The Polar Tiger:

Climate Change, India, and US Arctic Security Policy in a Multipolar World

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ABSTRACT

This article examines India's evolving role in Arctic policy and climate security, emphasizing the imperative for science-oriented cooperation between the United States and India in light of growing tensions and multipolar dynamics. The research explores India's increasing influence in the Arctic, analyzing its Observer status on the Arctic Council and the implications for US policy.

Addressing India's multifaceted interests in the Arctic, encompassing economic, political, and climate considerations, the article suggests leveraging these interests for collaborative efforts with the US to uphold a peaceful, stable, and cooperative Arctic regime. Security implications are scrutinized, focusing on the potential strategic alignment between India, Russia, and China, with emphasis on risks to US interests. The article advocates for constructive engagement by US policymakers with India to avoid issues caused by such alignment and highlights the absence of India in key US policy documents on the Arctic, even though India is featured in other key US security strategy documents.

The article underscores the vital connection between protecting the Arctic and global climate stability, framing the Arctic's dual role as a tipping point and feedback mechanism. It further explores the scientifically established link between Arctic sea ice loss and the Indian monsoons. The article outlines the implications of these teleconnections for the Indian economy, supporting the argument that Arctic protection is crucial for both the US and India.

Proposing science-led US-Indo cooperation in the Arctic, the article advocates for collaboration on understanding climate teleconnections, framing it as an opportunity to align mutual climate security objectives. This approach aims to strengthen bilateral relations and promote an Arctic governance model prioritizing climate protection. India's traditional non-alignment policy makes such cooperation feasible, offering the US an opportunity to advance its interests in a stable and peaceful Arctic. Overall, the article positions India's role as a strategic opportunity for the US to engage in Arctic governance with a science-based, climate-centric focus, ensuring long-term security considerations for both nations.

INTRODUCTION

India is emerging as a significant player in a multipolar world order, poised to become the third largest economy by 2030 (S & P Global, 2023). Unlike China and Russia, India has the flexibility to collaborate with states aligning with its interests, including in the Arctic. Additionally, India has gained prominence in climate negotiations and the Global South, as showcased by its successful Presidency of the G20 summit in 2023 (Economic Times, 2023).[1] This comes at a time when the US would benefit from more partners to support its own interests in the Arctic.

The article explores India's growing role in Arctic policy and governance and highlights opportunities for the US to pursue science-led cooperation with India. It notes how the latest developments in climate science have heightened Indian interests in the Arctic. This includes the teleconnections between the Arctic and the Indian Summer Monsoon (ISM), where Arctic sea ice loss affects the stability of the ISM, in turn threatens India's economy and food security. At the same time, the US has an urgent need to preserve the Arctic sea ice to prevent its own at-risk communities in Alaska from experiencing widespread devastation from climate change, and to prevent by self-amplifying climate feedbacks from pushing the Arctic past climate tipping points.

The article underscores the co-benefits of Arctic climate protection for both India and the U.S., providing a foundation for future cooperation. It argues that India could assist the US in countering further Arctic securitization by Russia and China. By jointly focusing on climate protection and leveraging common interests, the US and India can navigate evolving politics in the Arctic, ensuring long-term Arctic protection and security interests.

THE ARCTIC AND CLIMATE CHANGE

The Arctic is critical for climate stabilization, yet it is warming at four times the global average and may also be the weakest link in the chain of climate protection (Zaelke, 2023).[2] It serves as a dual indicator for long-term climate change that contains potential tipping points and self-amplifying feedback mechanisms (Zaelke, 2023).[3] Tipping points are thresholds in systems that trigger abrupt, often irreversible changes when crossed.[4] Understanding these sensitivities in the physical climate system, ecosystems, and human systems is vital for assessing risks associated with varying degrees of global warming.[5]

In the context of the Arctic, a feedback mechanism is evident as the diminishing extent of reflective sea ice increases the absorption of heat by the darker ocean (Mallett, et al., 2021; Zaelke, et al., 2023).[6] This triggers a selfamplifying feedback loop, causing more ice to melt (Zaelke, et al., 2023).[7] In this way, loss of sea ice—while not in and of itself a tipping point—can add to global heating and exert pressure on other parts of the Arctic that exhibitglobal or regional tipping thresholds, such as ice sheets and permafrost (International Cryosphere Climate Initiative, 2023).[8] Thawing permafrost can release substantial amounts of major greenhouse gas emissions from previously-frozen soil carbon. These emissions could rival the current output of the world's largest polluters[9] and contribute an additional 0.05–0.7 °C to end-of-century warming, emphasizing the critical role of Arctic preservation in broader climate protection (Armstrong McKay,2023; Permafrost Pathways, 2022; Schuur, et al., 2015).

