸ These routes include the Northeast Passage, the Northwest Passage, and the Transpolar Route, with the Northeast Passage receiving the most attention due to its highest shipping value. Particularly notable is the NSR in Russia, which connects the Kara Strait with the Bering Strait, and is considered the core segment of the “Polar Silk Road.” This initiative not only highlights China’s ambition to expand its involvement in Arctic affairs but also reflects the broader strategic considerations of its global trade policy.

China is not an Arctic Circle nation, and as such, it naturally faces geographical disadvantages in Arctic affairs. However, China’s outward-oriented economy heavily relies on maritime shipping, and the NSR offers a route from East Asia to Europe that shortens the journey by 40% compared to the traditional Suez Canal route.²⁹ This makes the “Polar Silk Road” an important initiative for China to enhance global logistics efficiency. Through this initiative, China aims to activate the economic potential of countries along the route, secure economic benefits, expand its participation in Arctic affairs, and further extend the strategic reach of the BRI.

In recent years, the “Polar Silk Road” has made notable progress. For example, the Yamal Liquefied Natural Gas (LNG) project, the largest energy cooperation project between China and Russia, has been operational since the end of 2017. The China National Petroleum Corporation (CNPC) and the Silk Road Fund each hold a 20% and 9.9% stake in the project, making it a significant cornerstone of the “Polar Silk Road” initiative. However, despite these achievements, the initiative still faces several limitations. First, the synergistic effect between the “Polar Silk Road” and the BRI has yet to be fully realized. At present, the cooperation under the “Polar Silk Road” is primarily confined to the China-Russia bilateral energy sector, with limited participation from other Eurasian countries. Among the 63 projects approved by the Asian Infrastructure Investment Bank (AIIB), none directly involve the “Polar Silk Road.” Furthermore, the Silk Road Fund’s investments are restricted to the Yamal LNG project, highlighting that the initiative is still in its early stages and has not yet been deeply integrated with the BRI. Second, the “Polar Silk Road” faces increasingly complex geopolitical challenges in the Arctic region. In recent years, many proposed Arctic projects have been delayed or canceled due to regional tensions.³⁰ After the outbreak of the Russia–Ukraine conflict, the West imposed multiple rounds of sanctions on Russia, restricting its energy production and export capacity. Moreover,

China's Arctic cooperation has also been affected. For instance, the Penglai Jutao Offshore Engineering Heavy Industry Co., Ltd. was sanctioned by the United States for its involvement in the Russian Arctic LNG-2 project, causing other Chinese companies to approach Arctic projects with greater caution.³¹ Additionally, the increasing "remilitarization" of the Arctic is evident, with the accession of Finland and Sweden to NATO, gradually shaping the Arctic into a confrontation zone between Russia and the Arctic Seven(A7). This situation brings additional uncertainty to the advancement of the "Polar Silk Road."

Overall, the "Polar Silk Road" initiative demonstrates China's strategic ambition in Arctic affairs. It is not only an important attempt to extend the BRI into the polar region, but also a key area of China-Russia cooperation. However, at its current stage, the development of the initiative is still constrained by multiple political and economic challenges. Looking ahead, how China navigates geopolitical complexities and fosters multilateral cooperation with other countries will determine the effectiveness and stability of this initiative.

China's Arctic interests: economic gains or strategic objectives?

China's interest in the Arctic can be traced back to its economic motivations and broader strategic goals. As a major player in global trade and energy demand, China reached a total export value of \$3.4 trillion in 2023, with crude oil imports amounting to 56.394 million tons.³² Furthermore, China is the world's largest net importer of natural gas. This immense energy demand aligns naturally with the resource reserves in the Arctic, making the region a key consideration in China's energy strategy. Additionally, Arctic shipping routes, with their distance advantages over traditional routes and the lack of disruptive factors like piracy, have also become a key component of China's energy trade and shipping layout.

China's interest in the Arctic extends beyond economic considerations. The scientific research potential of the Arctic is a significant component of China's broader strategic objectives. The region's unique characteristics in areas such as climate change, biodiversity, and natural resource studies make it a focal point for global scientific research. By enhancing its scientific research efforts in the Arctic, China can not only strengthen its influence in Arctic affairs but also demonstrate its commitment to environmental issues in the region, thereby cultivating a responsible international image.

Moreover, China is committed to enhancing the governance framework of the Arctic. This objective has become particularly salient in the context of a complex geopolitical environment and fragmented Arctic cooperation. China has proposed a diplomatic approach for the Arctic based on the principles of "respect, cooperation, win-win outcomes, and sustainability,"³³ aiming to foster strategic mutual trust among nations,

reduce confrontation, and strengthen dialogue in order to improve Arctic governance mechanisms. This position underscores China's intent to actively participate in shaping the Arctic governance order, thereby enhancing its influence in international affairs while promoting regional cooperation.

Lastly, China's Arctic strategy also includes the development of a balanced global maritime network. By advancing the Arctic shipping routes, China seeks to establish the shortest transportation path between East Asia and Western Europe, alleviating congestion and risks in traditional trade routes. In doing so, China aims to diversify its shipping operations, thereby enhancing the stability and sustainability of the international logistics network. This strategy not only serves China's global trade objectives but also contributes to the long-term development of the global shipping system.

In summary, China's interest in the Arctic reflects a multifaceted approach encompassing economic, scientific, and strategic objectives. This multidimensional strategy not only highlights China's long-term considerations in Arctic affairs but also demonstrates its commitment and concern for the region's future development. Unlike traditional regional competitions over resources and influence, China's Arctic strategy seeks to strike a balance between economic interests, scientific collaboration, and governance mechanisms, thereby expanding its influence in international Arctic affairs.

China-russia Arctic cooperation in the context of a divided Arctic

The Russia–Ukraine conflict has profoundly reshaped the geopolitical landscape of the Eurasian region, driving systemic and structural transformations within the Arctic order. The continued deterioration of relations between Russia and the West has prompted Moscow to recalibrate its Arctic strategy and pursue a “pivot to the East” policy. Consequently, China-Russia Arctic cooperation has entered a new phase, encompassing multiple dimensions including energy, shipping, and security.

At the political level, the two heads of state issued a joint statement emphasizing that “the Arctic should remain a region of peace, stability, and constructive cooperation.” They also agreed to establish the “China-Russia Arctic Navigation Cooperation Subcommittee” under the framework of regular Prime Minister meetings, with the aim of developing Arctic shipping routes into major international transport corridors.³⁴ At the economic level, Western sanctions have compelled Russia to redirect its export markets toward China. In 2023, bilateral trade between the two countries reached a record high of \$240.1 billion, surpassing the previous target of \$200 billion,³⁵ with energy trade accounting for roughly one-third of the total.³⁶ In addition, the two sides signed a “Memorandum of Understanding on China-Russia Maritime Law Enforcement Cooperation” in April 2023³⁷ and also planned to conduct joint exercises in the Barents Sea and other Arctic

waters, signaling that traditional security cooperation has also emerged as a potential area of engagement.

However, China-Russia Arctic cooperation also faces challenges. The United States and its allies have long viewed such cooperation with hostility, employing sanctions and diplomatic measures to impede related projects. Some Chinese enterprises, for instance, have suspended participation in Russia's Arctic LNG-2 project as a result of these sanctions.³⁸ This has disrupted supply chains for Arctic projects and introduced new uncertainties to the overall stability of China-Russia Arctic cooperation.

Overall, despite Western isolation and sanctions, China–Russia Arctic cooperation is expected to continue deepening. Chinese capital and technology remain crucial to Russia's Arctic resource development, while these resources constitute a key pillar of Russia's economic security. The cooperation between the two countries thus carries not only economic significance but also geopolitical implications, reflecting a shared strategic intent to reshape the governance and energy landscape of the Arctic.

