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China-Russia Cooperation in the Northern Sea Route Development[1]

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Abstract

As global warming leads to the melting of Arctic sea ice, the economic potential and strategic importance of the Northern Sea Route (NSR) as a new sea route connecting Asia and Europe are becoming increasingly prominent. In this context, China-Russia cooperation on the Arctic route has become a crucial component of their economic and strategic partnership. The paper basically follows the SWOT analysis model to conduct a comprehensive analysis of the current status and prospects of China-Russia economic cooperation on the Arctic route. It emphasizes the economic potential and strategic importance of the NSR due to changing Arctic ice conditions and geopolitical shifts. As an important background reference, the paper reviews the policy positions of both countries, identifying common interests and challenges. It also uses data analysis and case studies to analyze the opportunities and potential risks of cooperation. According to official shipping data, it examines the collaborative efforts between China and Russia to develop the NSR as a viable maritime corridor, emphasising that China is an indispensable force in the development of the NSR. Through detailed case studies, the paper conducts a pre-mortem analysis to identify potential risks in the cooperation, such as dependency, coercion, and cybersecurity threats. In light of the current status and prospects of cooperation between the two sides, we propose a long-term co-development strategy spanning ten to twenty years, focusing on confidence-building, joint feasibility studies, and phased execution. The goal is to establish a sustainable and mutually beneficial partnership that balances security and economic development in the Arctic. The successful cooperation between China and Russia in this region is positioned as a model for other countries with interests in the NSR, highlighting the potential for international collaboration in Arctic logistics and infrastructure development.

Keywords: arctic shipping, pre-mortem analysis, prospect analysis, Polar Silk Road, infrastructure development

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Introduction

The Arctic region holds significant geopolitical importance due to its abundant oil and gas resources and its strategic position in military and transportation fields. The Northern Sea Route (NSR) has the greatest potential among the transportation routes in the Arctic, which is a shortcut for transport connectivity between Europe and Asia. As global warming increases the accessibility of the NSR, this maritime route is drawing growing attention from the international community, including China and Russia.

The objective of this paper is to examine the prospects and risks involved in China and Russia cooperation in Arctic logistics. It argues that the economic potential of Arctic shipping through the NSR and the political will to develop the route is the catalyst for China and Russia cooperation in the region. Additionally, it highlights that confidence building is the key to building a lasting relationship that can withstand the test of time.

This paper first presents the prospects of Arctic shipping based on current observable trends and existing policies to develop the shipping line. Next, it reviews the expressed Arctic positions and interests of Russia and China in their respective policy documents. The review further establishes their commonalities and differences, and the existing challenges that hinder China-Russia cooperation in arctic connectivity. Third, through case studies, the paper conducts a pre-mortem analysis to explore potential failure points and risks in Russia's cooperation with China in Arctic port building. Fourth, it proposes a long-term co-development strategy spanning ten to twenty years. The objective of this strategy is for China and Russia to mutually benefit from sustainable development built on trust and to withstand the test of time. The extended objective is for the cooperation to be a proof of concept that balancing security and development cooperation in the Arctic is possible. Successful cooperation between China and Russia in the Arctic is therefore a calling card to other countries with a stake in the NSR to participate in its development.

Opportunities: Prospects in the NSR Shipping

This section examines the opportunities demonstrated in Sino-Russian Arctic cooperation, focusing on the prospects of the Northern Sea Route (NSR). It analyses key indicators including NSR transit voyages, transit cargo, and predicted navigable days to assess the NSR's potential. The study synthesises data from diverse sources, employing meta-analysis, rigorous source credibility assessments, and advanced statistical modelling techniques to ensure robust and comprehensive findings. The political will to develop the NSR is explicitly expressed in Russian Arctic policy, while pre-sanction development, operation, or planned reconstruction of ports or maritime systems along the NSR by other countries further validates the route's economic potential.

The NSR is emerging as a promising alternative for global maritime connectivity. It is attracting increasing attention due to two key factors. Firstly, climate change is altering Arctic ice conditions, making the route more navigable. Secondly, escalating tensions

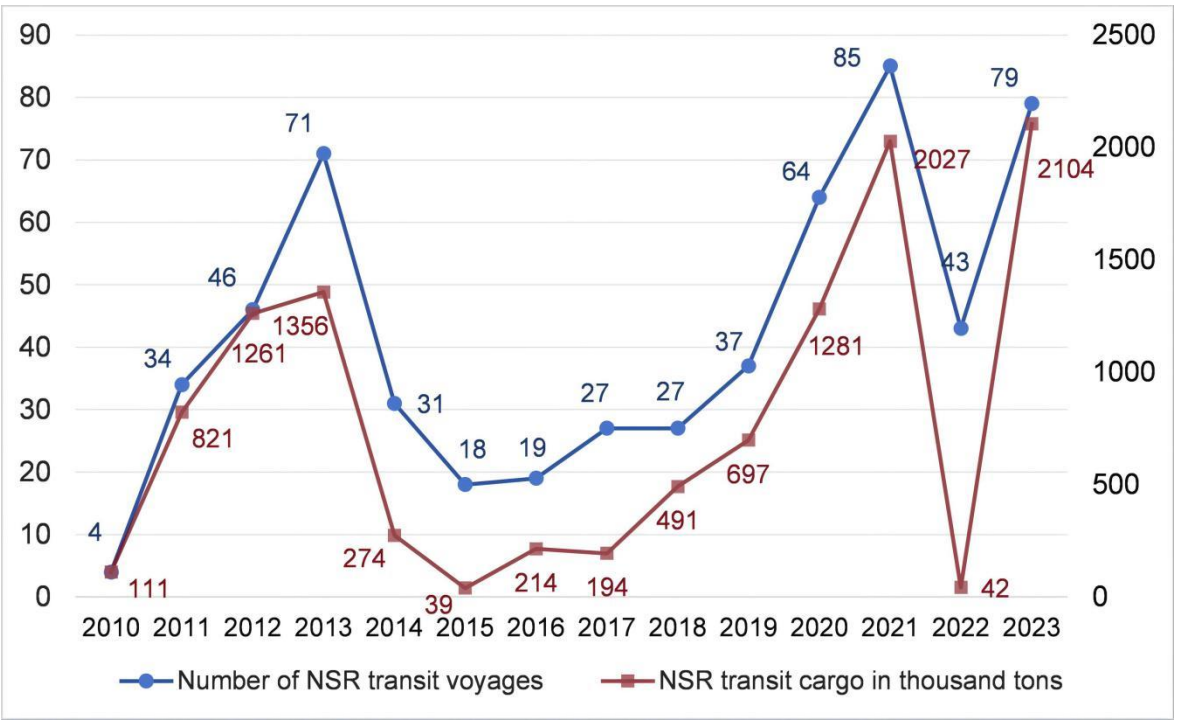
in the Middle East are increasing risks for traditional shipping lanes. As a result, the NSR offers a potentially more secure and efficient option for international shipping, particularly for trade between Asia and Europe.

While current NSR shipping volumes represent only a small fraction of annual global shipping tonnage due to the limited seasonal transit window, the route's future prospects are promising. Climate change is gradually extending the navigable period, and advancements in naval technology are enhancing vessels' capabilities to operate in Arctic conditions. These factors are expected to significantly increase the annual transit window, potentially leading to a substantial rise in traffic through the NSR. Consequently, despite its current modest share, the NSR is poised to play an increasingly important role in global maritime transportation in the coming years [Bensassi et al., 2016].