TELECONNECTIONS IN THE ARCTIC AND INDIA

The effects of climate change on the Arctic have far reaching consequences for the Global South, particularly impacting India. The direct influence stems from the loss of Arctic sea ice and is mediated by mechanisms called 'teleconnections.' Recent research highlights a potential link between the loss of Arctic sea ice and the destabilization of the Indian Summer Monsoons (ISM) (Zaelke, et al., 2023).10 Observation-based studies indicate a correlation between Arctic sea ice loss and extreme rainfall events during the ISM (Chatterjee, et al., 2021).

1 See also (Crawford & Westfall, 2023; Cave, et al., 2023; Haqqani & Pande, 2023)

2 See also (Zaelke, et al., 2023).

3 See also (Molina, et al., 2018)

4 See also (Hoegh-Guldberg, et al., 2018; Abram, et al., 2019; Armstrong McKay, 2023) Note that not all scientists consider Arctic sea ice an irreversible tipping point, as it is still possible in their analysis for the sea ice to return if the Arctic cools.

5 See also (Hoegh-Guldberg, et al., 2018; Abram, et al., 2019)

6 See also (National Snow & Ice Data Center , 2022)

7See also (International Cryosphere Climate Initiative, 2023; Armstrong McKay, 2023)

8 "**The effects of amplifying feedbacks will be widespread, ranging from accelerated loss of ice and associated sealevel rise from Greenland; to losses of ice-dependent species; to greater permafrost thaw**, leading to even larger carbon emissions and infrastructure damage" (International Cryosphere Climate Initiative, 2023). [emphasis added].

9 See also (EPA, 2023; Wang, et al., 2023; Turetsky, et al., 2020)

10 See also (Chatterjee, et al., 2021; Coumou, et al., 2018)

Moreover, the melting of Arctic sea ice leads to increased solar radiation absorption in the Arctic Ocean raising water temperatures. During winter, the warmer water is released into the atmosphere, altering geopotential heights and circulation patterns. While tropical troposphere warming strengthens mid-latitude westerlies, Arctic amplification has the opposite effect, weakening gradients and westerlies. Weakening westerlies cause mid-latitude troughs to extend southward, contributing to extreme monsoon rains in the Himalayan foothills (Coumou, et al., 2018).

For India, these teleconnections translate to increased monsoon instability. The ISM, supplying over 70% of India's annual precipitation, directly impacts the agriculture sector—a pivotal part of the economy employing over half of the population and contributing to a fifth to the GDP, as well as being crucial for food security (Zaelke, et al., 2023).11 Protecting Arctic sea ice lessens the impact of these teleconnections and preserving monsoon stability and reducing risks to India's long-term interests, supporting its ambition to become the world's third-largest economy by 2030.

While a detailed exploration of the implications of the scientific link between the Arctic and the ISM will be covered in part II, it is crucial to highlight now that this scientific understanding underscores the importance of cooperation between the US and India. Such collaboration aligns with the long-term interests of both states in mitigating the adverse effects of climate change on critical sectors like agriculture and economic development.

THE IMPORTANCE OF ARCTIC CLIMATE PROTECTION FOR US INTERESTS

Safeguarding against the impacts of climate change in the Arctic is critical to US climate and security policy. Existing US Arctic policy underscores the potential consequences of Arctic sea ice loss, including rising global sea levels, coastal erosion, more frequent and severe wildfires, and damaged ecosystems (White House, 2022).These impacts pose significant threats to US interests with the potential for widespread social and economic disruption, affecting both the US and its key allies.