India's Arctic interests and participation

The importance of the Arctic region to India

The Arctic region holds significant importance for India across multiple domains, including scientific research, environmental protection, economic development, and geopolitical interests. At the level of scientific research, India's primary concern lies in climate change and its impact on environmental systems. The monsoon is the lifeline of Indian agriculture, yet the Arctic's anomalous climate changes are increasingly disrupting South Asian monsoon patterns, posing tangible threats to agricultural production. Studies have shown that variations in the summer sea-ice extent of the Kara Sea in the Arctic are closely correlated with extreme rainfall events in central India and have become a key driver of fluctuations in grain yields. Consequently, India has emphasized research linking Arctic climate change with South Asian monsoon dynamics as a means to safeguard national food security and agricultural stability. Moreover, with a coastline stretching over 7,500 kilometers, India faces direct risks to its coastal ecosystems and socio-economic systems from rising sea levels.³⁹

In terms of economic development, the Arctic region is rich in vital resources such as iron, lead, coal, copper, gold, tin, and oil, which account for 22% of the world's undeveloped resources. Greenland alone holds 25% of the world's rare earth reserves, which are crucial for India's high-tech industries. As India continues to rise as a global power, New Delhi fully recognizes the Arctic's strategic and geopolitical significance.

Although India is not an Arctic state, it has shown a keen interest in Arctic affairs and has actively engaged in related activities. As an observer state of the

Arctic Council, India has participated in several discussions within this major intergovernmental forum. In 2007, India established its first permanent scientific research station, Himadri, on the Svalbard archipelago in Norway, marking the beginning of its scientific exploration of the Arctic. One area of focus for India is the study of the teleconnections between Arctic ice melt and fluctuations in the Indian monsoon. Additionally, India views the Arctic as a potential trade corridor. Through the International North–South Transport Corridor (INSTC) and the Chennai–Vladivostok Maritime Route, India seeks to connect Asia and Europe over shorter distances and at lower costs,⁴⁰ while expanding its channels for importing energy from Russia’s eastern regions and Arctic ports.

From an environmental protection perspective, India has pledged to promote sustainable development in the Arctic while emphasizing the preservation of the region’s unique ecosystems.⁴¹ The country also possesses technological advantages in areas such as renewable energy and climate change mitigation.⁴² As global temperatures continue to rise, India’s Arctic strategy has evolved from a singular focus on scientific research to a more comprehensive framework integrating geopolitical and geoeconomic objectives.

On March 17, 2022, India released its Arctic Policy: Building a Partnership for Sustainable Development, which established six core pillars: scientific research, climate and environmental protection, economic and human development, transportation and connectivity, Arctic governance and international cooperation, and national capacity building. By deepening cooperation with Arctic states and international partners, India seeks to advance peace, stability, and sustainable development in the region while safeguarding its interests in scientific research, security, and economic engagement.⁴³ However, the Russia–Ukraine conflict and broader global geopolitical turbulence have slowed India’s engagement in Arctic affairs, presenting the challenge of balancing scientific, economic and geopolitical priorities within its Arctic policy.

India’s Arctic cooperation practices

Given Russia’s dominant position in Arctic affairs and its long-standing, stable relations with India, it has become a key partner in India’s Arctic strategy. As a major energy-consuming nation, India relies heavily on Russia for its energy security. In October 2022, Russia became India’s largest crude oil supplier, accounting for 22% of India’s total crude imports (compared to 20.5% from Iraq and 16% from Saudi Arabia).⁴⁴ Russia also transferred the 20% stake in the Sakhalin-1 project, along with the 30% share previously held by Japan’s Sakhalin Oil and Gas Development Company (SODECO), to India’s Oil and Natural Gas Corporation (ONGC).⁴⁵

Both sides have also actively advanced the development of an Arctic Transport Corridor, reaching consensus on projects such as the NSR, the

International North–South Transport Corridor (INSTC), and the Chennai–Vladivostok Maritime Corridor, in order to strengthen logistical connectivity between Eurasia and the Russian Far East with India. As Russia reduces its dependence on Western capital and technology, the scope for India–Russia cooperation continues to expand in sectors such as oil and gas, mining, shipbuilding, and port development.

In addition, regional-level paradiplomacy has also created new opportunities for India–Russia cooperation in the Arctic. The region is home to approximately 40 distinct indigenous groups whose livelihoods and environments are particularly sensitive to change, yet who also seek to participate in and benefit from local development. India’s accumulated experience in engaging with its own indigenous communities may provide valuable insights and support for advancing the development of Arctic Indigenous societies. It is interesting to note that the Arctic has also come up in discussions about race in India. In his book *The Arctic Home in the Vedas* (1903), freedom fighter Bal Gangadhar Tilak made the case that the ancient Vedic civilization of India originated in the Arctic.⁴⁶

At the same time, India has actively deepened its cooperation with the other seven Arctic states. For instance, in 2010, India and Norway jointly launched the “Norwegian Programme for Research Cooperation with India (INDNOR),” which prioritized Arctic and polar research in its 2018–2021 work plan.⁴⁷ The Norway–India 2030 cooperation strategy further designates polar research as a central component of bilateral marine scientific collaboration. During the Raisina Dialogue in New Delhi, Norwegian Secretary of State Andreas Motzfeldt Kravik emphasized that even during the Cold War, Arctic cooperation persisted—particularly in areas such as sustainable fisheries—demonstrating that despite complex geopolitical dynamics, continued cooperation remains possible. India has also established a Green Strategic Partnership with Denmark, focusing on cooperation in renewable energy and pollution control. Moreover, Norwegian hydrogen technology companies have attracted investment from Indian sustainable development venture capital firms. In parallel, India has strengthened its Arctic partnerships with Canada and the United States, pursuing a diversified foreign policy aimed at building multiple strategic partnerships while safeguarding its national interests.⁴⁸

Discussion

Building on the preceding analysis, this discussion examines China–India Arctic cooperation through the dual analytical lens of structural factors and situational factors. Cooperation between China and India in the Arctic is shaped by both constraining and enabling conditions. Given the distinctive nature of the Arctic as a region largely governed by

Arctic states, the upper limits of cooperation between the two countries are determined by the structural factors embedded in the region's overall geopolitical and institutional environment, while the lower limits—or baseline—are constrained by their respective strategic interests and objectives. From a geopolitical standpoint, the spillover effects of the Russia–Ukraine conflict have disrupted the long-standing narrative of “Arctic exceptionalism,” ushering in a period of heightened uncertainty and intensified competition.

The Arctic is increasingly characterized by a complex interplay of rivalry and cooperation among major powers. From the perspective of structural factors, the escalating military rivalry between NATO and Russia in the Arctic has significantly heightened regional security tensions. Since the 2014 Crimea crisis, relations between NATO and Russia have continued to deteriorate, prompting Moscow to markedly strengthen its military posture in the Arctic. Russia has elevated the Northern Fleet to an independent military district, reestablished the Leningrad Military District and the Moscow Military District with expanded Arctic defense zones, accelerated the construction of military infrastructure, deployed polar remote-sensing and orbital satellite systems,⁴⁹ and conducted air combat training and air defense system deployment to enhance its monitoring and defense capabilities across the region. Meanwhile, NATO has also intensified its strategic engagement in the Arctic. The outbreak of the Russia–Ukraine war in 2022 has further exacerbated confrontation in Arctic affairs, leading states to prioritize security interests within their political-geographical identities. A significant turning point was the decision by traditionally neutral countries—Finland and Sweden – to abandon their long-held neutrality and join NATO, substantially expanding NATO's presence in the Arctic and eliminating the “buffer zone” that had previously moderated regional security dynamics. NATO has launched new regional defense plans and strengthened its force posture to support Arctic operations. Nested and overlapping military frameworks around the Arctic are increasingly coordinated, with the Nordic Defence Cooperation (NORDEFCO) pursuing greater defense integration and the Joint Declaration on EU – NATO Cooperation promoting enhanced defense coordination.⁵⁰ Nordic states such as Norway, Finland, and Denmark have also increased their defense budgets and expanded aerial and maritime patrols and joint exercises in the Arctic, including Operation Nanook, Arctic Gold Cobra, and Joint Viking.⁵¹

The Arctic governance system has suffered severe disruption in the aftermath of the Russia – Ukraine conflict. NATO's exclusion of Russia from cooperative mechanisms prompted Moscow to withdraw from the Council of the Baltic Sea States, while Russian official discourse has further reinforced the construction of a “NATO Other,” portraying the alliance as fundamentally antagonistic and inherently threatening. The cognitive divide between NATO

and Russia has become increasingly intractable, plunging the Arctic security environment into a state of binary confrontation.