The number of NSR transit voyages and transit cargo weight from 2010 to 2023 (See Figure 1). The total cargo volume travelling through the NSR saw a sharp increase between 2017 and 2019, and maintained an average of 33,300 million metric tons (mln T) from 2019 through to 2022 [Centre for High North Logistics, 2023]. Both remain small in size so far, despite being on a growth trend more generally, excluding 2014 and 2022. Additionally, the paper forecasts that the number of navigable days along the NSR will increase from 67 in 2020 to 135 in 2080 without icebreaker assistance, and from 140 in 2020 to 320 in 2080 with icebreaker assistance (See Figure 2). This indicates that the number of navigable days of the NSR will continue to increase and it may become an important maritime channel in the future. The observed trends in the data support the argument of this paper that the current level of NSR development is still insufficient but has immense potential. However, it should be noted that shipping volume in the NSR is affected by geopolitics and subsequent sanctions. Russia's exposure to growing sanctions and the strategy of some countries that seek to isolate Russia are significant factors hindering the development of the NSR.

The prospects of Arctic shipping are undoubtedly a major opportunity for Russia given the great economic potential of NSR, as most of the NSR runs along its coastline, allowing better service to its Arctic cities. Since 2021, the Decree of the Government of the Russian Federation No. 996-r dated April 25, 2021, *"Unified plan of measures for the implementation of the foundations of state policy of the Russian Federation in the Arctic for the period up to 2035 and the Strategy for the development of the Arctic Zone of the Russian Federation and ensuring national security for the period up to 203*5", provides the legal foundation and expresses the state's commitment towards the socio-economic development, which include infrastructure development in the NSR [Government of the Russian Federation, 2021; Nevskaya, 2022]. Specifically, the Decree of the Government of the Russian Federation No. 3120-r dated December 21, 2019, "*On approval of the attached plan for the development of the infrastructure of the Northern Sea Route for the period up to 2035*" anticipates significant traffic and tonnage transiting the NSR [Government of the Russian Federation, 2019].

Figure 1. Number of NSR Transit Voyages and Transit Cargo (2010-2023)



Source: Compiled by authors [Centre for High North Logistics, 2023; NSR General Administration, n.d.].

A comprehensive analysis of the cargo transit shares among key stakeholders in the Arctic region illustrates the evolving dynamics of their participation in NSR transits from 2018 to 2023 (See Table 1). This longitudinal comparison elucidates the shifting patterns of engagement and the increasing prominence of certain nations in Arctic maritime activities. The data encapsulated in the table not only quantifies the relative contributions of various countries but also provides insights into the geopolitical and economic trends shaping the utilisation of this strategic waterway.

To conduct a comparative analysis of NSR transit activities between 2018 and 2023, different data collection methods is employed due to variations in data availability. For 2018, detailed transit data are not readily accessible through public sources. Therefore, a comprehensive dataset is manually compiled. It included vessel name, owner, vessel type, gross register tonnage, departure and arrival information, and NSR passage details for each vessel that transited the NSR. Using this information, a method is developed to estimate cargo types and weights based on vessel characteristics and voyage patterns. For 2023, data published by the Centre for High North Logistics, are utilised, which provides a more direct source of information. Table 1 presents a comparison of aggregated 2018 estimates with the 2023 data from the Centre. This comparative approach allows for an analysis on changes in NSR utilisation over the five-year period, offering insights into evolving patterns of Arctic shipping.

The NSR experienced significant changes in its utilisation and geopolitical landscape from 2018 to 2023. Prior to 2022, the NSR attracted diverse international interest. In 2019, COSCO, a Chinese state-owned shipping enterprise, announced plans to operate 14 commercial container ships, each weighing between 28,000 and 34,000 tons, via

the NSR [Fedorov et al., 2020]. This move exemplified the growing international engagement with the route, particularly from Asian countries. Indeed, before the implementation of widespread sanctions against Russia in 2022, several companies from Japan, China, and South Korea were actively involved in the development, operation, or planning of ports and maritime systems along the NSR.

However, the comprehensive sanctions imposed on Russia from 2022 markedly altered this trajectory. Our comparative analysis of 2018 and 2023 data reveals both growth and shifts in NSR usage. While the number of vessels transiting the NSR in 2023 increased by a factor of 2.93 compared to 2018, and the total cargo weight grew by 4.29 times, there was a notable decrease in the diversity of participating countries. This geopolitical shift is most evident in China's dramatically increased presence. In 2018, China accounted for 31.68% of the total NSR transit cargo weight. By 2023, this figure had surged to 95.24%. This substantial increase, coupled with the reduced participation from other countries due to sanctions, suggests that China has become a crucial stakeholder in the NSR's operations and future development.

These trends indicate a complex interplay between geopolitical factors and economic opportunities in Arctic shipping. While the overall usage of the NSR has grown, its international character has narrowed, with China emerging as the dominant user. This shift raises important questions about the future development and governance of the NSR in the evolving global maritime landscape.

Table 1. NSR Transits in 2018 and 2023, Cargos between countries

2023				2018			
Country direction	voy N	Caro (tons)	%	Country direction	voy N	Cargo (tons)	%
Russia - China	**23**	**1957910**	**93.05%**	**South Korea - Netherlands**	**2**	**77703**	**15.83%**
– Crude oil	14	1465924	69.67%	– Crude oil	1	57286	11.67%
– Iron ore	2	324500	15.42%	– Heavy cargo	1	20417	4.16%
– Coal	1	72320	3.44%	**Canada - Russia**	**2**	**72494**	**14.76%**
– LNG	1	71500	3.40%	– Heavy cargo	2	72494	14.76%
– Containers	1	13171	0.63%	**Russia - Russia**	**9**	**45836**	**9.34%**
– General cargo	1	10494	0.50%	– Crude oil	2	27920	5.69%
– Ballast	3	0	0.00%	– General cargo	1	9274	1.89%
Russia - Russia	**36**	**58661**	**2.79%**	– Fish	3	8642	1.76%
– Containers	6	38203	1.82%	– Tug	2	0	0.00%
– Fish	8	11771	0.56%	– Icebreaker	1	0	0.00%
– General cargo	2	8687	0.41%	**China - Sweden**	**2**	**37364**	**7.61%**
– Ballast	20	0	0.00%	– General cargo	2	37364	7.61%
China - Russia	**12**	**46056**	**2.19%**	**Hong Kong (China) - UK**	**1**	**33645**	**6.85%**
– General cargo	2	23249	1.10%	– General cargo	1	33645	6.85%
– Containers	2	22807	1.08%	**South Korea - Germany**	**1**	**30785**	**6.27%**
– Ballast	8	0	0.00%	– Containers	1	30785	6.27%
South Korea - Russia	**5**	**41574**	**1.98%**	**Norway - China**	**1**	**23641**	**4.81%**