The US directly experiences the physical repercussions of Arctic changes, notably in Alaskan communities facing disruptions to subsistence fishing, infrastructure damage from coastal erosion, and the displacement of indigenous communities due to flooding risks.12 Moreover, the release of greenhouse gas emissions from permafrost jeopardizes the global effort to stay within the 1.5 °C temperature limit, necessitating a substantial reduction in US emissions beyond current commitments outlined in the National Determined Contribution (NDC) (UNFCCC, 2021; Zaelke, et al., 2023). Protecting the Arctic becomes imperative to mitigate these impacts and maintain a chance of staying within permissible temperature guardrails, aligning with the long-term interests of the U.S., considering the catastrophic consequences of unchecked climate change (Zaelke, et al., 2023).

From a security perspective, the melting of Arctic sea ice opens up shipping lanes in the Northern Sea Route (NSR), providing Russia with strategic advantages. Russia's control of these routes enhances its influence on the global stage posing a threat to US interests in Arctic bases and heightening risks to Alaska (Cusick, 2024; Strawa, et al., 2020). Equally, increased militarization facilitated by the loss of sea ice may escalate tensions between Russia and NATO, particularly in the context of the tensions caused by Russia's invasion of Ukraine (Groesmeyer, et al., 2019).13 As the Arctic is further affected by climate change, Russia can move more forces into the zone, which in turn puts pressure on NATO to ramp up its own security presence (Gardener, 2023).14 Maintaining Arctic sea ice integrity is crucial to preventing Russia's further exploitation of new routes and bases, aligning with the long-term interests of the U.S. (Gardener, 2023)

While part III will delve into a detailed analysis of Arctic risks and policies, the immediate impacts of climate change on US interests emphasize the need for the US to explore new and ambitious pathways for bilateral cooperation on Arctic climate protection. This proactive approach is essential when formulating a robust Arctic policy that considers the broader implications of climate change on security and global stability.

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11 See also (Ministry of Agriculture & Farmers Welfare, 2021)
12 See also (Strawa, et al., 2020)
13 See also (Congressional Research Service, 2024)
14 See also (Groesmeyer, et al., 2019; Congressional Research Service, 2024)

INDIA'S ARCTIC ASPIRATIONS

India's engagement with the Arctic encompasses climate, research, political, security, as highlighted in its Arctic policy released in 2022. The policy recognizes the disruptive impact of melting Arctic ice on national development, island territories, and the welfare of its population, while also acknowledging opportunities in energy, mining, food security, and shipping. Concurrently, it acknowledges the transformative potential arising from the changing Arctic landscape, opening avenues for energy exploration, mining, food security, and shipping. India's strategic approach aims to ensure the sustainable exploitation of Arctic resources, aligning with international best practices (Government of India, 2022).

While India values Arctic preservation, it also considers short-term interests, such as trade route expansion due to ice melt. Notably, India refrains from explicitly aligning with specific nations in the pursuit of its Arctic objectives. The policy emphasizes collaborating with "all stakeholders" to pursue its interests in the Arctic (Government of India, 2022). This strategic flexibility, characteristic of India's historical approach to multialignment, signifies a willingness to align with the bloc most amenable to its interests, including the potential for alignment with the US on mutual interests (Lin, 2023).15

INDIA'S RESEARCH AND SCIENTIFIC INTEREST IN THE ARCTIC

India's enduring interest in Arctic affairs, despite geographical remoteness, traces back to its signing of the Svalbard Treaty in 1920. Over the years, India has been deeply involved in Arctic science and research studies, marking a significant milestone with the establishment of its first research station in 2008. India has opened a multisensor moored observatory, an atmospheric laboratory, and has had researchers observing Arctic glaciers for their mass balance in order to compare them with Himalayan glaciers (Singh, 2024).

A notable advancement, in December 2023, saw India launch its first winter expedition (Government of India, 2023). It signals India's intent to further expand its scientific presence in the Arctic and demonstrates its openness to working with other States in the region.

INDIA'S POLITICAL INTEREST IN THE ARCTIC

India also holds the status of an Observer on the Arctic Council, an intergovernmental forum consisting of the U.S., Canada, Iceland, Norway, Denmark, Finland, Sweden, and Russia that acts as the primary governance body of the Arctic region. While the Council was suspended following the Russian invasion of Ukraine, limited activities have resumed under the chairmanship of Norway (Canova & Pic, 2023). As an Observer on the Council, India can exert little formal influence over Arctic affairs, partially as a result of the governance structure of the Arctic Council, which only provides traditional Arctic States including the US with permanent representation (Bisen, 2023).