Amid the resurgence of geopolitics, the re-securitization of the Arctic has become evident, with non-Arctic states' participation increasingly subject to geopolitical scrutiny. The Arctic Council, the central institutional platform for China and India's engagement in Arctic affairs, has been fractured and paralyzed, thereby weakening both countries' institutional avenues for cooperation. Although the BRICS framework has engaged in limited collaboration in areas such as scientific research and disaster management, internal divergences among member states and external constraints arising from their relations with Europe and the United States have hindered the establishment of stable policy coordination and institutional support. As a result, the Global South's discursive agency in Arctic governance remains restricted.

Second, the structural characteristics of Arctic economic and environmental governance also constrain China – India cooperation. Arctic economic governance is profoundly shaped by geographical and geopolitical factors. The interests of relevant actors are highly differentiated, while the mobility of economic factors is restricted by institutional boundaries and resource-specific disparities among mechanisms such as the Arctic Economic Council and the Arctic Circle Forum. These constraints have led to fragmented regional economic governance and uneven development across the Arctic. Environmental governance faces similar challenges. For instance, in the case of black carbon mitigation, although the regulatory framework encompasses multiple regimes – including the Polar Code, the MARPOL Convention, the Paris Agreement, and the IMO emission-reduction mechanisms – none impose binding obligations specific to the Arctic, relying instead on the voluntary compliance of Arctic states. Commercial actors, driven primarily by short-term economic interests, show limited enthusiasm for environmental initiatives. Moreover, corporate profit motives further influence the fiscal incentives and policy enforcement capacity of public-sector stakeholders. Overall, the fragmentation of Arctic economic and environmental governance, coupled with the imbalance in underlying interest structures, poses significant constraints on China and India's substantive participation in regional affairs.

Third, from the perspective of the relationship structure among Arctic states and between Arctic and non-Arctic states, although tensions in the region have intensified due to the Russia – Ukraine conflict and major-power rivalry, the overall situation remains manageable. On August 15, 2025, the leaders of the United States and Russia met in Alaska, where Arctic affairs featured prominently on the agenda.⁵² The two sides reportedly reached a tacit understanding on normalizing bilateral relations, demonstrating that the major Arctic powers continue to play a dominant role in shaping regional dynamics. Existing treaties and institutional mechanisms remain in force, and the overall regional order has not been overturned. Russia and

Norway continue to cooperate in areas such as fisheries and port operations, while Russia and Finland have maintained military communication channels to prevent miscalculation. Finland's border authorities also engage in regular contact with their Russian counterparts. Although disagreements have arisen between the United States and Denmark over issues related to Greenland, Denmark has expressed its willingness to resolve such differences through dialogue. Overall, Arctic states remain cautious about the involvement of non-Arctic actors, particularly those projects that may pose environmental risks or be classified as unsustainable investments.⁵³ While non-Arctic states can capitalize on the opportunities created by Russia's "pivot to the East" policy to expand their participation, U.S. secondary sanctions against Russia have already affected countries such as China and India. As a result, although the space for their Arctic cooperation has not been entirely closed, it continues to face significant institutional constraints.

In sum, the configuration of great-power relations and the complex geopolitical and institutional environment of the Arctic impose significant constraints on China – India cooperation. The volatile regional situation has undermined the stability of economic and environmental governance frameworks. Given that the confrontation between NATO and Russia – intensified by the Russia – Ukraine conflict – is unlikely to ease in the short term, the Arctic security structure will remain rigid in the foreseeable future. As non-Arctic states, China and India have limited policy space and operational autonomy in Arctic affairs. Their participation largely depends on external mechanisms or bilateral partnerships and remains exposed to risks such as secondary sanctions. Although cooperation with Russia and engagement through the BRICS framework offer potential channels for participation, these platforms are themselves constrained by geopolitical tensions and loose institutional structures. Overall, the Arctic's power configuration and institutional framework jointly delineate the boundaries of China – India cooperation, defining a clear upper limit to its potential scope.

The preceding analysis of structural factors has demonstrated the overarching constraints facing China – India cooperation in the Arctic. However, these constraints do not imply that the space for cooperation is completely closed. The potential for bilateral collaboration also depends on factors such as the two countries' strategic interests and objectives. Unlike the structural and largely immutable determinants discussed earlier, these belong to the category of situational factors – variables that can be shaped through policy adjustments and diplomatic negotiation. In contrast to the stability and generality of structural factors, situational factors emphasize actors' immediate responses and strategic adaptations to external change, often manifested in differentiated choices across specific issues or sectors. Accordingly, this study categorizes China – India Arctic cooperation based on the official Arctic policy documents of both countries. China's White Paper on Arctic Policy articulates core

principles such as “deepening the exploration and understanding of the Arctic,” “protecting the Arctic eco-environment and addressing climate change,” “utilizing Arctic resources in a lawful and rational manner,” and “participating actively in Arctic governance and international cooperation.” Similarly, India’s Arctic Policy identifies six major pillars, including Arctic scientific research and climate and environmental protection. The two policy frameworks therefore exhibit a high degree of convergence in their objectives. Building on this policy alignment – and to enhance the level of analytical abstraction and theoretical explanatory power – this study classifies potential directions of China – India Arctic cooperation into three broad areas: (1) climate change and scientific research, (2) environmental protection and sustainable development, and (3) shipping route utilization and the blue economy, corresponding respectively to the knowledge, ecological, and economic dimensions. The following sections assess these dimensions in turn.

In the field of climate change and scientific research, both India and China have placed Arctic scientific interests at the forefront of their national priorities. From a cost perspective, the two countries already possess the necessary infrastructure and human resources to support joint research initiatives. Since joining the Arctic Council in 1996, China has steadily strengthened its Arctic research capabilities. It currently operates two Arctic research stations – the Yellow River Station and the China – Nordic Arctic Research Station – and since 1999 has conducted fifteen Arctic Ocean scientific expeditions using the research vessel *Xue Long* (Snow Dragon), thereby accumulating extensive experience in polar research. India, meanwhile, holds a distinct advantage in employing space technology for studies of Arctic climate change. It has also carried out extensive scientific research in Antarctica and the “Third Pole” of the Himalayas, gaining substantial expertise in examining the cryosphere’s impact on climate systems, polar ecosystems, and ocean – atmosphere interactions.⁵⁴ Together, these scientific foundations significantly reduce the “search costs” and “transaction costs” of cooperation, creating favorable conditions for complementary collaboration under existing research frameworks.