– General cargo	3	37082	1.76%	– General cargo	1	23641	4.81%
– Containers	1	4492	0.21%	**South Korea - Sweden**	**1**	**23641**	**4.81%**
– Ballast	1	0	0.00%	– General cargo	1	23641	4.81%
Russia - South Korea	**3**	**0**	**0.00%**	**South Korea - France**	**1**	**23641**	**4.81%**
– Ballast	3	0	0.00%	– General cargo	1	23641	4.81%
				Germany - Japan	**1**	**23641**	**4.81%**
				– General cargo	1	23641	4.81%
				Denmark - China	**1**	**23626**	**4.81%**
				– Heavy cargo	1	23626	4.81%
				Finland - China	**1**	**23626**	**4.81%**
				– General cargo	1	23626	4.81%
				Japan - Sweden	**1**	**17611**	**3.59%**
				– General cargo	1	17611	3.59%
				Japan - Norway	**1**	**17611**	**3.59%**
				– General cargo	1	17611	3.59%
				China - Netherlands	**1**	**13723**	**2.79%**
				– Heavy cargo	1	13723	2.79%
				Island - Japan	**1**	**2410**	**0.49%**
				– Pallet	1	2410	0.49%
Total	**79**	**2104201**	**100%**	**Total**	**27**	**490998**	**100%**

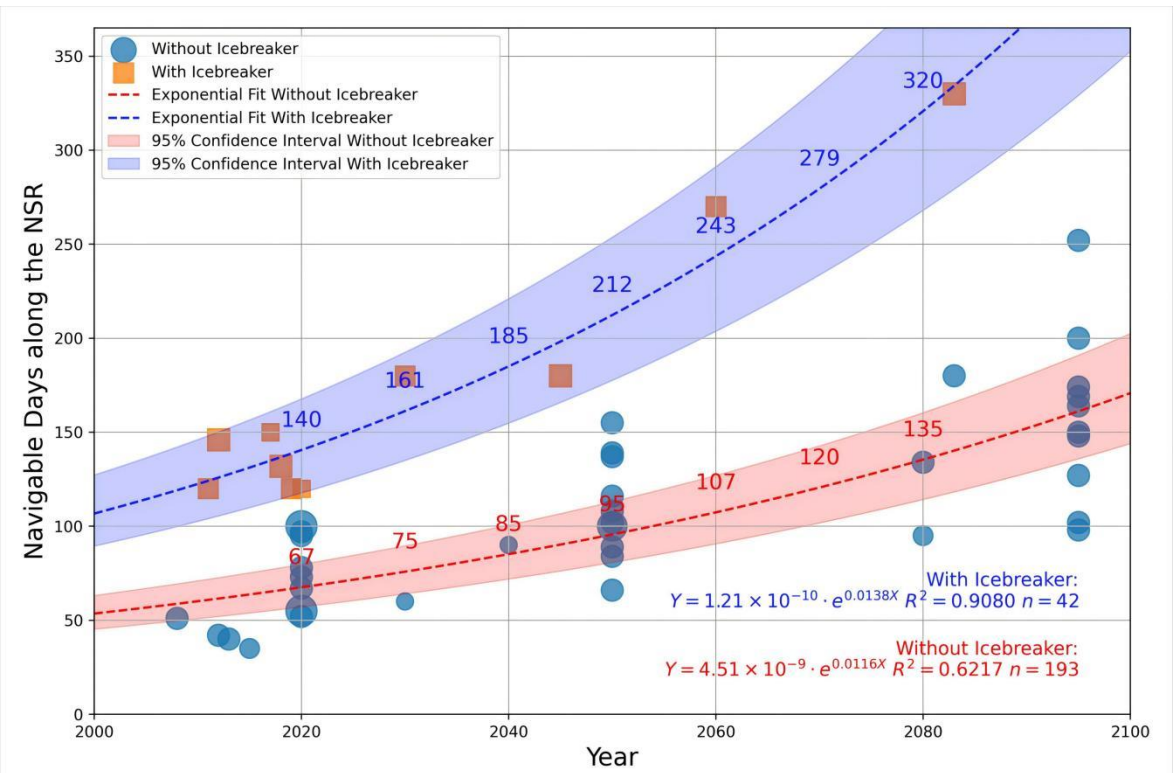
Source: Compiled and estimated by authors [Centre for High North Logistics, 2019; Centre for High North Logistics, 2024; NSR General Administration, n.d.].

Another factor limiting the large-scale operation of the route is the still limited number of navigable days in the NSR area. However, with the impact of global warming, scientists predict that the number of navigable days in the NSR will increase to a considerable number in the future [Chen et al., 2022; Khon et al., 2010; Khon, Mokhov, Semenov, 2017]. The predicted trend (see Figure 2), using a combination of technical methods to predict the number of navigable days with and without icebreaker assistance along the NSR from 2020 to 2080, verifies this important foundation.

First, we conduct a meta-analysis of the literature to find out the number of navigable days along the NSR predicted by scientists at various time points or periods as basic data. Second, we perform a source credibility assessment. We categorize the source into five trust levels and assign weights based on the source's type, authors and institutions, methodology, and other information. These are low credibility (0), relatively low credibility (0), medium credibility (3), relatively high credibility (4), high credibility (5). That is, we exclude sources with low credibility and relatively low credibility. They are assigned a weight of 0 due to reasons such as being literature reviews rather than original work, containing contradictory statements, lacking peer review, or not disclosing methodology. Third, we process the predicted values extracted from the literature. For ranges rather than specific values, we use smoothing

values over time, by employing the centered moving average method. This allows us to obtain key forecast values at certain time points, which serve as reference points and can be seen in Figure 2 (see yellow circles and red squares). The weight values obtained in the second step are used as the frequency of the reference points, which is also reflected in the sizes of the circles and squares. In the final step, we fit exponential models to these reference points to obtain the overall prediction curves using our self-written Python program. The exponential model is ideal for modeling nonlinear relationships found in real-world phenomena, but its parameters are difficult to estimate directly. However, the exponential model $Y = \alpha \cdot e^{\beta X}$ (where Y is the dependent variable (navigable days), X is the independent variable (year), and α and β are parameters) can be linearized by taking the natural logarithm of Y, resulting in $ln(Y) = ln(\alpha) + \beta X$. This transformation allows the use of ordinary least squares (OLS) to estimate parameters $\alpha' = ln(\alpha)$ and β. By back-transforming α', we obtain $\alpha = e^{\alpha'}$. This approach simplifies calculations, increases model stability, and is widely applicable in fields like economics and ecology. We provide the model expression, coefficient of determination (R squared), sample size, and 95% confidence interval in the figure.

Figure 2. Navigable Days With and Without Icebreaker Assistance along the NSR



Source: Authors' analysis.

Last but not least, given the scarcity of population in the region, the adoption of advanced technologies to automate and digitalise port facilities, and improved telecommunications are potential commercial solutions to increase the efficiency and safety of the NSR [Zoidov, Medkov, Dadabayeva, 2022]. These existing capabilities and commercial interests validate the economic potential of the NSR not just in passage and navigation, but also in the logistics infrastructure that serves the NSR.

Unfortunately, these NSR developments have been halted due to geopolitical tensions in East Europe. Despite the closer relationship and increased collaboration between Russia and China, cooperation between the two in the Arctic region has been hindered by various challenges.