Despite this limitation, India actively participates in various Arctic Council's working groups, notably the Expert Group on Black Carbon and Methane (EGBCM)(Arctic Council, n.d.). More broadly, India has expanded its engagement in multilateral Arctic and polar discussions. In 2022, it attended the Eastern Economic Forum hosted by Russia, which included a discussion on the efforts of Russia to develop the NSR in the Arctic (this will be discussed in detail in part IV) (Special Eurasia, 2022). In 2023, it attended the Polar Summit in France which sought to encourage greater investment into polar research including research in the Arctic (Summit, 2023).

With its increasing political and security interests in the Arctic, alongside its influential role in the Global South, the Indian voice becomes crucial to propel the Global South to advocate for protection of the Arctic.

INDIA'S ECONOMIC INTEREST IN PROTECTING THE ARCTIC

India has a tangible interest in safeguarding against and mitigating the further loss of sea ice as it aligns with its long-term economic interests. The ISM provides over 80% of the India's annual precipitation and has a critical indirect effect on India's economy (Katzenberger, et al., 2021; World Bank, 2021). Given that agriculture constitutes approximately 20% of India's gross domestic product and employs nearly 50% of the country's workforce, the reliance on rainfed arable land is significant, accounting for 54% of India's cultivable terrain (Dhawan, 2017). The variability in monsoon rainfall, particularly critical for crops like rice, emerges as a substantial risk to food security and the livelihoods of those engaged in agriculture (Katzenberger, et al., 2021).

Indian crop production relies heavily on the Indian Summer Monsoons (ISM), which directly affects food prices. The connection between India's economy, the ISM, and monetary policy is reinforced by the impact of food prices on the Reserve Bank of India's interest rate decisions (Anand, et al., 2014). Consequently, events in the Arctic that disrupt the ISM, poses a significant risk to India's economy.

15 See also (ISPI, 2023)

CURRENT US ARCTIC SECURITY POLICY AND INDIA

Existing US Arctic policy appears to have largely overlooked the role of India, thereby risking US climate and broader security interests in the Arctic. This includes key documents shaping US Arctic policy such as the White House's 2022 National Arctic Strategy, the subsequent 2023 Implementation Plan, and the 2019 Arctic Strategy of the Department of Defense (to be updated in 2024). While India is mentioned prominently in other US strategies, such as the White House Indo-Pacific Strategy, its inclusion in Arctic strategic documents is notably absent.

US 2022 NATIONAL ARCTIC STRATEGY

In the 2022 National Arctic Strategy, the US articulates its interest in "mitigating and building resilience to climate change and ecosystem degradation" (White House, 2022) recognising both "difficulties as well as some new possibilities" (White House, 2022). The Strategy states that "despite the challenges to Arctic cooperation resulting from Russia's aggression in Ukraine, the United States will work to sustain institutions for Arctic cooperation, including the Arctic Council, and position these institutions to manage the impacts of increasing activity in the region" (White House, 2022). As a means of achieving this, the Strategy states "we will deepen our cooperation with Arctic Allies and partners: Canada, the Kingdom of Denmark (including Greenland), Finland, Iceland, Norway, and Sweden" (White House, 2022). Notably, the focus on these nations adheres to the conventional perception of Arctic states, with only a brief reference to non-traditional Arctic States, like China, within the context of increased global presence, investments, and activities in the Arctic (White House, 2022).

The Strategy also states that the US plans to "expand private sector-led investment and pursue sustainable economic development in the Arctic (White House, 2022)," as part of a broader effort to "work with allies and partners to increase responsible Arctic investment, including in critical minerals" (White House, 2022). This economic development aspect, while potentially risky due to its impact on the fragile Arctic climate and potential strategic implications vis-à-vis Russia, draws parallels with the Indian approach to the Arctic. In both cases, diverse interests competing for attention could pose challenges to Arctic preservation if short-term development gains precedence.