In terms of political costs, China and India exhibit relatively low levels of confrontation in Arctic scientific research. As observer states of the Arctic Council, both countries adhere to international legal frameworks such as the UNCLOS, the Paris Agreement, and the Agreement on Enhancing International Arctic Scientific Cooperation (2017). This shared compliance provides a high degree of consensus regarding the boundaries and norms governing scientific activities, thereby keeping the costs of negotiation and coordination relatively limited. Moreover, both China and India advocate multilateral, science-based cooperation in Arctic governance and have continued to expand multilateral research collaboration through mechanisms such as the BRICS Working Group on Ocean and Polar Science. Even amid the fragmentation of Arctic governance mechanisms caused by the Russia –

Ukraine conflict, the two countries have managed to rely on universal international norms and functional cooperation platforms to sustain low political risk and a high level of institutional predictability, thereby reducing the overall cost of cooperation.

From a benefit perspective, China – India cooperation in Arctic scientific research not only promotes knowledge accumulation and technological complementarity but also generates political and institutional gains. Scientific research serves as a crucial foundation for enhancing a state's discursive power in Arctic affairs. Strategic documents of Arctic states consistently highlight the leading role of scientific research in shaping policy agendas and rule-making processes. As “latecomers” to the Arctic, China and India can deepen their understanding of the Arctic environment and strengthen their influence in global climate and Arctic governance through cooperation in fields such as atmospheric and ocean sciences, glaciology, and ecosystem studies. In June 2024, the sixth meeting of the BRICS Working Group on “Ocean and Polar Science and Technology” was held in Murmansk, emphasizing deeper collaboration in areas such as polar and high-latitude processes research, thereby providing China and India with a stable and institutionalized platform for scientific cooperation.

From a political perspective, a positive international reputation can yield long-term dividends in future cooperation. Joint scientific research not only shapes the image of China and India as “contributors to Arctic affairs” and enhances their credibility in global climate governance but also represents an accumulation of trust capital. Given the relatively low political sensitivity and the strong public-good nature of scientific and environmental cooperation, even modest investments can substantially strengthen international trust, foster a constructive atmosphere for collaboration, and facilitate the transition of cooperative mechanisms from confrontation to coordination.

In sum, China – India cooperation in Arctic climate change and scientific research is characterized by low cost and high long-term returns, driven by strong rational incentives. The benefits lie not only in the direct gains of research and technological complementarity but also in the long-term dividends derived from reputation building and trust formation. Consequently, this domain constitutes the most promising area for China – India cooperation in the Arctic.

At the level of perception and identity, China and India demonstrate strong resonance in their approaches to Arctic scientific research. Changes in Arctic sea ice directly alter global ocean circulation patterns and indirectly affect mid- and low-latitude climates through atmospheric circulation. The Arctic climate is closely interconnected with the climatic and environmental systems of both China and India. As the “upstream variable” of their climate security, the Arctic's ecological stability directly influences their agricultural productivity, water resource distribution, ecological

security, and food security. Accordingly, both countries identify climate and environmental protection in the Arctic as policy priorities. Moreover, China and India both engage in Arctic affairs as “major developing countries” and “stakeholders in Arctic interests,” jointly advocating the principle of “research and data sharing.” China emphasizes the principle of “joint contribution and shared benefits,” while India highlights that Arctic scientific research “will build partnerships and bridges with global research institutions.” This shared narrative reinforces a sense of identity alignment between the two countries. In addition, scientific research, as a domain characterized by “low politics,” provides a neutral arena for maintaining cooperation amid major-power competition and geopolitical tension. Although China and India differ in certain specific scientific interests in the Arctic, identity-based conflicts in this field remain limited, and the overall emotional and cognitive synergy between the two countries is comparatively strong. Therefore, the field of climate change and scientific research represents the most practical foundation and promising avenue for current China – India cooperation in the Arctic, and it is likely to serve as the primary entry point for future collaboration between the two countries.

Environmental protection and sustainable development are closely linked to climate change and scientific research. While the latter focuses on knowledge accumulation and cognitive exploration, the former emphasizes policy implementation and applied practice. From a cost perspective, this issue area carries low political sensitivity and strong institutional legitimacy. According to the 1996 Ottawa Declaration, the Arctic Council’s core mission is to promote “sustainable development and environmental protection in the Arctic.”⁵⁵ Cooperation between China and India in this field aligns not only with this mission but also with the policy orientations of both countries. As the topic does not directly involve resource exploitation or military security, it is less likely to provoke resistance from Arctic states. Although tensions persist between domestic development needs and international pressure regarding carbon emission control and financial contributions, these divergences mainly concern differences in approach rather than conflicts of objectives, keeping overall cooperation costs manageable.

From a benefit perspective, China and India demonstrate strong complementarity in environmental and climate governance. China has made notable advances in clean energy technologies, while India has extensive experience in solar and wind energy development. The two countries can jointly develop low-carbon technologies suited to Arctic conditions to reduce emissions, maintain ecological balance, and enhance their image as “responsible actors” by providing environmental public goods. This would not only help strengthen their standing and credibility within the Arctic governance system but also create greater room for agenda-setting and institutional participation in the future. Overall, although cooperation in this field does not take the form

of direct economic investment, its long-term reputational gains and institutional spillover effects hold significant strategic value.

From the perspective of perception and identity, China and India share broadly consistent policy orientations and value positions regarding environmental protection and sustainable development. As a Northern Hemisphere country, China is directly affected by Arctic cold air activity and high-latitude atmospheric circulation patterns. Fluctuations in the Arctic climate exert significant influence on China's ecosystems, agricultural production, and socioeconomic security in its coastal regions. Accelerated Arctic glacier melting, which contributes to global sea-level rise, also poses increasing risks to the development of China's eastern coastal areas. India, in turn, regards the Arctic as a critical link between the global climate system and the "Third Pole" – the Himalayan region – and believes that environmental changes in the Arctic have substantial impacts on its monsoon patterns, agricultural security, and coastal ecological stability.⁵⁶ This shared perception of cross-regional ecological interconnection fosters a common awareness of risk and mutual motivation for cooperation, providing a stable psychological and narrative foundation for bilateral engagement.

Overall, China – India cooperation in the field of environmental protection and sustainable development exhibits a pattern of low cost and high long-term return. The two countries' convergence in perception and value orientation strengthens positive expectations and political trust, reduces potential risks, and makes this domain one of the most promising directions for future China – India cooperation in the Arctic.

In the field of shipping route utilization and the blue economy, China and India face relatively high cooperation costs. First, India does not yet possess an icebreaker, which limits its polar navigation capabilities.⁵⁷ China, by contrast, operates four icebreakers and has accumulated extensive experience through multiple Arctic voyages; however, its activities in the Arctic remain subject to geopolitical scrutiny from Western countries, often perceived as part of a broader "new superpower" agenda.⁵⁸

Second, Arctic shipping route cooperation entails significant geopolitical risks, particularly concerning the jurisdictional disputes over the Northern Sea Route (NSR), which undermine its commercial viability. Russia, citing the "sector principle," "historic rights," and the "straight baseline principle," claims that the NSR within its adjacent waters constitutes internal waters.⁵⁹ Pursuant to this position, Russia enacted Decree No. 1487 on the Rules of Navigation on the NSR Water Area, establishing a mandatory navigation permit system that prohibits vessels without an NSR navigation permit from entering the route's waters. The decree also requires compulsory icebreaker escort services. The United States and its allies, however, contend that the NSR constitutes an international strait subject to the regime of transit passage and have previously raised freedom of navigation disputes in this regard. These

conflicting legal interpretations and political tensions increase the uncertainty and risk of China – India cooperation in this domain.