Positions, Interests and Challenges

The stakes of Russia in the Arctic is an existential matter, whereas for China, the region could become essential to its survival in the distant future should great power rivalry lead to sea lines of communication restrictions in the Indo-Pacific. Through reviewing their respective policy papers, it is established that Russia and China share an interest in developing the NSR, but their cooperation faces security concerns and geopolitical challenges. Russia claims sovereignty over a vast area in the Arctic region, and understandably, the presence of any foreign actor is viewed with suspicion and as a possible challenge to the security of its northern territory. Meanwhile, China, which is the distant and a latecomer to the Arctic (note that China has only become actively engaged in the Arctic from 2013), is seen as a security threat in the Arctic by all Arctic states. In particular, China launched the Polar Silk Road in 2018, which is seen as a powerful complement to the six economic corridors under the Belt and Road Initiative (BRI). Unsurprisingly, China's advancement strategy in the Arctic also raises suspicion from Russia. This section lays out the positions and interests of Russia and China, and the challenges to bilateral cooperation. The basic understanding of the current state of affairs and concerns will inform the policy recommendations in the paper.

Russia's Position and Interests

The Russian Arctic is an immense territory that stretches over 24,150 kilometres, and Russia stretches over 53 percent of the Arctic Ocean coastline. For Russia, the Arctic has traditionally been a zone of special interest. According to President Vladimir Putin, "*the Arctic is a concentration of practically all aspects of national security—military, political, economic, technological, environmental and that of resource*" [Russian President's Official Website, 2014].

Military infrastructure in the Arctic built during the Cold War by the Soviet Union continues to play a crucial role in Russia's national security. Russia has reopened Soviet military bases and expanded the navy's Northern Fleet. Russia seeks to increase its military power in the Arctic to enhance homeland defence and secure its economic future by attracting international investment [Franiok, 2020]. The Arctic has been a resource-rich area for Russia, providing significant shares of the national income. The Russian economy is largely dependent on revenues from oil and gas: at least 50 percent of federal budget revenues are generated through exports of energy resources. Russia is one of the world's biggest oil producers and the second-largest dry natural gas producer. Although most of Russia's oil and gas production is still located in the traditional areas of western Siberia, the depletion of these resources over the past 10 years means that production is shifting to new regions, including the Arctic [Grigoryev et al., 2016]. Furthermore, in the Arctic lies the NSR, which is the shortest shipping route between the western part of Eurasia and the Asia-Pacific region. It has

emerged as a new strategic opportunity for unlocking and monetizing Russia's vast oil and gas reserves in the Arctic. It also relies on expanding domestic shipbuilding capabilities for Arctic-class tankers and a new generation of nuclear icebreakers as these are seen as important engines of economic growth and job creation in Russia [Yermakov, Yermakova, 2021].

China's Position and Interests

Under President Xi, China's involvement in the Arctic region has been solidified and expanded. It first became an observer at the Arctic Council. Later, the inclusion of polar regions in its Comprehensive National Security outlook in 2014, cemented the polar regions in its national security framework. Furthermore, the proposal of the Polar Silk Road under the Belt and Road Initiative indicated China's economic interest in polar regions. The clearest articulation of China's position and interests in the Arctic region was in its 2018 "*Arctic Policy*", where the white paper defined China as a "*Near-Arctic State*" and an "*important stakeholder in Arctic affairs*" [State Council Information Office of China, 2018]. It also explicitly states that China respects the sovereignty of Arctic states and is committed to abiding by the current international laws governing the Arctic. The white paper outlines four distinct elements in its stated goals: "*to understand, protect, develop and participate in the governance of the Arctic*" based on existing international laws and treaties [State Council Information Office of China, 2018]. Scientific research on the effects of climate change and ecological protection was the focus of the first two elements. The white paper only emphasised China's concern over climate change effects, and potential environmental and ecological problems in the Arctic without elaborating why. Chen [2023] highlighted that environmental changes in the Arctic could cause cascading impacts on China and "*indirect implications for its economic interests in agriculture, forestry, fishery, marine industry, and other sectors*".

The "*develop*" element focuses on the utilisation of Arctic sea routes and resources. China seeks to build the Polar Silk Road with the shipping routes through the Northeast Passage, the Northwest Passage, and the Central Passage as the foundation. Infrastructure along these routes is expected to improve navigation, security, and logistical capacity.

The Polar Silk Road is regarded as a component of the Belt and Road Initiative and a powerful supplement to the Six Economic Corridors. We analyze the six corridors and the Polar Silk Road and rate the varying levels of geopolitical risk and construction difficulty from Level 1 (lowest) to Level 5 (highest), see Table 2. It can be seen that the Northeast Passage (the NSR stated by Russia) is the most promising of the Polar Silk Road, which will serve as a new route outside the Six Economic Corridors.

Table 2. Analysis of the Six Economic Corridors and the Polar Silk Road

Projects	**Corridors or Passages**	**Stakeholder Countries**	**Geopolitical Risks**		**Construction Difficulty**	
Six Economic Corridors	New Eurasia Land Bridge Economic Corridor	Russia, Belarus, Kazakhstan, Poland, Germany, etc.	4	Political tensions, especially between Russia and the EU, and recent instability due to the Special Military Operation in Ukraine.	3	Existing infrastructure needs to be modernized, and it is difficult to build coordinated infrastructure in diverse climate regions and countries.
	China-	Russia, Mongolia.	2	Relatively stable, but	3	Infrastructure is affected

	Mongolia-Russia Economic Corridor			subject to the strategic dynamics between China and Russia. Mongolia is unlikely to enter into hostilities with two neighboring superpowers.		by the harsh climate, and Mongolia's infrastructure is weak and does not have the financial strength to carry out large-scale investments.
	China-Central Asia-West Asia Economic Corridor	Kazakhstan, Kyrgyzstan, Tajikistan, Uzbekistan, Turkmenistan, Iran, Türkiye, Iraq, Saudi Arabia, etc.	4	It involves too many countries (difficult to reach a consensus), making construction and operation susceptible to being manipulated by different strengths. And there is political instability in parts of Central and West Asia.	4	Many countries along the route have poor infrastructure and lack the economic strength to promote construction. The diverse and often complex terrain also makes infrastructure construction difficult.
	China-Indochina Peninsula Economic Corridor	Vietnam, Laos, Cambodia, Thailand, Malaysia, Singapore, etc.	3	Relatively stable, but historical tensions between countries present some risks.	3	The tropical climate and infrastructure quality varies.
	China-Pakistan Economic Corridor	Pakistan.	4	Although China and Pakistan have friendly relations, security risks caused by regional conflicts and terrorism are high.	4	The terrain is complex and the infrastructure is vulnerable to destruction by terrorists or hostile countries.
	Bangladesh-China-India-Myanmar Economic Corridor	Bangladesh, India, Myanmar.	4	Myanmar's political situation is unstable and China-India relations are tense.	4	The terrain is diverse and the infrastructure is underdeveloped.
Polar Silk Road	Northeast Passage (includes the NSR)	Russia.	2	Although the extensive sanctions against Russia have hampered its development, this may just be an opportunity for China, given the current stable political partnership and economic cooperation between China and Russia.	4	It is the most likely to be developed in the near future. (1) The route offers the most substantial economic benefits in terms of reduced shipping times and costs. (2) Russia's significant investment in infrastructure and icebreaking capabilities makes this route more feasible.
	Northwest Passage	Canada.	4	There is a political confrontation between China and Canada. Canadian claims over the waters of the Northwest Passage are not universally recognized, leading to potential legal and geopolitical issues.	5	It has potential, particularly if the ice continues to recede, but its development will likely be slower due to infrastructural challenges.
	Central Passage	International waters.	1	Although the Arctic Council resists Chinese activities, it can be considered as having the	5	It is the least likely to see significant development in the near term due to extreme ice conditions

				most free waters.		and the lack of supporting infrastructure.