Prioritizing short-term development could accelerate loss of sea ice and hasten warming, posing threats to US communities in Alaska, complicate broader climate change mitigation efforts, and heighten security risks as it becomes easier for Russia to move warships and supplies through Arctic waters (Cusick, 2024). However, the Strategy leaves open the possibility for the US to place greater emphasis on its climate protection commitments, with the opportunity to identify partners like India with shared goals and collaborate on fulfilling these objectives.

IMPLEMENTATION PLAN FOR THE 2022 NATIONAL STRATEGY FOR THE ARCTIC REGION

The Implementation Plan for the 2022 National Strategy for the Arctic Region is more promising in terms of its commitment to climate protection. However, it continues to overlook India in its considerations. The plan outlines the U.S.'s intention to reduce emissions of carbon dioxide, methane, and black carbon through various initiatives, both bilateral and multilateral, to complement global mitigation efforts. It commits to "expand scientific cooperation among Arctic partners, including through the Arctic Council during the Norwegian chairmanship" focusing on understanding the science of Arctic tipping points, including those related to greenhouse gas emissions from permafrost thaw (White House, 2022). While these initiatives could benefit India, the US seems to be limiting its consideration of Arctic partners to traditional Arctic States, without appreciating the importance of India as a partner.

DEPARTMENT OF DEFENSE ARCTIC STRATEGY

The Department of Defense also has an Arctic Strategy, the most recent version of which was published in 2019, with a new version to be released in early 2024 (Evardson, 2023). The 2019 version highlights the threat posed to US interests by Russian and Chinese activities in the Arctic. Specifically, it notes the importance of "limiting the ability of China and Russia to leverage the region as a corridor for competition that advances their strategic objectives through malign or coercive behavior" (Office of the Under Secretary of Defense for Policy, 2019). The Department of Defense acknowledges Russia's strengthened presence in the Arctic, citing the creation of new units, refurbishment of airfields and infrastructure, and establishment of military bases along its Arctic coastline. Concerns also extend to Russia's efforts in establishing air defense and coastal missile systems, early warning radars, rescue centers, and a variety of sensors (Office of the Under Secretary of Defense for Policy, 2019).

Regarding China, the Department of Defense notes its "limited" operational presence in the region, but highlights China's attempts to exert influence over Arctic governance due to its stated interest in "access to natural resources and the opportunities offered by the Arctic sea routes for Chinese shipping" (Office of the Under Secretary of Defense for Policy, 2019). However, the Department of Defense Strategy does not acknowledge the potential role of India in collaborating with the US to counterbalance Russian influence and safeguard long-term US interests. This

omission overlooks the possibility of India being courted by Russia for Arctic policy collaboration, posing risks to US interests. Including analysis of the opportunity for U.S.-Indo Arctic collaboration within US Arctic strategy documents would not only enhance India's legitimate interests in the region but also bolster cooperation on climate protection, economic development, and security.

NATO ARCTIC POLICY AND INDIA

The lack of awareness regarding climate security in both the Arctic and India extends to NATO, a critical concern for broader US policy. As NATO'S leading partner, the US holds considerable influence over the bloc's focus. The absence of India's role in NATO's documents highlights a blind spot beyond domestic policy specifically in safeguarding the Arctic. In its 2023 Climate and Security Impact Assessment, NATO recognizes that "Russia has significantly increased its military activity in the Arctic in recent years, perceiving this region as vital to its security and economic development" (NATO, 2023). It also notes that "China is strengthening its maritime capabilities in the region, including by building new icebreakers to service Arctic shipping routes. China is also investing in energy exploration in the region" (NATO, 2023). However, India is not included in this assessment, despite the recognition of NATO that "easier access to the Arctic's natural resources, including sub-sea oil and gas reserves as well as fishing areas, may lead to increased economic activity in the region and may raise questions regarding ownership of resources" (NATO, 2023).

NATO's omission of India underscores the extent to which India's influence in the Arctic has been undervalued. By concentrating solely on traditional Arctic States for cooperation and considering Russia and China as threats, the US overlooks a crucial Indian dimension in its policy analysis.

INDIA, CHINA, RUSSIA – A RISKY ALLIANCE ON THE ARCTIC IN A MULTIPOLAR WORLD

The absence of bilateral cooperation on the Arctic between the US and India is making it easier for Russia to step into the vacuum and court India to support its efforts to expand further into its Arctic territories.