From the perspective of benefits, China places strong emphasis on the economic value of Arctic shipping routes, particularly through deepening cooperation with Russia in cross-Arctic cargo and energy transportation along the NSR. Studies indicate that the NSR holds considerable trade potential for China. In contrast, India's traditional maritime routes offer no significant distance advantage compared to the Arctic route, meaning that the opening of the NSR would not substantially enhance India's trade potential.⁶⁰ Nevertheless, India's strategic attention to the NSR has risen rapidly. During a meeting in Vladivostok, Indian Minister of Ports, Shipping and Waterways Sarbananda Sonowal held in-depth discussions with Russian Minister for the Development of the Far East and Arctic Alexei Chekunkov on the development and use of the NSR, as well as the Eastern Maritime Corridor (EMC) linking Russia's Far East with Chennai in southern India.

However, China and India have yet to establish bilateral cooperation on Arctic route utilization. Their interactions in the blue economy primarily take the form of "parallel cooperation," in which each country pursues separate bilateral initiatives with Russia. This divergence stems largely from differing strategic priorities. China seeks to develop the Arctic route as an alternative to traditional maritime corridors, thereby reducing its dependence on the Strait of Malacca. India, by contrast, perceives China's northward expansion into the Arctic as a potential strategic setback, as it weakens India's capacity to contain China through the Malacca chokepoint. India also fears that China's growing Arctic involvement could divert U.S. attention from the Indo-Pacific, thereby increasing strategic pressure on India in that region.⁶¹ Moreover, the operation of the Arctic routes remains heavily reliant on Russia's ports, search-and-rescue systems, and other infrastructure, which, in the short term, are insufficient to support large-scale commercial operations.

Overall, China – India cooperation in the field of Arctic shipping routes is characterized by high costs and delayed returns. Both countries must rely on Russia to achieve operational connectivity, resulting in limited short-term economic gains. However, if the navigational capacity and transport infrastructure of the Arctic routes are further improved, the two countries could still unlock complementary potential within the Arctic blue economy.

From the perspective of perception and identity, significant divergences exist between China and India. Since the early twenty-first century, India has generally viewed China as a strategic competitor. China's rapid economic growth and increasing political and military assertiveness have fueled India's concerns, embedding their bilateral relations within a competitive narrative shaped by great-power rivalry. To balance China, India has sought constructive relations with the United States and other Western countries, while simultaneously maintaining close cooperation with Russia, particularly in

the field of energy imports.⁶² As Indian scholar C. Raja Mohan has argued, balancing China is deeply embedded in the DNA of India's geopolitics and has long been an enduring national security objective. Regardless of whether the United States is friendly, neutral, or hostile toward China, this element of Indian policy is likely to remain unchanged.⁶³ Since the beginning of the twenty-first century, as the economic and military gap between China and India has widened, India has increasingly turned to external balancing as a way to respond to China. This tendency has become more pronounced under the Modi government, with the Quadrilateral Security Dialogue (Quad) emerging as an important pathway in India's external strategy. The Quad is a multilateral cooperation mechanism comprising the United States, Japan, India, and Australia. In recent years, it has gradually developed through leaders' summits, ministerial meetings, and multi-sectoral working groups, deepening cooperation in areas such as maritime security, infrastructure investment, critical and emerging technologies, climate change, and global health. It has thereby become an important strategic platform for the four countries to coordinate regional affairs and shape the Indo-Pacific order.⁶⁴ For India, the significance of the Quad lies not only in promoting regional cooperation, but also in balancing China's growing influence in the Indian Ocean region and maintaining India's international status. It is in this sense that former Indian Foreign Secretary Shyam Saran has argued that the Quad will become a key instrument for addressing the China challenge.⁶⁵

Within this cognitive framework, India's strategic concerns about China have further extended to changes in global maritime corridors and emerging strategic spaces. India's strategic circles fear that China's growing presence in the Arctic could undermine its "Malacca Containment" advantage and divert U.S. attention away from the Indo-Pacific. India perceives that if China leverages Arctic routes to bypass the geopolitical constraints of the Malacca Strait, it may establish a new sphere of influence in the Arctic. Consequently, India's Arctic engagement largely represents a defensive response to China's Polar Silk Road initiative rather than an effort toward proactive cooperation; its negative perceptions substantially outweigh its positive expectations.

In sum, under a cost – benefit framework, the costs of China – India cooperation in the Arctic shipping domain currently exceed the potential gains. At the level of perception and identity, India's distrust and defensive mind-set continue to shape its policy outlook. Therefore, in the short term, the scope for China – India cooperation in this area remains limited.

It is worth noting that several recent situational factors have led to subtle changes in China – India relations.

First, in the context of the Russia – Ukraine conflict, comprehensive Western sanctions on Russia have further highlighted the Arctic's strategic importance for Russia's national security, maritime strategy, and economic development. In the past, Russia was cautious about the involvement of non-

Arctic states in order to maintain its regional dominance. However, under mounting geopolitical pressure, Moscow has adjusted its stance and adopted a more open cooperative approach. To ease its strategic constraints, Russia has strengthened partnerships with countries such as China and India under its “pivot to the East” policy.⁶⁶ On March 31, 2023, President Vladimir Putin signed Presidential Decree No. 229 approving the Foreign Policy Concept of the Russian Federation. Article 50 of this document designates the NSR as an international transport corridor linking Eurasia and emphasizes closer collaboration with non-Arctic states interested in Arctic cooperation. In the absence of Western engagement, China and India have emerged as Russia’s key partners, creating new strategic opportunities for both to deepen their participation in Arctic affairs. Second, in August 2025, the Trump administration announced an increase in tariffs on Indian goods from 25 to 50% to penalize India for continuing to import Russian oil.⁶⁷ This measure generated short-term frictions between Washington and New Delhi on energy and trade issues, undermining India’s trust in the United States and prompting it to reconsider its diplomatic balance – thus creating conditions conducive to a thaw in China – India relations. Third, the China – India border situation has shown signs of stabilization. Following the 2020 Galwan clash, tensions along the border had persisted for several years. On August 19, 2025, the special representatives of the two countries held the 24th round of talks in New Delhi, reaching a ten-point consensus to advance de-escalation through new mechanisms, rebuild mutual confidence, and lay the groundwork for eventual boundary delimitation.⁶⁸ This progress toward institutionalized and normalized border management has provided a firmer political basis for Arctic cooperation. Fourth, Indian Prime Minister Modi attended the SCO Summit in Tianjin from 31 August to September 1, 2025—his first visit to China in seven years.⁶⁹ The resumption of high-level exchanges is helping to rebuild political trust, and, as a low-sensitivity issue, Arctic affairs hold potential to serve as a “breakthrough point” in improving China – India relations.

From a rational-analytical perspective, India’s recent actions appear to be more tactical than strategic. The tariff frictions between the United States and India are insufficient to fundamentally alter the structural nature of their bilateral relationship; India continues to seek a balance among major powers. Prior to his visit to China, Prime Minister Modi first visited Japan and then traveled to Tianjin to attend the SCO Summit, where he also met with Russian leaders. This sequence demonstrates India’s pursuit of flexibility in multilateral diplomacy. Nonetheless, Modi’s visit to China aligns with the shared interests of both countries and contributes to shifting their bilateral relations from rigid competition toward flexible negotiation, thereby creating a more favorable environment for future cooperation.

At present, the primary areas of convergence and the most promising domains of China – India cooperation in the Arctic lie in climate change

and scientific research, as well as environmental protection and sustainable development. Meanwhile, the existing Arctic governance framework has been fragmented and stalled by the Russia – Ukraine conflict, creating a “governance vacuum” that offers new opportunities for engagement by non-Arctic states. Against this backdrop, China and India should seize this strategic window to pursue incremental and low-sensitivity cooperation. Both sides could utilize Track II diplomacy to facilitate regular exchanges and mutual visits among researchers at their Arctic research stations, thereby fostering stable academic and interpersonal networks. Building upon this foundation, cooperation could gradually evolve into semi-institutionalized forms such as joint forums and collaborative expeditions. As mutual trust and cooperative foundations deepen, the two countries could further establish multilateral mechanisms – such as a BRICS platform for Arctic scientific cooperation – extending bilateral collaboration to the regional level and promoting a transition from functional cooperation to institutional cooperation.