Source: Compiled by authors.

Furthermore, China argues that the Arctic community will benefit from socio-economic developments resulting from the exploration and exploitation of energy and minerals, conservation of fishery resources, and the establishment of Arctic tourism standards. Given the level of cooperation required to fulfil its aspirations in the Arctic, China commits itself to bilateral and multilateral dialogues and mechanisms, becoming a stakeholder in Arctic governance.

Challenges in Arctic Cooperation

In the region, institutions formed by Arctic states, non-Arctic states, and non-state actors exist to discuss and regulate Arctic affairs. Due to differences in identity and interests, the various parties have different attitudes towards Arctic sustainable development cooperation. Unfortunately, the Special Military Operation in Ukraine and the sanctions imposed by the European Union and the United States on Russia have soured relations in the Arctic multilateral institutions. The widespread exclusion of Russia in Arctic cooperation, not only halts collaborative efforts in the region. It also hurts Russia's ability to defend its interests through dialogue. A pivotal event occurred on 3 March 2022, when the Arctic 7 (the United States, Canada, Denmark, Finland, Sweden, Norway, and Iceland) issued a joint statement announcing the suspension of their cooperation with Russia within the Arctic Council [Buchanan, 2022]. Following this suspension, the Arctic 7 promptly halted various cooperative initiatives with Russia in the Arctic and implemented concrete measures. For instance, the Nordic Council of Ministers declared a suspension of regional cooperation between Nordic countries and Russia. Greenland ceased its fishery quota exchanges with Russia, and Norway, following the Council of Europe's lead, joined in imposing restrictive sanctions against Russia. This stance adopted by the Arctic 7 towards Russia has had a spillover effect on other Arctic organisations. Significant regional cooperative bodies such as the Barents Euro-Arctic Council, the Nordic Council of Ministers, and the Council of the Baltic Sea States have successively announced the suspension of all collaborations involving Russia [Diplomatic Service of the European Union, 2022]. These developments occurred less than a year before Russia was scheduled to assume the rotating chairmanship of the Arctic Council from Iceland.

From a legalistic perspective, Russia's legal claims to the NSR are opposed by some countries with the United States leading the charge. Russia has always insisted on treating the NSR as an inland sea and managing it according to the standards of an inland sea. In the "*Diplomatic Concept of the Russian Federation*" released by the Russian Ministry of Foreign Affairs in 2023, the focus on the Arctic region is *"ensuring that the international legal system of inland seas established historically in the Russian Federation remains unchanged"* [Ministry of Foreign Affairs of the Russian Federation, 2023]. However, the United States believes that the Arctic route belongs to the high seas. It opposes and questions Russia's legal claims. In order to seize the strategic position and jurisdiction in the Arctic region, in December 2023, the United States unilaterally announced its sovereignty claims over the continental shelf outside seven regions, including the Arctic and the Bering Sea [U.S. Department of State, 2023]. The competition between Russia and the United States for jurisdiction over the Arctic route

at the legal level has further escalated.

China's position on Russia's legal claims to the NSR is clearly demonstrated in its acceptance of the Russian route management agency for pre-voyage declaration when Chinese vessels transit through the NSR. This acceptance can be interpreted positively or negatively depending on the threat perception of Arctic states toward China. Positively, accepting or acquiescing to Russia's sovereignty over the route, and forms the legal basis for Russia's sovereignty claims over the route. By extension, it is a signal of China's commitment to comply with international and national laws in the Arctic. Negatively, the increased Chinese interest and involvement in the Arctic brings to question how long will China comply with rules and norms, and suspicion over its true intention in the region.

From the perspective of geopolitical games, the militarization trend of the Arctic is obvious, and it has become a potential geopolitical chess piece. Based on the differences in legal claims, the contradictions between Russia and the United States have never been effectively resolved. Therefore, under the new international situation, the militarization tendency in the Arctic region has become more obvious. In July 2022, the new version of the "*Maritime Doctrine of the Russian Federation*" highlighted the main challenges and threats to national security and sustainable development. It stated, "*the advancement of the military infrastructure of the North Atlantic Treaty Organization (NATO) to the borders of the Russian Federation, an increase in the number of exercises conducted in the waters of the seas adjacent to the territory of the Russian Federation*"; and "*efforts by a number of states aimed at weakening the Russian Federation's control over the Northern Sea Route, building up foreign naval presence in the Arctic, and increasing conflict potential in this region*" [Russian President's Official Website, 2022]. Additionally, in October 2022, the United States released a new version of the "*National Strategy for the Arctic Region*", which particularly emphasized the "*increasingly fierce strategic competition in the Arctic region*" [White House, 2022]. Denmark, which has just taken over the chairmanship of the Nordic Defense Cooperation Organization (NORDEFCO) from Sweden, also said recently that the security environment in the Arctic region is expected to become more unstable due to the increase in military activities.

However, China's increased presence and capabilities in the Arctic region have raised questions about China's intentions and security concerns for Arctic states. China has repeatedly stated that it respects the sovereignty of Arctic states and is committed to abiding by international laws and treaties related to the region, unfortunately, suspicions brew due to the threat perception of China's rise coupled with its actions, which does not instill confidence over its benign ambition. This is the most prominent in navigation, resource exploitation, and infrastructure. In 2018, it was noted by Arctic states that China was hardening its submarines and certain surface vessels to operate in the Arctic region while it was building its icebreaker [Grady, 2018]. Furthermore, hydrographic data collected from scientific research can be used by the military in navigation and submarine operations. Against the backdrop of China's blue water navy ambition and Military-Civil Fusion, the observed development raised concerns over potential Chinese military presence in the Arctic in the future [Kossa, 2024].

The unique challenge in China-Russia cooperation, compared with other Arctic countries, is international sanctions imposed on the largest Arctic state. Despite closer political relations between China and Russia since Russia launched its Special Military Operation in Ukraine, China faces a greater risk of secondary sanctions by Western institutions. In 2022, Sinopec reportedly suspended discussions on a $500 million gas chemical plant with Sibur, Russia's largest petrochemical producer [Chen, Zhu, Xu, 2022]. It came after China's Ministry of Foreign Affairs cautioned the three state energy giants - Sinopec, China National Petroleum Corp (CNPC) and China National Offshore Oil Corp (CNOOC) - to review business ties with Russia amidst international sanctions. Similarly, COSCO steadily increased the number of passages along the NSR since 2013, but in 2022, none of its vessels sailed along the NSR [Information Analytical and Statistical Center of the Rosmorrechflot, n.d.]. The sudden zero passage correlates with international sanctions imposed after Russia's Special Military Operation, hence, it is fair to infer that risk from sanctions had a part to play. From the perspective of China's global interests, the Arctic region is not the highest of priorities as compared to troubles and cooperations in its neighbouring regions. Despite periodic highlights of the importance of the Arctic region, cooperation between Russia and China in the Arctic since China became an observer in the Arctic Council in 2013 has been limited. The risk of secondary sanctions restricts the already limited cooperation.