INDIA AND RUSSIA

Russia and India share a longstanding relationship, often described as 'all weather friends' (Bisen, 2023).16 Russian Foreign Minister, Sergey Lavrov, has described India as one of the most important poles of the emerging multipolar world order, and Russia has used its veto five times in the UN Security Council on issues concerning India (India Today, 2022). This well-established bond has paved the way for Russia to engage with India, aiming to build consensus on Arctic matters involving Russia, India, and China. Russia seeks collaboration with these two nations to garner the economic and political support essential for its ongoing commercial and military expansion into the Arctic (Khorrami, 2022). While this aligns with India's immediate interest in accessing expanded trade routes and exerting influence in Arctic affairs, it compromises its long-term climate and economic security.

Russia's response to sanctions may call for increasing work with both India and China, but not necessarily trilaterally given India's aversion to cooperation with China. Nonetheless, bilateral cooperation between Russia and India and Russia and China poses a significant risk to US interests.

RUSSIAN DEVELOPMENT IN THE ARCTIC AND INDIA

Russia's Arctic commercialization strategy includes intensified resource exploitation and the development of trade routes along the Northern Sea Route. It prioritizes leveraging the Northern Sea Route to transport strategic energy resources globally, anticipating a surge in throughput from 31.5 million tons in 2019 to 130 million tons by 2035. The policy also includes state support for investors making capital investments in infrastructure, implementing traditional economic activities, and advancing digital infrastructure (Mehdiyeva, 2021; Russia Maritime Naval Institute [RMNI], 2020). Measures extend to the continental shelf, including defining its outer border, creating economic models, advancing oil and gas field technologies, and the production of LNG. It further includes supporting the use of natural resources like fish, forests, and marine resources, constructing tourism infrastructure, icebreaker cruise ships, improving professional education, and facilitating relocation of individuals willing to relocate from other parts of Russia to the Arctic Zone (RMNI, 2020).

Russia has entered into negotiations with India and China for both States to supply icebreakers, particularly due to equipment sourcing difficulties in light of sanctions on Russia (Maritime Executive, 2023; Sputnik News, 2023). In addition, from 2021-2022, India increased its imports of Russian oil 33-fold, and Indian companies have signed

16 See also (Parthasarathy, 2019)

agreements with Russian counterparts, including natural gas producer Novatek and the state oil company Indian Oil & Natural Gas Corporation, focusing on Arctic offshore cooperation and exploration opportunities. Novatek intends to supply gas from its future gas chemical plant in the Arctic, which is currently on hold (Brodt, 2023; Dinakar Sethuraman, 2023; Interfax, 2023; Sharma, 2023). India's material support to Russia, not only threatens to exacerbate sea ice loss and Arctic climate stability, but poses a threat to both US and Indian climate and security interests.

RUSSIAN MILITARIZATION OF THE ARCTIC AND INDIA

Russia has significantly intensified its military presence in the Arctic, which includes collaboration with India. Russian strategy focuses on military security, protection, and defense in the Arctic Zone. Measures include enhancing forces' structure, combat readiness, armament, and basing infrastructure, and utilizing dual-use technologies and facilities for defense. These actions demonstrate Russia's commitment to border defense and readiness for potential combat scenarios (RMNI, 2020).

Russia's expansion and modernization of military bases and airfields in the Arctic, driven partly by its invasion of Ukraine, has led to more Russian bases than NATOs (Gronholt-Pedersen & Fouche, 2022). Russia and China were spotted patrolling waters near Alaska in August 2023 (Williams & Novak, 2023). Russia has the largest icebreaker fleet in the world and has equipped some of these icebreakers with military capabilities (Burgess, 2023). As noted by Center for Strategic International Studies (CSIS), Russia has also tested new Arctic-based military capabilities such as hypersonic cruise missiles and nuclear-powered undersea drones (Conley, Melino, & Alterman, 2020). This has led, according to CSIS senior US military leaders, to express growing concern about the prevalence of Russian cruise missiles in the Arctic and their “avenue of approach” to the US In turn, this is leading NATO to increase its own presence in the Arctic to counter Russia’s presence (Gronholt-Pedersen & Fouche, 2022).