Conclusion

This study aims to demonstrate that the analytical framework of structural and situational factors possesses strong explanatory power in assessing both the constraints and potential of China – India cooperation in the Arctic. The central hypothesis is that China – India Arctic cooperation is primarily constrained by structural factors; however, the stimulation of situational factors can, to some extent, moderate the cognitive and behavioral inertia shaped under structural conditions. This dynamic is influenced by two key mechanisms: first, a rational analysis based on cost – benefit considerations; and second, an emotional interplay grounded in perception and identity. Overall, as rational actors, states tend to assign greater weight to rational considerations in decision-making, while emotional factors play a complementary role.

The findings suggest that the upper limit of China – India cooperation in the Arctic remains low due to the prevailing power dynamics among major states and the region’s complex geopolitical and institutional environment. The Russia – Ukraine conflict has intensified military tensions in the Arctic, disrupted the functioning of cooperative platforms such as the Arctic Council, and undermined the stability of both economic cooperation and environmental governance. The confrontation between NATO and Russia is unlikely to ease in the short term. Despite this heightened tension, the Arctic situation remains largely under control, and Arctic states continue to approach the involvement of non-Arctic countries with caution. Consequently, China and India face limited room to act independently in Arctic affairs; their cooperation is not only constrained by structural conditions but also exposed to external risks such as secondary sanctions.

Despite structural constraints, China and India still possess tangible potential for cooperation in the Arctic. Both countries share significant interests in areas such as climate change and scientific research, environmental protection and sustainable development, as well as the utilization of Arctic shipping routes and the blue economy. A combined analysis of cost – benefit considerations and perceptual factors indicates that cooperation in the first two areas exhibits a “low-cost, medium- to long-term high-return” pattern, driven by strong rational incentives and emotional resonance. These domains therefore represent the primary directions for advancing China – India Arctic cooperation. In contrast, cooperation in Arctic shipping and the blue economy entails higher costs and delayed benefits. Nevertheless, as the navigability of Arctic routes continues to improve, the two countries could gradually unlock further potential for collaboration in this field.

Against the backdrop of the Russia – Ukraine conflict and the deterioration of Russia’s relations with the West, Moscow has significantly adjusted its Arctic strategy, redirecting a substantial share of its fossil-fuel exports toward Asian markets, particularly China and India. At the same time, Russia has become less sensitive to the involvement of non-Arctic states in Arctic affairs. Under these circumstances, both China – Russia and India – Russia cooperation in the Arctic are expected to deepen further. Meanwhile, the gradual stabilization of the China – India border situation and the resumption of high-level exchanges have created a favorable political environment for bilateral Arctic cooperation. For both countries, the Arctic represents a “low-sensitivity” domain that could serve as an entry point for stabilizing their broader relationship.

Nevertheless, this study has certain limitations. Its analysis focuses primarily on two dimensions – structural and situational factors – without fully incorporating other potential variables, such as domestic political transitions, the eventual resolution of the Russia – Ukraine conflict, the full navigability of NSR, and the increasing participation of non-state actors. These factors may also influence the trajectory of China – India Arctic cooperation. In addition, the study is situated within a specific temporal and geopolitical context characterized by the ongoing Russia – Ukraine conflict and the broader restructuring of the global order. Looking ahead, the evolution of Russia’s “pivot to the East” strategy, possible adjustments to U.S. Arctic policy during President Trump’s second term, and emerging developments in the China – India border situation may all reshape the cooperative landscape between the two countries in the Arctic. How these factors will ultimately affect the direction of China – India Arctic cooperation remains to be seen and constitutes a promising avenue for future research.

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Notes

1. Lin, Minwang, "中印关系十年的发展与曲折" [The Development and Setbacks in China-India Relations over the Past Decade], *World Affairs* 91, no. 12 (2024): 23–25. doi: CNKI:SUN:SJZS.0.2024–12-005.
2. Malone, David M., and Rohan Mukherjee, "India and China: Conflict and Cooperation," *Survival* 52, no. 1 (2010): 153, doi:<https://doi.org/10.1080/00396331003612513>.
3. Malone, David M., and Rohan Mukherjee, "India and China: Conflict and Cooperation," *Survival* 52, no. 1 (2010): 148, doi:<https://doi.org/10.1080/00396331003612513>.
4. Gail Osherenko and Oran R. Young, *The Age of the Arctic: Hot Conflicts and Cold Realities* (Cambridge: Cambridge University Press, 1989), 5–12.
5. "President Xi Jinping Meets with Indian Prime Minister Narendra Modi," *Ministry of Foreign Affairs of the People's Republic of China*, last modified October 24, 2024, https://www.fmprc.gov.cn/eng/xw/zyxw/202410/t20241023_11514914.html (accessed December 1, 2024).
6. "Prime Minister's Bilateral Meeting with Chinese President Xi Jinping," Press Releases, Ministry of External Affairs, Government of India, last modified August 31, 2025, https://www.mea.gov.in/press-releases.htm?dtl/40072/Prime_Ministers_bilateral_meeting_with_Chinese_President_Xi_Jinping_August_31_2025 (accessed September 3, 2025).
7. Khorrami, Nima, "India's Arctic Challenge: Aligning Strategic Interests With Regional Realities," *The Diplomat*, last modified September 30, 2024, <https://thediplomat.com/2024/09/indias-arctic-challenge-aligning-strategic-interests-with-regional-realities/> (accessed December 21, 2024).
8. Bisen, Anurag, "Arctic Geopolitics and Governance: An Indian Perspective," *Asia Pacific Bulletin*, East-West Center, last modified August 15, 2024, <https://www.eastwestcenter.org/sites/default/files/2024-08/APB%20681%20-%20Arctic%20Geopolitics%20and%20Governance%20-%20An%20Indian%20Perspective.pdf> (accessed December 9, 2024).
9. Lagutina, Maria, and Yana Leksytina, "BRICS Countries' Strategies in the Arctic and the Prospects for Consolidated BRICS Agenda in the Arctic," *The Polar Journal* 9, no. 1 (2019): 45–63, <https://doi.org/10.1080/2154896X.2019.1618559>.
10. Zhang, Yao, "Can India's Arctic Aspiration Lead to Effective Trilateral Cooperation with Russia, China?" *Global Times*, last modified July 30, 2024, <https://www.globaltimes.cn/page/202407/1317034.shtml> (accessed February 10, 2025).