In terms of resource exploitation and infrastructure development. These are difficult investments because the harsh conditions in the Arctic meant high operating costs. Consequently, the profitability and sustainability of these projects when Chinese companies conduct their feasibility studies. For example, it took 10 years of negotiation between Moscow and Beijing before Gazprom and the China National Petroleum Corporation (CNPC) signed on to the Power of Siberia project in 2014. However, the short fall from the Chayanda gas field, in the Yakutia region, had to be made up from a gas field (located 800 km south of Chayanda in the Irkutsk region) which does not have the infrastructure in place and yet to be connected to the Power of Siberia pipeline [Krutikhin, 2019]. The terms of linking gas prices with oil prices were also deemed to be unfavourable for Russia. Thus, the net present value of the project was assessed by Sberbank CIB to be in the negative [Podobedova, Dzyadko, 2018].

Premortem: Risks in Arctic Port Projects

China's involvement in constructing Russian Arctic ports presents a complex set of potential risks that warrant careful consideration. Ports are not merely docking places for ships; they are integral to a nation's import and export rights and trade relations, interconnecting with shipbuilding, land transportation, power grids, and other infrastructure and economic policies. Over the past two decades, China has accelerated its investment in overseas maritime infrastructure, strengthening its global port capabilities through acquisitions, construction, aid, and leasing.

In this section, we conduct a premortem analysis to evaluate the risk of Chinese presence in Arctic maritime transport infrastructure. This analysis aims to understand the risks and identify potential failure points thoroughly. By examining China's existing cases of overseas maritime infrastructure investments from the perspective of Russian national interests, the findings in the analysis will ensure that bilateral cooperation is

mutually beneficial and able to withstand the test of time. With potential risks investigated, mitigation can be implemented in the early stages of bilateral cooperation.

In order to analyze the risks involved in Chinese maritime investments in the Arctic, we develop a framework to score the impact and likelihood of the investments across major threat areas [Ghiretti et al., 2023]. We have selected four controversial cases of Chinese overseas maritime investments to illustrate the various risk factors. These cases are the Hambantota Port in Sri Lanka, the Chancay Port in Peru, the Hamburg Port in Germany, and the Piraeus Port in Greece. Each of these cases is analyzed to reveal one significant aspect of possible threat areas: dependency risk, coercion/influence risk, cyber/data risk, and hard security risk. Finally, we will return to the discussion on the bilateral cooperation in infrastructure development along the NSR and, from the perspective of Russian interests, analyze the risks based on the two indicators of impact and likelihood.

Dependency Risk: "Debt-Trap" in Hambantota, Sri Lanka

Dependency risk evaluates how dependent the host country (Russia) is on China's maritime infrastructure investment. Sri Lanka's Hambantota port has been featured as the prime example of China's "*debt trap*" and dependency risk concerns in infrastructure projects in low-income countries. The mechanism of debt-trap begins with excessive loans to the client state for infrastructure projects in strategically important locations [Himmer, Rod, 2022]. As a result, the client state is economically dependent and under the influence of the lender state. In cases where the client state is unable to repay or service the loans, the lender state will take over the assets - infrastructure and natural resources - of the client state to restructure the loan.

Unable to repay its debt, Sri Lanka gave China a controlling equity stake and a 99-year lease for Hambantota port, which it handed over in December 2017 [Hillman, 2018]. China was not the first lender Sri Lanka approached after a feasibility study was completed for Hambantota port [Brautigam, Rithmire, 2021]. When Sri Lanka could not service their loans from Western entities and other lenders, Chinese banks were willing to restructure the loan [Roy-Chaudhury, 2019]. Specifically related to port operations, Sri Lanka turned to one of the only two Chinese enterprises, China Merchants Group, that managed port operations in other Sri Lankan ports. The economic rationale for China's financial support in Hambantota is weak, fueling concerns that it could become a Chinese naval facility. Many believe that the efficacy of port infrastructure development financed by Chinese capital is contingent upon the state's capacity for strategic bargaining and adherence to contractual obligations.

It remains debatable whether China intended to apply a debt trap to secure strategic assets in Sri Lanka, as argued by United States officials. There is no conclusive evidence to support the notion that China's 99-year lease of Hambantota port was the intention from the start of China's involvement. Instead, retracing the historical development of Hambantota port reveals a series of poor financial decisions and management on the Sri Lankan government's part that led to China's 99-year lease. The port-related debt was only a tiny fraction of the overall national debt. Yet, the strategic decisions by the

Sri Lankan government to accelerate the port project for political gains, despite financial instability, played a crucial role in the outcome. Consequently, while the Hambantota port case is often cited as an example of China's strategic maneuvering, the underlying reasons are more complex and involve significant mismanagement by the Sri Lankan government. This complexity suggests that the situation cannot be solely attributed to China's strategic intentions but rather a combination of mismanagement and external financial pressures.

Coercion/influence risk: Geopolitical Implications in Chancay, Peru

Coercion/influence risk evaluates whether the investment intentionally raises the risk of China's coercion/influence over the host country's (Russian) politics. Peru Chancay Port is a significant example of China's maritime investment, raising vulnerability to geopolitical impact and concerns about possible coercion. Chancay Port aims to relieve the burden on Callao, Peru's principal port, by directly connecting South America's west coast to the Asian industrial heartland [Gelfenstein, 2024]. The project is China's first port infrastructure investment in Latin America within the BRI framework [Tiwari, 2024]. In 2019, COSCO Shipping acquired a 60% stake for US$225 million, marking a significant step in the collaborative construction of the Chancay Port [Gelfenstein, 2024]. In 2021, the National Port Authority of Peru (APN) and COSCO Shipping signed an agreement granting COSCO exclusive exploitation rights for the future port.

While the Peruvian public views the construction of the Chancay Port favorably, there are apprehensions regarding potential geostrategic implications and impacts on Peruvian politics. Despite the agreement, APN soon altered its stance on China's exclusive rights and declared it lacked the legal authority to grant them [Deza, 2024]. It was not until 30 May 2024 that the Peruvian Congress passed an amendment to the National Port System Law, eliminating the controversies associated with China's rights to operate port services. The United States has expressed concern about Chinese investment in such a strategic sector, criticizing the Peruvian government's perceived lack of focus in evaluating the risks associated with significant geostrategic endeavors [Ibid.]. Additionally, neighboring countries, particularly Chile, have voiced concerns over the potential impact on their port capacities and interconnections with the Atlantic [Gelfenstein, 2024]. These geopolitical tensions underscore the complexity of Chinese investments in strategic infrastructure projects in Latin America.

However, the narrative of Chinese investments posing significant coercion risks can be countered by examining the specific circumstances of the Chancay Port project. There is no conclusive evidence to support the notion that China's involvement was intended to enforce political influence or to secure strategic assets at the outset. Instead, the challenges faced by the project largely stem from Peru's internal legal and administrative inconsistencies. COSCO's investment has been framed as a necessary economic partnership, offering a significant cash infusion to a critical infrastructure project. Furthermore, the amendment to the National Port System Law by the Peruvian Congress, which resolved the legal disputes over exclusive operating rights, highlights a cooperative approach to mitigating potential risks and ensuring the project's success. This complexity suggests that the situation involves China's strategic maneuvering and the Peruvian authorities' significant administrative and legal missteps.