Russia’s militarization of the Arctic accelerates sea ice loss and permafrost thaw and increases geopolitical tensions, undermining international cooperation on Arctic protection. Despite these risks, Russia is a critical supplier of arms to India, and conducts joint military drills with China and India (Al Jazeera, 2022; Ferris & Nouwens, 2023). India and China have access to the Russian military zone in the Arctic, and without US outreach, India may find itself further drawn into the Russian military sphere, making it more challenging for the US and its allies to keep the Arctic as a demilitarized region (Stackhouse, 2023).

Russia’s desire to expand regional influence in Asia, coupled with India’s growing Arctic aspirations suggest that bilateral cooperation on the Arctic between India and Russia is plausible. While Russia may seek to enhance ties with both India and China separately, India's cautious approach to collaboration with China limits the likelihood of a trilateral partnership. Given this scenario, the importance of cooperation between the United States and India in the Arctic cannot be overstated. Additionally, India's strategic interests in the region, including climate security and economic development, aligning with the US can bolster efforts to counterbalance Russian influence while promoting sustainable practices in the Arctic. Moreover, U.S.-India collaboration can facilitate scientific research, technological innovation, and policy development aimed at safeguarding the fragile Arctic ecosystem and mitigating the impacts of climate change on a global scale.

COUNTERING RUSSIAN INFLUENCE THROUGH US OUTREACH TO INDIA

To counter the risks of Russia's engagement with India, the United States should work collaboratively with India to stabilize the Arctic's climate and security situation. Neglecting this Indo-Russia dimension could allow Russia to sway India with short-term economic incentives, contrary to US interests. This should start through cooperation in science, research, and technology to align both countries' climate goals and promote Arctic protection.

SCIENCE-LED U.S.-INDO COOPERATION TO ADVANCE US AND INDIAN LONG-TERM INTERESTS

India has great capacity for multi-alignment and its role as a voice for the Global South can benefit U.S.-India Arctic policy (CFR, 2023; Lin, 2023). While the US has not taken account of India in its Arctic policy, both countries have been working on strengthening their broader research and security relationship, and this should now be expanded to cooperation in the Arctic.

SCIENCE-LED COOPERATION BETWEEN THE US AND INDIA

The US has taken steps to strengthen its relationship with India through the Roadmap for U.S.-India Defense Industrial Cooperation, fast tracking technology cooperation and co-production in areas such as land and air combat, intelligence, surveillance among others. This initiative will provide India access to cutting-edge technologies and support its defense modernization plans (DOD, 2023). India and the US have also already worked together on studying monsoon science through the Enhancing Knowledge of the Arabian Sea Marine environment through Science

and Advanced Training (EKAMSAT) program, which examines the interactions between monsoon predictions and the Arabian Sea (Indian Ministry of Earth Sciences, 2023).

Initiating Arctic scientific collaboration to analyze teleconnections would be s a promising step to further strengthen U.S.-India cooperation. India's inaugural Arctic expedition illustrates this potential. Expanding Arctic cooperation benefits both countries: the US gains insights into the climate impacts of continued Arctic activities, while India enhances its international standing in Arctic governance through collaboration with the US This strategic alignment would bring India closer to the US on Arctic affairs, leaving China to be Russia's only major ally in the region.

CONCLUSION

The US and India share a vested interest in safeguarding the Arctic. For India, stringent regulation of commercial and military activities in the Arctic is crucial to averting exacerbated instability to its lifeline – the monsoon rains. Similarly, the US seeks to avoid exacerbating climate damage by refraining from expanding activities in the Arctic, while strategically challenging its rival, Russia, by curtailing its commercial and military influence. The geopolitical advantages of Arctic cooperation present mutual benefits for both, the US and India, provided a sciencebased approach centred on climate protection shapes their bilateral strategy on the Arctic.

India's emerging influence in the Arctic presents a unique opportunity for the US A climate-focused partnership is not just feasible, but imperative for the future of the Arctic and the shared interests of both nations. By embracing this path, the US and India can forge a powerful alliance for Arctic climate protection, leaving a lasting impact on the region and beyond.

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