11. Zhang, Xinyuan. "China and India in the Arctic: Goals and Implications for the Region" (Master's thesis, Norwegian University of Life Sciences, 2024), 55–56.
12. Krasnozhenova, E. E., S. V. Kulik, V. Pronina, K. Yu. Eidemiller, and P. L. Karabushenko, "Chinese, Pakistani and Indian Policy in the Arctic and Russian Stance," IOP Conference Series: Earth and Environmental Science 625, no. 1 (2021): 012005, doi:<https://doi.org/10.1088/1755-1315/625/1/012005>.
13. Strelnikova, I., Maiorov, M., and Popov, D., "BRICS Expansion: Implications for Logistics Cooperation in the Arctic," *Analysis & Forecasting. IMEMO Journal* 3 (2024): 71–82, doi:<https://doi.org/10.20542/afij-2024-3-71-82>.
14. Mammadli, Rasim, and Rabia Kalfaoglu, "BRICS in the Arctic: The Member-States' Interests and the Group's Disregard," *Contemporary Chinese Political Economy and Strategic Relations: An International Journal* 7, no. 1 (2021): 189–220.
15. Kenneth N. Waltz, *Theory of International Politics* (Reading, MA: Addison-Wesley Publishing Company, 1979), 100.
16. Kenneth N. Waltz, *Theory of International Politics* (Reading, MA: Addison-Wesley Publishing Company, 1979), 79–83, 97–99.
17. Rose, Gideon. "Review of Neoclassical Realism and Theories of Foreign Policy, by Michael E. Brown, Thomas J. Christensen, Randall L. Schweller, William Curti Wohlforth, and Fareed Zakaria." *World Politics* 51, no. 1 (1998): 146–47. <http://www.jstor.org/stable/25054068>; Ripsman, N. "Neoclassical Realism." Oxford Research Encyclopedia of International Studies, Oxford University Press, last modified December 22, 2017, <https://oxfordre.com/internationalstudies/view/10.1093/acrefore/9780190846626.001.0001/acrefore-9780190846626-e-36> (accessed September 23, 2025).
18. Rose, Gideon. "Review of Neoclassical Realism and Theories of Foreign Policy, by Michael E. Brown, Thomas J. Christensen, Randall L. Schweller, William Curti Wohlforth, and Fareed Zakaria." *World Politics* 51, no. 1 (1998): 146–47. <http://www.jstor.org/stable/25054068>.
19. Strange, Susan, *States and Markets: An Introduction to International Political Economy* (London: Continuum, 1994), 24–29.
20. Keohane, Robert O., and Joseph S. Nye, *Power and Interdependence*, 4th ed. (Boston: Longman, 2012), 24–31.
21. Dubreuil, Antoine, "The Arctic of the Regions: Between Indigenous Peoples and Subnational Entities – Which Perspectives?" *International Journal* 66, no. 4 (2011): 923–938, doi:<https://doi.org/10.1177/002070201106600418>.
22. Wu, Bingyi. "Progresses in the Impact Study of Arctic Sea Ice Loss on Wintertime Weather and Climate Variability over East Asia and Key Academic Disputes" [北极海冰融化影响东亚冬季天气和气候的研究进展以及学术争论焦点问题]. *Chinese Journal of Atmospheric Sciences* 42, no. 4 (2018): 786–805. doi:CNKI:SUN:DQXK.0.2018-04-006.
23. Nesheiwat, Julia. "Why the Arctic Matters." Atlantic Council, Atlantic Council, last modified June 17, 2021, <https://www.atlanticcouncil.org/blogs/energysource/why-the-arctic-matters/> (accessed August 6, 2024).
24. "Joint Statement on Arctic Council Cooperation Following Russia's Invasion of Ukraine," U.S. Department of State, March 3, 2022, <https://www.state.gov/joint-statement-on-arctic-council-cooperation-following-russias-invasion-of-ukraine/> (accessed December 23, 2024).
25. Russia's Northern Fleet Deploys with Nukes in First Since Cold War – Report. The Jerusalem Post, The Jerusalem Post Group, last modified February 15, 2023, <https://www.jpost.com/international/article-731730> (accessed June 3, 2023).

26. Sharma, Bipandeep, and Uttam Kumar Sinha. "Hot Stakes in the Arctic: Global Rivalries and New Geopolitical Forces." *Strategic Analysis* 48, no. 6 (2025): 578–87. doi:10.1080/09700161.2025.2451001.
27. Thangaraj, A., and Abhiroop Chowdhury. "Energy, Geopolitics and the Dying Arctic Ice Fields: An Enviro-Political Perspective," IOP Conference Series: Earth and Environmental Science 1084, no. 1 (2022): 012034, doi:10.1088/1755-1315/1084/1/012034.
28. "Chinese Ambassador to Russia: Building the 'Ice Silk Road' Is of Great Significance to Both China and Russia," China News Service, last modified November 15, 2017, <http://www.chinanews.com/gj/2017/11-15/8376615.shtml> (accessed December 12, 2024).
29. Ding, Wenyi, Yubing Wang, Lei Dai, and Hao Hu, "Does a Carbon Tax Affect the Feasibility of Arctic Shipping?" *Transportation Research Part D: Transport and Environment* 80 (2020): 102,257, doi:<https://doi.org/10.1016/j.trd.2020.102257>.
30. Lanteigne, Marc, "The Rise (and Fall?) of the Polar Silk Road," *The Diplomat*, last modified August 29, 2022, <https://thediplomat.com/2022/08/the-rise-and-fall-of-the-polar-silk-road/> (accessed December 26, 2024).
31. Humpert, Malte, "U.S. Sanctions LNG Carriers and Chinese Yard to Disrupt Russian Energy Projects," *gCaptain*, last modified June 13, 2024, <https://gcaptain.com/u-s-sanctions-lng-carriers-and-chinese-yard-to-disrupt-russian-energy-projects/> (accessed December 15, 2024).
32. "National Data," National Bureau of Statistics of China, <https://data.stats.gov.cn/english/> (accessed December 31, 2024).
33. "China's Arctic Policy," *The State Council Information Office of the People's Republic of China*, last modified January 26, 2018, https://www.gov.cn/zhengce/2018-01/26/content_5260891.htm (accessed January 22, 2025).
34. "Joint Statement of the People's Republic of China and the Russian Federation on Deepening the Comprehensive Strategic Partnership of Coordination for the New Era in the Context of the 75th Anniversary of China-Russia Diplomatic Relations," *The State Council of the People's Republic of China*, last modified May 16, 2024, https://www.gov.cn/yaowen/liebiao/202405/content_6951404.htm (accessed January 19, 2025).
35. "Press Conference for the 8th China-Russia Expo," Ministry of Commerce of the People's Republic of China, last modified May 6, 2024, <https://www.mofcom.gov.cn/xwfbzt/2024/swbzkdjbzblhxwfbh/index.html> (accessed December 31, 2024).
36. "Russian Government: Russia-China Energy Trade Currently Accounts for One-Third of Bilateral Trade Volume," *Sputnik News*, last modified December 15, 2023, <https://sputniknews.cn/20231215/1055757856.html> (accessed January 22, 2025).
37. "China Coast Guard and Russian Federal Security Service Sign Maritime Law Enforcement Cooperation Document," *Xinhua News Agency*, last modified April 27, 2023, https://www.xinhuanet.com/legal/2023-04/27/c_1129574145.htm (accessed December 28, 2024).
38. Xu, Yihe. "Bomesc Halts Novatek's Arctic LNG 2 Modules Amid US Sanctions Risk," *Upstream Online*, last modified July 2, 2024, <https://www.upstreamonline.com/exclusive/bomesc-halts-novatek-s-arctic-lng-2-modules-amid-us-sanctions-risk/2-1-1670038> (accessed January 4, 2025).
39. Kulkarni, Sujata, and Ankit Agarwal. "Quantifying the Association between Arctic Sea Ice Extent and Indian Precipitation." *International Journal of Climatology* 44, no. 2 (2024): 470–84.
40. Tekir, G. "India's Strategic Response to China's Belt and Road Initiative: The Case of Economic Corridors." *India Review* 24, no. 3 (2025): 331–57. doi:10.1080/14736489.2025.2514965.