Cyber/data Risk: "Critical Infrastructure" Controversies in Hamburg, Germany

Cyber/data risk evaluates whether the investment poses new threats to critical infrastructure or raises data security or privacy risks. China's maritime investment might raise cybersecurity or data risk concerns for the host state, as illustrated in the Port of Hamburg case. The Hamburg port is Germany's largest and Europe's third-largest container port. It takes on a crucial distribution function for worldwide flows of containerized goods. In 2021, COSCO reached a deal with Hamburger Hafen and Logistic (HHLA) to acquire a 35% holding of Container Terminal Tollerort (CTT) [Rinke, Schwartz, 2022]. Nevertheless, COSCO's acquisition proposal was followed by reported protests within the governing coalition, leading to further review of CTT's "*critical infrastructure*" issue [Si, 2023]. NATO vessels regularly visit the Port of Hamburg, whereas COSCO already has two offices in the city. COSCO operations might become a platform for cyber-attacks and espionage towards Germany and NATO military secrets. As geopolitical tensions grow between China and Europe, the acquisition will pose a threat to the host state. For example, China has potential access to the point of entry to politically instrumentalize part of Germany and Europe's critical infrastructure, such as COSCO's investment in Hamburger Hafen und Logistik AG.

Cybersecurity and data risks presented by China's presence in the Arctic are likely to expand in marginal ways despite the discussion above. Indeed, large-scale infrastructure projects are susceptible to shifts in the global political landscape, potentially affecting financing, technology transfer, or operational aspects of port development [Firstpost, 2024]. However, the strategic partnership between these two states demonstrates a commitment to mutual economic growth and regional stability. Russia's willingness to engage in extensive trade and investment deals with China, including in critical sectors like energy and technology, suggests that threats of espionage or cyber-attacks can be managed. Furthermore, China's investments in Russian ports, such as Zarubino, have not raised the alarm about potential security breaches or political instrumentalization [Chu, 2023]. Instead, these collaborations have enhanced regional trade efficiency and economic development.

Hard Security Risk: "Dual-use" Concerns in Piraeus, Greece

Hard security risk evaluates whether the investment creates new traditional national security risks, mainly related to using China's military force. China's port investments may raise concerns about "*dual-use*" capabilities, particularly the potential for these facilities to enhance its military presence in the region.

The Port of Piraeus, Greece, is often referred to as the "*Dragon's Head*" of China's BRI [Calatayud, 2023]. Since acquiring the Port stake in 2008, COSCO has obtained operational control via a majority stake in the Piraeus port authority. Some researchers highlighted that COSCO's presence next to critical civilian and military infrastructure is highly problematic in terms of both soft and hard security risks. Chinese warships have visited Piraeus several times since 2002, most recently in October 2017, when the Greek and Chinese navies held one-day joint drills. Port calls of Chinese warships feed into the debate on the potential dual use of COSCO's investment project. According to the Agence France-Pressee report in June 2015, newly built civilian ships must comply

with national defense requirements and technical standards. This enables China to convert the considerable potential of its civilian fleet into military strength to protect maritime support capabilities [Agence France-Presse, 2015]. It should be noted that the Chinese government categorically rejected this interpretation of its requirements and technical standards.

The notion of "*dual-use*" capabilities often oversimplifies complex geopolitical realities. Ghiasy and Zhou stated in their SIPRI report that "commercial ports are rarely suitable for direct military use without substantial modification" [Ghiasy, Zhou, 2017]. Furthermore, the presence of Chinese warships at Piraeus can be viewed as routine naval diplomacy rather than a sign of militarization. As in the case of China and Russia's cooperation in the Arctic, viewing these investments as potential military assets may oversimplify the nuanced nature of China and Russia relations. Korolev demonstrated in his analysis that Sino-Russian strategic partnership and cooperation are primarily driven by economic interests rather than military ambitions [Korolev, 2019]. Considering these investments within the broader context of global trade and economic cooperation is crucial rather than solely through a lens of potential security threats.

In summary, the primary risks associated with bilateral cooperation in infrastructure development along the NSR encompass dependency, coercion, cybersecurity, and hard security. Utilizing indicators of likelihood and impact to evaluate these risks enables more precise quantification of their levels, thereby enhancing the robustness of decision-making processes.

Dependency risk: Despite "*debt trap*" concerns, Russia's economy and fiscal health are in a better position than states that have become heavily dependent on China. The effects of exogenous events - pandemics, natural disasters, currency volatility, or lack of alternative partners - which can force Russia to over-depend on China or throw Russia off its fiscal balance cannot be ruled out. However, the strategic importance of the Arctic region and sound governance in Russia would mean that prudence will be exercised when negotiating the cooperation model and project financing arrangement. Therefore, relative economic disparity exists, but Russia's strategic interest and sound governance reduce the dependency risk to low likelihood.

Coercion/Influence Risk: The strategic partnership between China and Russia, coupled with the Arctic's unique geopolitical context, decreases the cost of mutual political coercion. However, the involvement of third parties, such as the United States, may complicate this dynamic through negative sanctions, exerting diplomatic pressure on international and regional organisations, or mobilizing international opinion against China and Russia. While the Sino-Russian strategic partnership suggests a lower likelihood of political coercion, the geopolitical sensitivities of the Arctic necessitate careful consideration of its potential impact. Consequently, political coercion remains a significant risk factor to be monitored in assessing Sino-Russian Arctic cooperation.

Cyber/Data Risk: The level of digitization in Arctic infrastructure and the existing state of bilateral technological cooperation underscores the significance of cybersecurity risks and the necessity for robust data sharing and protection mechanisms. Considering the ongoing digitization of Arctic infrastructure and the increasing frequency of cyber-attacks, both the likelihood and impact of cybersecurity and data

risks are expected to rise progressively.

Hard Security Risk: Although the potential for "*dual-use*" facilities in the Arctic exists, the current state of Russian-Chinese military cooperation and the unique geographic positioning of Arctic ports necessitate a reassessment of traditional military security risks within a new framework. The likelihood of such risks remains low; however, their occurrence would result in significant impact.

Effective risk reduction in bilateral Arctic cooperation can be achieved through improvements in the legal and institutional framework, establishing transparency and information-sharing mechanisms, and promoting multilateral cooperation and international supervision. Short-term efforts should focus on robust risk management, while medium—and long-term strategies must recalibrate the balance between joint development and security concerns.

Table 3. Risk matrix of bilateral cooperation in Arctic infrastructure and port development

		Impact				
		Insignificant	Minor	Moderate	Major	Catastrophic
Likelihood	Rare			Dependency risk: China's port and shipping firms increase the market share in local society	Hard security risk: China's port and shipping firms might be used for military purposes	
	Unlikely				Coercion/ influence risk: China's port and shopping firms threaten to shrink traffic via NSR to influence Russia's policy	
	Possible					
	Likely		Cyber/data risk: China's port and shipping firms marginally increase the risks of cyberattack and data leakage.			
	Almost Certain					

Source: Author's analysis [Karin, 2023].

Policy Advice: Phases for Cooperation

The stakes for Russia in the Arctic are primarily the security and sovereignty of its

northern territory, and more recently, a critical area of development in its turn to the East strategy. Whereas for China, its stakes in the Arctic are the viability of NSR to be an alternative sea lane of communication, and natural resources reserve that has not been exploited. In comparison, the stakes for Russia in the Arctic are an existential matter. The imbalance of stakes and the long cycle for development in the Arctic means that strategic trust is vital in Sino-Russian cooperation to weather volatility. In other words, without strategic trust as the foundation of the cooperation, the uncertainty in bilateral relations will be a major risk factor in Arctic projects and Russia's turn to the East strategy.