41. Singh, Manish. "India in the Arctic: Legal Framework and Sustainable Approach." The Arctic Institute, last modified January 9, 2024, <https://www.thearcticinstitute.org/india-arctic-legal-framework-sustainable-approach/> (accessed January 22, 2025).
42. Britton, Heather, "India's Energy-Climate Dilemma," Geology for Global Development, European Geosciences Union, last modified October 9, 2017, <https://blogs.egu.eu/network/gfgd/2017/10/09/heather-britton-indias-energy-climate-dilemma/> (accessed December 9, 2024).
43. Ministry of Earth Sciences, "India's Arctic Policy: Building a Partnership for Sustainable Development" (Government of India, March 17, 2022), <https://www.moes.gov.in/sites/default/files/2022-03/compressed-SINGLE-PAGE-ENGLISH.pdf> (accessed December 31, 2024).
44. "Russia Becomes India's Top Oil Supplier in October," *The Hindu*, last modified November 6, 2022, <https://www.thehindu.com/news/national/russia-becomes-indias-top-oil-supplier-in-october/article66103845.ece> (accessed February 5, 2025).
45. "The Cabinet Allowed ONGC and Sodeco to Obtain Shares in 'Sakhalin-1,'" TASS, last modified November 14, 2022, <https://tass.ru/ekonomika/16319165> (accessed February 3, 2025).
46. Sinha, Uttam Kumar. "India and the 'Age of the Arctic.'" *Indian Foreign Affairs Journal* 8, no. 1 (2013): 23. <http://www.jstor.org/stable/45341860>.
47. The Research Council of Norway, *The Norwegian Programme for Research Cooperation with India – INDNOR, Work Plan 2018–2021* (The Research Council of Norway, Oslo, 2018), ISBN 978–82–12–03667–3, <https://www.forskningsradet.no/siteassets/publikasjoner/1254034121999.pdf> (accessed February 9, 2025).
48. Sharma, Bipandeep, and Uttam Kumar Sinha. "Hot Stakes in the Arctic: Global Rivalries and New Geopolitical Forces." *Strategic Analysis* 48, no. 6 (2025): 578–87. <https://doi.org/10.1080/09700161.2025.2451001>.
49. Humpert, Malte. "Russia Plans to Launch Nine Polar-orbiting Satellites to Monitor the Arctic by 2026." High North News, last modified November 7, 2022, <https://www.highnorthnews.com/en/russia-plans-launch-nine-polar-orbiting-satellites-monitor-arctic-2026> (accessed August 9, 2024).
50. "Joint Declaration on EU – NATO Cooperation," NATO, North Atlantic Treaty Organization, last modified January 10, 2023, https://www.nato.int/cps/en/natohq/official_texts_210549.htm (accessed October 1, 2025).
51. "NATO's Military Leader: 'We Must Be Prepared for Military Conflicts Arising in the Arctic,'" ArcticToday, last modified October 30, 2023, <https://www.arctictoday.com/natos-military-leader-we-must-be-prepared-for-military-conflicts-arising-in-the-arctic/> (accessed November 20, 2024).
52. "Joint News Conference by the President of Russia and the President of the United States," Kremlin.ru, Russian Federation, last modified August 16, 2025, <http://en.kremlin.ru/events/president/news/77793> (accessed October 13, 2025).
53. "A Balanced Approach to the Arctic – A Conversation with U.S. Coordinator for the Arctic Region James P. DeHart," The Foreign Service Journal, American Foreign Service Association, last modified May 2021, <https://afsa.org/balanced-approach-arctic-conversation-us-coordinator-arctic-region-james-p-dehart> (accessed October 6, 2025).
54. Britton, Heather. "India's Energy-Climate Dilemma." Geology for Global Development, European Geosciences Union, last modified October 9, 2017, <https://blogs.egu.eu/network/gfgd/2017/10/09/heather-britton-indias-energy-climate-dilemma/> (accessed December 9, 2024).
55. "Declaration on the Establishment of the Arctic Council," The Arctic Council, The Arctic Council, last modified September 19, 1996, <https://oarchive.arctic-council.org/>

- server/api/core/bitstreams/bdc15f51-fb91-4e0d-9037-3e8618e7b98f/content (August 7, 2024).
56. Bisen, Anurag, "India's G20 Presidency: Opportunity to Resume Engagement in the Arctic," The Arctic Institute, last modified February 28, 2023, <https://www.thearcticinstitute.org/india-g20-presidency-opportunity-resume-engagement-arctic/> (accessed September 22, 2025).
 57. Bisen, Anurag, "India's Arctic Policy: Building a Partnership for Sustainable Development," Issue Brief, Manohar Parrikar Institute for Defense Studies and Analyses (MP-IDSA), last modified March 17, 2022, <https://www.idsa.in/issuebrief/indias-arctic-policy-building-a-partnership-for-sustainable-development-anurag-bisen-170322> (accessed September 22, 2025).
 58. Anders Christoffer Edström, Iselin Stensdal, and Gørild Heggelund, "The 'New Superpower': What Are China's Intentions in the Arctic," in *Norway's Arctic Policy: Geopolitics, Security, and Identity in the High North*, ed. Andreas Østhagen (Cheltenham, UK: Edward Elgar, 2023), 95–108.
 59. Gavrilov, V., "Russian Legislation on the Northern Sea Route Navigation: Scope and Trends," *The Polar Journal* 10, no. 2 (2020): 273–84, doi: 10.1080/2154896X.2020.1801032.
 60. Liu Quan and Hu Maixiu, "北极航道贸易潜力的时空分布分析" [Spatial and Temporal Distribution of Trade Potential of Arctic Passage], *Marine Economy* 13, no. 1 (2023): 28–40, doi: 10.19426/j.cnki.cn12-1424/p.2023.01.010.
 61. Suhag, Vikram, "India's Arctic Security Dimension: 'Thought Through' or 'A Remedial Process to Address an Insecurity,'" The Arctic Institute, last modified February 22, 2022, <https://www.thearcticinstitute.org/india-arctic-security-dimension-thought-through-remedial-process-address-insecurity/> (accessed September 25, 2025).
 62. Østhagen, Andreas, "Great Power Competition in the Arctic and the Role of India," *Strategic Analysis* 48, no. 6 (2025): 619–33, doi: 10.1080/09700161.2025.2450998.
 63. C. Raja Mohan, "The Evolution of Sino-Indian Relations: Implications for the United States," in *Power Realignments in Asia: China, India and the United States*, ed. Alyssa Ayres and C. Raja Mohan (New Delhi: Sage Publications, 2009), 288.
 64. "Quad Leaders' Joint Statement," Prime Minister of Australia, last modified May 20, 2023, <https://www.pm.gov.au/media/quad-leaders-joint-statement> (accessed April 10, 2026).
 65. Shyam Saran, "Quad Can Be the Anchor for the Indo-Pacific Region," *Hindustan Times*, last modified June 29, 2018, <https://www.hindustantimes.com/analysis/quad-can-be-the-anchor-for-the-indo-pacific-region/story-IC5jc7fxAUdI3BtD5ULwXN.html> (accessed April 10, 2026).
 66. Liu, Fenghua, "Russia's 'Turn to the East' Policy: Evolution and Assessment," *Chinese Journal of Slavic Studies* 3, no. 2 (2023): 247–62, doi: 10.1515/cjss-2023-0020.
 67. "Trump's Doubling of Tariffs Hits India, Damaging Ties," Reuters, last modified August 27, 2025, <https://www.reuters.com/world/india/trumps-doubling-tariffs-hits-india-damaging-ties-2025-08-27/> (accessed September 26, 2025).
 68. "Visit of China's Foreign Minister and Special Representative on the India-China boundary question," Press Releases, Ministry of External Affairs, Government of India, last modified August 19, 2025, https://www.mea.gov.in/press-releases.htm?dtl%2F40016%2FVisit_of_Chinas_Foreign_Minister_and_Special_Representative_on_the_IndiaChina_boundary_question= (accessed October 13, 2025).
 69. India-China Relations Take Center Stage at SCO Summit 2025, <https://www.india-briefing.com/news/india-china-relations-take-center-stage-at-sco-summit-2025-39569.html/>

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No potential conflict of interest was reported by the author(s).

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