Premised on the current international sanctions on Russia and closer relations between China and Russia, this paper opines the opportunity has arisen for cooperation. This paper breaks down the ten to twenty years cooperation process into three phases: confidence building; negotiation and feasibility study; execution. There are two main reasons why this paper argues that the cooperation process takes ten to twenty years. First, the environment in the Arctic is harsh. For reference, the recently completed Singapore Tuas Port Phase 1 took three years without taking into account reclamation works. The targeted completion of the remaining three phases of the 1,337ha port is in the 2040s. Unlike construction in the tropics, construction in the Arctic is at the mercy of weather and ground conditions. Furthermore, the transportation of construction materials and labour will take longer than similar projects along other sea routes because of the lack of an established transport network in sparsely populated regions. Second, mutual trust takes time to build. Given Russia's deep security concerns in the Arctic and suspicions over China's intentions in the Arctic, the time and effort required in confidence building will undoubtedly be a tedious undertaking.

The first phase of cooperation is confidence building to lay the strategic trust foundation through mutual understanding. Confidence building is traditionally applied in the domain of security, especially in areas with high potential for conflict to build mutual trust between states. At present, the desire for Arctic cooperation has been expressed at the highest political level of both countries. Dialogue on Arctic cooperation, as part of bilateral relations, has produced bilateral consensus. In 2023, Russian President Putin expressed alongside Chinese President Xi that "*Russia and China as a whole intend to actively develop international transport and logistics corridors. The idea is to more intensively use the potential of the Trans-Siberian and Baikal-Amur railways, the Northern Sea Route, multi-lane trans-Asian highways, jointly guarantee their stable operation, and increase the efficiency of cargo and passenger transportation*" [Russian President's Official Website, 2023]. This is a clear signal that the connectivity of goods between the two countries are on the agenda. In May 2024, the cooperation was elaborated in greater detail and covered a comprehensive set of domains. The leaders of the two countries agreed, "*to establish a Subcommission on the Development of the Northern Sea Route within the framework of the Russian-Chinese Commission for the Preparation of Regular Meetings of Heads of Government, to develop mutually beneficial cooperation in the development and use of the Arctic, ensuring the preservation and conservation of the region's ecological system. To promote the use of the Northern Sea Route as an important international transport corridor, to encourage companies from the two countries to strengthen cooperation in such areas as increasing cargo transportation along the Northern Sea Route and*

building logistics infrastructure. To deepen interaction in the field of Arctic shipbuilding, including technological cooperation… The parties express interest in maintaining the Arctic as a territory of peace, low military-political tension and stability, as well as the development of constructive dialogue and mutually beneficial cooperation in this region." [Russian President's Official Website, 2024].

However, leaders' summit and consensus on the highest level is not enough. Despite similar past consensus, Arctic cooperation did not make significant progress. One of the observations made was local governments, as the executing actor of central government policies, contest with requirements of environmental laws and development realities on the ground [Zhang, Hu, 2020]. Hence, other than confidence building on the central government level to address security, on the local level, the effort would need to focus on promoting cooperation to jointly resolve environmental challenges during execution to comply with national laws. Regular dialogue between Chinese officials involved in Arctic affairs and the Russian local government with the aim of build mutual understanding is a low laying fruit to achieve cooperation. Simultaneously, track 1.5 and 2 dialogue can help to keep channels of communication open and address outstanding issues on the granular level with greater care. The confidence building phase is expected to continue well into the completion of joint-projects. The ultimate test of bilateral basic trust and understanding on the local level, and an indicator to proceed to the next phase, is an agreement on the agenda of bilateral negotiations.

The second phase of the cooperation process is feasibility study and negotiation. The paper proposes that a feasibility study should be a joint effort to ensure that the findings are not questioned, but most importantly, sensitive and critical information is not withheld unnecessarily. Alternatively, a trusted third party can be jointly commissioned to conduct the feasibility study with all required access and information made available. The two countries can also consider jointly launching a multilateral mechanism. For Russia, this will not only help strengthen international cooperation and counter extensive sanctions. For China, multilateral mechanisms are a diplomatic principle it encourages. In bilateral negotiations, ensuring that both countries have equal stakes in the cooperation and successful outcome. Four key issues will need consensus on:

a) A vision and nature of the port, such as should the port be fully automated and digitised like other international ports?

b) Should the development of the port be a joint-venture or financed with Chinese loans?

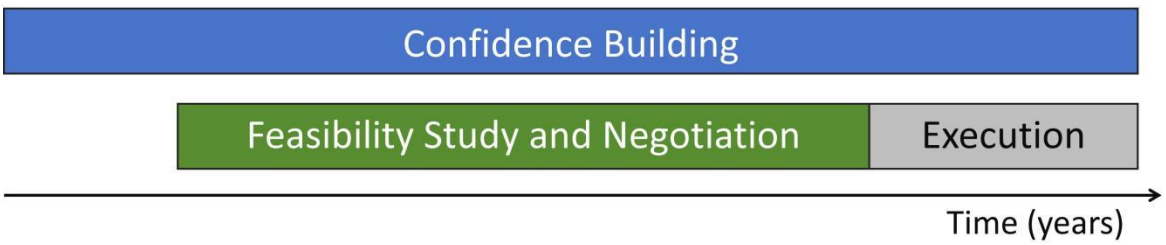
c) If the port is a joint-venture, what is the share percentage or what would the terms of operation and usage?

d) If the project is financed with Chinese loans, what will the terms of the loans be?

The third phase is execution, which is the outcome of negotiations. The end of this phase does not mean the end of the cooperation. Instead, the execution phase will receive the most international attention. Thus, it is a chance to feature the strength

and commitment of Sino-Russian cooperation. It is also a vital proof of concept that a balance between security and development cooperation in the Arctic is possible. Successful cooperation between China and Russia in the Arctic is a calling card to other countries that have a stake in NSR to be a part of its development. The condition to transit to this phase is when international sanctions are no longer an external barrier. It is important that confidence building measures continue through this phase to strengthen the foundation of bilateral cooperation.

Figure 3. Phases of Cooperation



Source: Drawn by authors.

Conclusion

In conclusion, this paper has presented that there is great economic opportunity along the NSR and strong political will to develop the route. Furthermore, with maritime technological advancement and global warming, NSR navigable days and speed can increase, but with environmental concerns. China-Russia cooperation can help achieve one of the sustainable development goals (SDG No. 9 Industrialization, Innovation and Infrastructure) in the region, although it is not analysed in depth in the paper. Additionally, the limitation of time and lack of field studies meant that port operation and management, and shipping companies' perspectives were not explored in detail. A specific and realistic time frame for the policy recommendation cannot be provided.

Security challenges and current international sanctions are found to be a hindrance to bilateral cooperation in the NSR. Pre-mortem analysis in this paper has also identified several failure points and risks in the bilateral. However, consistent confidence building between China and Russia at the national and local level, along with clear consensus, can mitigate security concerns and build lasting bilateral cooperation. Furthermore, the ten to twenty years cycle means that patience is needed before the cooperation comes to fruition and reaps its benefits. The returns of the cooperation are a proof of concept that a balance between security and development cooperation in the Arctic is possible, and the success of China and Russia in the Arctic is a calling card to other countries to be a part of NSR infrastructure development. The joint launching of a multilateral mechanism by Russia and China can serve as a long-term plan.

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